AFMSS

# U.S. Department of the Interior

Bureau of Land Management

Date Printed:

Well Status:

Well Name:

Well Number:

Application f	or Permit	to Drill
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APD ID: APD Received Date: Operator:

APD Package Report Contents

- Form 3160-3

- Operator Certification Report
- Application Report
- Application Attachments
  - -- Operator Letter of Designation: 1 file(s)
  - -- Well Plat: 1 file(s)
- Drilling Plan Report
- Drilling Plan Attachments
  - -- Blowout Prevention Choke Diagram Attachment: 1 file(s)
  - -- Blowout Prevention BOP Diagram Attachment: 1 file(s)
  - -- Casing Design Assumptions and Worksheet(s): 3 file(s)
  - -- Proposed horizontal/directional/multi-lateral plan submission: 1 file(s)
  - -- Other Facets: 1 file(s)
- SUPO Report
- SUPO Attachments
  - -- Existing Road Map: 1 file(s)
  - -- Attach Well map: 1 file(s)
  - -- Production Facilities map: 4 file(s)
  - -- Water source and transportation map: 1 file(s)
  - -- Construction Materials source location attachment: 1 file(s)
  - -- Well Site Layout Diagram: 2 file(s)
  - -- Recontouring attachment: 1 file(s)
  - -- Other SUPO Attachment: 4 file(s)
- PWD Report
- PWD Attachments
  - -- None
- Bond Report

- Bond Attachments -- None

Form 3160-3 (June 2015) UNITED STATES		FORM APPRC OMB No. 1004 Expires: January 3	-0137
DEPARTMENT OF THE INTERIOR		5. Lease Serial No.	
BUREAU OF LAND MANA			
APPLICATION FOR PERMIT TO D	RILL OR REENTER	6. If Indian, Allotee or Trib	e Name
		7. If Unit or CA Agreement	Nama and No
1a. Type of work:   DRILL   RE	EENTER	7. If Ollit of CA'Agreement	, Name and No.
1b. Type of Well:   Oil Well   Gas Well   Ot	her	8. Lease Name and Well No	0.
1c. Type of Completion: Hydraulic Fracturing Sin	ngle Zone Multiple Zone	$\sim 0$	
2. Name of Operator		9. API Well No. 30-03	9-31444
3a. Address	3b. Phone No. (include area code)	10. Field and Pool, or Explo	oratory
4. Location of Well (Report location clearly and in accordance w	vith any State requirements.*)	11. Sec., T. R. M. or Blk. ar	nd Survey or Area
At surface			
At proposed prod. zone			
14. Distance in miles and direction from nearest town or post office	ce*	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. Spaci	ng Unit dedicated to this well	 I
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 (as applicable)	Onshore Oil and Gas Order No. 1, and the F	Iydraulic Fracturing rule per	43 CFR 3162.3-3
1. Well plat certified by a registered surveyor.	4. Bond to cover the operation	is unless covered by an existin	ng bond on file (see
<ol> <li>A Drilling Plan.</li> <li>A Surface Use Plan (if the location is on National Forest Syster SUPO must be filed with the appropriate Forest Service Office)</li> </ol>		mation and/or plans as may be	e requested by the
25. Signature	Name (Printed/Typed)	Date	
Title		I	
Approved by (Signature)	Name (Printed/Typed)	Date	
Title	Office	I	
Application approval does not warrant or certify that the applican applicant to conduct operations thereon. Conditions of approval, if any, are attached.	t holds legal or equitable title to those rights	in the subject lease which we	ould entitle the
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, m	ake it a crime for any person knowingly and	willfully to make to any den	artment or agency
of the United States any false, fictitious or fraudulent statements of			



(Continued on page 2)

\*(Instructions on page 2)

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#### INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the wen, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionany drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

## NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48( d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

**BURDEN HOURS STATEMENT:** Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

## **Additional Operator Remarks**

#### Location of Well

0. SHL: SWSW / 897 FSL / 448 FWL / TWSP: 23N / RANGE: 6W / SECTION: 3 / LAT: 36.248652 / LONG: -107.464293 (TVD: 0 feet, MD: 0 feet ) PPP: NENW / 0 FNL / 1460 FWL / TWSP: 23N / RANGE: 6W / SECTION: 10 / LAT: 36.246302 / LONG: -107.460897 (TVD: 5516 feet, MD: 6818 feet ) PPP: SWSW / 669 FSL / 793 FWL / TWSP: 23N / RANGE: 6W / SECTION: 3 / LAT: 36.248065 / LONG: -107.463129 (TVD: 5524 feet, MD: 5898 feet ) BHL: SWSW / 233 FSL / 1032 FWL / TWSP: 23N / RANGE: 6W / SECTION: 11 / LAT: 36.232991 / LONG: -107.444053 (TVD: 5461 feet, MD: 13758 feet )

#### **BLM Point of Contact**

Name: CHRISTOPHER P WENMAN Title: Natural Resource Specialist Phone: (505) 564-7727 Email: cwenman@blm.gov

## **Review and Appeal Rights**

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

#### **Conditions of Approval**

Operator:	Enduring Resources IV, LLC
Well Names:	Haynes Canyon Unit 428H Pad: HCU 428H, 430H, 440H, 442H
	Haynes Canyon Unit 432H Pad: HCU 432H, 434H, 436H, 438H,
	Northeast Lybrook COM 176H Pad: NELCA 262H and 263H
Legal Location:	Sec 3 & Sec 6 Township 23N, Range 6W, Rio Arriba County
NEPA Log Number:	DOI-BLM-NM-F010-2023-0067-EA
Inspection Date:	June 27, 2023
Lease Number:	NMNM-028733, NMNM-142111X, NMSF-078362, NMNM-132829

The following conditions of approval will apply to Haynes Canyon Unit 428H, 432H, and NE Lybrook Com 176H Reoccupation (NELCA 262H) Oil and Gas Wells Project, and other associated facilities, unless a particular Surface Managing Agency or private surface owner has supplied to Bureau of Land Management and the operator a contradictory environmental stipulation. The failure of the operator to comply with these requirements may result in an assessment or civil penalties pursuant to 43 CFR 3163.1 or 3163.2.

**Disclaimers:** BLM's approval of the APD does not relieve the lessee and operator from obtaining any other authorizations that may be required by the BIA, Navajo Tribe, State, or other jurisdictional entities.

**Copy of Plans:** A complete copy of the APD package, including Surface Use Plan of Operations, Bare Soil Reclamation Plan, Plan of Development (if required), Conditions of Approval, Cultural Resource Record of Review, Cultural Resources Compliance Form (if required), and Project Stipulations (if required) shall be at the project area at all times and available to all persons.

**Review of NEPA documents:** It is the responsibility of the operator to follow all the design features, best management practices, and mitigation measures as contained in the Environmental Assessment DOI-BLM-NM-F010-2023-0067-EA, which contains additional design features and best management practices that must be followed. Copies of the EA, Decision Record, and Finding of No Significant Impact may be obtained from the BLM FFO public room, or online at: EplanningUi (blm.gov).

**Best Management Practices (BMPs)**: Farmington Field Office established environmental Best Management Practices (BMP's) will be followed during construction and reclamation of well site pads, access roads, pipeline ties, facility placement or any other surface disturbing activity associated with this project. Bureau wide standard BMP's are found in the Gold Book, Fourth Edition-Revised 2007 and at

<u>http://www.blm.gov/wo/st/en/prog/energy/oil\_and\_gas/best\_management\_practices.html</u>. Farmi ngton Field Office BMPs are integrated into the Environmental Assessment, Surface Use Plan of Operations, Bare Soil Reclamation Plan, and COAs.

## Construction, Production, Facilities, Reclamation & Maintenance

**Construction & Reclamation Notification:** The operator or their contractor will contact the Bureau of Land Management, Farmington Field Office Environmental Protection Staff (505) 564-7600 or by email, at least 48 hours prior to any construction or reclamation on this project.

**Production Facilities:** design and layout of facilities will be deferred until an onsite with BLM-FFO surface protection staff is conducted to determine the best location. Enduring Resources or their contractor will contact the Bureau of Land Management, Farmington Field Office, Surface, and Environmental Protection Staff (505) 564-7600 to schedule a facility layout onsite.

**Staking:** The holder shall place slope stakes, culvert location and grade stakes, and other construction control stakes as deemed necessary by the authorized officer to ensure construction in accordance with the plan of development. If stakes are disturbed, they shall be replaced before proceeding with construction.

**Weather:** No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts more than 6 inches deep, the soil shall be deemed too wet.

**Stockpile of Soil:** The top 6 inches of soil material will be stripped and stockpiled in the construction zones around the pad [construction zones may be restricted or deleted to provide resource avoidance]. The stockpiled soil will be free of brush and tree limbs, trunks, and roots. The stockpiled soil material will be spread on the reclaimed portions of the pad [including the reserve pit, cut and fill slopes] prior to re-seeding. Spreading shall not be done when the ground or topsoil is frozen or wet.

**Painting of Equipment:** Within 90 days of installation, all above ground structures not subject to safety requirements shall be painted by the Holder to blend with the natural color of the landscape. A reflective material may be used to reduce hazards that may occur when such structures are near roads. Otherwise, the paint use shall be a non-glare, non-reflective, non-chalking color of: Federal 595a-34127 (Juniper Green).

**Storage Tanks:** All open top permanent production or storage tanks regardless of diameter made of fiberglass, steel, or other material used for the containment of oil, condensate, produced water and or other production waste shall be screened, netted, or otherwise covered to protect migratory birds and other wildlife from access.

**Compressors:** Compressor units on this well location not equipped with a drip pan for containment of fluids shall be lined with an impervious material at least 8 mils thick and a 12-inch berm. The compressor will be painted to match the well facilities. Any variance to this will be approved by the Authorized Officer (AO). Noise mitigation may be required at the time of compressor installation.

Culverts: Silt Traps/Bell Holes will be built upstream of all culvert locations.

**Driving Surface Area:** All activities associated within the construction, operation, maintenance, and abandonment of the well location is limited to areas approved in the APD or ROW permit. During the production of the well, vehicular traffic is limited to the daily driving surface area established during interim reclamation construction operations. This area typically forms a keyhole or teardrop driving surface from which all production facilities may be serviced or inspected. A v-type ditch will be constructed on the outside of the driving surface to further define the driving surface and to deter vehicular traffic from entering onto the interim reclamation areas.

**Contouring of Cut and Fill Slopes:** The interim cut and fill slope grade shall be as close to the original contour as possible. To obtain this ratio, pits and slopes shall be back sloped into the pad during interim reclamation. Only subsurface soil and material shall be utilized in the contouring of the cut and fill slopes. Under no circumstances shall topsoil be utilized as substrate material for contouring of cut and fill slopes.

**Maintenance:** In order to perform subsequent well operations, right-of-way (ROW) operations, or install new/additional equipment, it may be necessary to drive, park, and operate on restored, interim vegetation within the previously disturbed area. This is generally acceptable provided damage is promptly repaired and reclaimed following use. Where vehicular travel has occurred as a "convenience" and interim reclamation/vegetation has been compromised, immediate remediation of the affected areas is required. Additionally, where erosion has occurred and compromised the reclamation of the well location, the affected area must be promptly remediated so that future erosion is prevented, and the landform is stabilized.

**Layflat Lines:** Layflat lines used for development of the wells may be on the ground for a maximum of 6 months and shall be retrieved immediately following completion operations. If the layflat lines are needed for longer than 6 months a Sundry NOI shall be submitted to the BLM FFO for review and decision that includes a rationale for the time extension.

The holder or its contractors will notify the BLM of any fires and comply with all rules and regulations administered by the BLM concerning the use, prevention and suppression of fires on federal lands, including any fire prevention orders that may be in effect at the time of the permitted activity. The holder or its contractors may be held liable for the cost of fire suppression, stabilization and rehabilitation. In the event of a fire, personal safety will be the first priority of the holder or its contractors.

#### "Hotwork" and Construction Affecting Fire Safety: The holder or its contractors shall:

- 1. Operate all internal and external combustion engines (including off-highway vehicles, chainsaws, generators, heavy equipment, etc.) with a qualified spark arrester. Qualified spark arresters are maintained and not modified, and meet the Society of Automotive Engineers (SAE) Recommended Practices J335 or J350. Refer to 43 CFR §8343.1.
  - a. Refueling of any combustible engine equipment must be minimum of 3 meters away from any ignition source (open flame, smoking, etc.).
- 2. Maintain and clean all equipment regularly to remove flammable debris buildup and prevent fluid leaks that can lead to ignitions.

- Carry at least one shovel or wildland fire hand tool (combi, Pulaski, McLeod) per person working, minimum 5 gallons of water, and a fire extinguisher rated at a minimum as ABC - 10 pound on each piece of equipment and each vehicle.
- 4. When conducting "hotwork" such as, but not limited to welding, grinding, cutting, sparkproducing work with metal, work that creates hot material or slag; choose an area large enough to contain all hot material that is naturally free of all flammable vegetation or remove the flammable vegetation in a manner compliant with the permitted activity. If adequate clearance cannot be made, wet an area large enough to contain all hot material prior to the activity and periodically throughout the activity to reduce the risk of wildfire ignition. Regardless of clearance, maintain readiness to respond to an ignition at all times. In addition, keep one hand tool per person and at least one fire extinguisher ready, minimum, as specified earlier (#3) during this activity.
- 5. Keep apprised of current and forecasted weather at <a href="https://www.weather.gov/abq/forecasts-fireweather-links">https://www.weather.gov/abq/forecasts-fireweather-links</a> and fire conditions at <a href="https://www.wfas.net">www.wfas.net</a> and take additional fire precautions when fire danger is rated High or greater. Red Flag Warnings are issued by the National Weather Service when fire conditions are most dangerous, and ignitions escape control quickly. Extra precautions are required during these warnings such as additional water, designate a fire watch/patrol and tools. If work is being conducted in an area that is not clear of vegetation within 50 feet of work area; then, when fire danger is rated High or greater and 1. There is a predicted Red Flag warning for your area or 2. If winds are predicted to be greater than 10 mph, stop all hotwork activities for the day at 10 am.
- 6. In the event of an ignition, initiate fire suppression actions in the work area to prevent fire spread to or on federally administered lands. If a fire spreads beyond the capability of workers with the stipulated tools, all will cease fire suppression action and leave the area immediately via pre-identified escape routes.
- 7. Call **911** or the **Taos Interagency Fire Dispatch Center (575-758-6208)** immediately of the location and status of any fire.

#### AND

Notify the respective BLM field office for which the permit or contract was issued immediately of the incident.

#### Farmington Field Office at 505-564-7600

Taos Field Office at 575-758-8851

#### **Noxious Weeds**

Inventory the proposed site for the presence of noxious and invasive weeds. Noxious weeds are those listed on the New Mexico Noxious Weed List and USDA's Federal Noxious Weed List. The New Mexico Noxious Weed List or USDA's Noxious Weed List can be updated at any time and should be regularly check for any changes. Invasive species may or may not be listed as a noxious weed but have been identified to likely cause economic or environmental harm or harm to human health. The following noxious weeds have been identified as occurring

on lands within the boundaries of the Farmington Field Office (FFO). There are numerous invasive species on the FFO such as Russian thistle (*Salsola spp.*) and field bindweed (*Convolvulus arvensis*).

Russian Knapweed (Centaurea repens)	Musk Thistle (Carduss nutans)
Bull Thistle (Cirsium vulgare)	Canada Thistle (Cirsium arvense)
Scotch Thistle (Onopordum acanthium)	Hoary Cress (Cardaria draba)
Perennial Pepperweed (Lepdium latiofolfium)	Halogeton (Halogeton glomeratus)
Spotted Knapweed (Centaurea maculosa)	Dalmation Toadflax (Linaria genistifolia)
Yellow Toadflax (Linaria vulgaris)	Camelthorn (Alhagi pseudalhagi)
African Rue (Penganum harmala)	Salt Cedar (Tamarix spp.)
Diffuse Knapweed (Centaurea diffusa)	Leafy Spurge (Euphorbia esula)

- a. Identified weeds will be treated prior to new surface disturbance if determined by the FFO Noxious Weed Coordinator. A Pesticide Use Proposal (PUP) must be submitted to and approved by the FFO Noxious Weed Coordinator prior to application of pesticide. The FFO Noxious Weeds Coordinator (505-564-7600) can provide assistance in the development of the PUP.
- b. Construction equipment should be inspected and cleaned prior to coming onto the work site. This is especially important on vehicles from out of state or if coming from a weed-infested site.
- c. Fill dirt or gravel may be needed for excavation, road construction/repair, or for spill remediation. If fill dirt or gravel will be required, the source shall be noxious weed free and approved by the FFO Noxious Weed Coordinator.
- d. The site shall be monitored for the life of the project for the presence of noxious weeds (includes maintenance and construction activities). If weeds are found the FFO Coordinator shall be notified at (505) 564-7600 and provided with a Weed Management Plan and if necessary, a Pesticide Use Proposal (PUP). The FFO Coordinator can provide assistance developing the Weed Management Plan and/or the Pesticide Use Proposal.
- e. Only pesticides authorized for use on BLM lands would be used and applied by a licensed pesticide applicator. The use of pesticides would comply with federal and state laws and used only in accordance with their registered use and limitations. (Company Name)'s weed-control contractor would contact the BLM-FFO prior to using these chemicals.
- f. Noxious/invasive weed treatments must be reported to the FFO Noxious Weed Coordinator. A Pesticide Application Record (PAR) is required to report any mechanical, chemical, biological or cultural treatments used to eradicate, and/or control noxious or invasive species. Reporting will be required quarterly and annually or per request from the FFO Noxious Weed Coordinator.

**Bare ground vegetation trim-out:** If bare ground vegetation treatment (trim-out) is desired around facility structures, the operator will submit a bare ground/trim-out design included in their Surface Use Plan of Operations (SUPO). The design will address vegetation safety concerns of the operator and BLM while minimizing impacts to interim reclamation efforts. The design must include what structures to be treated and buffer distances of trim-out. Pesticide use

for vegetation control around anchor structures is not approved. If pesticides are used for bare ground trim-out, the trim-out will not exceed three feet from the edge of any eligible permanent structure (i.e., well heads, fences, tanks). Additional distance/areas may be requested and must be approved by the FFO authorized officer. The additional information below must also be provided to the FFO:

- a. Pesticide use for trim out will require a Pesticide Use Proposal (PUP). A PUP is required *prior* to any treatment and must be approved by the FFO Noxious Weed Coordinator. Only pesticides authorized for use on BLM lands would be used and applied by a licensed pesticide applicator. The use of pesticides would comply with federal and state laws and used only in accordance with their registered use and limitations. Enduring Resources' weed-control contractor would contact the BLM-FFO prior to using these chemicals and provide Pesticide Use Reports (PURs) post treatment.
- A Pesticide Use Report (PUR) or a Biological Use Report (BUR) is required to report any chemical, or biological treatments used to eradicate, or control vegetation on site. Reporting will be required quarterly and annually or per request from the FFO Noxious Weed Coordinator.

#### **Paleontology**

Any paleontological resource discovered by the Operator, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant scientific values. The Holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the Holder.

#### Visual Resources

Dark Sky COAs need to be applied to existing lighting, which is not dark sky friendly and to any additional lights added as part of pad expansion. All permanent lighting will use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the lowest part of the light source). All permanent lighting will be pointed straight down at the ground in order to prevent light spill to the sides. All permanent lighting will be 4000° Kelvin or less with 3000° Kelvin preferred. Warmer light colors are less noticeable by humans and cause less impact to wildlife. All permanent lighting will be controlled by a switch and/or timer which allows the lights to be turned on when workers are on location during dark periods but will keep the lights off the majority of the time.

#### Wildlife Resources

**Wildlife:** The proposed project intersects a known mule deer migration route. Big game habitat areas and hunting activities are valuable land uses which support BLM's multiple-use land management objectives. To maintain reasonable concurrence with surface use closure

requirements in other recognized mule deer migration areas in the BLM FFO, no surface use will take place December 1 – March 1.

**Hazards:** Wildlife hazards associated with the proposed project would be fenced, covered, and/or contained in storage tanks, as necessary.

**Migratory Bird:** Migratory nest survey stipulations. Once drilling and completion activities are complete, any open water that could be harmful to birds and wildlife. must be covered, screened, or netted to prevent entry.

**Threatened, Endangered or Sensitive Species:** If, in operations the operator/holder discovers any Threatened, Endangered, or Sensitive species, work in the vicinity of the discovery will be suspended and the discovery promptly reported to the BLM-FFO T&E specialist at (505) 564-7600. The BLM-FFO will then specify what action is to be taken. Failure to notify the BLM-FFO about a discovery may result in civil or criminal penalties in accordance with The Endangered Species Act (as amended).

**Noise:** This well is located within a designated Noise Sensitive Area (NSA). Once proposed project activities are complete, noise from pumpjack, compressor or other facilities cannot exceed 48.6 db at edge of Bald eagle ACEC core area. Any compressor that emits noise > 48.6db may require a 'noise wall' to deflect sound away from ACEC...

**Nesting:** If a bird nest containing eggs or young is encountered in the path of construction the operator will cease construction and consult with BLM to determine appropriate actions.

**Livestock Grazing:** Cattle are in allotment between 5/1 and 10/31. Industry may need to coordinate with permittee if concerns of livestock in area during construction.

#### Soil, Air, Water

**Land Farming:** No excavation, remediation or closure activities will be authorized without prior approval, on any federal or Indian mineral estate, federal surface, or federal ROW. A Sundry Notice (DOI, BLM Form 3160-5) must be submitted with an explanation of the remediation or closure plan for on-lease actions.

**Emission Control Standard:** Compressor engines 300 horsepower or less used during well production must be rated by the manufacturer as emitting NOx at 2 grams per horsepower hour or less to comply with the New Mexico Environmental Department, Air Quality Bureau's guidance.

**Waste Disposal:** All fluids (i.e., scrubber cleaners) used during washing of production equipment, including compressors, will be properly disposed of to avoid ground contamination, or hazard to livestock or wildlife.

#### **Cultural Resources**

**Non-Permitted Disturbance:** Construction, construction maintenance or any other activity outside the areas permitted by the APD will require additional approval and may require a new cultural survey and clearance.

**Employee Education:** All employees of the project, including the Project Sponsor and its contractors and sub-contractors will be informed that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment. They will also be notified that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm) when on federal land and the New Mexico Cultural Properties Act NMSA 1978 when on state land.

Discovery of Cultural Resources in the Absence of Monitoring: Discovery of Cultural Resources in the Absence of Monitoring: If, in its operations, operator/holder discovers any previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery will be suspended and the discovery promptly reported to BLM Field Manager. BLM will then specify what action is to be taken. If there is an approved "discovery plan" in place for the project, then the plan will be executed. In the absence of an approved plan, the BLM will evaluate the significance of the discovery in accordance with 36 CFR Section 800.13, in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property, or in accordance with an approved program alternative. Minor recordation, stabilization, or data recovery may be performed by BLM or a third party acting on its behalf, such as a permitted cultural resources consultant. If warranted, more extensive archaeological or alternative mitigation, likely implemented by a permitted cultural resources consultant, may be required of the operator/holder prior to allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any mitigations determined appropriate through the agency's Section 106 consultation are completed. Failure to notify the BLM about a discovery may result in civil or criminal penalties in accordance with the Archeological Resources Protection Act (ARPA) of 1979, as amended, the Native American Graves Protection and Repatriation Act (NAGRPA) of 1990, as amended, and other applicable laws.

**Discovery of Cultural Resources during Monitoring:** If monitoring confirms the presence of previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery will be suspended and the monitor will promptly report the discovery to the BLM Field Manager. BLM will then specify what action is to be taken. If there is an approved "discovery plan" in place for the project, then the plan will be executed. In the absence of an approved plan, the BLM will evaluate the significance of the discovery in accordance with 36 CFR Section 800.13, in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property, or in accordance with an approved program alternative. Minor recordation, stabilization, or data recovery may be performed by BLM or a third party acting on its behalf, such as a permitted cultural resources consultant. If warranted, more extensive archaeological or alternative mitigation, likely implemented by a permitted cultural resources consultant, may be required of the operator/holder prior to

allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any mitigations determined appropriate through the agency's Section 106 consultation are completed.

**Damage to Sites:** If, in its operations, operator/holder damages, or is found to have damaged any previously documented or undocumented historic or prehistoric cultural resources, excluding "discoveries" as noted above, the operator/holder agrees at his/her expense to have a permitted cultural resources consultant prepare a BLM approved damage assessment and/or data recovery plan. The operator/holder agrees at his/her expense to implement a **mitigation** that the agency finds appropriate given the significance of the site, which the agency determines in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property. **This mitigation may entail execution of the data recovery plan by a permitted cultural resources consultant and/or alternative mitigations**. Damage to cultural resources may result in **civil or criminal penalties in accordance with the Archeological Resources Protection Act (ARPA) of 1979, as amended, the Native American Graves Protection and Repatriation Act (NAGRPA) of 1990, as amended, and other applicable laws**.

See below additional cultural stipulations.

# IN-HOUSE ARCHEOLOGICAL SURVEY DETERMINATION FARMINGTON FIELD OFFICE

NM-210-2024-003

Date Submitted: 10/17/2023.

Case No./Name: Haynes Canyon 428H Well Pad Company: Enduring Type of Case: Well Pad

#### IS A CULTURAL RESOURCE INVENTORY REQUIRED?

Proposal involves non-Federal lands.

Proposal is within an existing right-of-way.

 $\boxtimes$  Proposal is along an existing road.

Proposal is within an existing disturbed area.

The well pad is to be expanded feet to the

Other: This new well pad will be re-permitted and drilled on an existing location.

Please see the attached base map.

Submitted by: Kim A. on behalf of Chris W.

#### **CULTURAL RESOURCE SPECIALIST RECOMMENDATIONS**

Inventory for cultural resources **is** required.

 $\boxtimes$  Inventory for cultural resources **is not** required for the reason(s) indicated below.

