

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 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

Form C-101
August 1, 2011

Permit 334652

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address MANZANO LLC P.O. Box 1737 Roswell, NM 88202		2. OGRID Number 231429
		3. API Number 30-015-53460
4. Property Code 333807	5. Property Name MIA 64 FEE	6. Well No. 002H

7. Surface Location

UL - Lot H	Section 6	Township 20S	Range 26E	Lot Idn	Feet From 2530	N/S Line N	Feet From 996	E/W Line E	County Eddy
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8. Proposed Bottom Hole Location

UL - Lot G	Section 4	Township 20S	Range 26E	Lot Idn G	Feet From 2200	N/S Line N	Feet From 1375	E/W Line E	County Eddy
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9. Pool Information

WC 20S26E6;BONE SPRING	98380
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Additional Well Information

11. Work Type New Well	12. Well Type OIL	13. Cable/Rotary	14. Lease Type Private	15. Ground Level Elevation 3301
16. Multiple N	17. Proposed Depth 16840	18. Formation 3rd Bone Spring Sand	19. Contractor	20. Spud Date 6/1/2023
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

☒ We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	17.5	13.375	54.5	500	750	0
Int1	12.25	9.625	40	2000	1300	0
Prod	8.5	5.5	20	16840	2500	0

Casing/Cement Program: Additional Comments

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22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Ram	10000	10000	

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify I have complied with 19.15.14.9 (A) NMAC <input checked="" type="checkbox"/> and/or 19.15.14.9 (B) NMAC <input checked="" type="checkbox"/> if applicable.	OIL CONSERVATION DIVISION	
Signature:		
Printed Name: Electronically filed by Michael Hanagan	Approved By: Katherine Pickford	
Title: Manager	Title: Geoscientist	
Email Address: mike@manzanoenergy.com	Approved Date: 3/2/2023	Expiration Date: 3/2/2025
Date: 2/18/2023	Phone: 575-623-1996	Conditions of Approval Attached

DISTRICT I
825 N. French Dr., Hobbs, NM 88240
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DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone (505) 478-3480 Fax: (505) 478-3482

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to appropriate
District Office

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-015-53460	Pool Code 98380	Pool Name WC 20S26E6; BONE SPRING
Property Code 333807	Property Name MIA 64 FEE	Well Number 2H
OGRID No. 231429	Operator Name MANZANO LLC	Elevation 3301'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	6	20 S	26 E		2530	NORTH	996	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
G	4	20 S	26 E		2200	NORTH	1375	EAST	EDDY

Dedicated Acres 320	Joint or Infill	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

<p><u>SURFACE LOCATION</u></p> <p>Lat - N 32.602791° Long - W 104.415856° NMSPCE- N 583036.1 E 515925.3 (NAD-83)</p> <p>Lat - N 32.602677° Long - W 104.415339° NMSPCE- N 582975.3 E 474746.4 (NAD-27)</p>	<p><u>FIRST TAKE POINT</u> 2200' FNL & 500' FEL</p> <p>Lat - N 32.603776° Long - W 104.414243° NMSPCE- N 583393.9 E 516422.2 (NAD-83)</p> <p>Lat - N 32.603619° Long - W 104.413726° NMSPCE- N 583333.1 E 475243.3 (NAD-27)</p>	<p><u>LAST TAKE POINT</u> 2200' FNL & 1420' FEL</p> <p>Lat - N 32.603782° Long - W 104.382893° NMSPCE- N 583390.1 E 526076.0 (NAD-83)</p> <p>Lat - N 32.603667° Long - W 104.382378° NMSPCE- N 583329.2 E 484896.9 (NAD-27)</p>	<p><u>PROPOSED BOTTOM HOLE LOCATION</u></p> <p>Lat - N 32.603782° Long - W 104.382747° NMSPCE- N 583390.1 E 526121.0 (NAD-83)</p> <p>Lat - N 32.603667° Long - W 104.382232° NMSPCE- N 583329.2 E 484941.9 (NAD-27)</p>	<p><u>OPERATOR CERTIFICATION</u></p> <p>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.</p> <p><i>Mike Hanagan</i> 2/15/23 Signature Date</p> <p>MIKE HANAGAN Printed Name</p> <p>MIKE@MANZANOENERGY.COM Email Address</p>
				<p><u>SURVEYORS CERTIFICATION</u></p> <p>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.</p> <p>JANUARY 24, 2023 Date of Survey</p> <p>Signature and Seal of Professional Surveyor: <i>James C. Tompkins</i> JAMES C. TOMPKINS NEW MEXICO 27177 PROFESSIONAL SURVEYOR</p> <p>Job No.: 55803 Draft: FH! JAMES C. TOMPKINS 27177 DATE: 02/05/2023 Certificate Number</p> <p>0' 1500' 3000' 4500' 6000' SCALE: 1" = 3000'</p>

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Santa Fe, NM 87505

Form APD Conditions

Permit 334652

PERMIT CONDITIONS OF APPROVAL

Operator Name and Address: MANZANO LLC [231429] P.O. Box 1737 Roswell, NM 88202	API Number: 30-015-53460
	Well: MIA 64 FEE #002H

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	The Operator is to notify NMOCD by sundry (Form C-103) within ten (10) days of the well being spud
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	Cement is required to circulate on both surface and intermediate1 strings of casing
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
kpickford	The Operator is to notify NMOCD by sundry (Form C-103) within ten (10) days of the well being spud

Intent ☐ As Drilled ☐

API #		
Operator Name:	Property Name:	Well Number

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

First Take Point (FTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

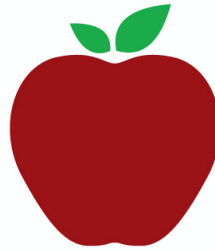
Is this well the defining well for the Horizontal Spacing Unit? ☐Is this well an infill well? ☐

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #		
Operator Name:	Property Name:	Well Number