Previous natural ground disturbance has modified the surface so extensively that the likelihood of finding cultural properties is negligible (e.g., within a floodplain), or

Human activity has created a new land surface to such an extent as to eradicate traces of cultural properties, or

Existing Class II or equivalent inventory or environmental data are sufficient to indicate that there is no likelihood of finding a National Register or eligible property, or

Inventory at the Class III level of intensity has previously been performed and records adequately documenting the location, methods, and results of the inventory are available in report no. NMCRIS No 130650

or

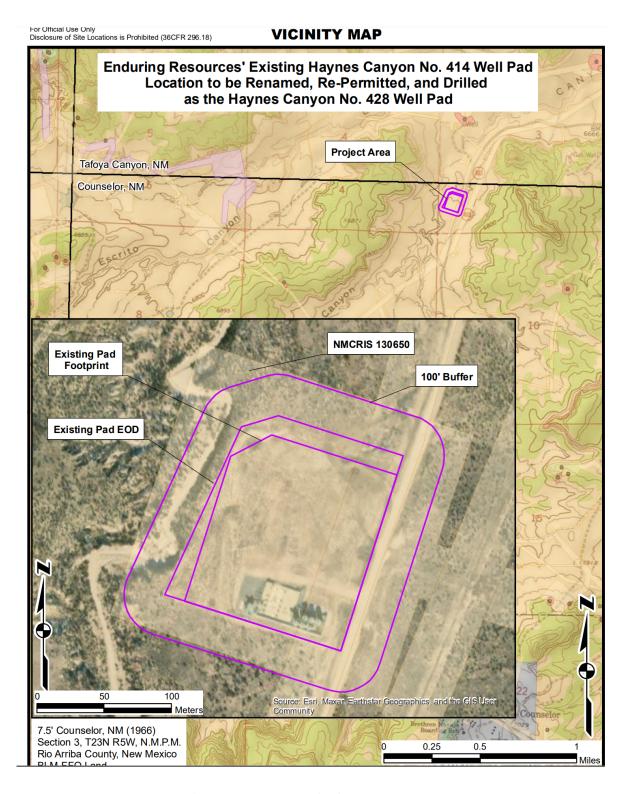
Natural environmental characteristics are unfavorable to the presence of cultural properties (such as recent landslide or rock falls), or

The nature of the proposed action is such that no impact can be expected on significant cultural resources (e.g. land use will not require any surface disturbing action, e.g., aerial spraying, hand application of chemicals, travel on existing roads, etc.), or

Other: Recommended by: Kin Adams

Date: 10/17/2023

Archaeologist Cultural Notes (if any, e.g., conditions, stipulations, etc.):



Released to Imaging: 12/28/2023 4:00:18 PM Approval Date: 12/05/2023



<u>BLM Report Number:</u> 2024(I)002F <u>USGS Map:</u> Counselor & Tafoya Canyon, NM <u>Activity Code</u>: 1310 <u>NMCRIS No:</u> 153816

#### **CULTURAL RESOURCE RECORD OF REVIEW**

BUREAU OF LAND MANAGEMENT FARMINGTON FIELD OFFICE

#### **1. Description of Report/Project:**

<u>Project Name:</u> Haynes Canyon Unit 432H Reoccupation Well Pad, Access Road Upgrade, Pipeline, Layflat, and Temporary Use Areas.

Project Sponsor: Enduring Resources.

Arch. Firm & Report No.: Division of Conservation Archaeology; DCA Report No. 23-DCA-027. Location: T23N R6W Section 3.

Well Footages: 1,773' FNL, 303' FWL.

<u>Split Estate:</u> No.

Project Dimensions:400 ft x 400 ft - well pad (500 ft x 500 ft w/ a 50 ft construction zone).1,571 ft x 30 ft - access road upgrade.3,384 ft x 40 ft - pipeline/layflat.248 ft x 25 ft - TUA.323 ft x 25 ft - TUA.Sites Located:LA39919/NM-01-31536 (NRHP- Eligible; Avoided).

Determination: No Effect to Historic Properties.

#### 2. Field Check: No

3. Cultural ACEC: No.

4. Sensitive Cultural Area: No.

**5. Recommendation:** *PROCEED WITH ACTION:* <u>X</u> *STIPULATIONS ATTACHED:* <u>X</u>

**6. Reviewer / Archaeologist:** Kim Adams **Date**: 10/23/2023

	cet was previ	Jusiy mvci	noi icu.
Report Summary	BLM	Other	Total
Acres Inventoried	14.93	0.00	14.93
Sites Recorded	0	0	0
Prev. Recorded Sites	1	0	1
Sites Avoided	1	0	1
Sites Treated	0	0	0

Note: Part of this project was previously inventoried.

Discovery of Cultural Resources in the Presence or Absence of Monitoring: If any previously unidentified historic or prehistoric cultural resources are discovered during construction or project operations, work in the vicinity of the discovery will be suspended and the discovery will promptly be reported to the BLM Field Manager.

**Note:** If there are questions about these stipulations, contact Kim Adams (BLM) at 505.564.7683 or kadams@blm.gov. Or Geoffrey Haymes (BLM) at 505.564.7684 or ghaymes@blm.gov

1

#### CULTURAL RESOURCE STIPULATIONS Farmington Field Office BLM Report Number: 2024(I)002F

Project Name: Haynes Canyon Unit 432H Reoccupation Well Pad, Access Road Upgrade, Pipeline, Layflat, and Temporary Use Area. Project Sponsor: Enduring Resources.

#### **1. SITE PROTECTION AND EMPLOYEE EDUCATION:**

All employees of the project, including the Project Sponsor and its contractors and sub-contractors will be informed that cultural sites are to be avoided by all personnel, personal vehicles and company equipment. They will also be notified that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm) when on federal land and the New Mexico Cultural Properties Act NMSA 1978 when on state land.

#### 2. ARCHAEOLOGICAL MONITORING IS REQUIRED:

A copy of these stipulations will be supplied to the archeological monitor at least two working days prior to the start of construction activities. No construction activities, including vegetation removal, may begin before the arrival of the archaeological monitor.

The monitor will:

- Ensure that the site protection barrier is located as indicated on the attached map in the vicinity of LA39919.
- Inform BLM-FFO archaeologists that monitoring will be occurring within 24 hours of the scheduled monitoring.
- Observe all construction activities within 100'of LA39919.
- Submit a report of the monitoring activities within 30 days of completion of monitoring unless other arrangements are made with the BLM. These stipulations must be attached to the report.

#### **3. SITE PROTECTION BARRIER:**

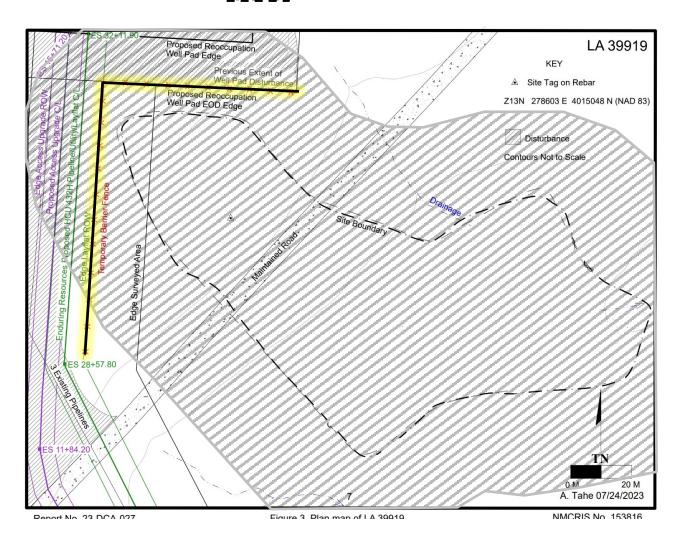
- The temporary site protection barrier will be erected prior to the start of construction. The barrier will consist of upright wooden survey lath spaced no more than 10 feet apart and marked with blue flagging or blue paint. The barrier will remain in place through reclamation and reseeding and shall be promptly removed after reclamation.
- The barrier will be placed as indicated on the attached map. •
- There will be no surface-disturbing activities or vehicle traffic past the barrier.

Note: If there are questions about these stipulations, contact Kim Adams (BLM) at 505.564.7683 or kadams@blm.gov.

#### For Official Use Only: Disclosure of site locations prohibited (43 CFR 7.18) CULTURAL RESOURCE STIPULATIONS Farmington Field Office BLM Report Number: 2024(I)002F

<u>Project Name:</u> Haynes Canyon Unit 432H Reoccupation Well Pad, Access Road Upgrade, Pipeline, Layflat, and Temporary Use Area. <u>Project Sponsor:</u> Enduring Resources.

MONITOR CONSTRUCTION = TEMPORARY FENCING =





BLM Report Number: 2024(I)005F USGS Map: Crow Mesa West, NM Activity Code: 1310 NMCRIS No: 154100

#### **CULTURAL RESOURCE RECORD OF REVIEW**

BUREAU OF LAND MANAGEMENT FARMINGTON FIELD OFFICE

1. Description of Report/Project:

<u>Project Name:</u> Northeast Lybrook Com No 262H **Reoccupation Well**. <u>Project Sponsor:</u> Enduring Resources. <u>Arch. Firm & Report No.:</u> Division of Conservation Archaeology; DCA Report No. 22-DCA-060. <u>Location:</u> T23N R6W Section 6.

Well Footages: See plats

Split Estate: No.

Project Dimensions: 300 ft x 500 ft – well pad (400 ft x 600 ft w/ a 50 ft construction zone).

Sites Located: LA64876/NM-01-34748 (NRHP- Eligible; Update; Avoided; No Further Work). LA175265/NM-210-47840 (NRHP- Eligible; Update; Avoided). LA178266/NM-210-48243 (NRHP- Eligible; Update; Avoided).

Determination: No Effect to Historic Properties.

2. Field Check: No

3. Cultural ACEC: No.

- 4. Sensitive Cultural Area: No.
- **5. Recommendation:** *PROCEED WITH ACTION:* <u>X</u> *STIPULATIONS ATTACHED:* <u>X</u>
- 6. Reviewer / Archaeologist: Kim Adams Date: 11/6/2023

Note: The majority of this project was previously inventoried (see NMCRIS No 129798).

Report Summary	BLM	Other	Total
Acres Inventoried	0.74	0.00	0.74
Sites Recorded	0	0	0
Prev. Recorded Sites	3	0	3
Sites Avoided	3	0	3
Sites Treated	0	0	0

Discovery of Cultural Resources in the Presence or Absence of Monitoring: If any previously unidentified historic or prehistoric cultural resources are discovered during construction or project operations, work in the vicinity of the discovery will be suspended and the discovery will promptly be reported to the BLM Field Manager.

**Note:** If there are questions about these stipulations, contact Kim Adams (BLM) at 505.564.7683 or kadams@blm.gov.

#### CULTURAL RESOURCE STIPULATIONS Farmington Field Office BLM Report Number: 2024(I)005F

<u>Project Name:</u> Northeast Lybrook Com No 262H **Reoccupation Well**. <u>Project Sponsor:</u> Enduring Resources.

#### **1. SITE PROTECTION AND EMPLOYEE EDUCATION:**

All employees of the project, including the Project Sponsor and its contractors and sub-contractors will be informed that cultural sites are to be avoided by all personnel, personal vehicles and company equipment. They will also be notified that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm) when on federal land and the New Mexico Cultural Properties Act NMSA 1978 when on state land.

## 2. ARCHAEOLOGICAL MONITORING IS REQUIRED:

A copy of these stipulations will be supplied to the archeological monitor at least two working days prior to the start of construction activities. No construction activities, including vegetation removal, may begin before the arrival of the archaeological monitor.

The monitor will:

- Ensure that the site protection barriers are located as indicated on the attached maps in the vicinity of LA175265, & LA178266.
- Inform BLM-FFO archaeologists that monitoring will be occurring within 24 hours of the scheduled monitoring.
- Observe all construction activities within 100'of LA175265, & LA178266.
- Submit a report of the monitoring activities within 30 days of completion of monitoring unless other arrangements are made with the BLM. These stipulations must be attached to the report.

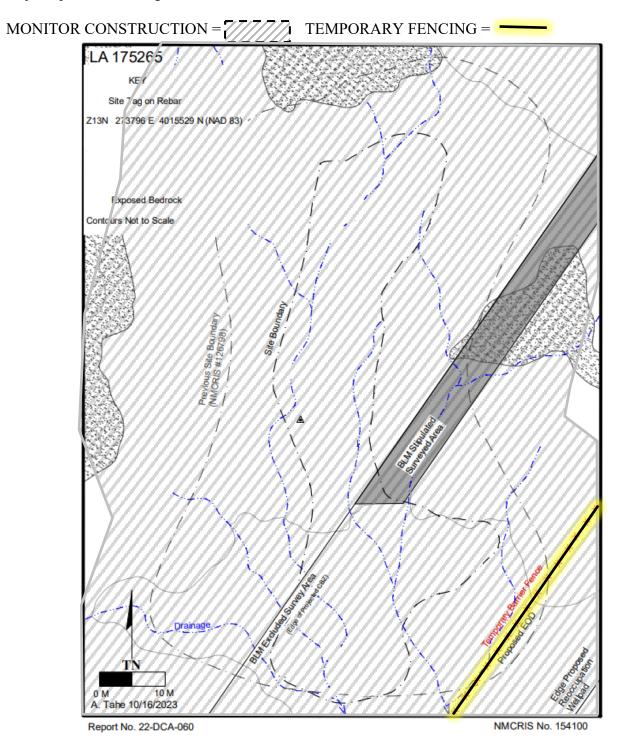
## **3. SITE PROTECTION BARRIER:**

- The temporary site protection barriers will be erected prior to the start of construction. The barriers will consist of upright wooden survey lath spaced no more than 10 feet apart and marked with blue flagging or blue paint. The barriers will remain in place through reclamation and reseeding and shall be promptly removed after reclamation.
- The barriers will be placed as indicated on the attached map.
- There will be no surface-disturbing activities or vehicle traffic past the barriers.

**Note:** If there are questions about these stipulations, contact Kim Adams (BLM) at 505.564.7683 or kadams@blm.gov.

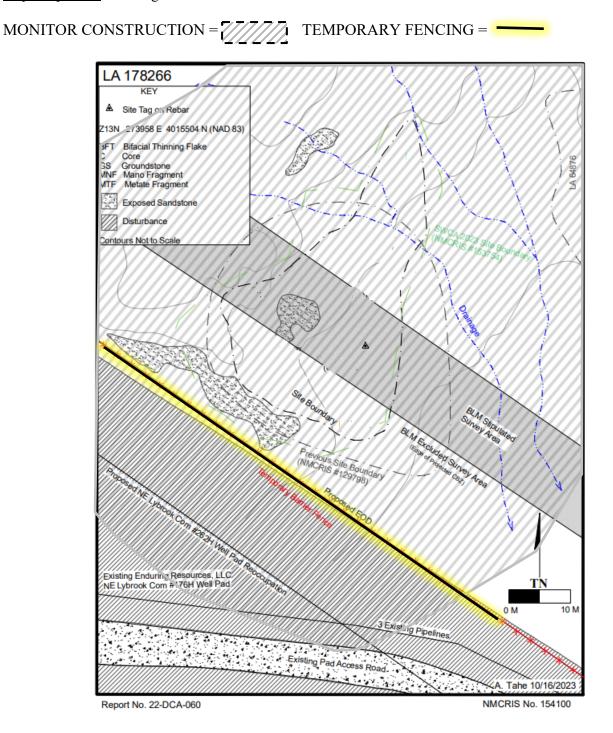
#### For Official Use Only: Disclosure of site locations prohibited (43 CFR 7.18) CULTURAL RESOURCE STIPULATIONS Farmington Field Office BLM Report Number: 2024(I)005F

<u>Project Name:</u> Northeast Lybrook Com No 262H **Reoccupation Well**. <u>Project Sponsor:</u> Enduring Resources.



#### For Official Use Only: Disclosure of site locations prohibited (43 CFR 7.18) CULTURAL RESOURCE STIPULATIONS Farmington Field Office BLM Report Number: 2024(I)005F

<u>Project Name:</u> Northeast Lybrook Com No 262H **Reoccupation Well**. <u>Project Sponsor:</u> Enduring Resources.





## United States Department of the Interior

BUREAU OF LAND MANAGEMENT Farmington District Office 6251 College Blvd, Suite A Farmington, New Mexico 87402



In Reply Refer To: 3162.3-1(NMF0110)

\* ENDURING RESOURCES LLC
#430H HAYNES CANYON UNIT
Lease: NMNM028733 Agreement: NMNM105770949
SH: SW1/4SW1/4 Section 3, T. 23N., R. 6W. Rio Arriba County, New Mexico
BH: SW1/4SW1/4 Section 11, T. 23N., R. 6W. Rio Arriba County, New Mexico
\* Above Data Required on Well Sign

#### GENERAL REQUIREMENTS FOR OIL AND GAS OPERATIONS ON FEDERAL AND INDIAN LEASES

The following special requirements apply and are effective when checked:

- A. 🖂 Note all surface/drilling conditions of approval attached.
- B. ☐ The required wait on cement (WOC) time will be a minimum of 500 psi compressive strength at 60 degrees. Blowout preventor (BOP) nipple-up operations may then be initiated
- C. ☐ Test all casing strings below the conductor casing to .22 psi/ft. of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the minimum internal yield (burst) for a minimum of 30 minutes. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.
- D. Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the Bureau of Land Management, New Mexico State Office, Reservoir Management Group, 301 Dinosaur Trail, Santa Fe, New Mexico 87508. The effective date of the agreement must be **prior** to any sales.
- E. The use of co-flex hose is authorized contingent upon the following: **1.** From the BOP to the choke manifold: the co-flex hose must be hobbled on both ends and saddle to prevent whip.
  - **2.** From the choke manifold to the discharge tank: the co-flex hoses must be as straight as practical, hobbled on both ends and anchored to prevent whip.
  - 3. The co-flex hose pressure rating must be at least commensurate with approved BOPE.

INTERIOR REGION 7 • UPPER COLORADO BASIN

COLORADO, NEW MEXICO, UTAH, WYOMING

#### I. <u>GENERAL</u>

- A. Full compliance with all applicable laws and regulations, with the approved Permit to drill, and with the approved Surface Use and Operations Plan is required. Lessees and/or operators are fully accountable for the actions of their contractors and subcontractors. Failure to comply with these requirements and the filing of required reports will result in strict enforcement pursuant to 43 CFR 3163.1 or 3163.2.
- B. Each well shall have a well sign in legible condition from spud date to final abandonment. The sign should show the operator's name, lease serial number, or unit name, well number, location of the well, and whether lease is Tribal or Allotted, (See 43 CFR 3162.6(b)).
- C. A complete copy of the approved Application for Permit to Drill, along with any conditions of approval, shall be available to authorized personnel at the drill site whenever active drilling operations are under way.
- D. For Wildcat wells only, a drilling operations progress report is to be submitted, to the BLM-Field Office, weekly from the spud date until the well is completed and the Well Completion Report is filed. The report should be on  $8-1/2 \times 11$  inch paper, and each page should identify the well by; operator's name, well number, location and lease number.
- E. As soon as practical, notice is required of all blowouts, fires and accidents involving life-threatening injuries or loss of life. (See NTL-3A).
- F. BOP equipment (except the annular preventer) shall be tested utilizing a test plug to full working pressure for 10 minutes. No bleed-off of pressure is acceptable. (See 43 CFR 3172.6(b)(9)(ii)).
- G. The operator shall have sufficient weighting materials and lost circulation materials on location in the event of a pressure kick or in the event of lost circulation. (See 43 CFR 3172.8(a)).
- H. The flare line(s) discharge shall be located not less than 100 feet from the well head, having straight lines unless turns are targeted with running tees, and shall be positioned downwind of the prevailing wind direction and shall be anchored. The flare system shall have an effective method for ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and to maintain a continuous flare. (See 43 CFR 3172.8(b)(7)).
- I. Prior approval by the BLM-Authorized Office (Drilling and Production Section) is required for variance from the approved drilling program and before commencing plugging operations, plug back work, casing repair work, corrective cementing operations, or suspending drilling operations indefinitely. Emergency approval may be obtained orally, but such approval is contingent upon filing of a Notice of Intent sundry within three business days. Any changes to the approved plan or any questions regarding drilling operations should be directed to BLM during regular business hours at 505-564-7600. Emergency program changes after hours should be directed to Virgil Lucero at 505-793-1836.
- J. The Inspection and Enforcement Section (I&E), phone number (505-564-7750) is to be notified at least 24 hours in advance of BOP test, spudding, cementing, or plugging operations so that a BLM representative may witness the operations.

- K. Unless drilling operations are commenced within two years, approval of the Application for Permit to Drill will expire. A written request for a two-year extension may be granted if submitted prior to expiration.
- L. From the time drilling operations are initiated and until drilling operations are completed, a member of the drilling crew or the tool pusher shall maintain rig surveillance at all times, unless the well is secured with blowout preventers or cement plugs.
- M. If for any reason, drilling operations are suspended for more than 90 days, a written notice must be provided to this office outlining your plans for this well.
- N. **Commingling**: No production (oil, gas, and water) from the subject well should start until Sundry Notices (if necessary) granting variances from applicable regulations as related to commingling and off-lease measurement are approved by this office.

#### II. <u>REPORTING REQUIREMENTS</u>

- A. For reporting purposes, all well Sundry notices, well completion and other well actions shall be referenced by the appropriate lease, communitization agreement and/or unit agreement numbers.
- B. The following reports shall be filed with the BLM-Authorized Officer online through AFMSS 2 within 30 days after the work is completed.
  - 1. Provide complete information concerning.
    - a. Setting of each string of casing. Show size and depth of hole, grade and weight of casing, depth set, depth of all cementing tools that are used, amount (in cubic feet) and types of cement used, whether cement circulated to surface and all cement tops in the casing annulus, casing test method and results, and the date work was done. Show spud date on first report submitted.
    - b. Intervals tested, perforated (include size, number and location of perforations), acidized, or fractured; and results obtained. Provide date work was done on well completion report and completion sundry notice.
    - c. Subsequent Report of Abandonment, show the way the well was plugged, including depths where casing was cut and pulled, intervals (by depths) where cement plugs were replaced, and dates of the operations.
  - 2. Well Completion Report will be submitted with 30 days after well has been completed.
    - a. Initial Bottom Hole Pressure (BHP) for the producing formations. Show the BHP on the completion report. The pressure may be: 1) measured with a bottom hole bomb, or; 2) calculated based on shut in surface pressures (minimum seven day buildup) and fluid level shot.
  - 3. Submit a cement evaluation log if cement is not circulated to surface.
- C. Production Startup Notification is required no later than the 5<sup>th</sup> business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site or resumes production in the case of a well which has been off production for more than 90 days. The operator shall notify the Authorized Officer by letter or Sundry Notice, Form 3160-5, or orally to be followed

by a letter or Sundry Notice, of the date on which such production has begun or resumed. CFR 43 3162.4-1(c).

#### III. DRILLER'S LOG

The following shall be entered in the daily driller's log: 1) Blowout preventer pressures tests, including test pressures and results, 2) Blowout preventer tests for proper functioning, 3) Blowout prevention drills conducted, 4) Casing run, including size, grade, weight, and depth set, 5) How pipe was cemented, including amount of cement, type, whether cement circulated to surface, location of cementing tools, etc., 6) Waiting on cement time for each casing string, 7) Casing pressure tests after cementing, including test pressure and results, and 8) Estimated amounts of oil and gas recovered and/or produced during drill stem test.

#### IV. GAS FLARING

Gas produced from this well may not be vented or flared beyond an initial, authorized test period of <u>\*</u> Days or 50 MMCF following its (completion)(recompletion), whichever first occurs, without the prior, written approval of the authorized officer. Should gas be vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted. You shall be required to compensate the lessor for the portion of the gas vented or flared without approval which is determined to have been avoidably lost.

\*30 days, unless a longer test period is specifically approved by the authorized officer. The 30-day period will commence upon the first gas to surface.

#### V. SAFETY

- A. All rig heating stoves are to be of the explosion-proof type.
- B. Rig safety lines are to be installed.
- C. Hard hats and other Personal Protective Equipment (PPE) must be utilized.

#### VI. <u>CHANGE OF PLANS OR ABANDONMENT</u>

A. Any changes of plans required to mitigate unanticipated conditions encountered during drilling operations, will require approval as set forth in Section 1.F.

- B. If the well is dry, it is to be plugged in accordance with 43 CFR 3162.3-4, approval of the proposed plugging program is required as set forth in Section 1.F. The report should show the total depth reached, the reason for plugging, and the proposed intervals, by depths, where cement plugs are to be placed, type of plugging mud, etc. A Subsequent Report of Abandonment is required as set forth in Section II.B.1c.
- C. Unless a well has been properly cased and cemented, or properly plugged, the drilling rig must not be moved from the drill site without prior approval from the BLM-Authorized Officer.

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U.S. Department of the Interior BUREAU OF LAND MANAGEMENT Operator Certification Data Report

#### Operator

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: DANIELLE GAVITO		Signed on: 09/22/2023
Title: Permit Agent		
Street Address: 9446 CLEARMON	T STREET	
City: THORNTON	State: CO	<b>Zip:</b> 80229
Phone: (303)524-4651		
Email address: DGAVITO@CDHC	ONSULT.COM	
Field		
Representative Name:		
Street Address:		
City: S	tate:	Zip:
Phone:		
Email address:		

#### Received by OCD: 12/5/2023 8:53:00 PM

## **WAFMSS**

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

#### **APD ID:** 10400093965

Operator Name: ENDURING RESOURCES LLC Well Name: HAYNES CANYON UNIT Well Type: OIL WELL

#### Submission Date: 09/29/2023

Well Number: 430H Well Work Type: Drill Highlighted data reflects the most recent changes <u>Show Final Text</u>

**Application Data** 

Section 1 - General	Section	1 -	General	
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<b>APD ID:</b> 10400093965	Tie to previous NOS? Y	<b>Submission Date:</b> 09/29/2023
BLM Office: Farmington	User: DANIELLE GAVITO	<b>Title:</b> Permit Agent
Federal/Indian APD: FED	Is the first lease penetrat	ted for production Federal or Indian? FED
Lease number: NMNM28733	Lease Acres:	
Surface access agreement in plac	e? Allotted?	Reservation:
Agreement in place? YES	Federal or Indian agreem	nent: FEDERAL
Agreement number: NMNM105770	)949	
Agreement name: Haynes Canyon	Unit	
Keep application confidential? Y		
Permitting Agent? YES	APD Operator: ENDURIN	IG RESOURCES LLC
Operator letter of	Operator_Certification_09062023_2	20230906163808.pdf

#### **Operator Info**

Operator Organization Name: ENDURING RESOURCES LLC Operator Address: 200 ENERGY COURT Operator PO Box: Operator City: FARMINGTON State: NM Operator Phone: (505)497-8574 Operator Internet Address:

#### **Section 2 - Well Information**

Well in Master Development Plan? NO	Master Development Plan nam	e:
Well in Master SUPO? NO	Master SUPO name:	
Well in Master Drilling Plan? NO	Master Drilling Plan name:	
Well Name: HAYNES CANYON UNIT	Well Number: 430H	Well API Number:
Field/Pool or Exploratory? Field and Pool	Field Name: COUNSELOR GALLUP-DAKOTA	<b>Pool Name:</b> COUNSELORS GALLUP DAKOTA

12/05/2023

# **Zip:** 87401

Operator Name: ENDURING RESOURCES LLC Well Name: HAYNES CANYON UNIT

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

Is the proposed well in a Helium production area? N	Use Existing Well Pad? Y	New surface disturbance? N
Type of Well Pad: MULTIPLE WELL	Multiple Well Pad Name: Haynes Canyon Unit	Number: 428
Well Class: HORIZONTAL	Number of Legs: 1	
Well Work Type: Drill		
Well Type: OIL WELL		
Describe Well Type:		
Well sub-Type: EXPLORATORY (WILDCAT)		
Describe sub-type:		
Distance to town: 57 Miles Distance to ne	arest well: 20 FT Distan	ce to lease line: 235 FT
Reservoir well spacing assigned acres Measurement	: 520 Acres	
Well plat: Haynes_Canyon_Unit430H_Revised_W	ell_PlatsSIGNED_202309121	41320.pdf
Well work start Date: 10/16/2023	Duration: 30 DAYS	

## **Section 3 - Well Location Table**

Survey Type: RECTANGULAR

**Describe Survey Type:** 

Datum: NAD83

Survey number: 15269

Vertical Datum: NAVD88

Reference Datum: GROUND LEVEL

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this
SHL	897	FSL	448	FW	23N	6W	3	Aliquot	36.24865	-	RIO	1	NEW	F	NMNM		0	0	N
Leg				L				SWS	2			1	MEXI		28733	3			
#1								W		93	BA	со	со						
KOP	897	FSL	448	FW	23N	6W	3	Aliquot	36.24865			1		F	NMNM	176	495	493	Ν
Leg				L				SWS	2			1	MEXI		28733	6	0	7	
#1								W		93	BA	со	со						
PPP	669	FSL	793	FW	23N	6W	3	Aliquot	36.24806	-	RIO	NEW	NEW	F	NMNM	117	589	552	Y
Leg				L				sws	5			1	MEXI		28733	9	8	4	
#1-1								W		29	BA	со	со						

## Operator Name: ENDURING RESOURCES LLC

## Well Name: HAYNES CANYON UNIT

#### Well Number: 430H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this
PPP	0	FNL	146	FW	23N	6W	10	Aliquot	36.24630		RIO	1		F	NMNM	118	681	551	Y
Leg			0	L				NENW	2	107.4608		1	MEXI		28737	7	8	6	
#1-2										97	BA	со	со						
EXIT	233	FSL	103	FW	23N	6W	11	Aliquot	36.23299	-	RIO	NEW	NEW	F	NMNM	124	137	546	Y
Leg			2	L				sws	1	107.4440			MEXI		24458	2	58	1	
#1								W		53	BA	со	со						
BHL	233	FSL	103	FW	23N	6W	11	Aliquot	36.23299	-	RIO	NEW	NEW	F	NMNM	124	137	546	Y
Leg			2	L				sws	1	107.4440			MEXI		24458	2	58	1	
#1								W		53	BA	со	со						

#### **Operator Certification:**

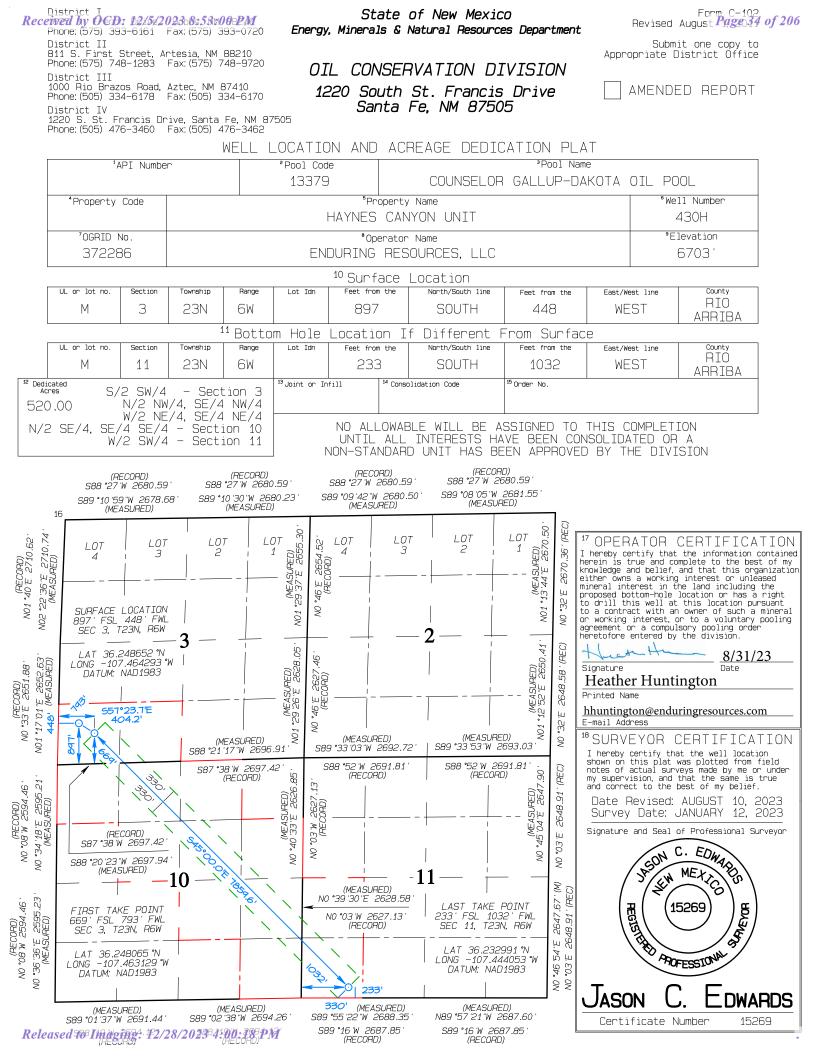
I hereby certify that I, or someone under my direct supervision, has inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package, to the best of my knowledge, are true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

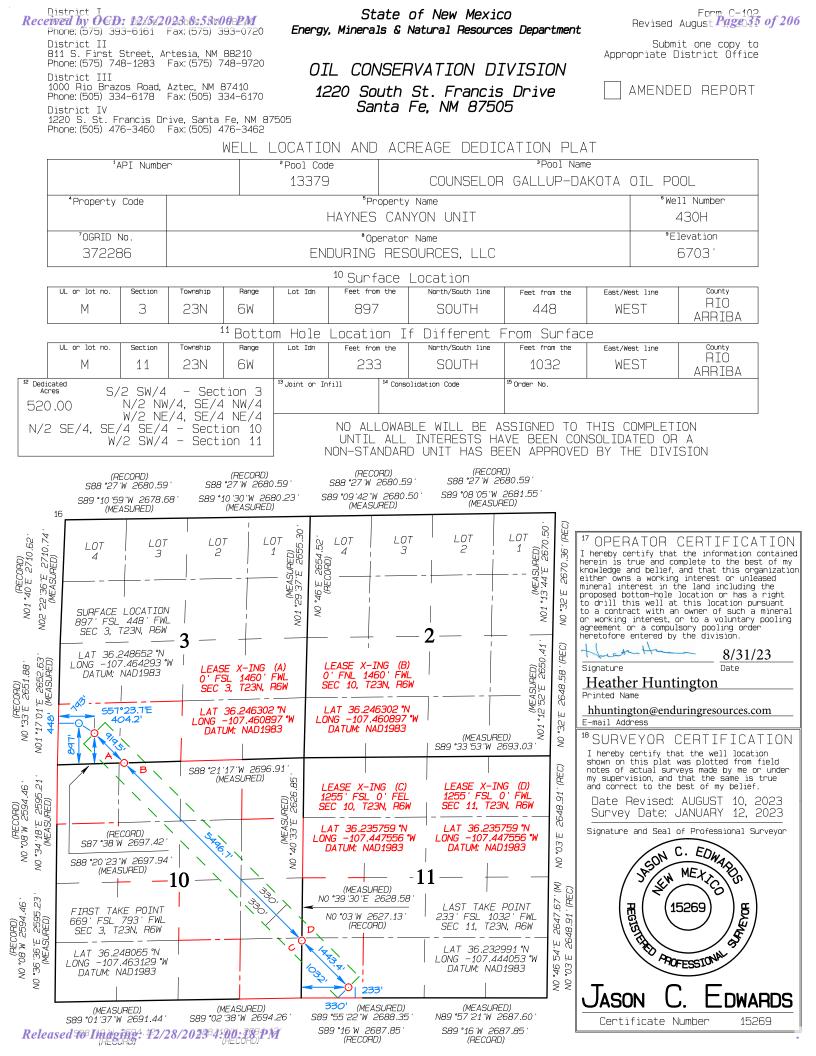
Executed this 6thday of September	_,2023.
Name: Heather Huntington	_
Position Title Permitting Technician	-
Address: 200 Energy Court, Farmington, NM 87401	-
Telephone: 505-636-9751	-
Field representative (if not above signatory)	
Email: <u>hhuntington@enduringresources.com</u>	_

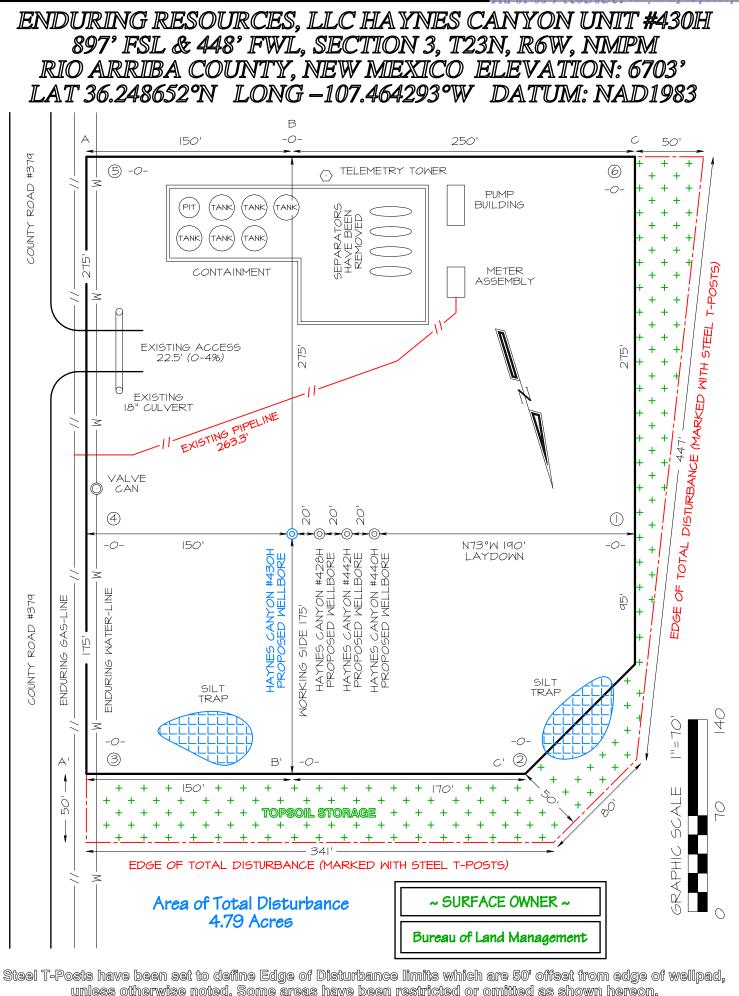
Date: 9/6/2023

at

Heather Huntington Permitting Technician Enduring Resources, LLC







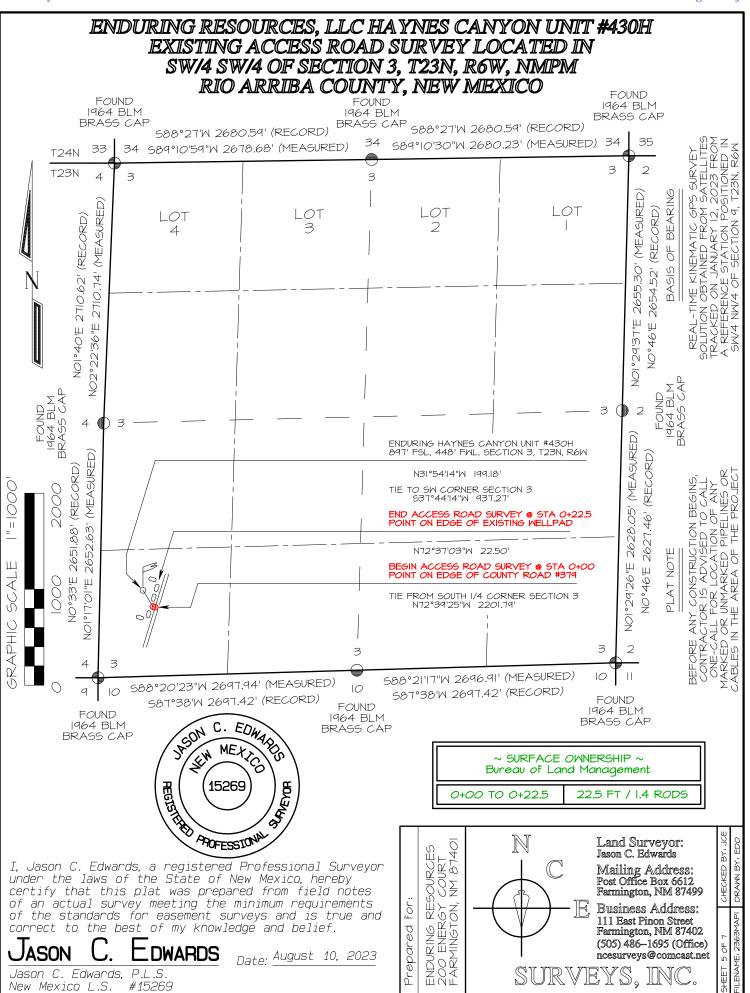
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EDWARDS SURVEYING, INC. IS NOT LIABLE FOR LOCATION OF UNDERGROUND UTILITIES OR PIPELINES ATRACTOR SHOULD CONTACT ONE-CALL FOR LOCATION OF ANY MARKED OR UNMARKED UNDERGROU OR PIPELINES ON WELLPAD AND/OR ACCESS ROAD AT LEAST TWO WORKING DAYS PRIOR TO CONSTR										· · · · · · · · · · · · · · · · · · ·		· · · ·	· · · ·			•	5CALE  "=60'	ENDURING RESOURCES, LLC HAYNES 897' FSL & 448' FWL, SECTION 3, T. RIO ARRIBA COUNTY, NEW MEXICO
LIABLE FOR LOCA ALL FOR LOCATION R ACCESS ROAD /			· · · · · · · · · · · · · · · · · · ·														60'	X, LLC E 7L, SECT Y, NEW I
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EDWARDS SURVEYING, INC. IS NOT LIABLE FOR LOCATION OF UNDERGROUND UTILITIES OR PIPELINES. CONTRACTOR SHOULD CONTACT ONE-CALL FOR LOCATION OF ANY MARKED OR UNMARKED UNDERGROUND UTILITIES OR PIPELINES ON WELLPAD AND/OR ACCESS ROAD AT LEAST TWO WORKING DAYS PRIOR TO CONSTRUCTION.															· · · · · · · · · · · · · · · · · · ·	- - - - - - - -	VERTICAL SCALE	CANYON UNIT #430H 23N, R6W, NMIPM ELEVATION: 6703'
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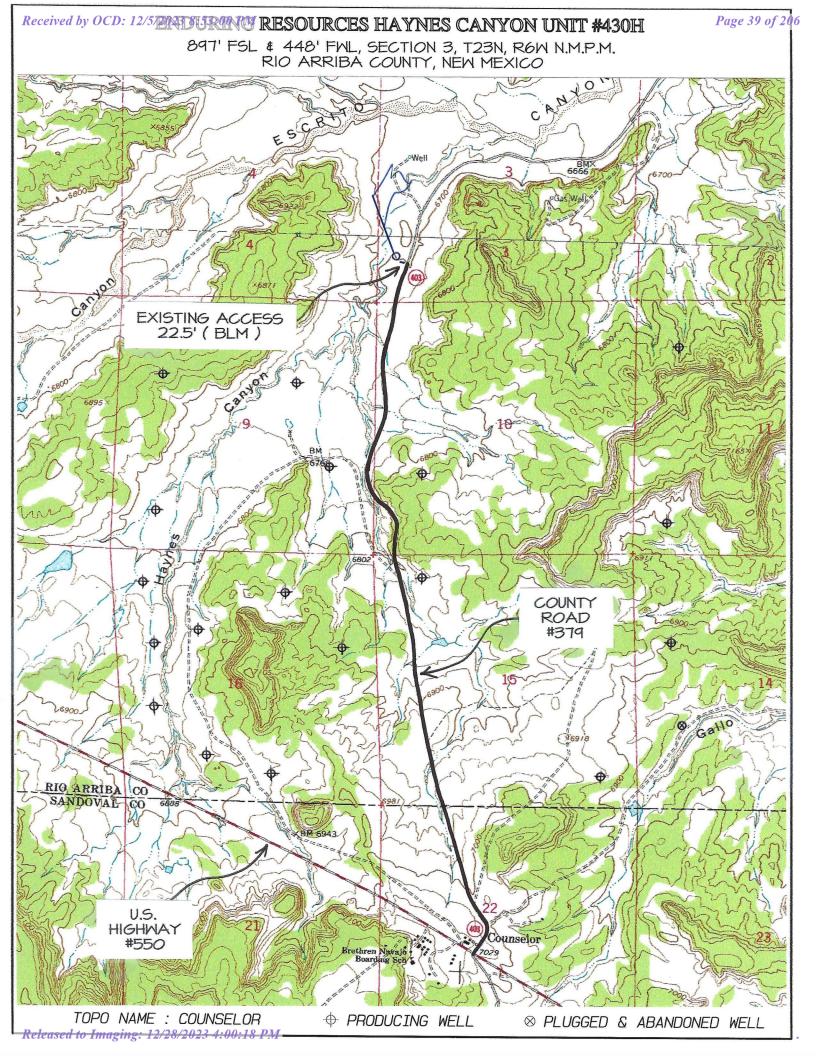
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Received by OCD: 12/5/2023 8:53:00 PM



Released to Imaging: 12/28/2023 4:00:18 PM

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### Directions from the Intersection of US Hwy 550 & US Hwy 64

### in Bloomfield, NM to Enduring Resources, LLC Haynes Canyon Unit #430H

# 897' FSL & 448' FWL, Section 3, T23N, R6W, N.M.P.M., Rio Arriba County, NM

### Latitude 36.248652°N Longitude -107.464293°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 53.8 miles to Mile Marker 97.6

Go Left (Northerly) on County Road #379 (aka State Highway #403) for 1.5 miles to fork in roadway;

Go Right (Northerly) which is straight remaining on County Road #379 (aka State Highway #403) for 1.4 miles to existing access road on left-hand side which continues for 22.5' to Enduring Haynes Canyon Unit #430H staked location.



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

APD ID: 10400093965

**Operator Name: ENDURING RESOURCES LLC** 

Well Name: HAYNES CANYON UNIT

Well Type: OIL WELL

Well Number: 430H Well Work Type: Drill

Submission Date: 09/29/2023

Highlighted data reflects the most recent changes

12/05/2023

Drilling Plan Data Report

Show Final Text

# **Section 1 - Geologic Formations**

ormation	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
12561028	NACIMIENTO	6728	0	0	SANDSTONE, SILTSTONE	USEABLE WATER	N
12561029	OJO ALAMO	5325	1403	1405	SANDSTONE, SILTSTONE	USEABLE WATER	Ν
12561030	KIRTLAND	5225	1503	1505	SANDSTONE, SHALE, SILTSTONE	USEABLE WATER	Ν
12561031	FRUITLAND	5000	1728	1731	COAL, SANDSTONE, SHALE, SILTSTONE	NATURAL GAS, OTHER : non-potable water	Ν
12561032	PICTURED CLIFFS	4765	1963	1967	SANDSTONE, SHALE	NATURAL GAS	Ν
12561033	LEWIS	4615	2113	2118	SHALE	NATURAL GAS	Ν
12561034	CHACRA	4320	2408	2415	SANDSTONE, SHALE	NATURAL GAS	Ν
12561035	CLIFFHOUSE	3210	3518	3531	SANDSTONE	NATURAL GAS	N
12561036	MENEFEE	3205	3523	3536	COAL, SANDSTONE, SHALE	NATURAL GAS	Ν
12561037	POINT LOOKOUT	2505	4223	4238	COAL, SANDSTONE, SHALE	NATURAL GAS	Ν
12561038	MANCOS	2210	4518	4533	SHALE	NATURAL GAS, OIL	Ν
12561039	GALLUP	1870	4858	4873	SHALE	NATURAL GAS, OIL	Y
12561040	MANCOS	1780	4948	4963	SHALE	NATURAL GAS, OIL	Y
12561041	MANCOS	1645	5083	5100	SHALE	NATURAL GAS, OIL	Y
12561042	MANCOS	1580	5148	5169	SHALE	NATURAL GAS, OIL	Y
12561043	MANCOS	1505	5223	5253	SHALE	NATURAL GAS, OIL	Y
12561044	MANCOS	1420	5308	5359	SHALE	NATURAL GAS, OIL	Y

# Operator Name: ENDURING RESOURCES LLC

Well Name: HAYNES CANYON UNIT

### Well Number: 430H

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
12561045	MANCOS	1290	5438	5574	SHALE	NATURAL GAS, OIL	Y
12561050	MANCOS	1267	5461	13759	SHALE	NATURAL GAS, OIL	Y
12561047	MANCOS	1245	5483	5672	SHALE	NATURAL GAS, OIL	Y
12561048	MANCOS	1245	5483	5694	SHALE	NATURAL GAS, OIL	Y
12561049	MANCOS	1245	5483	5694	SHALE	NATURAL GAS, OIL	Y

# **Section 2 - Blowout Prevention**

### Pressure Rating (PSI): 5M

Rating Depth: 5483

Equipment: REFERENCE BOP DIAGRAM

Requesting Variance? NO

Variance request:

Testing Procedure: REFERENCE OPS PLAN BOP TESTING

**Choke Diagram Attachment:** 

Enduring\_Resources\_8.31.23\_Choke\_BOPE\_20230831163811.pdf

# **BOP Diagram Attachment:**

Enduring\_Resources\_8.31.23\_Choke\_BOPE\_20230831163815.pdf

# Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	350	0	350	6703	6353	350	J-55	54.5	BUTT	7.39	3.45	BUOY	7.79	BUOY	7.31
2	INTERMED IATE	12.2 5	9.625	NEW	API	N	0	3685	0	3673	6703	3030	3685	J-55	36	LT&C	1.26	2.57	BUOY	2.1	BUOY	2.62
3	PRODUCTI ON	8.5	5.5	NEW	API	N	0	13759	0	5461	6703	1242	13759	P- 110	17	LT&C	2.77	1.18	BUOY	1.47	BUOY	1.81

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Operator Name: ENDURING RESOURCES LLC

Well Name: HAYNES CANYON UNIT

Well Number: 430H

### **Casing Attachments**

Casing ID: 1 String SURFACE
Inspection Document:
Spec Document:
Tapered String Spec:
Casing Design Assumptions and Worksheet(s):
Casing Design Assumptions and Worksheet(s).
Haynes_Canyon_Unit_430H_Drilling_Plan_20230913193720.pdf
Casing ID: 2 String INTERMEDIATE
Inspection Document:
Spec Document:
opee boeument.
Tapered String Spec:
Casing Design Assumptions and Worksheet(s):
Casing Design Assumptions and Worksheet(3).
Haynes_Canyon_Unit_430H_Drilling_Plan_20230913193731.pdf
Casing ID: 3 String PRODUCTION
Inspection Document:
Spec Document:
Tapered String Spec:
Casing Design Assumptions and Worksheet(s):
Haynes_Canyon_Unit_430H_Drilling_Plan_20230913193743.pdf

**Section 4 - Cement** 

# Operator Name: ENDURING RESOURCES LLC

# Well Name: HAYNES CANYON UNIT

### Well Number: 430H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	350	364	1.39	14.6	505.3	100	Type III	ASTM Type III Blend, Calcium Chloride 2% BWOC Accelerator, D- CD2 .3% BWOC Dispersant/Friction reducer .25 lbs/sx Cello Flake - seepage

	,	i	1				,	-		
INTERMEDIATE	Lead	0	3685	765	2.14	12.5	1636	70	90:10 Type III:POZ	ASTM Type III 90/10 Poz, D-CSE 1 5.0% BWOC Strength Enhancer, D-MPA-1 .4% BWOC Fluid Loss & Gas Migration Control, D-SA 1 1.4% BWOC Na Metasilicate, D-CD 2 .4% BWOC Dispersant Cello Flace LCM .25 lb/sx, D-FP1 0.5% BWOC Defoamer, D-R1 .5% Retarder
INTERMEDIATE	Tail	3185	3685	150	1.38	14.6	207	20	Type III	ASTM Type III Blend, D-MPA-1 .4% BWOC Fluid Loss & Gas Migration Control, D-CD 2 .5% BWOC Dispersant, Cello Flace LCM .25 lb/sx, D-R1 .2% Retarder
PRODUCTION	Lead	0	1375 9	541	2.37	12.4	1283	50	ASTM type I/II	ASTM Type I/II, BA90 Bonding Agent 5.0 Ib/sx, Bentonite Viscosifier 8% BWOB, FL24 Fluid Loss .5% BWOB, IntegraGuard GW86 Viscosifier .1% BWOB, R7C Retarder .2% BWOB, FP24 Defoamer 0.3% BWOB, Anti-Static .01 Ib/sx
PRODUCTION	Tail	4533	1375 9	1481	1.57	13.3	2325	10	G:POZ blend	Type G 50%, Pozzolan Fly Ash Extender 50%, BA90 Bonding Agent 3.0 lb/sx Bentonite Viscosifier 4% BWOB, FL24 Fluid Loss .4% BWOB, IntegraGuard GW86 Viscosifier .1%

# **Operator Name: ENDURING RESOURCES LLC**

### Well Name: HAYNES CANYON UNIT

### Well Number: 430H

String Type Lead/Tail Lead/Tail Stage Tool Depth Top MD Bottom MD Bottom MD Ouantity(sx) Yield Yield Cu Ft Cu Ft Cu Ft Cu Ft Cu Ft Cu Ft Cu Ft Cu Ft							-	-	-			
	ring Typ	-ead/Tai	tage Too epth	p MC	3ottom M	uantity(sx	ē	us I		xcess%	ment typ	itive

BWOB R3 Retarder .5% BWOB , FP24 Defoamer .3% BWOB, IntegraSeal 0.25 lb/sx

# **Section 5 - Circulating Medium**

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

**Describe what will be on location to control well or mitigate other conditions:** Sufficient barite will be on location to weight up mud system to balance maximum anticipated pressure gradient.

**Describe the mud monitoring system utilized:** A fully, closed-loop system will be utilized. The system will consist of aboveground piping and above-ground storage tanks and bins. The system will not entail any earthen pits, below-grade storage, or drying pads. All equipment will be disassembled and removed from the site when drilling operations cease. The system will be capable of storing all fluids and generated cuttings and of preventing uncontrolled releases of the same. The system will be operated in an efficient manner to allow the recycling and reuse of as much fluid as possible and to minimize the amount of fluids and solids that require disposal.