KZ 06/29/2018

RIG 11



MANZANO
ENERGY PARTNERS

Annular

13-5/8" 5,000#WP

Double Ram

13 5/8" 10,000#WP Pipe

13 5/8" 10,000#WP Blind

Single Ram

13 5/8" 10,000#WP Pipe

With required adaptors

Mud Cross 13 5/8" 10,000#WP

Wing Valve 4 1/16" 10,000#WP

HCR Valve 4 1/16" 10,000#WP

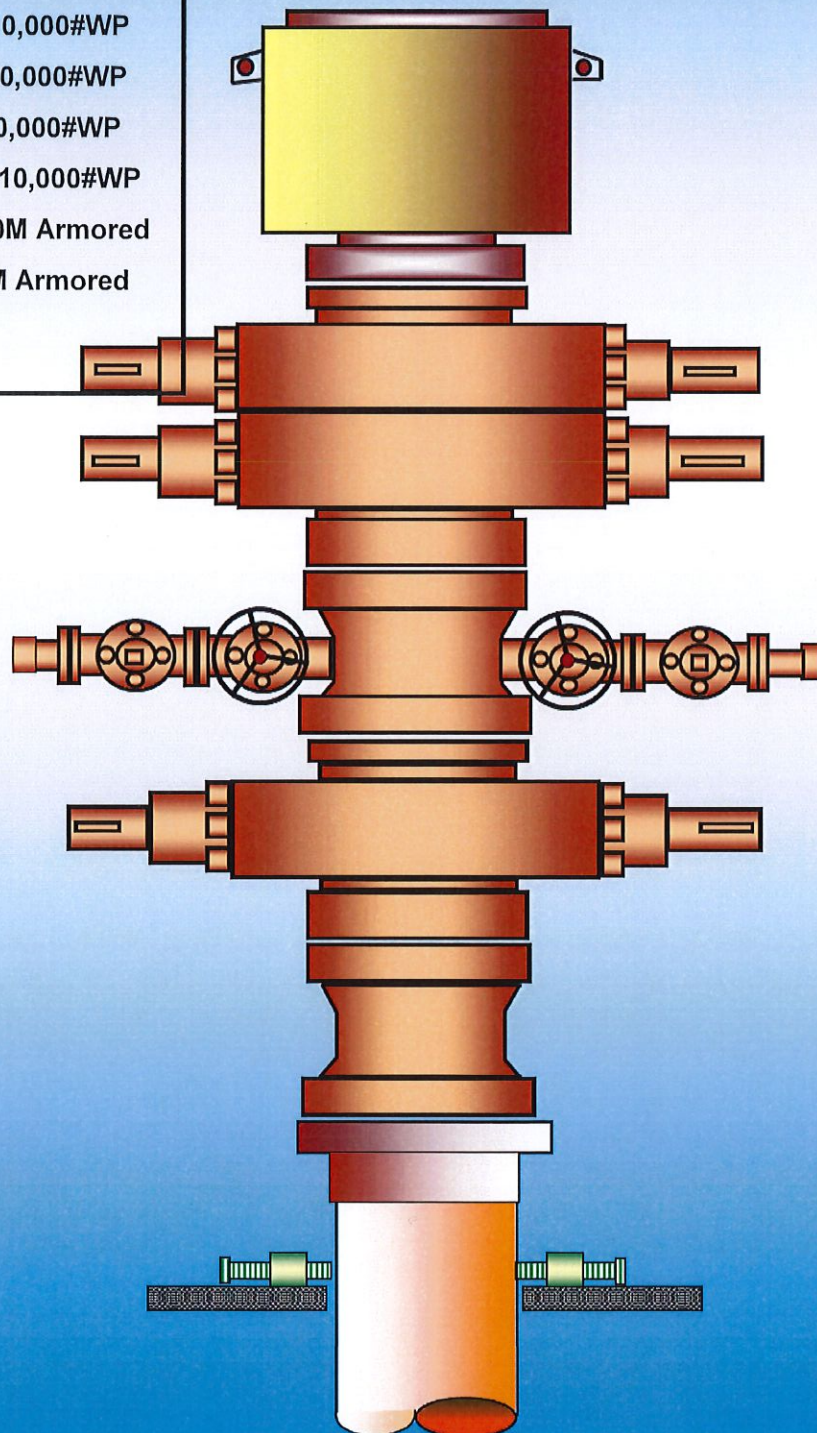
Choke Blk 4 1/16" 10,000#WP

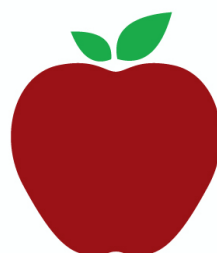
Kill Valve 2 1/16" 10,000#WP

Check Valve 2 1/16" 10,000#WP

Choke Line 4 1/16" 10M Armored

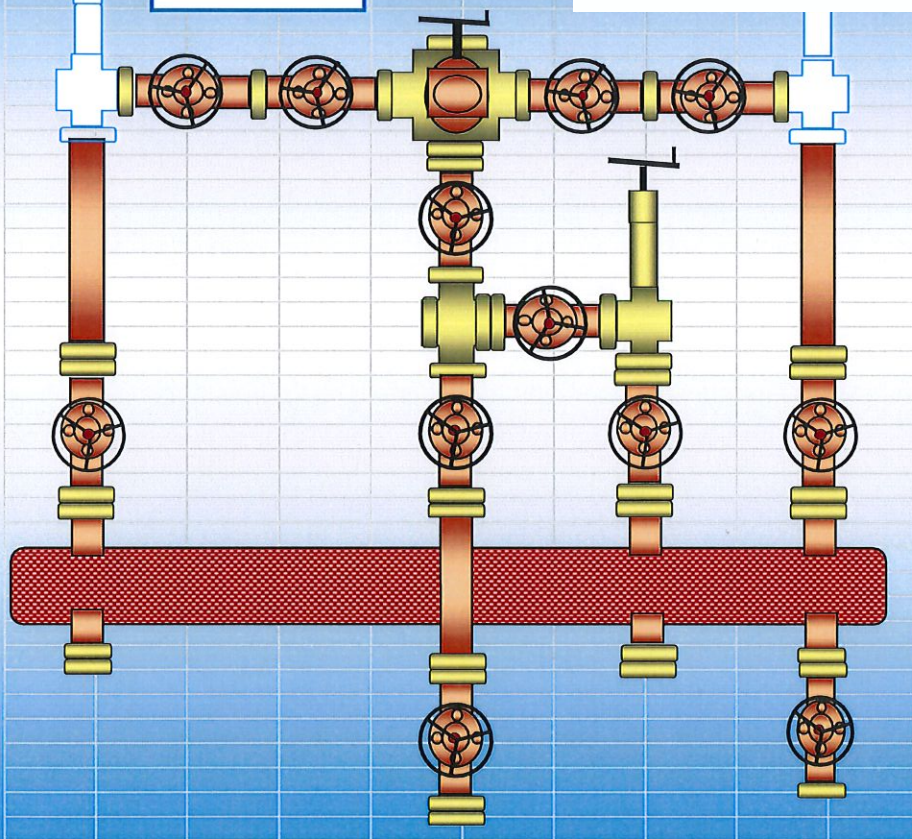
Kill Line 2 1/16" 10M Armored





MANZANO
E N E R G Y P A R T N E R S

Operator Supplied
Hydraulic Chokes



- 3 - Gate Valve 4 1/16" 10,000#WP
- 5 - Gate Valve 3 1/16" 10,000#WP
- 2 - Gate Valves 4 1/16" 5,000#WP
- 3 - Gate Valve 3 1/8" 5,000#WP
- 1- Gate Valve 2 1/16" 10,000#WP
- 1 - Manual Adjustable Choke 3 1/10" 10,000#WP
- 1 - DSA, 3 1/16" 10,000#WP
- 2 - Spacer Spool, 3 1/8" 5 000#WP
- 1 - Spool, flange adp 2 1/16" 10M
- 1 - Studded Cross (5way) 5,000#WP
- 1 - Tee Studded
- 1 - Instrument Flange and Gauge 10 3/4" Buffer Chamber
- 3 - Blind Flanges, 4 1/16" & 3 1/8" 5M
- 3 - Flanges, 4 1/16" 5M & 10M

**Manzano, LLC
Mia 64 Fee # 2H
Hydrogen Sulfide Contingency Plan
For Drilling/Workover/Facility**

SEC 6, T20S, R26E, Eddy County, New Mexico

This well and its anticipated facility are not expected to have hydrogen sulfide releases. However, there may be H₂S production in the nearby area. Manzano will implement the H₂S plan shown below. Manzano will have a company representative on location throughout the drilling and completion of this well. Monitoring equipment will be installed and utilized for monitoring and/or testing. An un-manned H₂S safety trailer and monitoring equipment will be stationed on location during the drilling operations, below the surface casing depth of \pm 500 ft. to total drilling depth. The monitoring equipment will have detection probes placed in the substructure, at the shale shaker and on the drill floor.

**Manzano, LLC
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Hydrogen Sulfide Contingency Plan
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SEC 6, T20S, R26E, Eddy County, New Mexico

EMERGENCY CALL LIST: (Start and continue until ONE of these people have been contacted)

	OFFICE	MOBILE	HOME
Manzano, LLC.	575-623-1996	Extension 310	
Mike Hanagan	575-623-1996.310	575-420-8821	
Tom Becker		432-664-6712	
John Thompson		575-840-5797	

EMERGENCY RESPONSE NUMBERS:

State Police:	Eddy County	575 748 9718
Sheriff	Eddy County	575 746 2701
Emergency Medical Ser	Eddy County	911 or 575 746 2701
Emergency Response	Eddy County SERC	575 476 9620
Artesia Fire Dept		575 746 5001
Carlsbad Police Dept		575 885 2111
Carlsbad Fire Dept		575 885 3125
NMOCD	District 2 (Eddy Chaves)	575 748 1283
American Safety	Lea/Eddy County	575 746 1096
Wild Well Control	Midland	281 784 4700 281 443 4873

**Manzano, LLC
Mia 64 Fee # 2H
Hydrogen Sulfide Contingency Plan
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SEC 6, T20S, R26E, Eddy County, New Mexico

General H2S Emergency Actions:

1. All personnel will immediately evacuate to an up-wind and if possible, up-hill "safe area"
2. If for any reason a person must enter the hazardous area, they must wear a SCBA (Self Contained Breathing Apparatus)
3. Always use the "buddy system"
4. Isolate the well/problem if possible
5. Account for all personnel
6. Display the proper colors warning all unsuspecting personnel of the danger at hand.
7. Contact the Company personnel as soon as possible if not at the location. (use the enclosed call list as instructed

At this point the company representative will evaluate the situation and coordinate the necessary duties to bring the situation under control, and if necessary, the notification of the emergency response agencies and nearby residents.

EMERGENCY PROCEDURES FOR AN UNCONTROLLABLE RELEASE OF H2S

1. All personnel will wear the self-contained breathing apparatus.
2. Remove all personnel to the "safe area". (Always use the buddy system).
3. Contact company personnel if not on location.
4. Set in motion the steps to protect and or remove the "general public" to an upwind "safe area". Maintain strict security & safety procedures while dealing with the source.
5. No entry to any unauthorized personnel.
6. Company representative to Notify appropriate agency: Eddy County Sheriff's Dept. (575-746-2700) &/or New Mexico State Police (575-748-9718).
7. Company representative to Notify NMOCD

**Manzano, LLC
Mia 64 Fee # 2H
Hydrogen Sulfide Contingency Plan
For Drilling/Workover/Facility**

SEC 6, T20S, R26E, Eddy County, New Mexico

PROTECTION OF THE GENERAL PUBLIC (Radius of Exposure):

- 100 ppm at any public area (any place not associated with this site)
- 500 ppm at any public road (any road which the “general public” may travel)
- 100 ppm radius of ¼ mile in New Mexico will be assumed if there is insufficient data to do the calculations, and there is a reasonable expectation that H2S could be present in concentrations greater than 100 ppm in the gas mixture

CALCULATIONS FOR THE 100 PPM (ROE) “Pasquill-Gifford equation”

$X = [(1.589) (\text{mole fraction}) (Q\text{- volume in std cu ft}) \text{ to the power of } (0.6258)]$

CALCULATION FOR THE 500 PPM ROE:

$X = [(.4546) (\text{mole fraction}) (Q\text{- volume in std cu ft}) \text{ to the power of } (0.6258)]$

Example:

If a well/facility has been determined to have 150 / 500 ppm H2S in the gas mixture and the well/facility is producing at a gas rate of 100 MCFPD then:

150 ppm $X = [(1.589) (.00015) (100,000 \text{ cfd }) \text{ to the power of } (.6258)]$
 $X = 7 \text{ ft}$

500 ppm $X = [(.4546) (.0005) (100,000 \text{ cfd }) \text{ to the power of } (.6258)]$
 $X = 3.3 \text{ ft.}$

(These calculations will be forwarded to the appropriate District NMOCD office when Applicable

PUBLIC EVACUATION PLAN:

- 1. Notification of the emergency response agencies of the hazardous condition and implement evacuation procedures.
- A trained person in H2S safety, shall monitor with detection equipment the H2S concentration, wind and area exposure (ROE). This person will determine the outer perimeter of the hazardous area. The extent of the evacuation area will be determined from the data being collected. Monitoring shall continue until the situation has been resolved. **(All monitoring equipment shall be UL approved, for use in class 1 groups A, B, C & D, Division 1, hazardous locations. All monitor will have a minimum capability of measuring H2S, oxygen, and flammable values).**

**Manzano, LLC
Mia 64 Fee # 2H
Hydrogen Sulfide Contingency Plan
For Drilling/Workover/Facility**

SEC 6, T20S, R26E, Eddy County, New Mexico

- Law enforcement shall be notified to set up necessary barriers and maintain such for the duration of the situation as well as aid in the evacuation procedure.
- The company supervising personnel shall stay in communication with all agencies throughout the duration of the situation and inform such agencies when the situation has been contained and the affected area(s) is safe to enter.

PROCEDURE FOR IGNITING AN UNCONTROLABLE CONDITION:

- 1. Human life and/or property are in danger
- 2. There is no hope of bringing the situation under control with the prevailing conditions at the site.

INSTRUCTION FOR IGNITION:

- 1. Two people are required. They must be equipped with positive pressure, "self - contained breathing apparatus" and a "D" ring style full body, OSHA approved safety harness. Nonflammable rope will be attached.
- 2. One of the people will be qualified safety person who will test the atmosphere for H₂S, Oxygen & LFL. The other person will be the company supervisor; he is responsible for igniting the well.
- 3. Ignite up wind from a distance no closer than necessary. Make sure that where you ignite from has the maximum escape avenue available. A 25 mm flare gun shall be used, with a \pm 500 ft. range to ignite the gas.
- 4. Prior to ignition, make a final check for combustible gases.
- 5. Following ignition, continue with the emergency actions & procedures as before.

A. All personnel shall receive proper H₂S training in accordance with Onshore Order III.C.3.a.

B. Briefing Area: two perpendicular areas will be designated by signs and readily accessible.

C. Required Emergency Equipment:

- Well control equipment

**Manzano, LLC MIA 64 Fee #2H
Hydrogen Sulfide Contingency Plan
For Drilling/Workover/Facility**

SEC 6, T20S, R26E, Eddy County, New Mexico

- a. Flare line 100' from wellhead to be ignited by flare gun or automatic striker.
 - b. Choke manifold with a remotely operated choke.
 - c. Mud/gas separator
- Protective equipment for essential personnel.

Breathing apparatus:

- a. Rescue Packs (SCBA) — 1 unit shall be placed at each breathing area, 2 shall be stored in the safety trailer.
- b. Work/Escape packs —4 packs shall be stored on the rig floor the sufficient air hose not to restrict work activity.
- c. Emergency Escape Packs —4 packs shall be stored in the doghouse for emergency evacuation.

Auxiliary Rescue Equipment:

- a. Stretcher
 - b. Two OSHA full body harness
 - c. 100 ft 5/8 inch OSHA approved rope
 - d. 1-20# class ABC fire extinguisher
- H2S detection and monitoring equipment:
The stationary detector with three sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible @ 14 ppm. Calibrate a minimum of every 30 days or as needed. The sensors will be placed in the following places: Rig floor / Bell nipple / End of flow line or where well bore fluid is being discharged.
(Gas sample tubes will be stored in the safety trailer)
- Visual warning systems.
 - a. One color code condition sign will be placed at the entrance to the site reflecting the possible conditions at the site.
 - b. A colored condition flag will be on display, reflecting the current condition at the site at the time.
 - c. Two wind socks will be placed in strategic locations, visible from all angles.
- Mud program: **Only utilized if H2S has been detected**
The mud program has been designed to minimize the volume of H2S circulated to surface. The operator will have the necessary mud products to minimize hazards while drilling in H2S bearing zones.
- Metallurgy: **Only utilized if H2S has been detected**
 - a. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.
 - b. All elastomers used for packing and seals shall be H2S trim.

**Manzano, LLC MIA 64 Fee #2H
Hydrogen Sulfide Contingency Plan
For Drilling/Workover/Facility**

SEC 6, T20S, R26E, Eddy County, New Mexico

- Communication: **Only utilized if H2S has been detected**
- Communication will be via two way radio in emergency and company vehicles. Cell phones and land lines where available.

USING SELF CONTAINED BREATHING AIR EQUIPMENT (SCBA):

- (SCBA) SHOULD BE WORN WHEN ANY OF THE FOLLOWING ARE PERFORMED:
Only utilized if H2S has been detected
 - Working near the top or on top of a tank
 - Disconnecting any line where H2S can reasonably be expected
 - Sampling air in the area to determine if toxic concentrations of H2S exist.
 - Working in areas where over 10 ppm on H2S has been detected.
 - At any time there is a doubt as the level of H2S in the area.
- All personnel shall be trained in the use of SCBA prior to working in a potentially hazardous location.
- Facial hair and standard eyeglasses are not allowed with SCBA.
- Contact lenses are never allowed with SCBA.
- Air quality shall continuously be checked during the entire operation.
- After each use, the SCBA unit shall be cleaned, disinfected, serviced and inspected
- All SCBA shall be inspected monthly.

**Manzano, LLC MIA 64 Fee #2H
Hydrogen Sulfide Contingency Plan
For Drilling/Workover/Facility**

SEC 6, T20S, R26E, Eddy County, New Mexico

RESCUE AND FIRST AID FOR VICTIMS OF HYDROGEN SULFIDE (H₂S) POISONING:

- Do not panic
- Remain Calm & think
- Get on the breathing apparatus
- Remove the victim to the safe breathing area as quickly as possible. Up wind an uphill from source or cross wind to achieve upwind.
- Notify emergency response personnel.
- Provide artificial respiration and or CPR, as necessary
- Remove all contaminated clothing to avoid further exposure.
- A minimum of two personnel on location shall be trained in CPR and First Aid.

Hydrogen Sulfide (H₂S) Toxic Effects

H₂S is extremely toxic. The acceptable ceiling for eight hours of exposure is 10 ppm, which is .001% by volume. H₂S is approximately 20% heavier than air (Sp. Gr= 1.19)(Air = 1) and H₂S is colorless. It forms an explosive mixture with air between 4.3% and 46%. By volume hydrogen sulfide is almost as toxic as hydrogen cyanide and 5-6 times more toxic than carbon monoxide.

Various Gases

COMMON NAME	CHEMICAL ABBREV.	SPECIFIC GRVTY.	THRESHOLD LIMITS	HAZARDOUS LIMITS	LETHAL CONCENTRATIONS
Hydrogen Sulfide	H ₂ S	1.19	10ppm 15 ppm	100 ppm/hr	600 ppm
Hydrogen Cyanide	HCN	0.94	10 ppm	150 ppm/hr	300 ppm
Sulfur Dioxide	SO ₂	2.21	2 ppm	N/A	1000 ppm
Chlorine	CL ₂	2.45	1 ppm	4 ppm/hr	1000 ppm
Carbon Monoxide	CO	0.97	50 ppm	400 ppm/hr	1000 ppm
Carbon Dioxide	CO ₂	1.52	5000 ppm	5%	10%
Methane	CH ₄	0.55	90,000	Combustible@ 5%	N/A

Threshold Limit: Concentrations at which it is believed that all workers may be repeatedly exposed, day after day without adverse effects.

Hazardous Limit: Concentrations that may cause death.

Lethal Concentrations: Concentrations that will cause death with short term exposure.

Threshold Limit- 10 ppm: NIOSH guide to chemical hazards.

PHYSICAL EFFECTS OF HYDROGEN SULFIDE:

CONCENTRATION		PHYSICAL EFFECTS
.001%	10 PPM	Obvious and unpleasant odor. Safe for 8 hour exposure
.005%	50 ppm	Can cause some flu like symptoms and can cause pneumonia
.01%	100 ppm	Kills the sense of smell in 3-15 minutes. May irritate the eyes and throat.
.02%	200 ppm	Kills the sense of smell rapidly. Severely irritates the eyes and throat. Severe flu like symptoms after 4 or more hours. May cause lung damage and or death.
.06%	600 ppm	Loss of consciousness quickly, death will result if not rescued promptly.

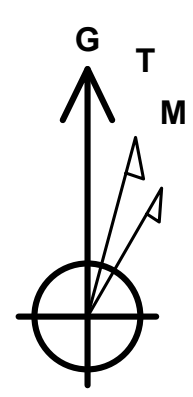


Company: Manzano
Site: Mia/Claire 64
Well: Mia 64 Fee 2H
Project: Eddy County, NM (NAD83)
Rig: 20' Rig



ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
2100.00	0.00	0.00	2100.00	0.00	0.00	0.00	0.00	Begin 2.00°/100' Build
2375.18	5.50	351.02	2374.76	13.04	-2.06	-2.07	13.21	Begin 5.50° Tangent
5878.62	5.50	351.02	5862.05	344.94	-54.54	-54.66	349.22	Begin 2.00°/100' Drop
6153.81	0.00	0.00	6136.81	357.98	-56.60	-56.72	362.43	Begin Vertical Hold
6258.37	0.00	0.00	6241.38	357.98	-56.60	-56.72	362.43	KOP, Begin 10.00°/100' Build
7138.87	88.05	90.02	6814.00	357.78	496.86	496.74	915.89	Begin 88.05° Lateral
7638.44	88.05	90.02	6831.00	357.60	996.14	996.02	1415.17	Begin 2.00°/100' Build
7665.56	88.59	90.02	6831.79	357.59	1023.25	1023.12	1442.27	Hold 88.59° Inc
10279.24	88.59	90.02	6896.00	356.56	3636.14	3636.02	4055.17	Begin 2.00°/100' Build
10289.97	88.81	90.02	6896.24	356.56	3646.87	3646.74	4065.89	Hold 88.81° Inc
12919.81	88.81	90.02	6951.00	355.53	6276.14	6276.02	6695.17	Begin 2.00°/100' Build
12939.32	89.20	90.02	6951.34	355.52	6295.64	6295.52	6714.67	Hold 89.20° Inc
16839.76	89.20	90.02	7006.00	354.00	10195.70	10195.58	10614.73	PBHL