# **Circulating Medium Table**

Top Depth	Bottom Depth	Mud Type	Min Weight (Ibs/gal)	Max Weight (Ibs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	НА	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	350	SPUD MUD	8.4	8.4				2			spud mud
0	3685	LOW SOLIDS NON- DISPERSED (LSND)	8.8	9.5			9	8		20	No OBM
0	1375 9	OIL-BASED MUD	8	9					120000		OWR 80:20, WBM as contingency

Received by OCD: 12/5/2023 8:53:00 PM

Operator Name: ENDURING RESOURCES LLC

Well Name: HAYNES CANYON UNIT

Well Number: 430H

# Section 6 - Test, Logging, Coring

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

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

GAMMA RAY LOG, DIRECTIONAL SURVEY, MEASUREMENT WHILE DRILLING,

Coring operation description for the well:

REFERENCE OPS PLAN

# **Section 7 - Pressure**

Anticipated Bottom Hole Pressure: 2360

Anticipated Surface Pressure: 1144

Anticipated Bottom Hole Temperature(F): 125

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

Describe:

Contingency Plans geoharzards description:

**Contingency Plans geohazards** 

Hydrogen Sulfide drilling operations plan required? NO

Hydrogen sulfide drilling operations

# **Section 8 - Other Information**

Proposed horizontal/directional/multi-lateral plan submission:

Enduring\_Haynes\_Canyon\_Unit\_430H\_rev0\_20230831165338.pdf

Other proposed operations facets description:

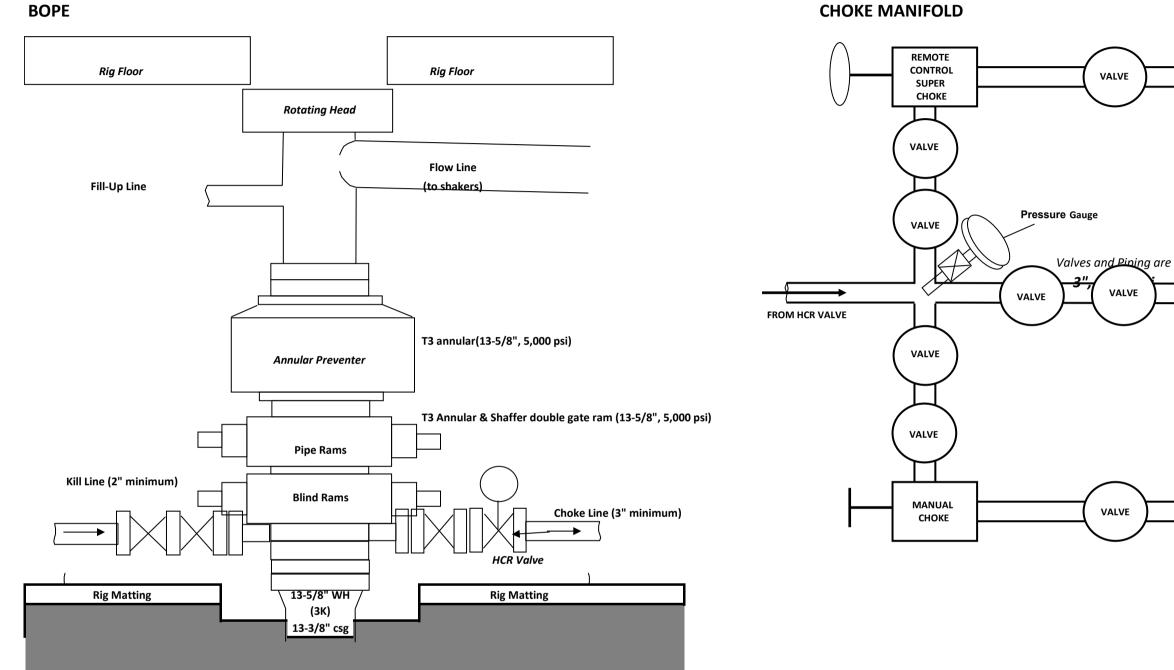
# Other proposed operations facets attachment:

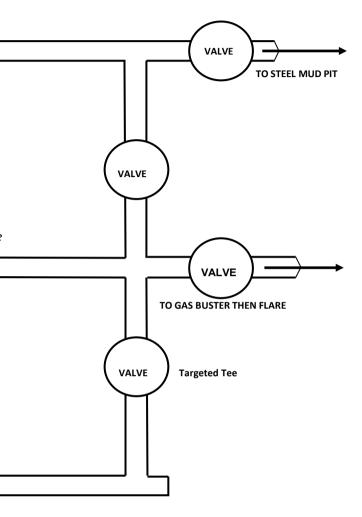
Haynes\_Canyon\_Unit\_430H\_WBD\_20230913193701.pdf

Other Variance attachment:

# **BOPE & CHOKE MANIFOLD DIAGRAMS**

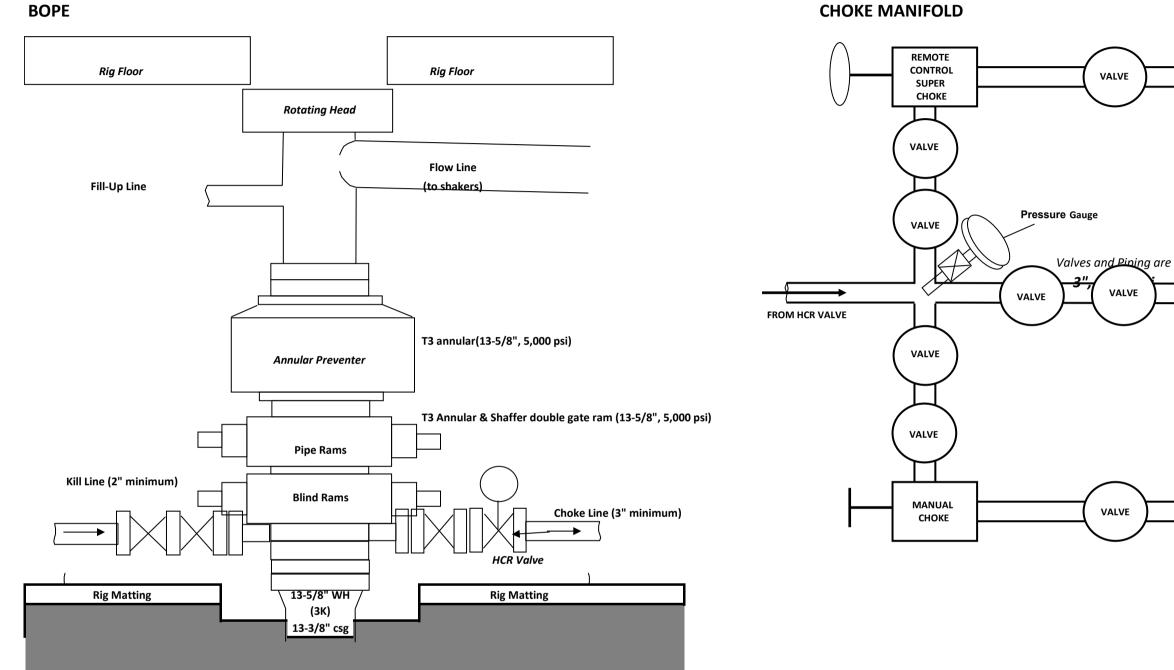
NOTE: EXACT BOPE AND CHOKE CONFIRGURATION AND COMPONENTS MAY DIFFER FROM WHAT IS DEPICTED IN THE DIGRAMS BELOW DEPENDING ON THE RIG AND ITS ASSOCIATED EQUIPMENT. RAM PREVENTERS, ANNULAR PREVENTERS, AND CHOKE MANIFOLD AND COMPONENTS WILL BE RATED TO 3,000 PSI MINIMUM.

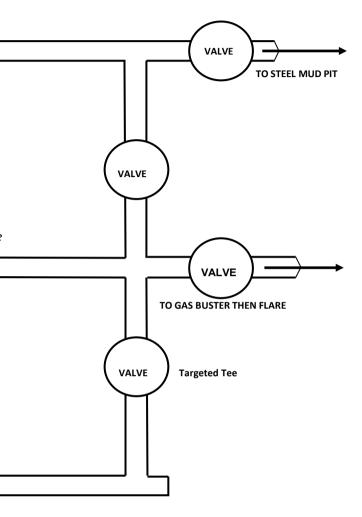




# **BOPE & CHOKE MANIFOLD DIAGRAMS**

NOTE: EXACT BOPE AND CHOKE CONFIRGURATION AND COMPONENTS MAY DIFFER FROM WHAT IS DEPICTED IN THE DIGRAMS BELOW DEPENDING ON THE RIG AND ITS ASSOCIATED EQUIPMENT. RAM PREVENTERS, ANNULAR PREVENTERS, AND CHOKE MANIFOLD AND COMPONENTS WILL BE RATED TO 3,000 PSI MINIMUM.







### **ENDURING RESOURCES IV, LLC** 6300 S SYRACUSE WAY, SUITE 525 **CENTENNIAL, COLORADO 80211**

#### DRILLING PLAN:

Drill, complete, and equip single lateral in the Mancos-H formation

W/FII	INFORMATION:
VVELL	INFORIVIATION.

Name: Haynes Canyon Unit 430H API Number: Not yet assigned AFE Number: Not yet assigned ER Well Number: Not yet assigned State: New Mexico County: Rio Arriba 6,728 ft ASL (KB) Surface Elevation: 6,703 ft ASL (GL)

Surface Location:	3-23-6	Sec-Twn-Rng	897	ft FSL	448	ft FWL
	36.248652	° N latitude	107.464293	° W longitude		(NAD 83)
BH Location:	11-23-6	Sec-Twn-Rng	233	ft FSL	1,032	ft FWL
	36.232991	° N latitude	107.444053	° W longitude		(NAD 83)
Driving Directions:	FROM THE INTE	RSECTION OF	USHWY 550 & U	SHWY 64 IN BLC		

South on US Hwy 550 for 53.8 miles to MM 97.6; Left (North) on CR #379 (State Hwy 403) for 1.3 miles to fork; Right (North) remaining on CR #379 for 1.5 miles to location access on left; Haynes Canyon Unit 428H Pad. From East to West 430H, 428H, 442H, 440H).

#### **GEOLOGIC AND RESERVOIR INFORMATION:**

gnosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	0/G/W	Pressure
	Ojo Alamo	5,325	1,403	1,405	W	normal
	Kirtland	5,225	1,503	1,505	W	normal
	Fruitland	5,000	1,728	1,731	G, W	sub
	Pictured Cliffs	4,765	1,963	1,967	G, W	sub
	Lewis	4,615	2,113	2,118	G, W	normal
	Chacra	4,320	2,408	2,415	G, W	normal
	Cliff House	3,210	3,518	3,531	G, W	sub
	Menefee	3,205	3,523	3,536	G, W	normal
	Point Lookout	2,505	4,223	4,238	G, W	normal
	Mancos	2,210	4,518	4,533	0,G	sub (~0.38)
	Gallup (MNCS_A)	1,870	4,858	4,873	0,G	sub (~0.38)
	MNCS_B	1,780	4,948	4,963	0,G	sub (~0.38)
	MNCS_C	1,645	5,083	5,100	0,G	sub (~0.38
	MNCS_Cms	1,580	5,148	5,169	0,G	sub (~0.38
	MNCS_D	1,505	5,223	5,253	0,G	sub (~0.38)
	MNCS_E	1,420	5,308	5,359	0,G	sub (~0.38
	MNCS_F	1,375	5,353	5,424	0,G	sub (~0.38
	MNCS_G	1,290	5,438	5,574	0,G	sub (~0.38
	MNCS_H	1,245	5,483	5,672	0,G	sub (~0.38
	MNCS_I	0	0	0	0,G	sub (~0.38)
	FTP TARGET	1,245	5,483	5,694	O,G	sub (~0.38)
	PROJECTED LTP	1,267	5,461	13,759	0,G	sub (~0.38)

Surface: Nacimiento

Oil & Gas Zones: Several gas bearing zones will be encountered; target formation is the Gallup

Pressure:	Normal (0.43 psi/ft) or sub-no	rmal pressure	gradients ant	icipated in all formations		
	Max. pressure gradient:	0.43	psi/ft	Evacuated hole gradient:	0.22	psi/ft
	Maximum anticipated BH pre	ssure, assumi	ng maximum	pressure gradient:	2,360	psi
	Maximum anticipated surface	pressure, ass	uming partia	ly evacuated hole:	1,160	psi
Temperature:	Maximum anticipated BHT is	$125^{\circ}$ F or less				

#### H<sub>2</sub>S INFORMATION:

H<sub>2</sub>S Zones: Encountering hydrogen-sulfide bearing zones is NOT anticipated.

Safety: Sensors and alarms will be placed in the substructure, on the rig floor, above the pits, and at the shakers.

#### LOGGING, CORING, AND TESTING:

Mud Logs:	
-	None planned; remote geo-steering from drill out of 9-5/8" casing to TD; gas detection from drillout of 13-3/8" casing to TD.
MWD/LWD:	Gamma Ray from drillout of 13-3/8" casing to TD
Open Hole Logs:	None planned
Testing:	None planned
Coring:	None planned
Cased Hole Logs:	CBL on 5-1/2" casing from deepest free-fall depth to surface

### DRILLING RIG INFORMATION:

Contractor: Aztec Rig No.: 1000 Draw Works: E80 AC 1,500 hp Mast: Hyduke Triple (136 ft, 600,000 lbs, 10 lines)

Top Drive: NOV IDS-350PE (350 ton)

Prime Movers: 4 - GE Jenbacher Natural Gas Generator **Pumps:** 2 - RS F-1600 (7.500 psi)

BOPE 1: Cameron single & double gate rams (13-5/8", 3,000 psi)

BOPE 2: Cameron annular (13-5/8", 5,000 psi)

Choke Cameron (4", 10,000 psi)

KB-GL (ft): 25

Note: Actual drilling rig may vary depending on availability at time the well is scheduled to be drilled.

STATE AND FEDERAL	NOTIFICATIONS	BLM	State
Construction and	BLM is to be notified minimum of 48 hours prior to start of construction or reclamation.		
Reclamation:	Grazing permittee is to be notified 10 days in advance.	(505) 564-7600	
Spud	BLM and state are to be notified minimum of 24 hours prior to spud.	(505) 564-7750	(505) 334-6178
BOP	BLM is to be notified minimum of 24 hours prior to BOPE testing.	(505) 564-7750	seenote
Casing / cementing	BLM and state are to be notified minimum of 24 hours prior to running casing and		
	cementing.	(505) 564-7750	(505) 334-6178
Plugging	BLM and state are to be notified minimum of 24 hours prior to plugging ops.	(505) 564-7750	seenote
	All notifications are to be recorded in the WellView report with time, date, name or		
	number that notifications were made to.		

Note: Monica Keuhling with the OCD requests state notifications 24 hrs in advance for spud, BOP tests, casing & cementing and any plugging be given to her in both phone message and email: (505) 320-0243, monica.keuhling@emnrd.nm.gov

#### **BOPE REQUIREMENTS:**

- See attached diaaram for details regarding BOPE specifications and configuration.
- 1) Rig will be equipped with upper and lower kelly cocks with handles available.
- 2)

Inside BOP and TIW valves will be available to use on all sizes and threads of drill pipe used while drilling the well. 2) BOP accumulator will have enough capacity to open the HCR valve, close all rams and annular preventer, and retain minimum of 200 psi above precharge on the closing manifold without the use of closing pumps. The fluid reservoir capacity shall be at least double the usable fluid volume of the accumulator system capacity, and the fluid level shall be maintained at manufacturer's recommendation. There will be two additional sources of power for the closing pumps (electric and air). Sufficient nitrogen bottles will be available and will be recharged when pressure falls below manufacturer's recommended minimum

3)

BOP testing shall be conducted (a) when initially installed, (b) whenever any seal is broken or repaired, (c) if the time since the previous test exceeds 30 days. Tests will be conducted using a test plug. BOP ram preventers will be tested to 3,000 psig for 10 minutes, and the annular preventer will be tested to 1,500 psi for 10 minutes. Ram and annular preventers will be tested to 250 psi for 5 minutes. Additionally, BOP and casing strings will be tested to .22 psi/ft or 1,500 psi, whichever is greater but not exceeding 70% of yield strength of the casing, for 30 minutes, prior to drilling out 13-3/8" and 9-5/8" casing. Rams and hydraulically operated remote choke line valve will be function tested daily at a minimum.

- 4) Remote valve for BOP rams, HCR, and choke shall be placed in a location that is readily available to the driller. The remote BOP valve shall be capable of closing and opening the rams.
- 5) Manual locking devices (hand wheels) shall be intalled on rams. A valve will be installed on the annular preventer's closing line as close as possible to the preventer to act as a locking device. The valve will be maintained in the open position and shall only be closed when the there is no power to the accumulator.

#### FLUIDS AND SOLIDS CONTROL PROGRAM:

#### Fluid Measurement:

Pumps shall be equipped with stroke counters with displays in the dog-house. Slow pump speed shall be recorded daily and after mudding up, at a minimum, on the drilling report. A Pit Volume Totalizer will be installed and the readout will be displayed in the dog-house. Gas-detecting equipment will be installed at the shakers, and readouts will be available in the dog-house and the in the geologist's work-station (if geologist or mud-logger is on-site). Closed-Loop System: A fully, closed-loop system will be utilized. The system will consist of above-ground piping and above-ground storage tanks and bins. The system will not entail any earthen pits, below-grade storage, or drying pads. All equipment will be disassembled and removed from the site when drilling operations cease. The system will be capable of storing all fluids and generated cuttings and of preventing uncontrolled releases of the same. The system will be operated in an efficient manner to allow the recycling and reuse of as much fluid as possible and to minimimize the amount of fluids and solids that require disposal Fluid Disposal : Fluids that cannot be reused, recycled, or returned to the supplier will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.). Solids Disposal : Drilling solids will be stored (until haul-off) on-site in separate containers with no other waste, debris, or garbage products,

Waste solids will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.). Fluid Program: See "Detailed Drilling Plan" section for additional details. Sufficient barite will be on location to weight up mud system to balance maximum anticipated pressure gradient.

#### DETAILED DRILLING PLAN:

<u>SURFACE:</u>	FACE: Drill vertically to casing setting depth (plus necessary rathole), run casing, cement casing to surface.								
	0 ft (MD)	to	350 ft (MD)	Hole Section Length:					
	0 ft (TVD)	to	350 ft (TVD)	Casing Required:					

Note: Surface hole may be drilled, cased, and cemented with a smaller rig in advance of the drilling rig.

350 ft

350 ft

Fluid:			FL (mL/30		YP (lb/100				
	Туре	MW (ppg)	min)	PV (cp)	sqft)	рН	Comr	nents	
.	Fresh Water	8.4	N/C	2 - 8	2 - 12	9.0	Spud	l mud	
Hole Size:									
-	Mill Tooth or P								
MWD / Survey:		ation survey							
Logging:									
					ll with 17-1/2" b				
					g as required. TO			as detailed	
	below. Monitor returns during cement job and note cement volume to surface. Install cellar and wellhead.								
							1	1	
							Tens. Body	Tens. Conn	
Casing Specs:		Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	(lbs)	(lbs)	
Specs	13.375	54.5	J-55	BTC	1,130	2,730	853,000	909,000	
Loading					153	791	116,634	116,634	
Min. S.F.					7.39	3.45	7.31	7.79	
	Assumptions:				equivalent exte				
					with 9.5 ppg flu	iid inside casing	g while drilling i	intermediate	
			og equivalent ex		-				
	• •		-		100,000 lbs over				
1U Torque (ft lbs):	Minumum:	N/A	Optimum:	N/A	Maximum:	N/A			
			onnection runni	• ·					
Casing Summary:		-	-						
centralizers:	z centralizers p	er jt stop-bande	eu 10 from each	collar on botto	om 3 jts, 1 centra	inzer per 2 jts to		1	
	<b>-</b>	Matche /	Madd ( Ath	Mate 1. 1. 1.	Hole Cap.	0/ =	Planned TOC	Table	
Cement:	Туре		Yield (cuft/sk)			% Excess	(ft MD)	Total Cmt (sx)	
	TYPE III	14.6	1.39	6.686	0.6946	100%	0	364	
Annular Capacity	0.6946	cuft/ft	13-3/8" casing	-		Csg capacity	0.8680	ft3/ft	
Drake Er	nergy Services:	Calculated cen	nent volumes as	sume gauge ho	le and the exces	s noted in table	•	Cu Ft Slurry	
			D-CD2 .3% BWOC					505.3	
			Dispersant/Friction						
		BWOC Accelerator		Flake - seepage					
		& BLIVI IT cemen	t is not circulate	ed to surface. Co	ement must ach	ieve 500 psi co	mpressive strer	ngth before	
	drilling out.								
INTERMEDIATE:									
		ft (MD)	to		ft (MD)		ection Length:		
	350	ft (TVD)	to	3,673	ft (TVD)	Ca	asing Required:	3,685 ft	
,									
			FL (mL/30		YP (lb/100				
	Туре	MW (ppg)	min)	PV (cp)	sqft)	рН		nents	
Fluid:		88-05	20	8-14	8-14	9.0-9.5	No (	DBM	
	LSND (5% KCl)	8.8-9.5							
Hole Size:	12-1/4"						•		
Hole Size: Bit / Motor:	12-1/4" 12-1/4" PDC bi	t w/mud motor							
Hole Size: Bit / Motor: Bit / Motor:	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0	t w/mud motor 87840 - 7/8, 4.	0, stage, 0.16 re		, 900 GPM, 950				
Hole Size: Bit / Motor: Bit / Motor:	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI	t w/mud motor 87840 - 7/8, 4. DC w/16 mm or	0, stage, 0.16 re 19 mm cutters,	TFA=0.67 sq-ir	n (range 0.65 - 0.	90 max), <b>jet wi</b> t	th 6 - 12s		
Hole Size: Bit / Motor: Bit / Motor:	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI	t w/mud motor 87840 - 7/8, 4. DC w/16 mm or	0, stage, 0.16 re 19 mm cutters,	TFA=0.67 sq-ir	n (range 0.65 - 0.	90 max), <b>jet wi</b> t	th 6 - 12s		
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging:	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None	t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a	0, stage, 0.16 re 19 mm cutters, and azimuth sur	TFA = 0.67 sq-ir vey (every 100'a	n (range 0.65 - 0. at a minimum), (	90 max), <b>jet wi</b> t GR optional			
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to	t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo	0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te	TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin	n (range 0.65 - 0. at a minimum), ( g to	90 max), <b>jet wi</b> i GR optional <b>1,500</b>	psi for 30 minu	ites.	
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Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if: casing running well. Perform c volume to surfa 9.625	t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len d keep slide len d ble to control u . TOOH. Run cas off-line cement j ace. wt (lb/ft) 36.0	0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan ( <b>20' rat-h</b> gth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemen Grade J-55	TFA = 0.67 sq-ir vey (every 100' : st 13-3/8" casin iole past casing possible. Take su nimum desired ind washing / ci nt as detailed be Conn. LTC	n (range 0.65 - 0. at a minimum), o g to setting depth). urveys every star flow-rate is 650 rculating as reque elow. Monitor res Collapse (psi) 2,020 1,604 1.26	90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casin teurns during ce Burst (psi) 3,520 1,370 2.57	psi for 30 minu to keep well on m. Target flow-r. ndition hole and ng. ND BOPE. W. ment job and no Tens. Body (lbs) 564,000 215,309 2.62	Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000	
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if: casing running well. Perform c volume to surfa 9.625	t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas fff-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully	D, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemer Grade J-55	TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin iole past casing possible. Take su nimum desired und washing / ci nt as detailed be Conn. LTC	n (range 0.65 - 0. at a minimum), o setting depth). urveys every star flow-rate is 650 rculating as reque elow. Monitor res Collapse (psi) 2,020 1,604 1.26 equivolent exte	90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gu	psi for 30 minu to keep well on m. Target flow-r. ndition hole an- ng. ND BOPE. We ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10	
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Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if: casing running well. Perform c volume to surfa 9.625	t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas iff-line cement j ace. <b>Wt (lb/ft)</b> 36.0 <i>Collapse: fully</i> . <i>Burst: maximu</i> <i>hole and 8.4 pj</i>	0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when J return rates). Mi ing using a CRT a ob. Pump cemer Grade J-55 evacuated casir m anticipated s og equivalent es	TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be Conn. LTC ag with 8.4 ppg urface pressure cternal pressure	n (range 0.65 - 0. at a minimum), o g to setting depth). J urveys every star flow-rate is 650 rculating as requ elow. Monitor re Collapse (psi) 2,020 1,604 1.26 equivalent exter s with 9.5 ppg flo e gradient	90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co uired. Land casin eturns during ce <u>Burst (psi)</u> 3,520 1,370 2.57 rnal pressure guid inside casing	psi for 30 minu to keep well on m. Target flow-r. ndition hole an- ng. ND BOPE. We ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10	
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and te OPM (higher if casing running well. Perform c volume to surfa 9.625 Assumptions:	t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j ace. <b>Wt (lb/ft)</b> 36.0 <i>Collapse: fully</i> . <i>Burst: maximu</i> <i>hole and 8.4 pj</i> <i>Tension: buoye</i>	0, stage, 0.16 re 19 mm cutters, and azimuth sur- ove); pressure te al plan (20' rat-h geth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemer Grade J-55 evacuated casir m anticipated s og equivalent ex- rd weight in 8.4	TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be <u>Conn.</u> LTC ag with 8.4 ppg surface pressure cternal pressure ppg fluid with 2	n (range 0.65 - 0. at a minimum), ( g to setting depth). urveys every star flow-rate is 650 rculating as requ elow. Monitor re collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo e gradient 100,000 lbs over	90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co uired. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr uid inside casing r-pull	psi for 30 minu to keep well on m. Target flow-r. ndition hole an- ng. ND BOPE. We ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10	
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and te Drill to TD follo < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum:	t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abd wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j ace. <b>Wt (lb/ft)</b> 36.0 <i>Collapse: fully</i> <i>Burst: maximu</i> <i>hole and 8.4 pj</i> <i>Tension: buoye</i> <i>3,400</i>	0, stage, 0.16 re 19 mm cutters, and azimuth sur- ove); pressure te al plan (20' rat-h geth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemer Grade J-55 evacuated casir m anticipated s og equivalent es rd weight in 8.4 Optimum:	TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin nole past casing possible. Take su nimum desired and washing / ci nt as detailed be <u>Conn.</u> LTC ag with 8.4 ppg surface pressure ternal pressure ppg fluid with 3 4,530	n (range 0.65 - 0. at a minimum), o g to setting depth). urveys every star flow-rate is 650 rculating as requ elow. Monitor re collapse (psi) 2,020 1,604 1.26 equivalent exte with 9.5 ppg flu gradient 100,000 lbs over Maximum:	90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co iired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gui if inside casing 5,660	psi for 30 minu to keep well on m. Target flow-rr. ndition hole an ng. ND BOPE. W. ment job and nu Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10	
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<b>ge 1</b> Spacer	D-Mud Breaker	8.5				0	10 bbls	
	90:10 Type					-		
Lead		12.5	2.140	12.05	70%	0	765	1,636
Tail		14.6	1.380	6.64	20%	3,185	150	207
Displacement	281	est bbls						
Annular Capacity	0.3627	cuft/ft	9-5/8" casing >	(13-3/8" casing	annulus	•	•	4
	0.3132	cuft/ft	9-5/8" casing >	(12-1/4" hole a	nnulus	9-5/8" 36# ID	8.921	
	0.4341	cuft/ft	9-5/8" casing v	vol	est shoe jt ft	44		
	Calculated cer	nent volumes as	ssume gauge ho	le and the exce	ss (open hole or	ly) noted in tab	le	
Space	D-Mud Breaker	SAPP						
Lead	ASTM Type III 90/10 Poz	D-CSE 1 5.0% BWOC Strength Enhancer	D-MPA-1 .4% BWOC Fluid Loss & Gas Migration Control	D-SA 1 1.4% BWOC Na Metasilicate	D-CD 2 .4% BWOC Dispersant	Cello Flace LCM .25 lb/sx	D-FP1 0.5% BWOC Defoamer	D-R1 .5% Retarder
Tail	ASTM Type III Blend	diate Cementing	D-MPA-1 .4% BWOC Fluid Loss & Gas Migration Control		D-CD 2 .5% BWOC Dispersant	Cello Flace LCM .25 Ib/sx		D-R1 .2% Retarder
PRODUCTION.		ft (MD)	to	13,759	ft (MD)		Section Length:	
	3,673	ft (TVD)	to	5,461	ft (TVD)	C	asing Required:	13,759 f
								1
			stimated KOP:		ft (MD)		ft (TVD)	
		Estimated Landi	3 1 7	-	ft (MD)	5,483	ft (TVD)	]
		Estimated L	ateral Length:	8,065	ft (MD)			
	r	1	-					-
	_				YP (lb/100			- ·
Fluid	Туре	MW (ppg)	WPS ppm	нтнр	YP (lb/100 sqft)	ES	OWR	Comment
Fluid					sqft)	ES		WBM as
	ОВМ	8.0 - 9.0	120,000 CaCl	NC	sqft) ±6	<b>ES</b> +300	80:20	WBM as contingency
luids / Solids Notes.	OBM OptiDrill OBM shakers. Solids required to ma	8.0 - 9.0	120,000 CaCl uilt from previo n retorts on cu	NC pus well. Ensure ttings samples o	sqft) ±6 that drying sha ne per tour to c	ES +300 kers are rigged u heck % ROC. Ad	80:20 p after the rig (2 d diesel and pro	WBM as contingency nd set) of
luids / Solids Notes. Hole Size.	OBM OptiDrill OBM shakers. Solids required to ma	8.0 - 9.0 system will be b control will bur intain mud in p	120,000 CaCl uilt from previo n retorts on cu	NC pus well. Ensure ttings samples o	sqft) ±6 that drying sha ne per tour to c	ES +300 kers are rigged u heck % ROC. Ad	80:20 p after the rig (2 d diesel and pro	WBM as contingency nd set) of
luids / Solids Notes. Hole Size. Bit / Motor.	OBM OptiDrill OBM shakers. Solids required to ma	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor	120,000 CaCl uilt from previc n retorts on cur rogram specs. R	NC pus well. Ensure ttings samples o eference Newpa	sqft) ±6 that drying shai ne per tour to c ırk's mud progra	ES +300 kers are rigged u heck % ROC. Ad am for additiona	80:20 p after the rig (2 d diesel and prov I details.	WBM as contingency nd set) of ducts as
luids / Solids Notes. Hole Size. Bit / Motor.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor	120,000 CaCl uilt from previc n retorts on cur rogram specs. R 8, 5.0 stage, 0.2	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o	sqft) ±6 that drying shal ne per tour to c ırk's mud progra	ES +300 kers are rigged u heck % ROC. Ad am for additiona	80:20 p after the rig (2 d diesel and prov l details.	WBM as contingency nd set) of ducts as
luids / Solids Notes. Hole Size. Bit / Motor.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breaking	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 n tool spaced ~3	sqft) ±6 that drying shai ne per tour to c irk's mud progra deg, 750 GPM, 2 ,000' behind th	ES +300 kers are rigged u heck % ROC. Ad am for additiona L,580 DIFF PSIG e bit.	80:20 p after the rig (2 d diesel and prov l details.	WBM as contingency nd set) of ducts as
luids / Solids Notes. Hole Size. Bit / Motor. Bit / Motor.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breaking	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 077857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 n tool spaced ~3 natrix body, tar	sqft) ±6 that drying sha ne per tour to c irk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1	ES +300 kers are rigged u heck % ROC. Ad am for additiona for additiona L,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prov l details. (or similar); on o	WBM as contingency nd set) of ducts as
luids / Solids Notes. Hole Size. Bit / Motor. Bit / Motor.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR,	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 077857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 n tool spaced ~3 natrix body, tar	sqft) ±6 that drying sha ne per tour to c irk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1	ES +300 kers are rigged u heck % ROC. Ad am for additiona for additiona L,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prov l details. (or similar); on o	WBM as contingency nd set) of ducts as
luids / Solids Notes. Hole Size. Bit / Motor. Bit / Motor. MWD / Survey.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR,	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor )77857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 , inclination, and d after Landing P	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint)	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro	sqft) ±6 that drying sha ne per tour to c irk's mud progra deg, 750 GPM, : ,000'behind th get TFA = 1.0 - 1 pm KOP to Land	ES +300 kers are rigged u heck % ROC. Ad am for additiona for additiona L,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prov l details. (or similar); on o	WBM as contingency nd set) of ducts as
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 77857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 i.inclination, and a fater Landing P titre section, no est (as noted abo	120,000 CaCl uilt from previo rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut pove); pressure te	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, est 9-5/8" casing	sqft) ±6 that drying sha ne per tour to c irk's mud progra deg, 750 GPM, : ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to	ES +300 kers are rigged u heck % ROC. Ad am for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu	WBM as contingency nd set) of ducts as demand minimum
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 077857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 i.inclination, and a fater Landing P tire section, no est (as noted abo	120,000 CaCl uilt from previo rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut pove); pressure te nal plan. Target	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, tst 9-5/8" casing flow-rate is 650	sqft) ±6 that drying shall ne per tour to co irk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar	ES +300 kers are rigged u heck % ROC. Ad am for additiona L,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700	WBM as contingency nd set) of ducts as demand minimum ites.
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM OptiDrill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit * 8-1/2" PDC bit * 000000000000000000000000000000000000	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 077857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 i, inclination, and d after Landing P ntire section, no est (as noted abo llowing directio 0 - 600 ft/hr. Ste	120,000 CaCl uilt from previo rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (survi 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, est 9-5/8" casing flow-rate is 650 keep well on pla	sqft) ±6 that drying shal ne per tour to c irk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar in. Keep DLS < 3	ES +300 kers are rigged u heck % ROC. Ad am for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length -	WBM as contingency nd set) of ducts as demand minimum ites. 0 - 1,000 psig. < 10' until KOP,
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM Opti Drill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit * 8-1/2" PDC bit * 8-1/2" PDC bit friction breaki BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible.	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 077857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 i, inclination, and after Landing P ntire section, no est (as noted abo llowing directio 0 - 600 ft/hr. Ste Take surveys ever	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to ery stand, at a m	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3 natrix body, tar ey every joint fro tings sampling, est 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir	sqft) ±6 that drying shal ne per tour to c irk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar in. Keep DLS < 3 m landing targe	ES +300 kers are rigged u heck % ROC. Ad am for additiona L,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR	80:20 p after the rig (2 d diesel and prov al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length < for curve, and K0	WBM as contingency nd set) of ducts as demand minimum ites. - 1,000 psig. < 10' until KOP, OP with
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM Opti Drill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible. Geology and Er	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor )77857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 , inclination, and d after Landing P tire section, no est (as noted ab lowing directio ) - 600 ft/nr. Ste Take surveys even ngineering. Drill	120,000 CaCl uilt from previo rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to ery stand, at a m curve following	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, est 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir g directional pla	sqft) ±6 that drying sha ne per tour to c urk's mud progra deg, 750 GPM, : ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar in. Keep DLS < 3 m landing targe n and updated	ES +300 kers are rigged u heck % ROC. Ad am for additiona L,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR anding target. T	80:20 p after the rig (2 d diesel and prov al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length of for curve, and K0 ake survey every	WBM as contingency nd set) of ducts as demand minimum ites. ) - 1,000 psig. < 10' until KOP, OP with y joint during
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cu	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 77857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 , inclination, and d after Landing P ntire section, no est (as noted abo llowing directio D - 600 ft/hr. Ste Take surveys ever agineering. Drill rve. Continue dr	120,000 CaCl uilt from previo rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (survi 'oint) mud-log or cut pove); pressure te nal plan. Target er as needed to ery stand, at a m curve following filling in lateral	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 ( 1 tool spaced ~3 natrix body, tar ey every joint fro tings sampling, est 9-5/8" casing flow-rate is 65 flow-rate is 65 flow-rate is 60 flow-rate is 60 f	sqft) ±6 that drying sha ne per tour to c irk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar in. Keep DLS < 3 m landing targe n and updated i g as needed to k	ES +300 kers are rigged u heck % ROC. Ad am for additiona L,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plar	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length - or curve, and Kd ake survey every and in the targe	WBM as contingency nd set) of ducts as demand minimum ites. ) < 1,000 psig. < 10' until KOP, OP with y joint during et window.
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP for Target ROP 500 when feasible. Geology and Er curve. Land cu Keep DLS < 2 do	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor )77857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 , inclination, and d after Landing P ntire section, no est (as noted abo llowing direction 0 - 600 ft/nr. Ste Take surveys eve agineering. Drill rve. Continue dr eg/100' and keep	120,000 CaCl uilt from previo rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (survi 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to cry stand, at a m curve following rilling in lateral o slide length < 2	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, est 9–5/8" casing flow-rate is 650 keep well on pla inimum. Confir gdirectional pla section, steering 20', when feasib	sqft) ±6 that drying shall ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar in. Keep DLS < 3 m landing targed n and updated g as needed to k le. Take surveys	ES +300 kers are rigged u heck % ROC. Ad am for additiona L,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR ; anding target. T eep well on plar every stand, at a	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 crourye, and Ko ake survey every and in the targe	WBM as contingency nd set) of ducts as demand demand ites. 0 - 1,000 psig. < 10' until KOP, DP with joint during et window. get rotating
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM OptiDrill OBM shakers. Solids required to ma ************************************	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 077857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 i. inclination, and d after Landing P ntire section, no est (as noted abo llowing directio 0 - 600 ft/hr. Ste Take surveys even agineering. Drill rve. Continue dr eg/100' and keep performance: floo	120,000 CaCl uilt from previo rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (survi toint) mud-log or cut pove); pressure te nal plan. Target er as needed to curve following filling in lateral o slide length < 2 pw-rate is 650 -	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, est 9-5/8" casing flow-rate is 650 keep well on pla section, steering 20', when feasib 700 GPM, differ	sqft) ±6 that drying sha ne per tour to c rrk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar in. Keep DLS < 3 m landing target n and updated g as needed to k le. Take surveys rential is pressu	ES +300 kers are rigged u heck % ROC. Ad am for additiona L,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100'and kd t, planned BUR i anding target. T eep well on plar every stand, at a <b>rre is 700 - 1,00</b>	80:20 p after the rig (2 d diesel and provi l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700' exep slide length for curve, and Ko ake survey every and in the targe minimum. Targ 0 psig, ROP 500	WBM as contingency nd set) of ducts as demand minimum ttes. ) - 1,000 psig. < 10' until KOP, DP with / joint during at window. set rotating - 600 ft/hr,
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM OptiDrill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible. Geology and E. Geology and E. Geology and E. Geology and E. Geology and E.	8.0 - 9.0 system will be b control will bur intain mud in p 077857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abo llowing directio 0 - 600 ft/hr. Ste Take surveys eve Take surveys ever gineering. Drill rve. Continue dr eg/100' and keep berformance: flo lbs (MAX drill pi	120,000 CaCl uilt from previo rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve toint) mud-log or cut pove); pressure te nal plan. Target er as needed to curve following illing in lateral o slide length < 2 ow-rate is 650 - pe MUT). After	NC bus well. Ensure ttings samples o eference Newpa a tool spaced ~3 natrix body, tar ey every joint fro tings sampling, est 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir gection, steering 20', when feasib <b>700 GPM, diffe</b> reaching TD, pet	sqft) ±6 that drying sha ne per tour to c irk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar in. Keep DLS < 3 m landing target n and updated g as needed to k le. Take surveys rential is pressu rform no more f	ES +300 kers are rigged u heck % ROC. Ad am for additiona L,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR t, planned BUR eop well on plar every stand, at a <b>re is 700 - 1,00</b> than one clean-u	80:20 p after the rig (2 d diesel and provided and provid	WBM as contingency nd set) of ducts as demand minimum ites. ) - 1,000 psig. < 10' until KOP, DP with / joint during et window. set rotating - 600 ft/hr, ition hole for
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							Tens. Body	Tens. Conn
Casing Specs:	Size (in)	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	(lbs)	(lbs)
Specs	5.500	17.0	P-110	LTC	7,460	10,640	546,000	445,000
Loading					2,698	9,011	301,837	301,837
Min. S.F.					2.77	1.18	1.81	1.47
					a	1 (6 )		

Assumptions: Collapse: fully evacuated casing with 9.5 ppg fluid in the annulus (floating casing during running) Burst: 8,500 psi maximum surface treating pressure with 10.2 ppg equivalent mud weight sand laden fluid with 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 9.0 ppg fluid with 100,000 lbs over-pull

MU Torque (ft lbs): Casing Summary:	Float shoe, floa spaced evenly i	in lateral every 2	<i>Optimum:</i> ing, float collar, 2,000', floatatio 30' to the unit b	n sub at KOP, ca	sing to surface.	The toe-initiatio	on sleeve (last-ta				
Casing Summary:	intitiation slee sub <b>(NCS Air-Lo</b> boundary than Wellbore path <i>sleeve and is n</i>	loat shoe, float collar w/debris catcher, 1 jt casing, float collar <b>(Weatherford (WFT) float equipment)</b> , 20' marker joint, toe- ntitiation sleeve <b>(WFT RD 8,500 psi)</b> , casing to KOP with 20' marker joints spaced evenly in lateral every ~2,000', floatation ub <b>(NCS Air-Lock 2,500 psi from WFT)</b> , casing to surface. The toe-initiation sleeve shall be placed no closer to the unit ioundary than 300' measured perpendicular to the East or West lease lines for a East-West azimuth drilled wellbore. Vellbore path must be no closer than 600' from the parallel lease lines. <i>Note: the LTP is the maximum depth of the toe leeve and is noted on the Well Plan. Drill past the LTP as required for necessary rat-hole and shoe-track length to place the toe sleeve as close to (but not past) the planned LTP as possible.</i>									
Centralizers:	Lateral: 1 cent Top of curve to	ntralizer count and placement may be adjusted based on well conditions and as-drilled surveys. seral: 1 centralizer per 3 joints (purchase centralizers from either Scepter Supply or Arsenal) p of curve to 9-5/8" shoe: 1 centralizer per 5 joints ;/8" shoe to surface: 1 centralizer per 5 joints									
						Planned TOC		Total Cmt (cu			
Cement:	Туре	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	(ft MD)	Total Cmt (sx)	ft)			
Spacer	IntegraGuard Star	11		31.6		0	60 bbls				
Lead	ASTM type I/II	12.4	2.370	13.40	50%	0	541	1,283			
Tail	G:POZ blend	13.3	1.570	7.70	10%	4,533	1,481	2,325			
Displacement	119	est bbls									
Annular Capacity	0.2691	cuft/ft		9-5/8" casing a	innulus						
	0.2291	cuft/ft	5-1/2" casing x	8-1/2" hole an	nulus						
	0.1245	cuft/ft	5-1/2" casing v	vol	est shoe jt ft	100					
	Calculated cer	nent volumes a	ssume gauge ho	le and the exce	s noted in table	2					
			Production Blen								
			5004.0 ( 5	IntegraGuard Star							
Spacer	S-8 Silica Flour 163.7 lbs/bbl	Avis 616 viscosifier 11.6 lb/bbl	Ib/bbl	Plus 3K LCM 15 Ib/bbl	SS201 Surfactant 1 gal/bbl						
Lead	ASTM Type I/II	BA90 Bonding Agent 5.0 lb/sx	Bentonite Viscosifier 8% BWOB	FL24 Fluid Loss .5% BWOB	IntegraGuard GW86 Viscosifier .1% BWOB	R7C Retarder .2% BWOB	FP24 Defoamer 0.3% BWOB, Anti- Static .01 lb/sx				
Tail	Type G 50%	Pozzolan Fly Ash Extender 50%	BA90 Bonding Agent 3.0 lb/sx	Bentonite Viscosifier 4% BWOB	FL24 Fluid Loss .4% BWOB	IntegraGuard GW86 Viscosifier .1% BWOB	R3 Retarder .5% BWOB	FP24 Defoamer .3% BWOB, IntegraSeal 0.25 lb/sx			
Note:	Notify NMOCD This well will n 19.15.16.15.C measured alon completed into 19.15.16.7.E a initiation sleev perforation she	<b>b &amp; BLM if ceme</b> ot be considere .1.a and 19.15.3 g the azimuth o erval, as defined nd NMAC 19.15 re, and the first t	16.15.C.1.b, no f the well or 330 by NMAC 19.15 5.16.7.J, respect take point will b the unit bounda	ted to surface. x well location a point in the cor 'measured perp 5.16.7.B, are the tively. In the cas e the top perfor	as definted by Ni npleted interval pendicular to th e last take point e of this well, th ation. <b>Neither t</b>	MAC19.15.16.1 I shall be closer e azimuth well. and first take p e last take poin <b>he toe-initiatic</b>	to the unit bour The boundaries pint, as defined t will be the bot <b>on sleeve nor th</b>	ndary than 100' of the by NMAC tom toe- <b>e top</b>			
	ND BOP, cap w			S			less seed.				
Procedure:	After off-line ce	ement Job, cap a	and cover well. C	ontinue drilling	operations on	subsequent we	ns on pad.				
		A.N.									
COMPLETION AND PF											
Est Lateral Length:	/		420.000	1.1.1P.1		40.200.000					
Est Frac Inform:		Frac Stages		bbls slick wate	r	10,360,000	lbs proppant				
	Flow back thro Produce throu	0 1	0 1		nt production ar	nd storage facili	ties				
ESTIMATED START D											
Drilling:											
Completion:											
Production:											
Prepared by:	Alec Bridge	12/20/21									

Prepared by:	Alec Bridge	12/20/21
Updated:	Greg Olson	2/20/23
	Greg Olson	3/27/23
	G Olson	8/8/23



### **ENDURING RESOURCES IV, LLC** 6300 S SYRACUSE WAY, SUITE 525 **CENTENNIAL, COLORADO 80211**

#### DRILLING PLAN:

Drill, complete, and equip single lateral in the Mancos-H formation

W/FII	INFORMATION:
VVELL	INFORIVIATION.

Name: Haynes Canyon Unit 430H API Number: Not yet assigned AFE Number: Not yet assigned ER Well Number: Not yet assigned State: New Mexico County: Rio Arriba Surface Elevation: 6,703 ft ASL (GL) 6,728 ft ASL (KB) 3-23-6 Sec-Twn-Rng Surface Location: 897 ft FSL 448 ft FWL 36 248652 °N latitude 107 464293 °W longitude (NAD 83)

	30.240032 Mialitude	107.404295 Wiongitude	(NAD 03)
BH Location:	11-23-6 Sec-Twn-Rng	233 ft FSL	1,032 ft FWL
	36.232991 °N latitude	107.444053 °W longitude	(NAD 83)
Driving Directions:	FROM THE INTERSECTION OF US	HWY 550 & US HWY 64 IN BLOO	MFIELD, NM:

South on US Hwy 550 for 53.8 miles to MM 97.6; Left (North) on CR #379 (State Hwy 403) for 1.3 miles to fork; Right (North) remaining on CR #379 for 1.5 miles to location access on left; Haynes Canyon Unit 428H Pad. From East to West 430H, 428H, 442H, 440H).

#### **GEOLOGIC AND RESERVOIR INFORMATION:**

ognosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	0/G/W	Pressure
Ojo	Alamo	5,325	1,403	1,405	W	normal
Kir	tland	5,225	1,503	1,505	W	normal
Fru	itland	5,000	1,728	1,731	G, W	sub
Pic	tured Cliffs	4,765	1,963	1,967	G, W	sub
Lev	vis	4,615	2,113	2,118	G, W	normal
Cha	acra	4,320	2,408	2,415	G <i>,</i> W	normal
Clif	ff House	3,210	3,518	3,531	G <i>,</i> W	sub
Me	nefee	3,205	3,523	3,536	G <i>,</i> W	normal
Poi	nt Lookout	2,505	4,223	4,238	G, W	normal
Ma	ncos	2,210	4,518	4,533	0,G	sub (~0.38)
Gal	lup (MNCS_A)	1,870	4,858	4,873	0,G	sub (~0.38)
MN	ICS_B	1,780	4,948	4,963	0,G	sub (~0.38)
MN	ICS_C	1,645	5,083	5,100	0,G	sub (~0.38)
MN	ICS_Cms	1,580	5,148	5,169	0,G	sub (~0.38)
MN	ICS_D	1,505	5,223	5,253	0,G	sub (~0.38)
MN	ICS_E	1,420	5,308	5,359	0,G	sub (~0.38)
MN	ICS_F	1,375	5,353	5,424	0,G	sub (~0.38)
MN	ICS_G	1,290	5,438	5,574	0,G	sub (~0.38)
MN	ICS_H	1,245	5,483	5,672	0,G	sub (~0.38)
MN	ICS_I	0	0	0	0,G	sub (~0.38)
FTF	TARGET	1,245	5,483	5,694	0,G	sub (~0.38)
PR	OJECTED LTP	1,267	5,461	13,759	O,G	sub (~0.38)

Surface: Nacimiento

Oil & Gas Zones: Several gas bearing zones will be encountered; target formation is the Gallup

Pressure:	Normal (0.43 psi/ft) or sub-noi	rmal pressure	gradients ant	icipated in all formations		
	Max. pressure gradient:	0.43	psi/ft	Evacuated hole gradient:	0.22	psi/ft
	Maximum anticipated BH pre	ssure, assumi	ng maximum	pressure gradient:	2,360	psi
	Maximum anticipated surface	pressure, ass	uming partia	ly evacuated hole:	1,160	psi
Temperature:	Maximum anticipated BHT is 1	$125^{\circ}$ F or less				

#### H<sub>2</sub>S INFORMATION:

H<sub>2</sub> S Zones: Encountering hydrogen-sulfide bearing zones is NOT anticipated.

Safety: Sensors and alarms will be placed in the substructure, on the rig floor, above the pits, and at the shakers.

#### LOGGING, CORING, AND TESTING:

Mud Logs:	
-	None planned; remote geo-steering from drill out of 9-5/8" casing to TD; gas detection from drillout of 13-3/8" casing to TD.
MWD/LWD:	Gamma Ray from drillout of 13-3/8" casing to TD
Open Hole Logs:	None planned
Testing:	None planned
Coring:	None planned
Cased Hole Logs:	CBL on 5-1/2" casing from deepest free-fall depth to surface

### DRILLING RIG INFORMATION:

Contractor: Aztec Rig No.: 1000 Draw Works: E80 AC 1,500 hp Mast: Hyduke Triple (136 ft, 600,000 lbs, 10 lines)

Top Drive: NOV IDS-350PE (350 ton)

Prime Movers: 4 - GE Jenbacher Natural Gas Generator **Pumps:** 2 - RS F-1600 (7.500 psi)

BOPE 1: Cameron single & double gate rams (13-5/8", 3,000 psi)

BOPE 2: Cameron annular (13-5/8", 5,000 psi)

Choke Cameron (4", 10,000 psi)

KB-GL (ft): 25

Note: Actual drilling rig may vary depending on availability at time the well is scheduled to be drilled.

STATE AND FEDERAL	NOTIFICATIONS	BLM	State
Construction and	BLM is to be notified minimum of 48 hours prior to start of construction or reclamation.		
Reclamation:	Grazing permittee is to be notified 10 days in advance.	(505) 564-7600	
Spud	BLM and state are to be notified minimum of 24 hours prior to spud.	(505) 564-7750	(505) 334-6178
BOP	BLM is to be notified minimum of 24 hours prior to BOPE testing.	(505) 564-7750	seenote
Casing / cementing	BLM and state are to be notified minimum of 24 hours prior to running casing and		
	cementing.	(505) 564-7750	(505) 334-6178
Plugging	BLM and state are to be notified minimum of 24 hours prior to plugging ops.	(505) 564-7750	seenote
	All notifications are to be recorded in the WellView report with time, date, name or		
	number that notifications were made to.		

Note: Monica Keuhling with the OCD requests state notifications 24 hrs in advance for spud, BOP tests, casing & cementing and any plugging be given to her in both phone message and email: (505) 320-0243, monica.keuhling@emnrd.nm.gov

#### **BOPE REQUIREMENTS:**

- See attached diaaram for details regarding BOPE specifications and configuration.
- 1) Rig will be equipped with upper and lower kelly cocks with handles available.
- 2)

Inside BOP and TIW valves will be available to use on all sizes and threads of drill pipe used while drilling the well. 2) BOP accumulator will have enough capacity to open the HCR valve, close all rams and annular preventer, and retain minimum of 200 psi above precharge on the closing manifold without the use of closing pumps. The fluid reservoir capacity shall be at least double the usable fluid volume of the accumulator system capacity, and the fluid level shall be maintained at manufacturer's recommendation. There will be two additional sources of power for the closing pumps (electric and air). Sufficient nitrogen bottles will be available and will be recharged when pressure falls below manufacturer's recommended minimum

3)

BOP testing shall be conducted (a) when initially installed, (b) whenever any seal is broken or repaired, (c) if the time since the previous test exceeds 30 days. Tests will be conducted using a test plug. BOP ram preventers will be tested to 3,000 psig for 10 minutes, and the annular preventer will be tested to 1,500 psi for 10 minutes. Ram and annular preventers will be tested to 250 psi for 5 minutes. Additionally, BOP and casing strings will be tested to .22 psi/ft or 1,500 psi, whichever is greater but not exceeding 70% of yield strength of the casing, for 30 minutes, prior to drilling out 13-3/8" and 9-5/8" casing. Rams and hydraulically operated remote choke line valve will be function tested daily at a minimum.

- 4) Remote valve for BOP rams, HCR, and choke shall be placed in a location that is readily available to the driller. The remote BOP valve shall be capable of closing and opening the rams.
- 5) Manual locking devices (hand wheels) shall be intalled on rams. A valve will be installed on the annular preventer's closing line as close as possible to the preventer to act as a locking device. The valve will be maintained in the open position and shall only be closed when the there is no power to the accumulator.

#### FLUIDS AND SOLIDS CONTROL PROGRAM:

#### Fluid Measurement:

Pumps shall be equipped with stroke counters with displays in the dog-house. Slow pump speed shall be recorded daily and after mudding up, at a minimum, on the drilling report. A Pit Volume Totalizer will be installed and the readout will be displayed in the dog-house. Gas-detecting equipment will be installed at the shakers, and readouts will be available in the dog-house and the in the geologist's work-station (if geologist or mud-logger is on-site). Closed-Loop System: A fully, closed-loop system will be utilized. The system will consist of above-ground piping and above-ground storage tanks and bins. The system will not entail any earthen pits, below-grade storage, or drying pads. All equipment will be disassembled and removed from the site when drilling operations cease. The system will be capable of storing all fluids and generated cuttings and of preventing uncontrolled releases of the same. The system will be operated in an efficient manner to allow the recycling and reuse of as much fluid as possible and to minimimize the amount of fluids and solids that require disposal Fluid Disposal : Fluids that cannot be reused, recycled, or returned to the supplier will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.). Solids Disposal : Drilling solids will be stored (until haul-off) on-site in separate containers with no other waste, debris, or garbage products,

Waste solids will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.). Fluid Program: See "Detailed Drilling Plan" section for additional details. Sufficient barite will be on location to weight up mud system to balance maximum anticipated pressure gradient.