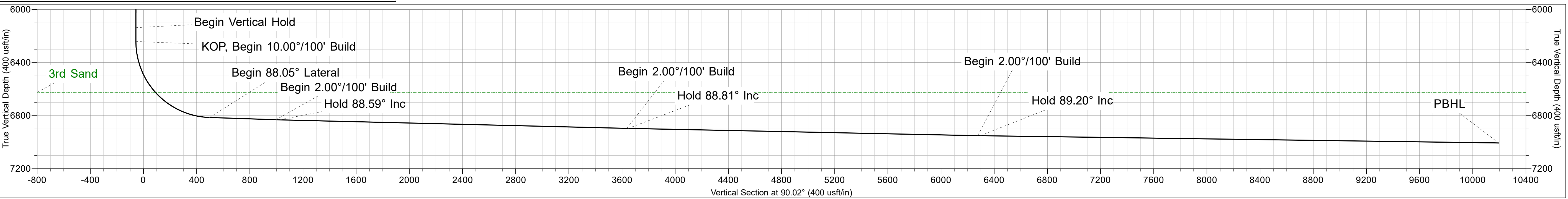
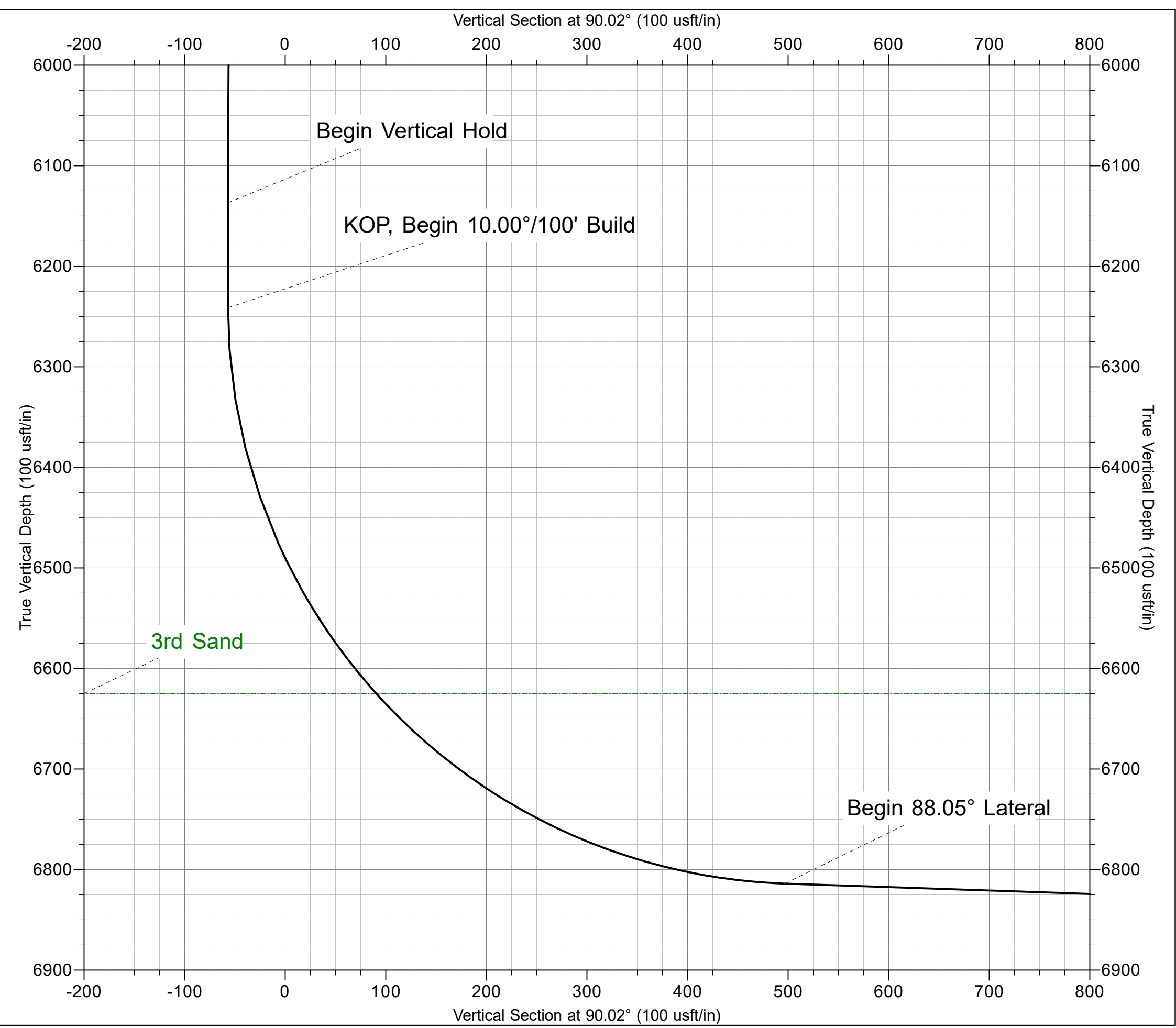
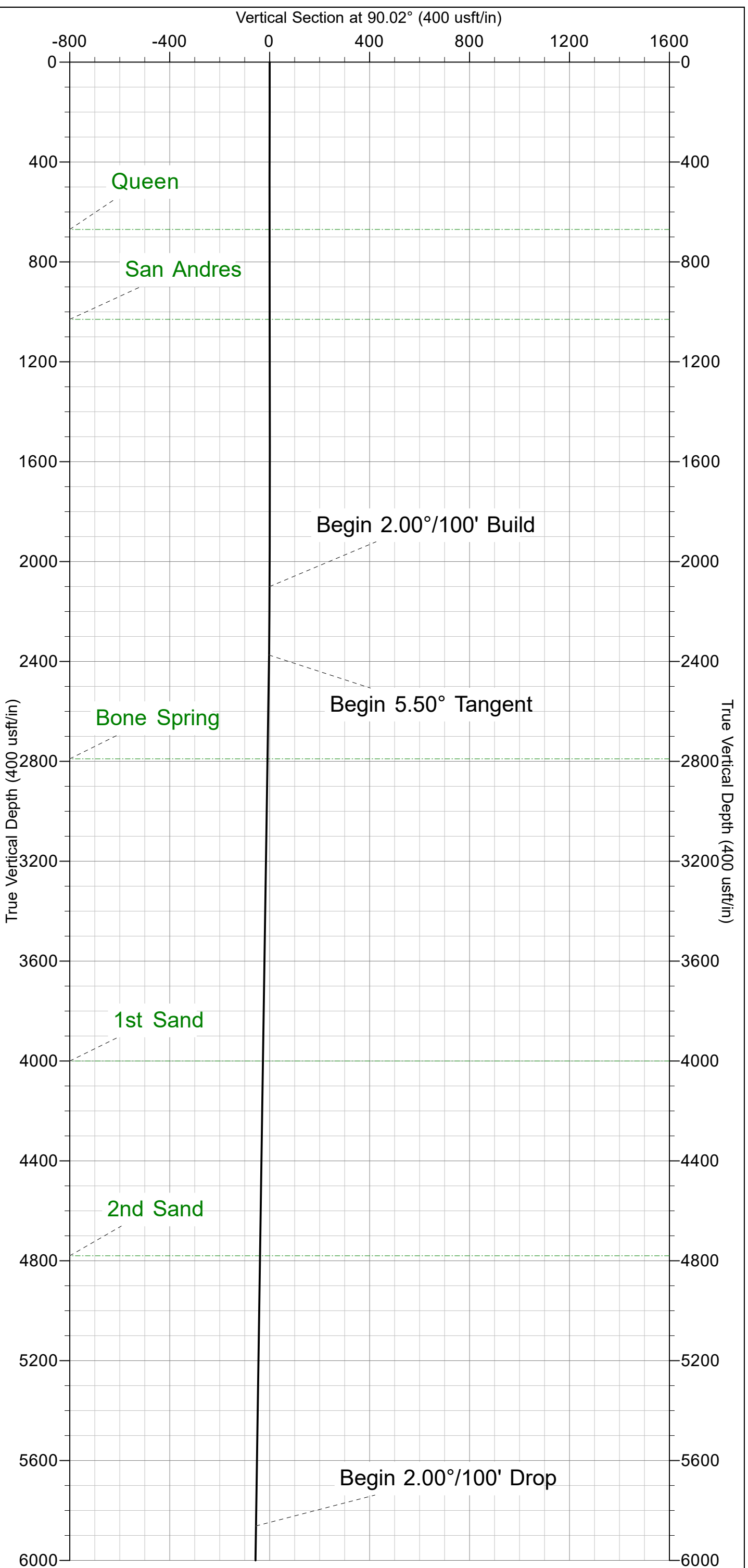
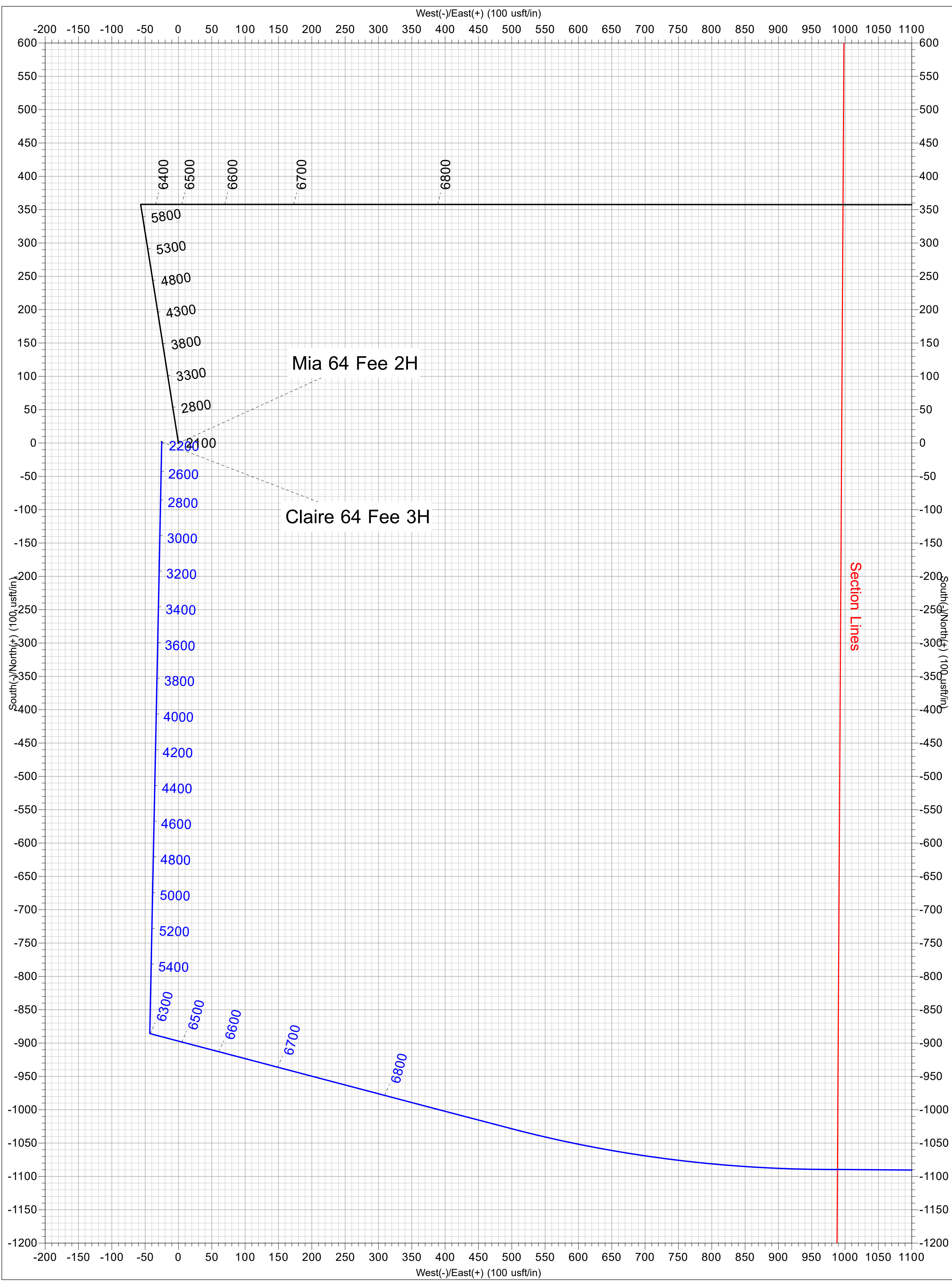
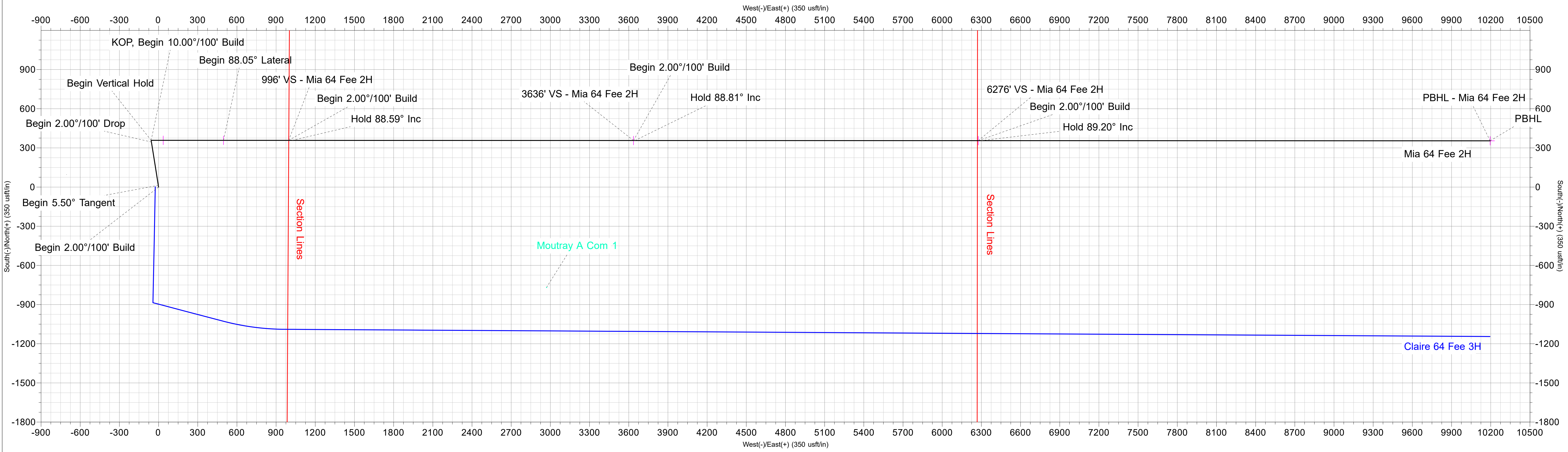
Azimuths to Grid North
True North: 0.04°
Magnetic North: 6.81°

Magnetic Field
Strength: 47453.4nT
Dip Angle: 60.06°
Date: 3/1/2023
Model: IGRF2020

US State Plane 1983
New Mexico Eastern Zone

Created By: HLH
Date: 12:07, February 16 2023
Plan: Design #1

Grid North is 0.04° West of True North (Grid Convergence)
To convert a Magnetic Direction to a Grid Direction, Add 6.81°
To convert a Magnetic Direction to a True Direction, Add 6.76° East





Manzano

Eddy County, NM (NAD83)

Mia/Claire 64

Mia 64 Fee 2H

Wellbore #1

Plan: Design #1

Standard Planning Report

16 February, 2023





Stryker Directional Planning Report



Database:	EDM5000	Local Co-ordinate Reference:	Well Mia 64 Fee 2H
Company:	Manzano	TVD Reference:	RKB @ 3321.00usft (20' Rig)
Project:	Eddy County, NM (NAD83)	MD Reference:	RKB @ 3321.00usft (20' Rig)
Site:	Mia/Claire 64	North Reference:	Grid
Well:	Mia 64 Fee 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Eddy County, NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site		Mia/Claire 64			
Site Position:		Northing:	583,037.70 usft	Latitude:	32.602796
From:	Map	Easting:	515,900.30 usft	Longitude:	-104.415937
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.04

Well	Mia 64 Fee 2H					
Well Position	+N/-S	-1.60 usft	Northing:	583,036.10 usft	Latitude:	32.602791
	+E/-W	25.00 usft	Easting:	515,925.30 usft	Longitude:	-104.415856
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	3,301.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	3/1/2023	6.76	60.06	47,453.40655511

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	90.02

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
2,375.18	5.50	351.02	2,374.76	13.04	-2.06	2.00	2.00	0.00	351.02	
5,878.62	5.50	351.02	5,862.05	344.94	-54.54	0.00	0.00	0.00	0.00	
6,153.81	0.00	0.00	6,136.81	357.98	-56.60	2.00	-2.00	0.00	180.00	
6,258.37	0.00	0.00	6,241.38	357.98	-56.60	0.00	0.00	0.00	0.00	
7,138.87	88.05	90.02	6,814.00	357.78	496.86	10.00	10.00	0.00	90.02	
7,638.44	88.05	90.02	6,831.00	357.60	996.14	0.00	0.00	0.00	0.00	996' VS - Mia 64 Fee
7,665.56	88.59	90.02	6,831.79	357.59	1,023.25	2.00	2.00	0.01	0.20	
10,279.24	88.59	90.02	6,896.00	356.56	3,636.14	0.00	0.00	0.00	0.00	3636' VS - Mia 64 Fee
10,289.97	88.81	90.02	6,896.24	356.56	3,646.87	2.00	2.00	0.00	-0.06	
12,919.81	88.81	90.02	6,951.00	355.53	6,276.14	0.00	0.00	0.00	0.00	6276' VS - Mia 64 Fee
12,939.32	89.20	90.02	6,951.34	355.52	6,295.64	2.00	2.00	0.00	0.00	
16,839.76	89.20	90.02	7,006.00	354.00	10,195.70	0.00	0.00	0.00	0.00	PBHL - Mia 64 Fee