#### DETAILED DRILLING PLAN:

<u>SURFACE:</u>	Drill vertically to casing setting depth (plus necessary rathole), run casing, cement casing to surface.								
	0 ft (MD)	to	350 ft (MD)	Hole Section Length:					
	0 ft (TVD)	to	350 ft (TVD)	Casing Required:					

Note: Surface hole may be drilled, cased, and cemented with a smaller rig in advance of the drilling rig.

350 ft

350 ft

			FL (mL/30		YP (lb/100			
Fluid:	Туре	MW (ppg)	min)	PV (cp)	sqft)	рН		nents
	Fresh Water	8.4	N/C	2 - 8	2 - 12	9.0	Spud	l mud
Hole Size:								
•	Mill Tooth or P							
MWD / Survey:	,	ation survey						
Logging:		42 /411 hit and		الاستعاد والمتعادية		the Device in all such		
Proceaure:					ll with 17-1/2" b			
					g as required. TO	-		asdetailed
	below. Monito	r returns during	cement job and	a note cement v	olume to surface	e. Install cellar a	nd weimead.	
				-			Tens. Body	Tens. Conn
Casing Specs:		Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	(lbs)	(lbs)
Specs	13.375	54.5	J-55	BTC	1,130	2,730	853,000	909,000
Loading					153	791	116,634	116,634
Min. S.F.	A	Callenaarfullu		a with 0 4 and	7.39	3.45	7.31	7.79
	Assumptions:				equivalent exte with 9.5 ppg flu			intermediate
			og equivalent ex			ina misiae cusing	y while arriting	memute
					100,000 lbs over	r-null		
IU Torque (ft lbs):	Minumum:	N/A	Optimum:	N/A	Maximum:	N/A		
o loique (je los).			onnection runni	,	waximam.	N/A		
Casing Summary:								
		-	-		m 3 jts, 1 centra	lizer ner 2 its to	surface	
	_ centranzer3 p				Hole Cap.		Planned TOC	
Cement:	Туре	Weight (nng)	Yield (cuft/sk)	Water (gal/sk)	(cuft/ft)	% Excess	(ft MD)	Total Cmt (sx)
cement.	TYPE III	14.6	1.39	6.686	0.6946	100%	0	364
Annular Capacity	0.6946	cuft/ft		x 17-1/2" hole (		Csg capacity	0.8680	ft3/ft
					le and the exces			Cu Ft Slurry
Druke El	iergy services.	curculated cell		sume gauge no	ie unu the exces			505.3
			D-CD2 .3% BWOC					505.5
Tail	ASTM Type III Blend		Dispersant/Friction reducer	Flake - seepage				
					ement must ach	ieve 500 psi co	mpressive strer	ngth before
	drilling out.							
	a							
INTERMEDIATE:	Drill as per dire	ectional plan to	casina settina i	lenth run casir	a coment casir	a to surface		
		ft (MD)	to		ft (MD)		ection Length:	3,335 ft
		ft (TVD)	to		ft (TVD)		sing Required:	3,685 ft
ļ		10(100)		3,073	10(100)		ing nequireu.	3,003 11
I			FL (mL/30		YP (lb/100			
			<b>, , , , , , , , , ,</b>	PV (cp)				
Fluid:	Type	MW (ppg)	min)		saft)	рΗ	Comr	nents
Fluid:	Type LSND (5% KCl)	MW (ppg) 8.8 - 9.5	min) 20		<b>sqft)</b> 8 - 14	рН 9.0-9.5		nents DBM
	LSND (5% KCl)	<b>MW (ppg)</b> 8.8 - 9.5	<b>min)</b> 20	8 - 14	<b>sqft)</b> 8 - 14			nents DBM
Hole Size:	LSND (5% KCl) 12-1/4"	8.8 - 9.5	20					
Hole Size: Bit / Motor:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi	8.8 - 9.5 t w/mud motor	20	8-14	8-14	9.0 - 9.5		
Hole Size: Bit / Motor:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4.	20 0, stage, 0.16 re	8 - 14 v/gal, 1.83 DEG	8 - 14	9.0 - 9.5 DIFF PSIG	No (	
Hole Size: Bit / Motor: Bit / Motor:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or	20 0, stage, 0.16 re 19 mm cutters,	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir	8 - 14 , 900 GPM, 950 (range 0.65 - 0.	9.0 - 9.5 DIFF PSIG 90 max), jet wit	No (	
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or	20 0, stage, 0.16 re 19 mm cutters,	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir	8 - 14 , 900 GPM, 950 (range 0.65 - 0.	9.0 - 9.5 DIFF PSIG 90 max), jet wit	No (	
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100' a	8 - 14 , 900 GPM, 950 (range 0.65 - 0. at a minimum), (	9.0 - 9.5 DIFF PSIG 90 max), <b>jet wi</b> t GR optional	No ( th 6 - 12s	DBM
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin	8 - 14 , 900 GPM, 950 1 (range 0.65 - 0. at a minimum), 0 g to	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500	No ( <b>:h 6 - 12s</b> psi for 30 minu	DBM
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a cest (as noted abo	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan <b>(20' rat-h</b>	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin tole past casing	8 - 14 , 900 GPM, 950 1 (range 0.65 - 0. at a minimum), 0 g to setting depth). 1	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed	No ( th <b>6 - 12s</b> psi for 30 minu to keep well on	DBM Ites. plan. Keep DLS
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination est (as noted abo wing direction d keep slide len	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin pole past casing possible. Take su	8 - 14 , 900 GPM, 950 (range 0.65 - 0. at a minimum), o g to setting depth). Irveys every star	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed	No ( th <b>6 - 12s</b> psi for 30 minu to keep well on n. Target flow-ra	DBM Ites. plan. Keep DLS ates of 750
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey NOBPE and to Drill to TD follo < 3 deg/100' an GPM (higher if for	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin sole past casing possible. Take su nimum desired	8 - 14 , 900 GPM, 950 (range 0.65 - 0. at a minimum), o g to setting depth). urveys every star flow-rate is 650	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co	No ( th <b>6 - 12s</b> psi for 30 minu to keep well on n. Target flow-r. ndition hole and	DBM Ites. plan. Keep DLS ates of 750 d fluid for
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin tole past casing possible. Take su nimum desired und washing / ci	8 - 14 , 900 GPM, 950 (range 0.65 - 0. at a minimum), q gto setting depth). urveys every star flow-rate is 650 rculating as requ	9.0 - 9.5 DIFF PSIG 90 max), <b>jet wi</b> f GR optional <b>1,500</b> Steer as needed dd, at a minimu GPM. At TD, co uired. Land casin	No ( th <b>6 - 12s</b> psi for 30 minu to keep well on n. Target flow-r. ndition hole an ng. ND BOPE. W	DBM tes. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin tole past casing possible. Take su nimum desired und washing / ci	8 - 14 , 900 GPM, 950 (range 0.65 - 0. at a minimum), o g to setting depth). urveys every star flow-rate is 650	9.0 - 9.5 DIFF PSIG 90 max), <b>jet wi</b> f GR optional <b>1,500</b> Steer as needed dd, at a minimu GPM. At TD, co uired. Land casin	No ( th <b>6 - 12s</b> psi for 30 minu to keep well on n. Target flow-r. ndition hole an ng. ND BOPE. W	DBM tes. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin tole past casing possible. Take su nimum desired und washing / ci	8 - 14 , 900 GPM, 950 (range 0.65 - 0. at a minimum), q gto setting depth). urveys every star flow-rate is 650 rculating as requ	9.0 - 9.5 DIFF PSIG 90 max), <b>jet wi</b> f GR optional <b>1,500</b> Steer as needed dd, at a minimu GPM. At TD, co uired. Land casin	No ( th <b>6 - 12s</b> psi for 30 minu to keep well on n. Target flow-r. ndition hole an ng. ND BOPE. W	DBM tes. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin tole past casing possible. Take su nimum desired und washing / ci	8 - 14 , 900 GPM, 950 (range 0.65 - 0. at a minimum), q gto setting depth). urveys every star flow-rate is 650 rculating as requ	9.0 - 9.5 DIFF PSIG 90 max), <b>jet wi</b> f GR optional <b>1,500</b> Steer as needed dd, at a minimu GPM. At TD, co uired. Land casin	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-r. ndition hole and ng. ND BOPE. Wo ment job and no	DBM plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure:	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas iff-line cement j ace.	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemen	8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin <b>tole past casing</b> possible. Take su nimum desired and washing / ci nt as detailed be	8-14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). rrveys every star flow-rate is 650 rculating as requ elow. Monitor re	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin aturns during ce	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-r. ndition hole an ng. ND BOPE. Wo ment job and no Tens. Body	DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs:	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j ace. Wt (lb/ft)	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan <b>(20' rat-h</b> gth < 10', when µ return rates). Mi ing using a CRT a ob. Pump cemen	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin <b>tole past casing</b> possible. Take su nimum desired and washing / ci nt as detailed be <b>Conn.</b>	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 6 setting depth). roveys every star flow-rate is 650 rculating as requ elow. Monitor re Collapse (psi)	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co uired. Land casin aturns during ce	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-r. ndition hole an- ng. ND BOPE. W. ment job and no Tens. Body (lbs)	DBM plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs)
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs	LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas iff-line cement j ace.	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemen	8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin <b>tole past casing</b> possible. Take su nimum desired and washing / ci nt as detailed be	8 - 14 , 900 GPM, 950 (range 0.65 - 0. at a minimum), 6 g to setting depth). urveys every star flow-rate is 650 rculating as requ elow. Monitor re Collapse (psi) 2,020	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co uired. Land casin eturns during ce Burst (psi) 3,520	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ra ndition hole an- ng. ND BOPE. Wa ment job and no <b>Tens. Body</b> (lbs) 564,000	DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j ace. Wt (lb/ft)	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan <b>(20' rat-h</b> gth < 10', when µ return rates). Mi ing using a CRT a ob. Pump cemen	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin <b>tole past casing</b> possible. Take su nimum desired and washing / ci nt as detailed be <b>Conn.</b>	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 6 g to setting depth). 1 rycys every star flow-rate is 650 rculating as requ elow. Monitor re Collapse (psi) 2,020 1,604	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co uired. Land casin eturns during ce Burst (psi) 3,520 1,370	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-r: ndition hole an ng. ND BOPE. W. ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u to OH. Run cas off-line cement j ace. Wt (lb/ft) 36.0	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when return rates). Mi ing using a CRT a ob. Pump cemer Grade J-55	8 - 14 v/gal, 1.83 DEG, TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin nole past casing possible. Take su nimum desired nimum desired nimum desired nimum desired not as detailed be <u>Conn.</u> LTC	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o g to setting depth). Inveys every star flow-rate is 650 rculating as requ elow. Monitor re Collapse (psi) 2,020 1,604 1.26	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co irred. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ra ndition hole an ng. ND BOPE. Wa ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62	DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directions d keep slide len able to control u TOOH. Run cas iff-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemer Grade J-55 evacuated casir	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired nimum desired nimum desired not as detailed be <u>Conn.</u> LTC ag with 8.4 ppg	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). Inveys every star flow-rate is 650 rculating as required collapse (psi) 2,020 1,604 1.26 equivalent exte	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimum GPM. At TD, co uired. Land casin GPM. At TD, co uired. Land casin GPM. At TD, co 1,370 2.57 rnal pressure gu	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ro ndition hole an ng. ND BOPE. W. ment job and nu <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemen Grade J-55 evacuated casir m anticipated s	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired ind washing / ci nt as detailed be <u>Conn.</u> LTC ag with 8.4 ppg wrface pressure	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 reulating as requ elow. Monitor re Collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimum GPM. At TD, co uired. Land casin GPM. At TD, co uired. Land casin GPM. At TD, co 1,370 2.57 rnal pressure gu	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ro ndition hole an ng. ND BOPE. W. ment job and nu <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u . TOOH. Run cas fff-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemen Grade J-55 evacuated casir m anticipated s og equivalent es	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take st nimum desired ind washing / ci nt as detailed be Conn. LTC bg with 8.4 ppg surface pressure cternal pressure	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 rculating as requi- collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flow- gradient	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin aturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casing	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ro ndition hole an ng. ND BOPE. W. ment job and nu <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas iff-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj Tension: buoye	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemen Grade J-55 evacuated casir m anticipated s og equivalent ex- rd weight in 8.4	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired ind washing / ci nt as detailed be <u>Conn.</u> LTC ng with 8.4 ppg urface pressure kternal pressure pg fluid with 1	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 reulating as requ elow. Monitor re Collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo	9.0-9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin aturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casing	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ro ndition hole an ng. ND BOPE. W. ment job and nu <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum:	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas iff-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj Tension: buoye 3,400	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemen ob. Pump cemen Grade J-55 evacuated casim m anticipated s og equivalent es ad weight in 8.4 Optimum:	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired ind washing / ci nt as detailed be <u>Conn.</u> LTC ag with 8.4 ppg surface pressure cternal pressure ppg fluid with 1 4,530	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o setting depth). urveys every star flow-rate is 650 rculating as requ low. Monitor ref Collapse (psi) 2,020 1,604 1.26 equivalent exte with 9.5 ppg flu gradient 100,000 lbs over Maximum:	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casing turns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing r-pull 5,660	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-r. ndition hole an- ng. ND BOPE. W. ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling j	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Procedure: Specs Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control i tool. Run cas off-line cement j- ace. wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pf Tension: buoye 3,400 casing, float col	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when j return rates). Mi ing using a CRT a ob. Pump cemer ob. Pump cemer J-55 evacuated casir m anticipated s og equivalent ex- d weight in 8.4 Optimum: lar, casing to su	8 - 14 v/gal, 1.83 DEG, TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin possible. Take su nimum desired nimum desired nimum desired nimum desired nimum desired nimum desired nimum desired nimum desired nimum desired conn. LTC conn. LTC g with 8.4 ppg urface pressure external pressure pg fluid with 1 4,530 rface (FLOAT EQ	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o setting depth). urveys every star flow-rate is 650 rculating as requ low. Monitor ref Collapse (psi) 2,020 1,604 1.26 equivalent exte with 9.5 ppg flu gradient 100,000 lbs over Maximum:	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casing turns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing r-pull 5,660	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-r. ndition hole an- ng. ND BOPE. W. ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling j	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Procedure: Specs Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control i tool. Run cas off-line cement j- ace. wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pf Tension: buoye 3,400 casing, float col	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemen ob. Pump cemen Grade J-55 evacuated casim m anticipated s og equivalent es to weight in 8.4 Optimum:	8 - 14 v/gal, 1.83 DEG, TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin possible. Take su nimum desired nimum desired nimum desired nimum desired nimum desired nimum desired nimum desired nimum desired nimum desired conn. LTC conn. LTC g with 8.4 ppg urface pressure external pressure pg fluid with 1 4,530 rface (FLOAT EQ	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o setting depth). urveys every star flow-rate is 650 rculating as requ low. Monitor ref Collapse (psi) 2,020 1,604 1.26 equivalent exte with 9.5 ppg flu gradient 100,000 lbs over Maximum:	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casing turns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing r-pull 5,660	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-r. ndition hole an- ng. ND BOPE. W. ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling j	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in n	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u to control u TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 p Tension: buoye 3,400 casing, float col on-vertical hole	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when return rates). Mi ing using a CRT a ob. Pump cemer dob. Pump cemer J-55 evacuated casir m anticipated s tog equivalent ex- d weight nex- Optimum: lar, casing to su ; 1 per 2-joints i	8 - 14 v/gal, 1.83 DEG, TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin possible. Take su nimum desired ind washing / ci int as detailed be <u>Conn.</u> LTC ag with 8.4 ppg urface pressure ppg fluid with 1 4,530 rface (FLOAT EQ n vertical hole	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o setting depth). urveys every star flow-rate is 650 rculating as requ low. Monitor ref Collapse (psi) 2,020 1,604 1.26 equivalent exte with 9.5 ppg flu gradient 100,000 lbs over Maximum:	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co irred. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing -pull 5,660 WEATHERFORD	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ra ndition hole an ng. ND BOPE. Wa ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient g while drilling j	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if: casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KO	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directions d keep slide len able to control u TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 p Tension: buoye 3,400 casing, float col on-vertical hole : stop-banded 1 P; 1 centralizer	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemer al plan 20' rat-h gth < 10', when p return rates). Mi return rates). Mi return rates). Mi return rates). Mi source and the sur- source and the sur- generation of the sur- per 3 jts (floating per 3 jts (floating)	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin possible. Take su nimum desired ind washing / ci nt as detailed be Conn. LTC ag with 8.4 ppg surface pressure ppg fluid with 3 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). Inveys every star flow-rate is 650 rculating as required collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flow ogradient 100,000 lbs over Maximum: UIPMENT FROM	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co irred. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gravit id inside casing -pull 5,660 WEATHERFORD	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ra ndition hole and rg. ND BOPE. W. ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient g while drilling p )	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if: casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KO	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directions d keep slide len able to control u to Collapse slide len able to control u TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pp Tension: buoye 3,400 casing, float col on-vertical hole top-banded 10	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemer al plan 20' rat-h gth < 10', when p return rates). Mi return rates). Mi return rates). Mi return rates). Mi source and the sur- source and the sur- generation of the sur- per 3 jts (floating per 3 jts (floating)	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin possible. Take su nimum desired ind washing / ci nt as detailed be Conn. LTC ag with 8.4 ppg surface pressure ppg fluid with 3 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). Inveys every star flow-rate is 650 rculating as requ- elow. Monitor re- Collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flu- or gradient 100,000 lbs over Maximum: UIPMENT FROM	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co irred. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gravit id inside casing -pull 5,660 WEATHERFORD	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ra ndition hole and rg. ND BOPE. W. ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient g while drilling p )	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if: casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KO	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directions d keep slide len able to control u TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 p Tension: buoye 3,400 casing, float col on-vertical hole : stop-banded 1 P; 1 centralizer	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemer al plan 20' rat-h gth < 10', when p return rates). Mi return rates). Mi return rates). Mi return rates). Mi source and the sur- source and the sur- generation of the sur- per 3 jts (floating per 3 jts (floating)	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100' a st 13-3/8" casin possible. Take su nimum desired ind washing / ci nt as detailed be Conn. LTC ag with 8.4 ppg surface pressure ppg fluid with 3 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). Inveys every star flow-rate is 650 rculating as requ- elow. Monitor re- Collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flu- or gradient 100,000 lbs over Maximum: UIPMENT FROM	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimum GPM. At TD, co irred. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gravit s,660 WEATHERFORD floating on bot Scepter Supply	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ra ndition hole and rg. ND BOPE. W. ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient g while drilling p )	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if: casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KO	8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. OC w/16 mm or ith inclination a est (as noted abo wing directions d keep slide len able to control u TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 p Tension: buoye 3,400 casing, float col on-vertical hole : stop-banded 1 P; 1 centralizer GODY POLYMER	20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemer al plan 20' rat-h gth < 10', when p return rates). Mi return rates). Mi return rates). Mi return rates). Mi source and the sur- source and the sur- generation of the sur- per 3 jts (floating per 3 jts (floating)	8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take sc nimum desired ind washing / ci nt as detailed be Conn. LTC by with 8.4 ppg wrface pressure cternal pressure strenal pressure ternal pressure fluid with 1 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j ng) to surface (Co	8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). Inveys every star flow-rate is 650 rculating as requ- elow. Monitor re- Collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flu- or gradient 100,000 lbs over Maximum: UIPMENT FROM	9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co irred. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gravit id inside casing -pull 5,660 WEATHERFORD	No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ra ndition hole and rg. ND BOPE. W. ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient g while drilling p )	ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production

age 1 Concern	D Mud Develop	8 5				0	10 bbls	
age 1 Spacer		8.5				U		
1.000	90:10 Type	12 5	2 1 4 0	12.05	70%	0	765	1.626
Leaa Tail		12.5 14.6	2.140 1.380	12.05 6.64	70% 20%	0 3,185	765 150	1,636 207
Displacement			1.380	0.04	2078	3,185	150	207
Annular Capacity		cuft/ft	9-5/8" casina y	: 13-3/8" casing	annulus			1
Annalar capacity	0.3132	cuft/ft		: 13 3/8 cusing : 12-1/4" hole a		9-5/8" 36# ID	8 921	
	0.4341	cuft/ft	9-5/8" casing v		est shoe jt ft	44	0.521	
		nent volumes as					le	
Space	D-Mud Breaker	SAPP						
			D-MPA-1 .4% BWOC					
Lead	ASTM Type III 90/10 Poz	D-CSE 1 5.0% BWOC Strength Enhancer		D-SA 1 1.4% BWOC Na Metasilicate	D-CD 2 .4% BWOC Dispersant	Cello Flace LCM .25 lb/sx	D-FP1 0.5% BWOC Defoamer	D-R1 .5% Retarder
			D-MPA-1 .4% BWOC		D-CD 2 .5% BWOC	Collo Flaco ICM 25		
Tai	ASTM Type III Blend		Fluid Loss & Gas Migration Control		Dispersant	Cello Flace LCM .25 lb/sx		D-R1 .2% Retarder
		diate Cementing						
PRODUCTION.	drilling out.	wing direction	<i>al plan, run cas</i> to	-	<i>ing to surface.</i> ft (MD)	Holes	Section Length:	10,074
		ft (TVD)	to		ft (TVD)		asing Required:	13,759 f
	3,073	it (1VD)		5,401			asing Requireu.	13,735
		E	stimated KOP:	4.950	ft (MD)	4.937	ft (TVD)	1
		- Estimated Landi			ft (MD)		ft (TVD)	
	-		ateral Length:		ft (MD)	5,405		
		Lotinated L	aterar Length.	0,005	10 (1110)	1		
					YP (lb/100			1
Fluid	Туре	MW (ppg)	WPS ppm	нтнр	YP (lb/100 saft)	ES	OWR	Comment
Fluid	Туре	MW (ppg)	WPS ppm	НТНР	YP (lb/100 sqft)	ES	OWR	
Fluid	Туре	<b>MW (ppg)</b> 8.0 - 9.0	WPS ppm	HTHP NC	•	<b>ES</b> +300	<b>OWR</b> 80:20	WBM as
	ОВМ	8.0 - 9.0	120,000 CaCl	NC	sqft) ±6	+300	80:20	WBM as contingency
	OBM OptiDrill OBM	8.0 - 9.0 system will be b	120,000 CaCl uilt from previo	NC us well. Ensure	sqft) ±6 that drying shal	+300 Kers are rigged u	80:20 p after the rig (2)	WBM as contingency nd set) of
	OBM OptiDrill OBM shakers. Solids	8.0 - 9.0	120,000 CaCl uilt from previo n retorts on cut	NC us well. Ensure tings samples o	sqft) ±6 that drying shal ne per tour to c	+300 kers are rigged u heck % ROC. Add	80:20 p after the rig (2) d diesel and prod	WBM as contingency nd set) of
	OBM OptiDrill OBM shakers. Solids	8.0 - 9.0 system will be b control will bur	120,000 CaCl uilt from previo n retorts on cut	NC us well. Ensure tings samples o	sqft) ±6 that drying shal ne per tour to c	+300 kers are rigged u heck % ROC. Add	80:20 p after the rig (2) d diesel and prod	WBM as contingency nd set) of
luids / Solids Notes.	OBM OptiDrill OBM shakers. Solids required to ma	8.0 - 9.0 system will be b control will bur	120,000 CaCl uilt from previo n retorts on cut	NC us well. Ensure tings samples o	sqft) ±6 that drying shal ne per tour to c	+300 kers are rigged u heck % ROC. Add	80:20 p after the rig (2) d diesel and prod	WBM as contingency nd set) of
luids / Solids Notes Hole Size	OBM OptiDrill OBM shakers. Solids required to ma	8.0 - 9.0 system will be b control will bur intain mud in p	120,000 CaCl uilt from previo n retorts on cut	NC us well. Ensure tings samples o	sqft) ±6 that drying shal ne per tour to c	+300 kers are rigged u heck % ROC. Add	80:20 p after the rig (2) d diesel and prod	WBM as contingency nd set) of
luids / Solids Notes. Hole Size. Bit / Motor.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor	120,000 CaCl uilt from previc n retorts on cut rogram specs. R	NC us well. Ensure tings samples o eference Newpa	sqft) ±6 that drying shal ne per tour to c ırk's mud progra	+300 kers are rigged u heck % ROC. Add im for additiona	80:20 p after the rig (2) d diesel and prod l details.	WBM as contingency nd set) of ducts as
luids / Solids Notes. Hole Size. Bit / Motor.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2	NC rus well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83	sqft) ±6 that drying shal ne per tour to c ırk's mud progra	+300 kers are rigged u heck % ROC. Add im for additiona .,580 DIFF PSIG	80:20 p after the rig (2) d diesel and prod l details.	WBM as contingency nd set) of ducts as
luids / Solids Notes. Hole Size. Bit / Motor.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breaking	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/- ng device(s) as re	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom	NC rus well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3	sqft) ±6 that drying shal ne per tour to c ırk's mud progra deg, 750 GPM, 2 ,000' behind th	+300 kers are rigged u heck % ROC. Add im for additiona .,580 DIFF PSIG e bit.	80:20 p after the rig (2) d diesel and prod l details.	WBM as contingency nd set) of ducts as
luids / Solids Notes Hole Size Bit / Motor Bit / Motor	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r	NC rus well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar	sqft) ±6 that drying shal ne per tour to c irk's mud progra deg, 750 GPM, 2 ,000' behind th get TFA = 1.0 - 1	+300 kers are rigged u heck % ROC. Add im for additiona .,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prod l details. (or similar); on c	WBM as contingency nd set) of ducts as
luids / Solids Notes Hole Size Bit / Motor Bit / Motor	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR,	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve	NC rus well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar	sqft) ±6 that drying shal ne per tour to c irk's mud progra deg, 750 GPM, 2 ,000' behind th get TFA = 1.0 - 1	+300 kers are rigged u heck % ROC. Add im for additiona .,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prod l details. (or similar); on c	WBM as contingency nd set) of ducts as
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR,	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/, ng device(s) as re DC w/16 mm - 1 . inclination, and d after Landing P	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint)	NC nus well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3 natrix body, tar ey every joint fro	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, : ,000' behind th get TFA = 1.0 - 1 om KOP to Land	+300 kers are rigged u heck % ROC. Add im for additiona .,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prod l details. (or similar); on c	WBM as contingency nd set) of ducts as
luids / Solids Notes. Hole Size. Bit / Motor. Bit / Motor. MWD / Survey. Logging.	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 77857 - 6.5" 7/. ng device(s) as rep DC w/16 mm - 1 inclination, and d after Landing P ntire section, no	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve roint) mud-log or cut	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling,	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs	+300 kers are rigged u heck % ROC. Add im for additiona .,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prod l details. (or similar); on c	WBM as contingency nd set) of ducts as
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and a fater Landing P titre section, no est (as noted abo	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut pove); pressure te	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 ( tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to	+300 kers are rigged u heck % ROC. Adv m for additiona .,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu	WBM as contingency nd set) of ducts as demand minimum ites.
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM Opti Drill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and a fater Landing P titre section, no est (as noted abo	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut pove); pressure te nal plan. Target	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 ( tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar	+300 kers are rigged u heck % ROC. Adv m for additiona .,580 DIFF PSIG e bit. .5 sq-in ing Point and su <b>1,500</b> get differential i	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700	WBM as contingency nd set) of ducts as demand minimum ites. 0 - 1,000 psig.
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM Opti Drill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GP MWD or er NU BOPE and t Drill to KOP fol Target ROP 50C	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and a fater Landing P titre section, no est (as noted abo lowing directio	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut pove); pressure te nal plan. Target er as needed to	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar in. Keep DLS < 3	+300 kers are rigged u heck % ROC. Adv im for additiona .,580 DIFF PSIG e bit. 5 sq-in ing Point and su 1,500 get differential i deg/100' and ke	80:20 p after the rig (2) d diesel and prod d details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length <	WBM as contingency nd set) of ducts as demand minimum ites. ) - 1,000 psig. <10' until KOP
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM Opti Drill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit * 8-1/2" PDC bit * 8-1/2" PDC bit friction breaki BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible.	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and a fater Landing P thire section, no est (as noted abo lowing directio 0 - 600 ft/hr. Ste	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to ery stand, at a m	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 ( tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar n. Keep DLS < 3 m landing targe	+300 kers are rigged u heck % ROC. Add m for additiona .,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR f	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length < for curve, and K0	WBM as contingency nd set) of ducts as demand minimum tes. - 1,000 psig. - 1,000 psig. - 10' until KOP DP with
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test	OBM Opti Drill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible. Geology and Er	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and a fter Landing P ntire section, no est (as noted abo lowing directio 0 - 600 ft/hr. Ste Take surveys ever	120,000 CaCl uilt from previc ro retorts on cui rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to ery stand, at a m curve following	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir directional pla	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar in. Keep DLS < 3 m landing targe n and updated l	+300 kers are rigged u heck % ROC. Adi im for additiona .,580 DIFF PSIG a bit. .5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR i anding target. T	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length < for curve, and KO ake survey every	WBM as contingency nd set) of ducts as demand minimum tes. - 1,000 psig. - 10' until KOP DP with r joint during
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cu	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing directio ) - 600 ft/hr. Ste Take surveys even ngineering. Drill	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut pove); pressure te ral plan. Target er as needed to ery stand, at a m curve following rilling in lateral s	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 ( tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 flow-rate is	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar m. Keep DLS < 3 m landing targe n and updated l g as needed to k	+300 ters are rigged u heck % ROC. Adi im for additiona .,580 DIFF PSIG a bit. .5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length - or curve, and KG ake survey every and in the targe	WBM as contingency nd set) of ducts as demand minimum ites. - 1,000 psig. - 1,000 psig. - 10' until KOP P with gioint during et window.
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP for Target ROP 500 when feasible. Geology and Er curve. Land cu Keep DLS < 2 do	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/, ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing directio 0 - 600 ft/hr. Ste Take surveys eve agineering. Drill rve. Continue dr	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to rry stand, at a m curve following rilling in lateral so so slide length < 2	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 ( tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir directional pla section, steering to', when feasib	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar m Landing targe n and updated l g as needed to k le. Take surveys	+300 kers are rigged u heck % ROC. Add im for additiona .,580 DIFF PSIG e bit. 5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan every stand, at a	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length - 'or curve, and K0 ake survey every and in the targe	WBM as contingency nd set) of ducts as demand demand demand tes. 0 - 1,000 psig. c10' until KOP joint during et window. get rotating
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cu Keep DLS < 2 do parameters / p	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abo lowing direction 0 - 600 ft/nr. Ste Take surveys ever agineering. Drill rve. Continue dr eg/100' and keep	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve toint) mud-log or cut pove); pressure te nal plan. Target er as needed to iry stand, at a m curve following illing in lateral : p slide length < 2 pw-rate is 650 -	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla section, steering 0', when feasib 700 GPM, differ	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar n. Keep DLS < 3 m landing target n and updated l gas needed to k le. Take surveys rential is pressu	+300 kers are rigged u heck % ROC. Add im for additiona .,580 DIFF PSIG e bit. 5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b>	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length < for curve, and KC ake survey every and in the targe minimum. Targ 0 psig, ROP 500	WBM as contingency nd set) of ducts as demand minimum tes. - 1,000 psig. <10' until KOP DP with 'joint during ± window. <b>tet rotating</b> - <b>600 ft/hr</b> ,
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM OptiDrill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible. Geology and E. Geology and E. Geology and E. Geology and E. Geology and E.	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 077857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abo lowing directio 0 - 600 ft/hr. Ste Take surveys eve Take surveys e	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve toint) mud-log or cut ove); pressure te nal plan. Target er as needed to curve following illing in lateral o slide length < 2 ow-rate is 650 - pe MUT). After	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir gdirectional pla esection, steering 10', when feasib 700 GPM, differ reaching TD, pen	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar in. Keep DLS < 3 m landing targe n and updated l gas needed to k le. Take surveys rential is pressu form no more t	+300 kers are rigged u heck % ROC. Add im for additional .,580 DIFF PSIG e bit. .5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan every stand, at ar re is 700 - 1,00 han one clean-u	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length < ior curve, and KC ake survey every and in the targe minimum. <b>Targ</b> <b>D psig, ROP 500</b> p cycle to condi	WBM as contingency nd set) of ducts as demand minimum tes. - 1,000 psig. 10' until KOP DP with 'joint during zt window. get rotating - 600 ft/hr, ition hole for
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM OptiDrill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV CO friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible. Geology and Eu Geology and cu Keep DLS < 2 di parameters / p torque 38K ft-l casing running	8.0 - 9.0 system will be b control will bur intain mud in p 77857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abo lowing directio 0 - 600 ft/hr. Ste Take surveys eve Take surveys ever agineering. Drill rye. Continue dr ag/100' and keep performance: fto bs (MAX drill pi	120,000 CaCl uilt from previc on retorts on cut rogram specs. R 9 mm cutters, r d azimuth (surve oint) mud-log or cut ove); pressure te nal plan. Target er as needed to very stand, at a m curve following illing in lateral o slide length < 2 ow-rate is 650 - pe MUT). After ndicate additio	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir g directional place inimum. Confir g direction, steering 10', when feasib 700 GPM, differ reaching TD, per nal cleaning nee	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar in. Keep DLS < 3 m landing targe n and updated l gas needed to k le. Take surveys rential is pressu form no more to ded. TOOH & LI	+300 kers are rigged u heck % ROC. Add im for additional .,580 DIFF PSIG e bit. .5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR i anding target. T aep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u 0 drill pipe (ROC	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length < for curve, and KC ake survey every and in the targe minimum. <b>Targ</b> <b>D psig, ROP 500</b> p cycle to condi IH, if required; sl	WBM as contingency nd set) of ducts as demand demand tes. ) - 1,000 psig. 10' until KOP DP with 'joint during et window. yet rotating - 600 ft/hr, ition hole for hould NOT be
luids / Solids Notes Hole Size Bit / Motor Bit / Motor MWD / Survey Logging Pressure Test.	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2"PDC bit MOTOR: NOV CO friction breakin BIT: 5-BLADE P MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 50C when feasible. Geology and Er curve. Land cu Keep DLS < 2 dd parameters / p torque 38K ft-1 casing running required with 0	8.0 - 9.0 system will be b control will bur intain mud in p 77857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abc lowing directio ) - 600 ft/hr. Ste Take surveys even gineering. Drill rve. Continue dr seg/100' and keep berformance: fto bs (MAX drill pi unless shakers i	120,000 CaCl uilt from previo retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut ove); pressure te nal plan. Target er as needed to rry stand, at a m curve following rilling in lateral : o slide length < 2 o sli	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 ( 1 tool spaced ~3 natrix body, tar ey every joint from tings sampling, st 9-5/8" casing flow-rate is 650 keep well on plating inimum. Confir gdirectional plating section, steering to', when feasib 700 GPM, differ reaching TD, per hal cleaning need ble cleaning section	sqft) ±6 that drying shal ne per tour to c rk's mud progra deg, 750 GPM, 2 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar in. Keep DLS < 3 m landing targe n and updated 1 g as needed to k le. Take surveys rential is pressu form no more to ded. TOOH & LI seps, fine LCM p	+300 kers are rigged u heck % ROC. Adv im for additional .,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u o drill pipe (ROC roduct is to be u	80:20 p after the rig (2) d diesel and prod d details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length or curve, and KC ake survey every and in the targe <b>D psig, ROP 500</b> p cycle to condi H, if required; sl	WBM as contingency nd set) of ducts as demand minimum ites. 10' until KOP 2P with joint during et window. get rotating - 600 ft/hr, tion hole for hould NOT be barite for
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							Tens. Body	Tens. Conn
Casing Specs:	Size (in)	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	(lbs)	(lbs)
Specs	5.500	17.0	P-110	LTC	7,460	10,640	546,000	445,000
Loading					2,698	9,011	301,837	301,837
Min. S.F.					2.77	1.18	1.81	1.47
	A	Callenaarfullu			fluid in the same			

Assumptions: Collapse: fully evacuated casing with 9.5 ppg fluid in the annulus (floating casing during running) Burst: 8,500 psi maximum surface treating pressure with 10.2 ppg equivalent mud weight sand laden fluid with 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 9.0 ppg fluid with 100,000 lbs over-pull

MU Torque (ft Ibs): Casing Summary:	spaced evenly i	in lateral every 2	<i>Optimum:</i> ing, float collar, 2,000', floatation 30' to the unit b	n sub at KOP, ca	sing to surface.	The toe-initiatio	on sleeve (last-ta	
Casing Summary:	intitiation slee sub <b>(NCS Air-L</b> c boundary than Wellbore path <i>sleeve and is no</i> <i>the toe sleeve c</i>	we (WFT RD 8,50 ock 2,500 psi fro 300' measured must be no clos oted on the Wel as close to (but n	00 psi), casing to pom WFT), casing perpendicular t ser than 600' fro Il Plan. Drill pasi not past) the pla	KOP with 20' m to surface. The t o the East or W m the parallel le t the LTP as requ nned LTP as po	harker joints spa coe-initiation sle est lease lines fo case lines. <b>Note:</b> <i>vired for necesso</i> <i>ssible.</i>	ced evenly in la eveve shall be pla r a East-West az the LTP is the m irry rat-hole and	teral every ~2,00 icced no closer to imuth drilled w paximum depth I shoe-track leng	00', floatation the unit ellbore. of the toe
Centralizers:	Lateral: 1 centre Top of curve to	ralizer per 3 joir 9-5/8" shoe: 1	ent may be adju nts (purchase cer centralizer per 5 ralizer per 5 join	ntralizers from e 5 joints			,	
	5 576 5000 00	Surface. 1 cent				Planned TOC		Total Cmt (cu
Cement:	Туре	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	(ft MD)	Total Cmt (sx)	ft)
Spacer	IntegraGuard Star	11		31.6	,	0	60 bbls	,
Lead	ASTM type I/II	12.4	2.370	13.40	50%	0	541	1,283
Tail	G:POZ blend	13.3	1.570	7.70	10%	4,533	1,481	2,325
Displacement		est bbls	1.570	7.70	10/0	4,555	1,401	2,323
Annular Capacity	0.2691	cuft/ft	<u> </u> 5-1/2" casina x	9-5/8" casing a	nnulus			
rundial capacity	0.2291	cuft/ft		8-1/2" hole an				
	0.1245	cuft/ft	5-1/2" casing v	,	est shoe jt ft	100		
			ssume gauge ho					
			Production Blen		Shotea in tuble			
	American cem	chilling Enler & r	routerion bien	IntegraGuard Star				
Spacer	S-8 Silica Flour 163.7 lbs/bbl	Avis 616 viscosifier 11.6 lb/bbl	FP24 Defoamer .5 Ib/bbl	Plus 3K LCM 15 Ib/bbl	SS201 Surfactant 1 gal/bbl			
Lead	ASTM Type I/II	BA90 Bonding Agent 5.0 lb/sx	Bentonite Viscosifier 8% BWOB	FL24 Fluid Loss .5% BWOB	IntegraGuard GW86 Viscosifier .1% BWOB	R7C Retarder .2% BWOB	Static .01 lb/sx	
Tail	Type G 50%	Pozzolan Fly Ash Extender 50%	BA90 Bonding Agent 3.0 lb/sx	Bentonite Viscosifier 4% BWOB	FL24 Fluid Loss .4% BWOB	IntegraGuard GW86 Viscosifier .1% BWOB		FP24 Defoamer .3% BWOB, IntegraSeal 0.25 lb/sx
Note:	Notify NMOCD	& BLM if ceme	ssume gauge ho nt is not circula d an unorthodo	ted to surface.			5 C 5 As define	d in NMAC
, ioic.	19.15.16.15.C measured alon completed inte 19.15.16.7.E a initiation sleev perforation sha	.1.a and 19.15. g the azimuth o erval, as defined nd NMAC 19.15 re, and the first t	16.15.C.1.b, no f the well or 330 by NMAC 19.15 5.16.7.J, respect take point will b the unit bounda	point in the cor ' measured perp .16.7.B, are the ively. In the cas e the top perfor	npleted interval pendicular to the elast take point e of this well, th ation. <b>Neither t</b>	shall be closer e azimuth well. and first take po e last take point <b>he toe-initiatio</b>	to the unit bour The boundaries bint, as defined l t will be the bot on sleeve nor the	ndary than 100' of the oy NMAC tom toe- <b>e top</b>
FINISH WELL:								
Procedure:	After off-line ce	ement job, cap a	and cover well. C	ontinue drilling	g operations on a	subsequent wel	Is on pad.	
COMPLETION AND PR	ODUCTION PL	AN:						
Est Lateral Length:	7,965							
Est Frac Inform:	,	Frac Stages	128,000	bbls slick wate	r	10,360,000	lbs proppant	
Flowback:	Flow back thro	ugh productior	n tubing as press cubing via gas-lif	ures allow				
ESTIMATED START D	ATES:							
Drilling:	11/1/23							
Completion:	12/31/23							
Production:	2/14/24							
Prepared by:	Alec Bridge	12/20/21						

Prepared by:	Alec Bridge	12/20/21
Updated:	Greg Olson	2/20/23
	Greg Olson	3/27/23
	G Olson	8/8/23



### **ENDURING RESOURCES IV, LLC** 6300 S SYRACUSE WAY, SUITE 525 **CENTENNIAL, COLORADO 80211**

#### DRILLING PLAN:

Drill, complete, and equip single lateral in the Mancos-H formation

W/FII	INFORMATION:
VVELL	INFORIVIATION.

Name: Haynes Canyon Unit 430H API Number: Not yet assigned AFE Number: Not yet assigned ER Well Number: Not yet assigned State: New Mexico County: Rio Arriba Surface Elevation: 6,703 ft ASL (GL) 6,728 ft ASL (KB) 110 A E\A/I SurfaceLocation 3-23-6 Sec-Twn-Rng 007 ft ECI

Surjuce Locution.	5-25-0 Sec-1WII	-nig 037	IL F3L	440 ILF	VVL
	36.248652 °N latitu	ide 107.464293	° W longitude	(NA	AD 83)
BH Location:	11-23-6 Sec-Twn	-Rng 233	ft FSL	1,032 ft F	WL
	36.232991 °N latitu	ide 107.444053	° W longitude	(NA	AD 83)
Driving Directions:	FROM THE INTERSECTIO	N OF US HWY 550 & US	S HWY 64 IN BLOOMFIEL	D, NM:	

South on US Hwy 550 for 53.8 miles to MM 97.6; Left (North) on CR #379 (State Hwy 403) for 1.3 miles to fork; Right (North) remaining on CR #379 for 1.5 miles to location access on left; Haynes Canyon Unit 428H Pad. From East to West 430H, 428H, 442H, 440H).

#### **GEOLOGIC AND RESERVOIR INFORMATION:**

ognosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	0/G/W	Pressure
	Ojo Alamo	5,325	1,403	1,405	W	normal
	Kirtland	5,225	1,503	1,505	W	normal
	Fruitland	5,000	1,728	1,731	G, W	sub
	Pictured Cliffs	4,765	1,963	1,967	G, W	sub
	Lewis	4,615	2,113	2,118	G <i>,</i> W	normal
	Chacra	4,320	2,408	2,415	G <i>,</i> W	normal
	Cliff House	3,210	3,518	3,531	G <i>,</i> W	sub
	Menefee	3,205	3,523	3,536	G <i>,</i> W	normal
	Point Lookout	2,505	4,223	4,238	G, W	normal
	Mancos	2,210	4,518	4,533	0,G	sub (~0.38)
	Gallup (MNCS_A)	1,870	4,858	4,873	0,G	sub (~0.38)
	MNCS_B	1,780	4,948	4,963	0,G	sub (~0.38)
	MNCS_C	1,645	5,083	5,100	0,G	sub (~0.38)
	MNCS_Cms	1,580	5,148	5,169	0,G	sub (~0.38)
	MNCS_D	1,505	5,223	5,253	0,G	sub (~0.38)
	MNCS_E	1,420	5,308	5,359	0,G	sub (~0.38)
	MNCS_F	1,375	5,353	5,424	0,G	sub (~0.38
	MNCS_G	1,290	5,438	5,574	0,G	sub (~0.38)
	MNCS_H	1,245	5,483	5,672	0,G	sub (~0.38)
	MNCS_I	0	0	0	0,G	sub (~0.38)
	FTP TARGET	1,245	5,483	5,694	0,G	sub (~0.38)
	PROJECTED LTP	1,267	5,461	13,759	0,G	sub (~0.38)

Surface: Nacimiento

Oil & Gas Zones: Several gas bearing zones will be encountered; target formation is the Gallup

Pressure:	Normal (0.43 psi/ft) or sub-nor	mal pressure	gradients ant	icipated in all formations		
	Max. pressure gradient:	0.43	psi/ft	Evacuated hole gradient:	0.22	psi/ft
	Maximum anticipated BH pres	ssure, assumi	ng maximum	pressure gradient:	2,360	psi
	Maximum anticipated surface	pressure, ass	uming partia	ly evacuated hole:	1,160	psi
Temperature:	Maximum anticipated BHT is 1	$25^{\circ}$ F or less				

#### H<sub>2</sub>S INFORMATION:

H<sub>2</sub>S Zones: Encountering hydrogen-sulfide bearing zones is NOT anticipated.

Safety: Sensors and alarms will be placed in the substructure, on the rig floor, above the pits, and at the shakers.

#### LOGGING, CORING, AND TESTING:

Mud Logs:	
-	None planned; remote geo-steering from drill out of 9-5/8" casing to TD; gas detection from drillout of 13-3/8" casing to TD.
MWD/LWD:	Gamma Ray from drillout of 13-3/8" casing to TD
Open Hole Logs:	None planned
Testing:	None planned
Coring:	None planned
Cased Hole Logs:	CBL on 5-1/2" casing from deepest free-fall depth to surface

### DRILLING RIG INFORMATION:

Contractor: Aztec Rig No.: 1000 Draw Works: E80 AC 1,500 hp Mast: Hyduke Triple (136 ft, 600,000 lbs, 10 lines)

Top Drive: NOV IDS-350PE (350 ton)

Prime Movers: 4 - GE Jenbacher Natural Gas Generator **Pumps:** 2 - RS F-1600 (7.500 psi)

BOPE 1: Cameron single & double gate rams (13-5/8", 3,000 psi)

BOPE 2: Cameron annular (13-5/8", 5,000 psi)

Choke Cameron (4", 10,000 psi)

KB-GL (ft): 25

Note: Actual drilling rig may vary depending on availability at time the well is scheduled to be drilled.

STATE AND FEDERAL	NOTIFICATIONS	BLM	State
Construction and	BLM is to be notified minimum of 48 hours prior to start of construction or reclamation.		
Reclamation:	Grazing permittee is to be notified 10 days in advance.	(505) 564-7600	
Spud	BLM and state are to be notified minimum of 24 hours prior to spud.	(505) 564-7750	(505) 334-6178
BOP	BLM is to be notified minimum of 24 hours prior to BOPE testing.	(505) 564-7750	see note
Casing / cementing	BLM and state are to be notified minimum of 24 hours prior to running casing and		
	cementing.	(505) 564-7750	(505) 334-6178
Plugging	BLM and state are to be notified minimum of 24 hours prior to plugging ops.	(505) 564-7750	see note
	All notifications are to be recorded in the WellView report with time, date, name or		
	number that notifications were made to.		

Note: Monica Keuhling with the OCD requests state notifications 24 hrs in advance for spud, BOP tests, casing & cementing and any plugging be given to her in both phone message and email: (505) 320-0243, monica.keuhling@emnrd.nm.gov

#### **BOPE REQUIREMENTS:**

- See attached diaaram for details regarding BOPE specifications and configuration.
- 1) Rig will be equipped with upper and lower kelly cocks with handles available.
- 2)

Inside BOP and TIW valves will be available to use on all sizes and threads of drill pipe used while drilling the well. 2) BOP accumulator will have enough capacity to open the HCR valve, close all rams and annular preventer, and retain minimum of 200 psi above precharge on the closing manifold without the use of closing pumps. The fluid reservoir capacity shall be at least double the usable fluid volume of the accumulator system capacity, and the fluid level shall be maintained at manufacturer's recommendation. There will be two additional sources of power for the closing pumps (electric and air). Sufficient nitrogen bottles will be available and will be recharged when pressure falls below manufacturer's recommended minimum

3)

BOP testing shall be conducted (a) when initially installed, (b) whenever any seal is broken or repaired, (c) if the time since the previous test exceeds 30 days. Tests will be conducted using a test plug. BOP ram preventers will be tested to 3,000 psig for 10 minutes, and the annular preventer will be tested to 1,500 psi for 10 minutes. Ram and annular preventers will be tested to 250 psi for 5 minutes. Additionally, BOP and casing strings will be tested to .22 psi/ft or 1,500 psi, whichever is greater but not exceeding 70% of yield strength of the casing, for 30 minutes, prior to drilling out 13-3/8" and 9-5/8" casing. Rams and hydraulically operated remote choke line valve will be function tested daily at a minimum.

- 4) Remote valve for BOP rams, HCR, and choke shall be placed in a location that is readily available to the driller. The remote BOP valve shall be capable of closing and opening the rams.
- 5) Manual locking devices (hand wheels) shall be intalled on rams. A valve will be installed on the annular preventer's closing line as close as possible to the preventer to act as a locking device. The valve will be maintained in the open position and shall only be closed when the there is no power to the accumulator.

#### FLUIDS AND SOLIDS CONTROL PROGRAM:

#### Fluid Measurement:

Pumps shall be equipped with stroke counters with displays in the dog-house. Slow pump speed shall be recorded daily and after mudding up, at a minimum, on the drilling report. A Pit Volume Totalizer will be installed and the readout will be displayed in the dog-house. Gas-detecting equipment will be installed at the shakers, and readouts will be available in the dog-house and the in the geologist's work-station (if geologist or mud-logger is on-site). Closed-Loop System: A fully, closed-loop system will be utilized. The system will consist of above-ground piping and above-ground storage tanks and bins. The system will not entail any earthen pits, below-grade storage, or drying pads. All equipment will be disassembled and removed from the site when drilling operations cease. The system will be capable of storing all fluids and generated cuttings and of preventing uncontrolled releases of the same. The system will be operated in an efficient manner to allow the recycling and reuse of as much fluid as possible and to minimimize the amount of fluids and solids that require disposal Fluid Disposal : Fluids that cannot be reused, recycled, or returned to the supplier will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.). Solids Disposal : Drilling solids will be stored (until haul-off) on-site in separate containers with no other waste, debris, or garbage products,

Waste solids will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.). Fluid Program: See "Detailed Drilling Plan" section for additional details. Sufficient barite will be on location to weight up mud system to balance maximum anticipated pressure gradient.

#### DETAILED DRILLING PLAN:

<u>SURFACE:</u>	Drill vertically to casing setting depth (plus necessary rathole), run casing, cement casing to surface.						
	0 ft (MD)	to	350 ft (MD)	Hole Section Length:			
	0 ft (TVD)	to	350 ft (TVD)	Casing Required:			

Note: Surface hole may be drilled, cased, and cemented with a smaller rig in advance of the drilling rig.