Stryker Directional Planning Report



Database:	EDM5000	Local Co-ordinate Reference:	Well Mia 64 Fee 2H
Company:	Manzano	TVD Reference:	RKB @ 3321.00usft (20' Rig)
Project:	Eddy County, NM (NAD83)	MD Reference:	RKB @ 3321.00usft (20' Rig)
Site:	Mia/Claire 64	North Reference:	Grid
Well:	Mia 64 Fee 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
Begin 2.00°/100' Build									
2,200.00	2.00	351.02	2,199.98	1.72	-0.27	-0.27	2.00	2.00	0.00
2,300.00	4.00	351.02	2,299.84	6.89	-1.09	-1.09	2.00	2.00	0.00
2,375.18	5.50	351.02	2,374.76	13.04	-2.06	-2.07	2.00	2.00	0.00
Begin 5.50° Tangent									
2,400.00	5.50	351.02	2,399.46	15.40	-2.43	-2.44	0.00	0.00	0.00
2,500.00	5.50	351.02	2,499.00	24.87	-3.93	-3.94	0.00	0.00	0.00
2,600.00	5.50	351.02	2,598.54	34.34	-5.43	-5.44	0.00	0.00	0.00
2,700.00	5.50	351.02	2,698.08	43.82	-6.93	-6.94	0.00	0.00	0.00
2,800.00	5.50	351.02	2,797.62	53.29	-8.43	-8.44	0.00	0.00	0.00
2,900.00	5.50	351.02	2,897.16	62.76	-9.92	-9.95	0.00	0.00	0.00
3,000.00	5.50	351.02	2,996.70	72.24	-11.42	-11.45	0.00	0.00	0.00
3,100.00	5.50	351.02	3,096.24	81.71	-12.92	-12.95	0.00	0.00	0.00
3,200.00	5.50	351.02	3,195.77	91.18	-14.42	-14.45	0.00	0.00	0.00
3,300.00	5.50	351.02	3,295.31	100.66	-15.91	-15.95	0.00	0.00	0.00
3,400.00	5.50	351.02	3,394.85	110.13	-17.41	-17.45	0.00	0.00	0.00
3,500.00	5.50	351.02	3,494.39	119.60	-18.91	-18.95	0.00	0.00	0.00
3,600.00	5.50	351.02	3,593.93	129.07	-20.41	-20.45	0.00	0.00	0.00
3,700.00	5.50	351.02	3,693.47	138.55	-21.91	-21.95	0.00	0.00	0.00
3,800.00	5.50	351.02	3,793.01	148.02	-23.40	-23.46	0.00	0.00	0.00
3,900.00	5.50	351.02	3,892.55	157.49	-24.90	-24.96	0.00	0.00	0.00
4,000.00	5.50	351.02	3,992.09	166.97	-26.40	-26.46	0.00	0.00	0.00
4,100.00	5.50	351.02	4,091.63	176.44	-27.90	-27.96	0.00	0.00	0.00
4,200.00	5.50	351.02	4,191.16	185.91	-29.39	-29.46	0.00	0.00	0.00
4,300.00	5.50	351.02	4,290.70	195.39	-30.89	-30.96	0.00	0.00	0.00
4,400.00	5.50	351.02	4,390.24	204.86	-32.39	-32.46	0.00	0.00	0.00
4,500.00	5.50	351.02	4,489.78	214.33	-33.89	-33.96	0.00	0.00	0.00
4,600.00	5.50	351.02	4,589.32	223.81	-35.39	-35.46	0.00	0.00	0.00
4,700.00	5.50	351.02	4,688.86	233.28	-36.88	-36.97	0.00	0.00	0.00
4,800.00	5.50	351.02	4,788.40	242.75	-38.38	-38.47	0.00	0.00	0.00
4,900.00	5.50	351.02	4,887.94	252.23	-39.88	-39.97	0.00	0.00	0.00



Stryker Directional Planning Report



Database:	EDM5000	Local Co-ordinate Reference:	Well Mia 64 Fee 2H
Company:	Manzano	TVD Reference:	RKB @ 3321.00usft (20' Rig)
Project:	Eddy County, NM (NAD83)	MD Reference:	RKB @ 3321.00usft (20' Rig)
Site:	Mia/Claire 64	North Reference:	Grid
Well:	Mia 64 Fee 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,000.00	5.50	351.02	4,987.48	261.70	-41.38	-41.47	0.00	0.00	0.00
5,100.00	5.50	351.02	5,087.02	271.17	-42.88	-42.97	0.00	0.00	0.00
5,200.00	5.50	351.02	5,186.55	280.65	-44.37	-44.47	0.00	0.00	0.00
5,300.00	5.50	351.02	5,286.09	290.12	-45.87	-45.97	0.00	0.00	0.00
5,400.00	5.50	351.02	5,385.63	299.59	-47.37	-47.47	0.00	0.00	0.00
5,500.00	5.50	351.02	5,485.17	309.07	-48.87	-48.97	0.00	0.00	0.00
5,600.00	5.50	351.02	5,584.71	318.54	-50.36	-50.48	0.00	0.00	0.00
5,700.00	5.50	351.02	5,684.25	328.01	-51.86	-51.98	0.00	0.00	0.00
5,800.00	5.50	351.02	5,783.79	337.49	-53.36	-53.48	0.00	0.00	0.00
5,878.62	5.50	351.02	5,862.05	344.94	-54.54	-54.66	0.00	0.00	0.00
Begin 2.00°/100' Drop									
5,900.00	5.08	351.02	5,883.34	346.88	-54.85	-54.97	2.00	-2.00	0.00
6,000.00	3.08	351.02	5,983.08	353.90	-55.96	-56.08	2.00	-2.00	0.00
6,100.00	1.08	351.02	6,083.01	357.48	-56.52	-56.65	2.00	-2.00	0.00
6,153.81	0.00	0.00	6,136.81	357.98	-56.60	-56.72	2.00	-2.00	0.00
Begin Vertical Hold									
6,200.00	0.00	0.00	6,183.00	357.98	-56.60	-56.72	0.00	0.00	0.00
6,258.37	0.00	0.00	6,241.38	357.98	-56.60	-56.72	0.00	0.00	0.00
KOP, Begin 10.00°/100' Build									
6,300.00	4.16	90.02	6,282.97	357.98	-55.09	-55.21	10.00	10.00	0.00
6,350.00	9.16	90.02	6,332.61	357.98	-49.29	-49.41	10.00	10.00	0.00
6,400.00	14.16	90.02	6,381.57	357.97	-39.18	-39.31	10.00	10.00	0.00
6,450.00	19.16	90.02	6,429.45	357.97	-24.85	-24.98	10.00	10.00	0.00
6,500.00	24.16	90.02	6,475.90	357.96	-6.40	-6.53	10.00	10.00	0.00
6,550.00	29.16	90.02	6,520.57	357.95	16.03	15.90	10.00	10.00	0.00
6,600.00	34.16	90.02	6,563.12	357.94	42.27	42.14	10.00	10.00	0.00
6,650.00	39.16	90.02	6,603.21	357.93	72.11	71.99	10.00	10.00	0.00
6,700.00	44.16	90.02	6,640.55	357.92	105.34	105.21	10.00	10.00	0.00
6,750.00	49.16	90.02	6,674.86	357.91	141.69	141.57	10.00	10.00	0.00
6,800.00	54.16	90.02	6,705.86	357.89	180.90	180.78	10.00	10.00	0.00
6,850.00	59.16	90.02	6,733.33	357.88	222.66	222.53	10.00	10.00	0.00
6,900.00	64.16	90.02	6,757.06	357.86	266.65	266.53	10.00	10.00	0.00
6,950.00	69.16	90.02	6,776.86	357.85	312.55	312.42	10.00	10.00	0.00
7,000.00	74.16	90.02	6,792.58	357.83	360.00	359.87	10.00	10.00	0.00
7,050.00	79.16	90.02	6,804.11	357.81	408.63	408.51	10.00	10.00	0.00
7,100.00	84.16	90.02	6,811.36	357.79	458.09	457.96	10.00	10.00	0.00
7,138.87	88.05	90.02	6,814.00	357.78	496.86	496.74	10.00	10.00	0.00
Begin 88.05° Lateral									
7,200.00	88.05	90.02	6,816.08	357.76	557.95	557.83	0.00	0.00	0.00
7,300.00	88.05	90.02	6,819.48	357.72	657.90	657.77	0.00	0.00	0.00
7,400.00	88.05	90.02	6,822.89	357.69	757.84	757.71	0.00	0.00	0.00
7,500.00	88.05	90.02	6,826.29	357.65	857.78	857.66	0.00	0.00	0.00
7,600.00	88.05	90.02	6,829.69	357.61	957.72	957.60	0.00	0.00	0.00
7,638.44	88.05	90.02	6,831.00	357.60	996.14	996.02	0.00	0.00	0.00
Begin 2.00°/100' Build									
7,665.56	88.59	90.02	6,831.79	357.59	1,023.25	1,023.12	2.00	2.00	0.01
Hold 88.59° Inc									
7,700.00	88.59	90.02	6,832.64	357.58	1,057.68	1,057.55	0.00	0.00	0.00
7,800.00	88.59	90.02	6,835.10	357.54	1,157.65	1,157.52	0.00	0.00	0.00
7,900.00	88.59	90.02	6,837.55	357.50	1,257.62	1,257.49	0.00	0.00	0.00
8,000.00	88.59	90.02	6,840.01	357.46	1,357.59	1,357.46	0.00	0.00	0.00
8,100.00	88.59	90.02	6,842.47	357.42	1,457.56	1,457.43	0.00	0.00	0.00
8,200.00	88.59	90.02	6,844.92	357.38	1,557.53	1,557.40	0.00	0.00	0.00



Stryker Directional Planning Report



Database:	EDM5000	Local Co-ordinate Reference:	Well Mia 64 Fee 2H
Company:	Manzano	TVD Reference:	RKB @ 3321.00usft (20' Rig)
Project:	Eddy County, NM (NAD83)	MD Reference:	RKB @ 3321.00usft (20' Rig)
Site:	Mia/Claire 64	North Reference:	Grid
Well:	Mia 64 Fee 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,300.00	88.59	90.02	6,847.38	357.34	1,657.50	1,657.37	0.00	0.00	0.00
8,400.00	88.59	90.02	6,849.84	357.30	1,757.47	1,757.34	0.00	0.00	0.00
8,500.00	88.59	90.02	6,852.29	357.26	1,857.44	1,857.31	0.00	0.00	0.00
8,600.00	88.59	90.02	6,854.75	357.22	1,957.41	1,957.28	0.00	0.00	0.00
8,700.00	88.59	90.02	6,857.21	357.18	2,057.38	2,057.25	0.00	0.00	0.00
8,800.00	88.59	90.02	6,859.66	357.14	2,157.35	2,157.22	0.00	0.00	0.00
8,900.00	88.59	90.02	6,862.12	357.10	2,257.32	2,257.19	0.00	0.00	0.00
9,000.00	88.59	90.02	6,864.58	357.06	2,357.29	2,357.16	0.00	0.00	0.00
9,100.00	88.59	90.02	6,867.03	357.02	2,457.26	2,457.13	0.00	0.00	0.00
9,200.00	88.59	90.02	6,869.49	356.99	2,557.23	2,557.10	0.00	0.00	0.00
9,300.00	88.59	90.02	6,871.94	356.95	2,657.20	2,657.07	0.00	0.00	0.00
9,400.00	88.59	90.02	6,874.40	356.91	2,757.17	2,757.04	0.00	0.00	0.00
9,500.00	88.59	90.02	6,876.86	356.87	2,857.14	2,857.01	0.00	0.00	0.00
9,600.00	88.59	90.02	6,879.31	356.83	2,957.10	2,956.98	0.00	0.00	0.00
9,700.00	88.59	90.02	6,881.77	356.79	3,057.07	3,056.95	0.00	0.00	0.00
9,800.00	88.59	90.02	6,884.23	356.75	3,157.04	3,156.92	0.00	0.00	0.00
9,900.00	88.59	90.02	6,886.68	356.71	3,257.01	3,256.89	0.00	0.00	0.00
10,000.00	88.59	90.02	6,889.14	356.67	3,356.98	3,356.86	0.00	0.00	0.00
10,100.00	88.59	90.02	6,891.60	356.63	3,456.95	3,456.83	0.00	0.00	0.00
10,200.00	88.59	90.02	6,894.05	356.59	3,556.92	3,556.80	0.00	0.00	0.00
10,279.24	88.59	90.02	6,896.00	356.56	3,636.14	3,636.02	0.00	0.00	0.00
Begin 2.00°/100' Build									
10,289.97	88.81	90.02	6,896.24	356.56	3,646.87	3,646.74	2.00	2.00	0.00
Hold 88.81° Inc									
10,300.00	88.81	90.02	6,896.45	356.55	3,656.89	3,656.77	0.00	0.00	0.00
10,400.00	88.81	90.02	6,898.53	356.51	3,756.87	3,756.75	0.00	0.00	0.00
10,500.00	88.81	90.02	6,900.62	356.47	3,856.85	3,856.73	0.00	0.00	0.00
10,600.00	88.81	90.02	6,902.70	356.43	3,956.83	3,956.71	0.00	0.00	0.00
10,700.00	88.81	90.02	6,904.78	356.40	4,056.81	4,056.68	0.00	0.00	0.00
10,800.00	88.81	90.02	6,906.86	356.36	4,156.79	4,156.66	0.00	0.00	0.00
10,900.00	88.81	90.02	6,908.95	356.32	4,256.76	4,256.64	0.00	0.00	0.00
11,000.00	88.81	90.02	6,911.03	356.28	4,356.74	4,356.62	0.00	0.00	0.00
11,100.00	88.81	90.02	6,913.11	356.24	4,456.72	4,456.60	0.00	0.00	0.00
11,200.00	88.81	90.02	6,915.19	356.20	4,556.70	4,556.58	0.00	0.00	0.00
11,300.00	88.81	90.02	6,917.27	356.16	4,656.68	4,656.55	0.00	0.00	0.00
11,400.00	88.81	90.02	6,919.36	356.12	4,756.66	4,756.53	0.00	0.00	0.00
11,500.00	88.81	90.02	6,921.44	356.08	4,856.63	4,856.51	0.00	0.00	0.00
11,600.00	88.81	90.02	6,923.52	356.04	4,956.61	4,956.49	0.00	0.00	0.00
11,700.00	88.81	90.02	6,925.60	356.01	5,056.59	5,056.47	0.00	0.00	0.00
11,800.00	88.81	90.02	6,927.68	355.97	5,156.57	5,156.45	0.00	0.00	0.00
11,900.00	88.81	90.02	6,929.77	355.93	5,256.55	5,256.42	0.00	0.00	0.00
12,000.00	88.81	90.02	6,931.85	355.89	5,356.53	5,356.40	0.00	0.00	0.00
12,100.00	88.81	90.02	6,933.93	355.85	5,456.50	5,456.38	0.00	0.00	0.00
12,200.00	88.81	90.02	6,936.01	355.81	5,556.48	5,556.36	0.00	0.00	0.00
12,300.00	88.81	90.02	6,938.09	355.77	5,656.46	5,656.34	0.00	0.00	0.00
12,400.00	88.81	90.02	6,940.18	355.73	5,756.44	5,756.32	0.00	0.00	0.00
12,500.00	88.81	90.02	6,942.26	355.69	5,856.42	5,856.29	0.00	0.00	0.00
12,600.00	88.81	90.02	6,944.34	355.65	5,956.40	5,956.27	0.00	0.00	0.00
12,700.00	88.81	90.02	6,946.42	355.62	6,056.37	6,056.25	0.00	0.00	0.00
12,800.00	88.81	90.02	6,948.51	355.58	6,156.35	6,156.23	0.00	0.00	0.00
12,900.00	88.81	90.02	6,950.59	355.54	6,256.33	6,256.21	0.00	0.00	0.00
12,919.81	88.81	90.02	6,951.00	355.53	6,276.14	6,276.02	0.00	0.00	0.00
Begin 2.00°/100' Build									



Stryker Directional Planning Report



Database:	EDM5000	Local Co-ordinate Reference:	Well Mia 64 Fee 2H
Company:	Manzano	TVD Reference:	RKB @ 3321.00usft (20' Rig)
Project:	Eddy County, NM (NAD83)	MD Reference:	RKB @ 3321.00usft (20' Rig)
Site:	Mia/Claire 64	North Reference:	Grid
Well:	Mia 64 Fee 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,939.32	89.20	90.02	6,951.34	355.52	6,295.64	6,295.52	2.00	2.00	0.00
Hold 89.20° Inc									
13,000.00	89.20	90.02	6,952.19	355.50	6,356.32	6,356.19	0.00	0.00	0.00
13,100.00	89.20	90.02	6,953.59	355.46	6,456.31	6,456.18	0.00	0.00	0.00
13,200.00	89.20	90.02	6,954.99	355.42	6,556.30	6,556.17	0.00	0.00	0.00
13,300.00	89.20	90.02	6,956.39	355.38	6,656.29	6,656.16	0.00	0.00	0.00
13,400.00	89.20	90.02	6,957.80	355.34	6,756.28	6,756.15	0.00	0.00	0.00
13,500.00	89.20	90.02	6,959.20	355.30	6,856.27	6,856.14	0.00	0.00	0.00
13,600.00	89.20	90.02	6,960.60	355.26	6,956.26	6,956.13	0.00	0.00	0.00
13,700.00	89.20	90.02	6,962.00	355.23	7,056.25	7,056.12	0.00	0.00	0.00
13,800.00	89.20	90.02	6,963.40	355.19	7,156.24	7,156.11	0.00	0.00	0.00
13,900.00	89.20	90.02	6,964.80	355.15	7,256.23	7,256.11	0.00	0.00	0.00
14,000.00	89.20	90.02	6,966.20	355.11	7,356.22	7,356.10	0.00	0.00	0.00
14,100.00	89.20	90.02	6,967.61	355.07	7,456.21	7,456.09	0.00	0.00	0.00
14,200.00	89.20	90.02	6,969.01	355.03	7,556.20	7,556.08	0.00	0.00	0.00
14,300.00	89.20	90.02	6,970.41	354.99	7,656.19	7,656.07	0.00	0.00	0.00
14,400.00	89.20	90.02	6,971.81	354.95	7,756.18	7,756.06	0.00	0.00	0.00
14,500.00	89.20	90.02	6,973.21	354.91	7,856.17	7,856.05	0.00	0.00	0.00
14,600.00	89.20	90.02	6,974.61	354.87	7,956.16	7,956.04	0.00	0.00	0.00
14,700.00	89.20	90.02	6,976.01	354.84	8,056.15	8,056.03	0.00	0.00	0.00
14,800.00	89.20	90.02	6,977.42	354.80	8,156.14	8,156.02	0.00	0.00	0.00
14,900.00	89.20	90.02	6,978.82	354.76	8,256.13	8,256.01	0.00	0.00	0.00
15,000.00	89.20	90.02	6,980.22	354.72	8,356.12	8,356.00	0.00	0.00	0.00
15,100.00	89.20	90.02	6,981.62	354.68	8,456.11	8,455.99	0.00	0.00	0.00
15,200.00	89.20	90.02	6,983.02	354.64	8,556.10	8,555.98	0.00	0.00	0.00
15,300.00	89.20	90.02	6,984.42	354.60	8,656.09	8,655.97	0.00	0.00	0.00
15,400.00	89.20	90.02	6,985.82	354.56	8,756.08	8,755.96	0.00	0.00	0.00
15,500.00	89.20	90.02	6,987.22	354.52	8,856.07	8,855.95	0.00	0.00	0.00
15,600.00	89.20	90.02	6,988.63	354.48	8,956.06	8,955.94	0.00	0.00	0.00
15,700.00	89.20	90.02	6,990.03	354.44	9,056.05	9,055.93	0.00	0.00	0.00
15,800.00	89.20	90.02	6,991.43	354.41	9,156.04	9,155.92	0.00	0.00	0.00
15,900.00	89.20	90.02	6,992.83	354.37	9,256.03	9,255.91	0.00	0.00	0.00
16,000.00	89.20	90.02	6,994.23	354.33	9,356.02	9,355.90	0.00	0.00	0.00
16,100.00	89.20	90.02	6,995.63	354.29	9,456.01	9,455.89	0.00	0.00	0.00
16,200.00	89.20	90.02	6,997.03	354.25	9,556.00	9,555.88	0.00	0.00	0.00
16,300.00	89.20	90.02	6,998.44	354.21	9,655.99	9,655.87	0.00	0.00	0.00
16,400.00	89.20	90.02	6,999.84	354.17	9,755.98	9,755.86	0.00	0.00	0.00
16,500.00	89.20	90.02	7,001.24	354.13	9,855.97	9,855.85	0.00	0.00	0.00
16,600.00	89.20	90.02	7,002.64	354.09	9,955.96	9,955.84	0.00	0.00	0.00
16,700.00	89.20	90.02	7,004.04	354.05	10,055.95	10,055.83	0.00	0.00	0.00
16,800.00	89.20	90.02	7,005.44	354.02	10,155.94	10,155.82	0.00	0.00	0.00
16,839.76	89.20	90.02	7,006.00	354.00	10,195.70	10,195.58	0.00	0.00	0.00
PBHL									



Stryker Directional Planning Report



Database:	EDM5000	Local Co-ordinate Reference:	Well Mia 64 Fee 2H
Company:	Manzano	TVD Reference:	RKB @ 3321.00usft (20' Rig)
Project:	Eddy County, NM (NAD83)	MD Reference:	RKB @ 3321.00usft (20' Rig)
Site:	Mia/Claire 64	North Reference:	Grid
Well:	Mia 64 Fee 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
VP/KOP - Mia 64 Fee	0.00	360.00	6,136.81	357.98	35.68	583,394.08	515,960.98	32.603775	-104.415741
- plan misses target center by 92.28usft at 6153.67usft MD (6136.67 TVD, 357.98 N, -56.60 E)									
- Point									
LP - Mia 64 Fee 2H	0.00	0.00	6,814.00	357.80	496.90	583,393.90	516,422.20	32.603776	-104.414243
- plan misses target center by 0.02usft at 7138.91usft MD (6814.00 TVD, 357.78 N, 496.90 E)									
- Point									
996' VS - Mia 64 Fee	0.00	360.00	6,831.00	357.60	996.14	583,393.70	516,921.44	32.603776	-104.412622
- plan hits target center									
- Point									
3636' VS - Mia 64 Fee	0.00	360.00	6,896.00	356.56	3,636.14	583,392.66	519,561.44	32.603779	-104.404049
- plan hits target center									
- Point									
6276' VS - Mia 64 Fee	0.00	360.00	6,951.00	355.53	6,276.14	583,391.63	522,201.44	32.603780	-104.395476
- plan hits target center									
- Point									
PBHL - Mia 64 Fee 2H	0.00	360.00	7,006.00	354.00	10,195.70	583,390.10	526,121.00	32.603782	-104.382748
- plan hits target center									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
670.00	670.00	Queen		0.00		
1,030.00	1,030.00	San Andres		0.00		
2,792.35	2,790.00	Bone Spring		0.00		
4,007.95	4,000.00	1st Sand		0.00		
4,791.56	4,780.00	2nd Sand		0.00		
6,678.70	6,625.00	3rd Sand		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
2,100.00	2,100.00	0.00	0.00	Begin 2.00°/100' Build	
2,375.18	2,374.76	13.04	-2.06	Begin 5.50° Tangent	
5,878.62	5,862.05	344.94	-54.54	Begin 2.00°/100' Drop	
6,153.81	6,136.81	357.98	-56.60	Begin Vertical Hold	
6,258.37	6,241.38	357.98	-56.60	KOP, Begin 10.00°/100' Build	
7,138.87	6,814.00	357.78	496.86	Begin 88.05° Lateral	
7,638.44	6,831.00	357.60	996.14	Begin 2.00°/100' Build	
7,665.56	6,831.79	357.59	1,023.25	Hold 88.59° Inc	
10,279.24	6,896.00	356.56	3,636.14	Begin 2.00°/100' Build	
10,289.97	6,896.24	356.56	3,646.87	Hold 88.81° Inc	
12,919.81	6,951.00	355.53	6,276.14	Begin 2.00°/100' Build	
12,939.32	6,951.34	355.52	6,295.64	Hold 89.20° Inc	
16,839.76	7,006.00	354.00	10,195.70	PBHL	

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description

Effective May 25, 2021

I. Operator: MANZANO, LLC **OGRID:** 231429 **Date:** 2 / 10 / 23

II. Type: ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
MIA 64 FEE #2H	30-015-	H-6-20s-26e	2530'N & 996' FE	1500	2000	2000

3

IV. Central Delivery Point Name: Same [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
MIA 64 FEE #2H		7/1/23	8/1/23	9/1/23	9/15/23	10/1/23

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan
EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☐ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.

If Operator checks this box, Operator will select one of the following:

Well Shut-In. ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- (a) power generation on lease;
- (b) power generation for grid;
- (c) compression on lease;
- (d) liquids removal on lease;
- (e) reinjection for underground storage;
- (f) reinjection for temporary storage;
- (g) reinjection for enhanced oil recovery;
- (h) fuel cell production; and
- (i) other alternative beneficial uses approved by the division.

Section 4 - Notices


1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature: 
Printed Name: Mike Hanagan
Title: MANAGER
E-mail Address: mike@manzanoenergy.com
Date: 2/10/23
Phone: 575-623-1996 ext 310

OIL CONSERVATION DIVISION
(Only applicable when submitted as a standalone form)

Approved By:
Title:
Approval Date:
Conditions of Approval:

**ATTACHMENT TO SECTION 1 OF THE NATURAL GAS
MANAGEMENT PLAN
FOR THE
MANZANO, LLC MIA 64 FEE #2H**

Section VI. Separation Equipment

The well will initially be brought thru an adjustable choke into a 72" x 15' 500psi 3-Phase vertical Inlet Separator rated to handle 13500+ BFPD and 15+ MMCFGPD where the gas will be separated from the produced liquids with the residue gas metered before going into the Production Gas Scrubber which is rated to handle 3050 BFPD + 4.5 MMCFGPD and will remove any remaining liquids before sending the residue gas into the Enterprise gas sales line (residual liquids from the Production Gas Scrubber will go into the Production Separator). The fluid coming out of the 3-Phase vertical Inlet Separator will go into a 36" x 10' 500psi 2-phase vertical Production Separator that is rated to handle 4500 BFPD + 6 MMCFGPD where the gas will be separated from the produced liquids with the residue gas then going into the Production Gas Scrubber which will remove any remaining liquids before sending the residue gas into the Enterprise gas sales line. The oil and water will each be metered separately and then the oil will go thru vapor recovery tower into the tank battery. Tank vapors from both the water and the oil tanks will be captured thru a vapor recovery unit and sent to the Enterprise gas sales line.

Anticipated peak production for this well is expected to be 1500 BFPD + 2.0 MMCF which should be easily managed by the Separation Equipment described above which we have already installed for this well.

Section VII. Operational Practices as per 19.15.27.8 NMAC Subsections A through F

Subsection A: Manzano will maximize the recovery of natural gas and minimize the waste of natural gas by properly sizing and maintaining tanks, vessels and related equipment including thief hatches, enardo valves, flares and vapor recovery equipment. In all circumstances, Manzano shall flare rather than vent natural gas except when flaring is technically infeasible or when flaring would a risk to safe operations or personal safety.

Subsection B - Venting and flaring during drilling operations: Manzano will capture natural gas coming from the wellbore during drilling operations by routing any gas laden fluids through a mud gas separator with the gas then being routed to a flare stack located at least 100' from the wellbore. In addition, Manzano will be drilling the well with fluid sufficiently weighted to minimize the entry of natural gas into the wellbore. Any gas that is flared during the drilling operations will be reported pursuant to Paragraph (1) of Subsection G of 19.15.27.8 NMAC.

Subsection C - Venting and flaring during completion operations: After fracing, sand and the frac plugs will be cleaned out of the wellbore under controlled conditions (circulating 1 barrel in per 1 barrel out) that will reduce or eliminate the flow of gas to the atmosphere. After cleaning

the well out, it is anticipated that a Electronic Submersible Pump will be run on 2.875" tubing and then flowback will commence.

During the initial flowback after the frac job the fluids will go directly into temporary storage tanks until there is sufficient pressure to function a temporary Flowback Separator at which point the fluids will be diverted into the Flowback Separator that will remove the gas from the fluid and send the metered gas to an on-site flare stack until it is feasible to route the gas to the Inlet Separator described in Section VI above for.

As soon as it is practical, the produced fluids will be switched out of the Flowback Separator and into the flowline going to the Inlet Separator described in Section VI above for separation and sale as soon as is feasible.

Gas that is flared during the completion operations will be reported pursuant to Paragraph (1) of Subsection G of 19.15.27.8 NMAC.

Subsection D - Venting and flaring during production operations: Manzano shall not vent or flare natural gas during production operations except as allowed in 19.15.27.8.1,2 &4 NMAC. Any gas that is flared during production operations will be reported pursuant to Paragraph (1) of Subsection G of 19.15.27.8 NMAC. Manzano shall conduct weekly AVO inspections and repair any equipment failures immediately.

Subsection E - Performance standards: The production facilities that will be utilized by this well have been designed to handle in excess of the anticipated maximum throughput and are rated for pressures greater than the anticipated pressures. In addition, the facilities have been designed to minimize waste of natural gas.

The production storage tanks are equipped with an automated tank gauging system that reduces the need to open thief hatches on the tanks or to be on the tanks.

Manzano will install an anchored flare stack over 100' away from the wellbore and production tanks that has an automatic ignitor and continuous pilot that will combust any natural gas routed to the flare stack and is capable of handling 5 MMCFGPD. Any natural gas routed through the flare stack will be metered and will be reported pursuant to Paragraph (1) of Subsection G of 19.15.27.8 NMAC. Natural gas will not be vented except as allowed in 19.15.27.8.1,2 &4 NMAC.

Low bleed pilots in Pneumatic valves will be installed if necessary.

Manzano will utilize SCADA to monitor production and equipment as well as to shut in the wellbore in case of an emergency or other situation that could result in gas being released to the atmosphere.

Should the sales line pressure reach the desired maximum operating pressure, the SCADA system will close the Emergency Shut Down Valve on the wellhead and send an alarm to production personnel. In the event the ESD valve failed to close, gas would be routed to the flare stack with a continuous pilot. Any flared gas would be metered until such time that personnel could be dispatched to resolve the problem or manually shut the well in.

Manzano shall conduct weekly AVO inspections consisting of visual inspections, listening for leaks and smelling for odors, to confirm that all production equipment is operating properly and that there are no leaks or releases of natural gas except as allowed in Subsection D of 19.15.27.8 NMAC. The AVO inspection shall include the inspection of all components to identify defects and leaks. Any leaks that are found shall be immediately repaired. Manzano shall keep record of an AVO inspection for at least 5 years and shall make such record available for inspection by the Division upon request.

Subsection F – Measurement or estimation of vented and flared natural gas: Manzano shall measure or estimate the volume of natural gas that it vents, flares or beneficially uses during drilling, completion and production operations.

Manzano will install equipment to measure the volume of natural gas flared from the Separation Equipment described in Section VI above as well as the process piping and vapor recovery equipment. Metering equipment will be installed to measure the volume of natural gas delivered to the custody transfer point into the Enterprise gas line.

If metering is not practical due to circumstances such as low flow rate or low-pressure venting or flaring, Manzano shall estimate the volume of vented or flared natural gas using a verifiable methodology.

VIII. Best Management Practices to minimize venting during active and planned maintenance:

Manzano will install an automated Emergency Shut Down Valve on wellhead to close the well in the event of an abnormal low or high-pressure occurrence on the flowline or within the facility.

Swabbing operations, if necessary, will be performed through the Separation Equipment described in Section VI above in a closed system.

If tubing is to be pulled, the well will be killed and pulled in an overbalanced condition to increase the safety of personnel and reduce gas emissions.

Should a production vessel need to be worked on, the vessel will be bled down into the system to as low a pressure as is practical and then the vessel will be isolated by valves at the vessel to minimize the volume of gas to be bled off the vessel with none from the associated piping.

Manzano shall verbally notify the division as soon as is possible for any venting or flaring event that exceed 500 MCF or otherwise qualifies as a major release and shall follow up the verbal notification with the filing of a form C-129. On venting or flaring events that are less than 500 MCF, Manzano shall notify the division in writing by filing a form C-129 within 15 days of the event.

MANZANO, LLC MIA 64 FEE #2H

API#: 30-015-_____

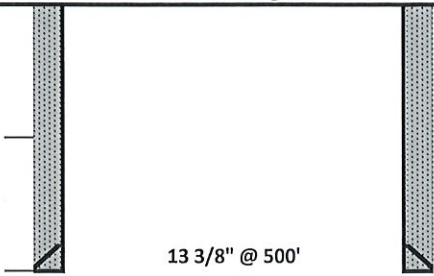
Surface Location: Section 6-T20S-R26E: 2530' FNL & 996' FEL

Bottom Hole Location: Section 4-T20S-R26E: 2200' FNL & 1375' FEL

DIRECTIONS: From Carlsbad, go north on Hwy 285 for 15.8 miles to 7 Rivers, NM, Turn right & go 0.5 miles to location

Geological Prognosis	Wellbore Sketch	Bits	Drilling Fluids	Cement
20" Conductor Pipe @ 100'		20" 52.73#/ft 13.375" 54.5# J55 BTC @ 500'	Fresh Water 8.5 - 9.0 ppg Vis 32 - 45 Solids <4%	500sx Lead (13.5/1.74) & 250sx tail (14.8/1.33)
QUEEN - 670'		17.5" Ulterra CF716 PDC Bit		
SAN ANDRES - 1030'		9.625" 40# L80 BTC @ 2000'	12.25" Ulterra SPL6116 PDC Bit	
BONE SPRINGS CARB 2792'MD/2790'TVD			Fresh Water 8.5 - 9.0 ppg 28 - 30 Vis Solids <5% Chlorides <5k	500sx Lead (10.5/3.71) + 800sx Tail (14.8/1.37)
1st BS sand - 4005'MD/4000'TVD		8.5" Ulterra SPL616 PDC Bit		
2nd BS Sand - 4790/4780'TVD	5.5" 20# P110HC BTC to TD		Cut Brine Weight 8.7 - 9.2 ppg Vis 28 - 32 > 20 Solids <5%	750sx Lead (11.0/3.56) + 1750sx Tail (13.0/1.87)
3rd Sand-6680'MD/6625'TVD	KOP @ 6250' EOC @ 7140'MD	8.5" Curve - Halliburton GT65DHEO 8.5" Lateral - Halliburton GT65DHE		
				MD 16840' TVD 7005'
	KOP @ 6250' EOC @ 7140'MD/6815'TVD	Landing Point @ 7140'MD/6815'TVD		BHL @ 16840'
	890'		9700'	

Wellbore Diagram



13 3/8" Casing Properties

Weight (#/ft)	Grade	Conn	Burst (psi)	Collapse (psi)	Pipe	Conn OD	ID (in)	Drift (in)
54.50	J-55	BTC	2730	1130		14.375	12.615	12.459
80% of Rated Values			2184	904				

Tally Design

Description	~ # of jts	Length	Top	Bottom	Centralizers
Casing	11	457	-1	456	Run a centralizer on bottom 3 joint then every 3rd jt to surface.
Float Collar		1	456	457	
Casing	1	42	457	499	Place bow centralizers across the collars
Float Shoe		1	499	500	
Clean, drift and visually inspect casing on the racks.					
assumes 40' jts					

Hole Size:	17.500 in	Excess:	175%
Casing Size:	13.375 in		
Previous Csg ID:	19.500 in	Previous Csg Depth:	100 ft
Csg Annular Volume:	0.1956 bbls/ft	Casing Volume:	0.1546 bbls/ft
OH Annular Volume:	0.1237 bbls/ft		

Lead

100% Class C+4% Gel+1% CaCl2+0.25PPS Pol-E-Flake+0.005GPS NoFoam V1A

Weight:	13.5 ppg	Mixing Fluid:	9.17 gal/sx
Yield:	1.74 cuft/sx	Total Wtr Required:	108 bbls
Top of Cement:	0 ft	Column Height:	450 ft
Bottom of Cement:	450 ft		
Gauge Volume		Excess Volume	
Cased Hole Volume:	0.3 bbls	0.3 bbls	1 sx
OH Annular:	55.7 bbls	153.1 bbls	494 sx
		153.4 bbls	495 sx

Tail

100% Class C+1% CaCl2+0.005GPS NoFoam V1A

Weight:	14.8 ppg	Mixing Fluid:	6.37 gal/sx
Yield:	1.34 cuft/sx	Total Wtr Required:	38 bbls
Top of Cement:	345 ft	Column Height:	155 ft
Bottom of Cement:	500 ft		
Gauge Volume		Excess Volume	
OH Annular:	19.2 bbls	52.7 bbls	221 sx
Float Track:	6.5 bbls	6.5 bbls	27 sx
		59.2 bbls	248 sx

Required Pump Times

Fluid	Volume bbls	Rate BPM	Minutes	Lead	Tail
Water Spacer	35	6	6		
Lead	153.4	6	26	26	
Tail	59.2	6	10	10	10
Drop Plug	0		15	15	15
Displacement	70.5	8	9	9	9
Contingency			60	60	60
				119	94
				Hrs: 1.99	1.56
				Lead	Tail
				2 hrs : 46 min	1 hrs : 55 min

5/8" CASING AND CEMENTING PROCEDURE:

Wellbore Diagram

13 3/8" @ 500'

9 5/8" @ 2000'

9 5/8" Casing Properties

Weight (#/ft)	Grade	Conn	Burst (psi)	Collapse (psi)	Yield	Conn OD	ID (in)	Drift (in)
40.00	L80	BTC	5750	3090		10.625	8.835	8.679
80% of Rated Values			4600	2472				

Tally Design

Description	~ # of jts	Length	Top	Bottom	Centralizers
Casing	47	1956	0	1956	Run centralizers on bottom 3 joints then every 4th jt to surface.
Float Collar		1	1956	1957	
Casing	1	42	1957	1999	
Shoe		1	1999	2000	
					2000
Clean, drift and visually inspect casing on the racks.					

Hole Size:	12.250 in	Excess:	200%
Casing Size:	9.625 in	Previous Csg Depth:	500 ft
Previous Csg ID:	12.615 in	Casing Volume:	0.0758 bbls/ft
Csg Annular Volume:	0.0646 bbls/ft		
OH Annular Volume:	0.0558 bbls/ft		

Lead ProLite C + 5pps Plexcrete + 2% SME + 0.05% SuspendedCem + 0.25pps Pol-E-Flake + 0.005gps

NoFoam V1A			
Weight:	10.5 ppg	Mixing Fluid:	23.5 gal/sx
Yield:	3.71 cuft/sx	Water Required:	304 bbls
Top of Cement:	0 ft	Column Height:	1950 ft
Bottom of Cement:	1950 ft		
Gauge Volume		Excess Volume	
Cased Hole Volume:	32.3 bbls	32.3 bbls	49 sx
OH Annular:	108.8 bbls	326.3 bbls	494 sx
		358.6 bbls	543 sx

Tail Class C + 5% Salt + 0.005gps NoFoam V1A

Weight:	14.8 ppg	Mixing Fluid:	6.54 gal/sx
Yield:	1.37 cuft/sx	Water Required:	117 bbls
Top of Cement:	900 ft	Column Height:	1100 ft
Bottom of Cement:	2000 ft		
Gauge Volume		Excess Volume	
OH Annular:	61.4 bbls	184.1 bbls	754 sx
Float Track:	0.0 bbls	0.0 bbls	0 sx
		184.1 bbls	754 sx

Lead

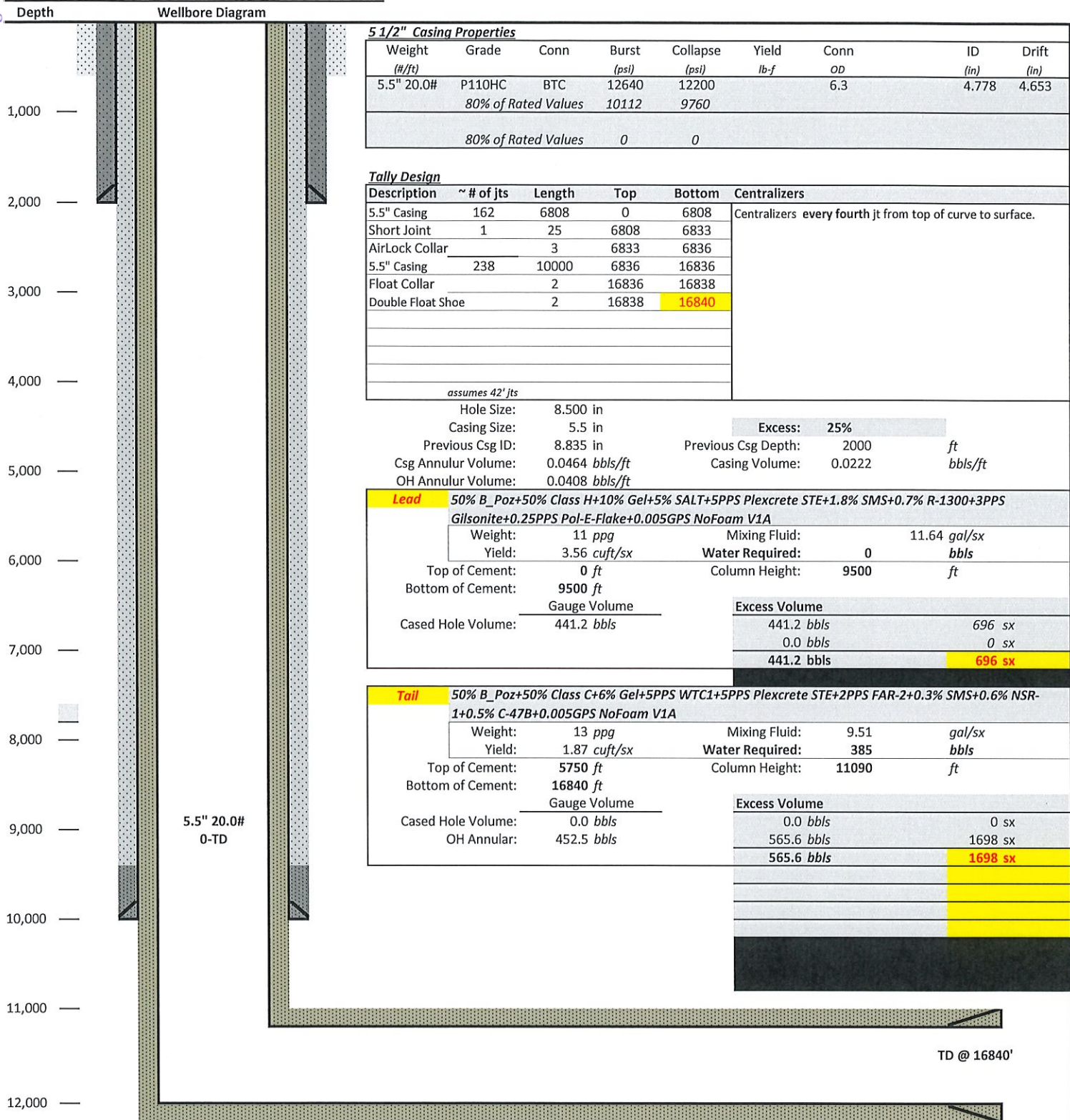
Weight:	ppg	Mixing Fluid:	gal/sx
Yield:	cuft/sx	Total Wtr Required:	0 bbls
Top of Cement:	ft	Column Height:	0 ft
Bottom of Cement:	ft		
Gauge Volume		Excess Volume	
Cased Hole Volume:	32.3 bbls	32.3 bbls	#DIV/0! sx
OH Annular:	-27.9 bbls	-83.7 bbls	#DIV/0! sx
		-51.4 bbls	-78 sx

Tail

Weight:	ppg	Mixing Fluid:	gal/sx
Yield:	cuft/sx	Total Wtr Required:	#DIV/0! bbls
Top of Cement:	ft	Column Height:	0 ft
Bottom of Cement:	ft		
Gauge Volume		Excess Volume	
OH Annular:	0.0 bbls	0.0 bbls	#DIV/0! sx
Float Track:	0.0 bbls	0.0 bbls	#DIV/0! sx
		0.0 bbls	#DIV/0! sx

Required Pump Times		Volume bbls	Rate BPM	Minutes			
Fluid				Lead 1	Tail 1	Lead 2	Tail 2
Stop Loss Spacer	50	6					
Water Spacer	30						
Lead	359	6		60			
Tail	184	6		31	31		
Drop Plug				15	15		
Displacement	152	8		19	19		
Drop Bomb & Open DV Tool				30	30		
Circ OH Annulus	109	8		30	30		
Contingency				90	90		
Water Spacer	30	6					
Lead	-51	6		-9			
Tail	0	6		0	0		
Drop Plug	15			15	15		
Displacement	148	8		19	19		
Contingency				60	60		
274 min		215 min		85 min		94 min	
Lead 1		Tail 1		Lead 2		Tail 2	
5 hrs : 55 min		3 hrs : 30 min		hrs : min		1 hrs : 49 min	

1/2" CASING AND CEMENTING PROCEDURE:



<u>Required Pump Times</u>		Volume	Rate			
Fluid	bbls	BPM	Minutes	Lead	Tail	
MudWash II	30	6	5			
Lead	131.4	6	22	22		
Tail	612.2	6	102	102	102	
Drop Plug	30		30	30	30	
Displacement	0.0	8	0	0	0	
Contingency				90	90	90
				244	222	
				Hrs:	4.07	3.70
			Lead	Tail		
			4 hrs : 4 min	3 hrs : 42 min		