350 ft

350 ft

			FL (mL/30		YP (lb/100			
Fluid:	Туре	MW (ppg)	min)	PV (cp)	sqft)	рН		nents
	Fresh Water	8.4	N/C	2 - 8	2 - 12	9.0	Spud	l mud
Hole Size:								
-	Mill Tooth or P							
MWD / Survey:		ation survey						
Logging:		42 (411)		1. Constant and the second second		the Barris strength and		
Proceaure:			open to 17-1/2"					
			nole and fluid fo			-		as detailed
	below. Monito	r returns during	cement job and	note cement v	olume to surface	e. Install cellar a	ind weithead.	
							1	1
							Tens. Body	Tens. Conn
Casing Specs:		Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	(lbs)	(lbs)
Specs	13.375	54.5	J-55	BTC	1,130	2,730	853,000	909,000
Loading					153	791	116,634	116,634
Min. S.F.					7.39	3.45	7.31	7.79
	Assumptions:	Collapse: fully	evacuated casir	ng with 8.4 ppg	equivalent exte	rnal pressure gi	radient	
		Burst: maximu	m anticipated s	urface pressure	with 9.5 ppg flu	uid inside casing	g while drilling i	intermediate
		hole and 8.4 p	og equivalent ex	kternal pressure	gradient			
		Tension: buoye	d weight in 8.4	ppg fluid with 2	100,000 lbs over	r-pull		
1U Torque (ft lbs):	Minumum:	N/A	Optimum:	N/A	Maximum:	N/A		
	Make-up as per	API Buttress Co	, onnection runni	ng procedure.				
Casing Summary:				• ·				
		-	ed 10' from each		m 3 jts, 1 centra	alizer per 2 its to	surface	
		2 p			Hole Cap.	, ,,,,,,	Planned TOC	
Cement:	Туре	Weight (nng)	Yield (cuft/sk)	Water (gal/sk)	(cuft/ft)	% Excess	(ft MD)	Total Cmt (sx)
cement.	TYPE III	14.6	1.39	6.686	0.6946	100%	0	364
Annular Capacity	0.6946	cuft/ft	1.39 13-3/8" casing				0.8680	564 ft3/ft
				-		Csg capacity		-
<i>D</i> rake E	nergy services:	cuiculatea cen	nent volumes as	sume gauge no	ie und the exces	s notea in table	T	Cu Ft Slurry
			D-CD2 .3% BWOC					505.3
			Dispersant/Friction					
Tail	ASTM Type III Blend			Flake - seepage				
	Notify COGCC 8	& BLM if cemen	t is not circulate	ed to surface. Co	ement must ach	ieve 500 psi co	mpressive strer	ngth before
	drilling out.							
INTERMEDIATE:	Drill as per dire	ectional plan to	casing setting a	depth, run casir	iq, cement casin	ng to surface.		
		ft (MD)	to		ft (MD)		ection Length:	3,335 ft
		ft (TVD)	to		ft (TVD)		-	3,685 ft
				3,073	it (10D)	- Ca	sing Required:	3,085 1
				3,673				3,005 11
Eluid			FL (mL/30		YP (lb/100			
Fluid:	Туре	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	рН	Comr	nents
	Type LSND (5% KCl)		FL (mL/30		YP (lb/100		Comr	
Hole Size:	<b>Type</b> LSND (5% KCI) 12-1/4"	<b>MW (ppg)</b> 8.8 - 9.5	FL (mL/30 min) 20	PV (cp)	YP (lb/100 sqft)	рН	Comr	nents
Hole Size: Bit / Motor:	<b>Type</b> LSND (5% KCl) 12-1/4" 12-1/4" PDC bi	<b>MW (ppg)</b> 8.8 - 9.5 t w/mud motor	FL (mL/30 min) 20	<b>PV (cp)</b> 8 - 14	YP (lb/100 sqft) 8-14	<b>рН</b> 9.0 - 9.5	Comr	nents
Hole Size: Bit / Motor:	<b>Type</b> LSND (5% KCl) 12-1/4" 12-1/4" PDC bi	<b>MW (ppg)</b> 8.8 - 9.5 t w/mud motor	FL (mL/30 min) 20	<b>PV (cp)</b> 8 - 14	YP (lb/100 sqft) 8-14	<b>рН</b> 9.0 - 9.5	Comr	nents
Hole Size: Bit / Motor:	<b>Type</b> LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0	<b>MW (ppg)</b> 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4.	FL (mL/30 min) 20	<b>PV (cp)</b> 8 - 14 v/gal, 1.83 DEG	YP (lb/100 sqft) 8 - 14	<b>рН</b> 9.0 - 9.5 DIFF PSIG	Comr No (	nents
Hole Size: Bit / Motor:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters,	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir	YP (lb/100 sqft) 8 - 14 900 GPM, 950 0 (range 0.65 - 0.	<b>pH</b> 9.0 - 9.5 DIFF PSIG 90 max), <b>jet w</b> it	Comr No (	nents
Hole Size: Bit / Motor: Bit / Motor:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters,	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir	YP (lb/100 sqft) 8 - 14 900 GPM, 950 0 (range 0.65 - 0.	<b>pH</b> 9.0 - 9.5 DIFF PSIG 90 max), <b>jet w</b> it	Comr No (	nents
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters,	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's	YP (lb/100 sqft) 8 - 14 .900 GPM, 950 (range 0.65 - 0. at a minimum), 6	<b>pH</b> 9.0 - 9.5 DIFF PSIG 90 max), <b>jet w</b> it	Comr No (	nents DBM
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o g to	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500	Comr No ( th 6 - 12s	nents DBM
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin tole past casing	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), ( g to setting depth).	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed	Comr No ( th 6 - 12s psi for 30 minu to keep well on	nents DBM Ites. plan. Keep DLS
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" POC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters, and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when plan	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take so	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 b (range 0.65 - 0. at a minimum), o g to setting depth). Irveys every star	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu	Comr No ( th 6 - 12s psi for 30 minu to keep well on n. Target flow-ra	nents DBM Ites. plan. Keep DLS ates of 750
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey W None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when present rates). Mi	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 to (range 0.65 - 0. at a minimum), o g to setting depth). urveys every star flow-rate is 650	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-ra ndition hole and	nents DBM Ites. plan. Keep DLS ates of 750 d fluid for
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey NONE NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	PV (cp) 8 - 14 V/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired und washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r. ndition hole an ing. ND BOPE. W	nents DBM Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey W None NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when present rates). Mi	PV (cp) 8 - 14 V/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired und washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r. ndition hole an ing. ND BOPE. W	nents DBM Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey NONE NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	PV (cp) 8 - 14 V/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired und washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r. ndition hole an ing. ND BOPE. W	nents DBM Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey W None NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	PV (cp) 8 - 14 V/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired und washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r. ndition hole an ing. ND BOPE. W	nents DBM Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey W None NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas ff-line cement j	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	PV (cp) 8 - 14 V/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired und washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-ra ndition hole an ng. ND BOPE. Wa ment job and no	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement
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Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and tt Drill to TD follo <3 deg/100 are GPM (higher if casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide lead sole to control i TOOH. Run cas off-line cement j ace. Wt (lb/ft)	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when p	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired und washing / ci nt as detailed be Conn.	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 reculating as requeed elow. Monitor ref	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin sturns during ce Burst (psi)	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r. ndition hole an ing. ND BOPE. We ment job and no Tens. Body (lbs)	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs)
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey W None NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u . TOOH. Run cas iff-line cement j ace.	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when preturn rates). Mi	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100': st 13-3/8" casin tole past casing possible. Take st nimum desired ind washing / ci nt as detailed be	YP (lb/100 sqft) 8 - 14 . 900 GPM, 950 (range 0.65 - 0. at a minimum), 0 g to setting depth). trveys every star flow-rate is 650 rculating as requ low. Monitor ref Collapse (psi) 2,020	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed nd, at a minimu GPM. At TD, co Jired. Land casin sturns during ce Burst (psi) 3,520	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r. ndition hole an ng. ND BOPE. W. ment job and nu Tens. Body (lbs) 564,000	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and tt Drill to TD follo <3 deg/100 are GPM (higher if casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide lead sole to control i TOOH. Run cas off-line cement j ace. Wt (lb/ft)	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when p	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired und washing / ci nt as detailed be Conn.	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 0 gto setting depth). grveys every star flow-rate is 650 rculating as requ low. Monitor ref Collapse (psi) 2,020 1,604	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed d, at a minimu GPM. At TD, co jired. Land casin aturns during ce Burst (psi) 3,520 1,370	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r. ndition hole and mg. ND BOPE. W. ment job and no Tens. Body (lbs) 564,000 215,309	nents DBM DBM ites. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement <b>Tens. Conn</b> (lbs) 453,000 215,309
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len, able to control u . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin pole past casing possible. Take st nimum desired and washing / ci nt as detailed be Conn. LTC	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). urveys every star flow-rate is 650 rculaing as requ clow. Monitor ref 2,020 1,604 1.26	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an- ng. ND BOPE. We ment job and no Tens. Body (lbs) 564,000 215,309 2.62	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000
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Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u TOOH. Run cas off-line cement ji ace. Wt (lb/ft) 36.0 Collapse: fully	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired nimum	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 0 g to setting depth). 1 grveys every star flow-rate is 650 rculating as requ clow. Monitor re Collapse (psi) 2,020 1,604 1.26 equivalent exte	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed nd, at a minimu GPM. At TD, co uired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gu	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an- ng. ND BOPE. W ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	nents DBM DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u TOOH. Run cas off-line cement ji ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu	FL       (mL/30 min)         20       20         0, stage, 0.16 re       19 mm cutters,         19 mm cutters,       and azimuth sur         ove); pressure te       al plan (20' rat-h         gth < 10', when preturn rates). Mi	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su nimum desired nimum desired nimum desired conn. LTC bg with 8.4 ppg urface pressure	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 0 g to setting depth). Inveys every star flow-rate is 650 rculating as requ elow. Monitor re Collapse (psi) 2,020 1,604 1.26 equivalent exte with 9.5 ppg flo	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed nd, at a minimu GPM. At TD, co uired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gu	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an- ng. ND BOPE. W ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	nents DBM DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u TOOH. Run cas off-line cement ji ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when preturn rates). Ming using a CRT a	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100': st 13-3/8" casin possible. Take so nimum desired nd washing / ci nt as detailed be <u>Conn.</u> LTC bg with 8.4 ppg surface pressure cternal pressure	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 0 g to setting depth). Inveys every star flow-rate is 650 rculating as requered elow. Monitor ref 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co Jired. Land casis eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gu	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an- ng. ND BOPE. W ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	nents DBM DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing directiona d keep slide len able to control u TOOH. Run cas off-line cement ji ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when preturn rates). Mi	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100': st 13-3/8" casin possible. Take so nimum desired nd washing / ci nt as detailed be <u>Conn.</u> LTC bg with 8.4 ppg surface pressure cternal pressure	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 0 g to setting depth). Inveys every star flow-rate is 650 rculating as requered elow. Monitor ref 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co Jired. Land casis eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gu	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an- ng. ND BOPE. W ment job and no <b>Tens. Body</b> (lbs) 564,000 215,309 2.62 radient	nents DBM DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic <3 deg/100 <sup>a</sup> deg/100 <sup>a</sup> well. Perform c volume to surfa 9.625 Assumptions: Minumum:	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide leave able to control u .TOOH. Run cas fff-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj Tension: buoye 3,400	FL (mL/30 min) 20 0, stage, 0.16 ret 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when j return rates). Mi ing using a CRT a ob. Pump cement Grade J-55 evacuated casim m anticipated s og equivalent es d weight in 8.4 Optimum:	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin possible. Take ss nimum desired ind washing / ci nt as detailed be Conn. LTC bg with 8.4 ppg urface pressure cternal pressure pg fluid with 2 4,530	YP (lb/100 sqft) 8 - 14 .900 GPM, 950 (range 0.65 - 0. at a minimum), G gto setting depth). urveys every star flow-rate is 650 rculating as required low. Monitor res Collapse (psi) 2,020 1,604 1.26 equivalent exte with 9.5 ppg flu gradient 100,000 lbs over Maximum:	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin casing turns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gui id inside casing 5,660	Comr No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-rr ndition hole an m. Target flow-rr ndition hole an m. Target flow-rr ndition hole an m. Target flow-rr ndition hole an m. Target flow-rr ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents DBM DBM ites. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if; casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4, DC w/16 mm or ith inclination a est (as noted abo wing direction d keep slide len, able to control u able to control u TOOH. Run cas ff-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj Tension: buoye 3,400 casing, float col	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cement dob. Pump cement J-55 evacuated casim m anticipated s og equivalent ex- d weight in 8.4 Optimum: lar, casing to su	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin possible. Take ss nimum desired ind washing / ci nt as detailed be Conn. LTC g with 8.4 ppg urface pressure cternal pressure sternal pressure 4,530 rface (FLOAT EQ	YP (lb/100 sqft) 8 - 14 .900 GPM, 950 (range 0.65 - 0. at a minimum), G gto setting depth). urveys every star flow-rate is 650 rculating as required low. Monitor res Collapse (psi) 2,020 1,604 1.26 equivalent exte with 9.5 ppg flu gradient 100,000 lbs over Maximum:	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin casing turns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gui id inside casing 5,660	Comr No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-rr ndition hole an m. Target flow-rr ndition hole an m. Target flow-rr ndition hole an m. Target flow-rr ndition hole an m. Target flow-rr ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents DBM DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: Uogging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and te Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in n	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted aboving directional d keep slide len, able to control u . TOOH. Run cas off-line cement ju ace. Wt (lb/ft) 36.0 Collapse: fully, Burst: maximu hole and 8.4 pj Tension: buoye 3,400 casing, float col on-vertical hole	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when p	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin possible. Take ss nimum desired ind washing / ci nt as detailed be <u>Conn.</u> LTC sg with 8.4 ppg urface pressure cternal pressure pg fluid with 1 4,530 rface (FLOAT EQ n vertical hole	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), ( gto setting depth). urveys every star flow-rate is 650 rculating as requ low. Monitor re 2,020 1,604 1.26 equivalent exte with 9.5 ppg flo gradient 200,000 lbs over Maximum: UIPMENT FROM	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, coo jired. Land casin aturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casin r-pull 5,660 WEATHERFORD	Comr No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r: ndition hole and m. Target flow-r: ndition hole and ng. ND BOPE. We ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling (	nents DBM DBM ites. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: Uogging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and te Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abc wing directiona d keep slide len, able to control u TOOH. Run cas off-line cement j- ace. Wt (lb/ft) 36.0 Collapse: fully- Burst: maximu hole and 8.4 pj Tension: buoye 3,400 casing, float col on-vertical hole stop-banded 10	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin possible. Take ss nimum desired und washing / ci int as detailed be Conn. LTC Ag with 8.4 ppg urface pressure cternal pressure 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), ( gto setting depth). urveys every star flow-rate is 650 rculating as requ clow. Monitor re clow. Monitor r	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing r-pull 5,660 WEATHERFORD	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-randition hole and m. Target flow-randition ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling j )	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: Uogging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if, casing running well. Perform of volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in n- 1 centralizers jt (floating) to KO	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abc wing directions d keep slide len able to control I TOOH. Run cas off-line cement ji ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj Tension: buoye 3,400 casing, float col on-vertical hole : stop-banded 11 P; 1 centralizer	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin possible. Take ss nimum desired und washing / ci int as detailed be Conn. LTC Ag with 8.4 ppg urface pressure cternal pressure 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), ( gto setting depth). urveys every star flow-rate is 650 rculating as required elow. Monitor ref 2,020 1,604 1.26 equivalent exter with 9.5 pp flor or gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizer	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing r-pull 5,660 WEATHERFORD	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-randition hole and m. Target flow-randition ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling j )	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if, casing running well. Perform of volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in n- 1 centralizers jt (floating) to KO	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abc wing directiona d keep slide len, able to control u TOOH. Run cas off-line cement j- ace. Wt (lb/ft) 36.0 Collapse: fully- Burst: maximu hole and 8.4 pj Tension: buoye 3,400 casing, float col on-vertical hole stop-banded 10	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin possible. Take ss nimum desired und washing / ci int as detailed be Conn. LTC Ag with 8.4 ppg urface pressure cternal pressure 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), ( gto setting depth). urveys every star flow-rate is 650 rculating as required elow. Monitor ref 2,020 1,604 1.26 equivalent exter with 9.5 pp flor or gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizer	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing r-pull 5,660 WEATHERFORD	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-randition hole and m. Target flow-randition ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling j )	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if, casing running well. Perform of volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in n- 1 centralizers jt (floating) to KO	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abc wing directions d keep slide len able to control I TOOH. Run cas off-line cement ji ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj Tension: buoye 3,400 casing, float col on-vertical hole : stop-banded 11 P; 1 centralizer	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin possible. Take ss nimum desired und washing / ci int as detailed be Conn. LTC Ag with 8.4 ppg urface pressure cternal pressure 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), ( gto setting depth). urveys every star flow-rate is 650 rculating as required elow. Monitor ref 2,020 1,604 1.26 equivalent exter with 9.5 pp flor or gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizer	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing r-pull 5,660 WEATHERFORD	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-randition hole and m. Target flow-randition ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling j )	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: Uogging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and te Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KC 11.75" SOLID E	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abc wing directions d keep slide len able to control u TOOH. Run cas off-line cement j: ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pp Tension: buoye 3,400 casing, float col on-vertical hole : stop-banded 10 P; 1 centralizer GODY POLYMER	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take sc nimum desired ind washing / ci int as detailed be Conn. LTC bg with 8.4 ppg surface pressure cternal pressure ppg fluid with sc 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j ng) to surface (Co	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o gto setting depth). Inveys every star flow-rate is 650 rculating as reque elow. Monitor ref 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo or gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizers from	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casing the comparison of the comparison geturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gravity id inside casing r-pull 5,660 WEATHERFORD comparison of the comparison Scepter Supply Planned TOC	Comr No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an- ng. ND BOPE. We ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling ( - SLIP'N'SLIDE S	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production htralizer per jt 9-5/8" x
Hole Size: Bit / Motor: Bit / Motor: U Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if, casing running well. Perform of volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in n- 1 centralizers jt (floating) to KO	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abc wing directions d keep slide len able to control u TOOH. Run cas off-line cement j: ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pp Tension: buoye 3,400 casing, float col on-vertical hole : stop-banded 10 P; 1 centralizer GODY POLYMER	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take sc nimum desired ind washing / ci int as detailed be Conn. LTC bg with 8.4 ppg surface pressure cternal pressure ppg fluid with sc 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j ng) to surface (Co	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), ( gto setting depth). urveys every star flow-rate is 650 rculating as required elow. Monitor ref 2,020 1,604 1.26 equivalent exter with 9.5 pp flor or gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizer	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casin s,660 WEATHERFORD	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-randition hole and m. Target flow-randition ment job and no Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling j )	nents DBM ttes. plan. Keep DLS ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production

ge 1	Spacer	D-Mud Breaker	8.5				0	10 bbls	
-	,	90:10 Type							
	Lead	III:POZ	12.5	2.140	12.05	70%	0	765	1,636
	Tail	Type III	14.6	1.380	6.64	20%	3,185	150	207
Displac	ement	281	est bbls						
Annular Ca	pacity	0.3627	cuft/ft		13-3/8" casing				
		0.3132	cuft/ft	-	: 12-1/4" hole a		9-5/8" 36# ID	8.921	
		0.4341	cuft/ft	9-5/8" casing v		est shoe jt ft	44	1.	
		Calculatea cen	nent volumes as	sume gauge no	ie ana the exce	ss (open note on	iy) notea în tab	le	
و	Spacer	D-Mud Breaker	SAPP						
		ASTM Type III 90/10 Poz	D-CSE 1 5.0% BWOC Strength Enhancer	D-MPA-1 .4% BWOC Fluid Loss & Gas Migration Control		D-CD 2 .4% BWOC Dispersant	Cello Flace LCM .25 lb/sx	D-FP1 0.5% BWOC Defoamer	D-R1 .5% Retarder
	Tail	ASTM Type III Blend	diate Cementin	D-MPA-1 .4% BWOC Fluid Loss & Gas Migration Control		D-CD 2 .5% BWOC Dispersant	Cello Flace LCM .25 lb/sx		D-R1 .2% Retarder
PRODUC	<u>CTION:</u>	drilling out. Drill to TD follo	& BLM if ceme		ing, cement cas			Section Length:	10,074
			ft (TVD)	to		ft (TVD)		asing Required:	13,759
					,				
			E	stimated KOP:	4,950	ft (MD)	4,937	ft (TVD)	]
		E	Estimated Landi	ing Point (FTP):	5,694	ft (MD)	5,483	ft (TVD)	
			Estimated L	ateral Length:	8,065	ft (MD)			
								1	1
						YP (lb/100		014/2	
	Fluid:	Туре	MW (ppg)	WPS ppm	нтнр	YP (lb/100 sqft)	ES	OWR	Comment
	Fluid:					sqft)			WBM as
uids / Solids		OBM	MW (ppg) 8.0 - 9.0 system will be b	120,000 CaCl	NC	sqft) ±6	+300	80:20	WBM as contingency
	Notes:	OBM OptiDrill OBM shakers. Solids required to ma	8.0 - 9.0	120,000 CaCl uilt from previo n retorts on cut	NC pus well. Ensure ctings samples o	sqft) ±6 that drying sha ne per tour to c	+300 kers are rigged u heck % ROC. Add	80:20 p after the rig (2 d diesel and pro	WBM as contingency nd set) of
Hol	Notes: le Size:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2"	8.0 - 9.0 system will be b control will bur intain mud in p	120,000 CaCl uilt from previo n retorts on cut	NC pus well. Ensure ctings samples o	sqft) ±6 that drying sha ne per tour to c	+300 kers are rigged u heck % ROC. Add	80:20 p after the rig (2 d diesel and pro	WBM as contingency nd set) of
Hol Bit / N	Notes: le Size: Motor:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor	120,000 CaCl uilt from previc n retorts on cut rogram specs. R	NC pus well. Ensure ttings samples o eference Newpa	sqft) ±6 that drying shai ne per tour to c ark's mud progra	+300 kers are rigged u heck % ROC. Add am for additiona	80:20 p after the rig (2 d diesel and prod l details.	WBM as contingency nd set) of ducts as
Hol Bit / N	Notes: le Size: Motor:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0	8.0 - 9.0 system will be b control will bur intain mud in p	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 d	sqft) ±6 that drying shai ne per tour to c ark's mud progra deg, 750 GPM, 2	+300 kers are rigged u heck % ROC. Add im for additiona 1,580 DIFF PSIG	80:20 p after the rig (2 d diesel and prod l details.	WBM as contingency nd set) of ducts as
Hol Bit / N	Notes: le Size: Motor:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breaking	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/- ng device(s) as re	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom	NC nus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3	sqft) ±6 that drying sha one per tour to c ark's mud progra deg, 750 GPM, 2 ,000' behind th	+300 kers are rigged u heck % ROC. Add m for additiona 1,580 DIFF PSIG e bit.	80:20 p after the rig (2 d diesel and prov l details.	WBM as contingency nd set) of ducts as
Hol Bit / N Bit / N	Notes: le Size: Motor: Motor:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3 natrix body, tar	sqft) ±6 that drying sha ne per tour to c ark's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1	+300 kers are rigged u heck % ROC. Add m for additiona 1,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prov l details. (or similar); on o	WBM as contingency nd set) of ducts as
Hol Bit / N Bit / N	Notes: le Size: Motor: Motor:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR,	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve	NC pus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3 natrix body, tar	sqft) ±6 that drying sha ne per tour to c ark's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1	+300 kers are rigged u heck % ROC. Add m for additiona 1,580 DIFF PSIG e bit. .5 sq-in	80:20 p after the rig (2 d diesel and prov l details. (or similar); on o	WBM as contingency nd set) of ducts as
Hol Bit / N Bit / N MWD / S Log	Notes: le Size: Motor: Motor: Survey: gging:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 77857 - 6.5" 7/. ng device(s) as rep DC w/16 mm - 1 inclination, and d after Landing P ntire section, no	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve roint) mud-log or cut	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling,	that drying sha ine per tour to c ark's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs	+300 kers are rigged u heck % ROC. Adv im for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su	80:20 p after the rig (2 d diesel and prov l details. (or similar); on o	WBM as contingency nd set) of ducts as demand minimum
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV friction breakin BIT: 5-BLADE PI MWD with GR, MWD with GR, GR MWD for er NU BOPE and to	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and a fater Landing P titre section, no est (as noted abo	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut pove); pressure te	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, ist 9-5/8" casing	that drying sha ne per tour to c ark's mud progra deg, 750 GPM, : ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to	+300 kers are rigged u heck % ROC. Adv im for additiona t,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu	WBM as contingency nd set) of ducts as demand minimum ites.
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and a fater Landing P titre section, no est (as noted abo lowing directio	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut pove); pressure te nal plan. Target	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, ist 9-5/8" casing flow-rate is 650	that drying sha ne per tour to c ark's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar	+300 kers are rigged u heck % ROC. Adv im for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700	WBM as contingency nd set) of ducts as demand minimum ites. 0 - 1,000 psig.
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GR, GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and a fater Landing P thire section, no est (as noted abo lowing directio 0 - 600 ft/hr. Ste	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut pove); pressure te nal plan. Target er as needed to	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, tst 9-5/8" casing flow-rate is 650 keep well on pla	sqft) ±6 that drying shall ne per tour to c ark's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar an. Keep DLS < 3	+300 kers are rigged u heck % ROC. Adv im for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length <	WBM as contingency nd set) of ducts as demand minimum ites. ) - 1,000 psig. <10' until KOP
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and t Drill to KOP fol Target ROP 500 when feasible.	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and a fter Landing P ntire section, no est (as noted abo lowing directio 0 - 600 ft/hr. Ste Take surveys ever	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to ery stand, at a m	NC nus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir	that drying shaine per tour to control of the second secon	+300 kers are rigged u heck % ROC. Add m for additiona .,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR f	80:20 p after the rig (2 d diesel and prov al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length < for curve, and K0	WBM as contingency nd set) of ducts as demand minimum tes. 0 - 1,000 psig. <10' until KOP, OP with
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and tr Drill to KOP fol Target ROP 500 when feasible. Geology and Er	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ag device(s) as re DC w/16 mm - 1 . inclination, and d after Landing P titre section, no est (as noted abo lowing directio ) - 600 ft/hr. Ste Take surveys even agineering. Drill	120,000 CaCl uilt from previo ro retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to ery stand, at a m curve following	NC nus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 tool spaced ~3 natrix body, tar ey every joint fro tings sampling, ist 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir g directional pla	sqft) ±6 that drying sha ne per tour to c ark's mud progra deg, 750 GPM, i ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar an. Keep DLS < 3 m landing target n and updated	+300 kers are rigged u heck % ROC. Adv m for additiona (,580 DIFF PSIG e bit. .5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR i anding target. T	80:20 p after the rig (2 d diesel and prov al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length of for curve, and K0 ake survey every	WBM as contingency nd set) of ducts as demand minimum tes. - 1,000 psig. - 1,000 psig. - 1,000 psig. - 1,000 psig. - 1,000 psig.
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" PDC bit MOTOR: NOV C friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and tu Drill to KOP fol Target ROP 50C when feasible. Geology and Er curve. Land cur	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and a fter Landing P ntire section, no est (as noted abo lowing directio 0 - 600 ft/hr. Ste Take surveys ever	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut prosure te nal plan. Target er as needed to rry stand, at a m curve following rilling in lateral s	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 of tool spaced ~3 natrix body, tar ey every joint fro tings sampling, ist 9-5/8" casing flow-rate is 650 flow-rate is 650 keep well on pla inimum. Confir g directional pla section, steering	sqft) ±6 that drying sha one per tour to c ark's mud progra deg, 750 GPM, 7 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar an. Keep DLS < 3 m landing targe in and updated g as needed to k	+300 kers are rigged u heck % ROC. Adi am for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length - or curve, and K( ake survey every and in the targe	WBM as contingency nd set) of ducts as demand minimum ites. ) - 1,000 psig. < 10' until KOP, DP with joint during et window.
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and ti Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cur Keep DLS < 2 de	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/, ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abc lowing directio 0 - 600 ft/hr. Ste Take surveys even ngineering. Drill rve. Continue dr	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to rry stand, at a m curve following rilling in lateral so so slide length < 2	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir directional pla section, steering 20', when feasib	sqft) ±6 that drying sha one per tour to c ark's mud progra deg, 750 GPM, 1 ,000'behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar an. Keep DLS < 3 m landing targed in and updated g as needed to k le. Take surveys	+300 kers are rigged u heck % ROC. Add am for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR f anding target. T eep well on plan every stand, at a	80:20 p after the rig (2 d diesel and pro- al details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 crourye, and Ko ake survey every and in the targe	WBM as contingency nd set) of ducts as demand demand demand ites. 0 - 1,000 psig. c10' until KOP, DP with cjoint during et window. get rotating
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 when feasible. Geology and Er Geology and ter Curve. Land cur Keep DLS < 2 de parameters / p	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abo lowing direction 0 - 600 ft/nr. Ste Take surveys ever agineering. Drill rve. Continue dr eg/100' and keep	120,000 CaCl uilt from previc rogram specs. R s, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve toint) mud-log or cut ove); pressure te nal plan. Target er as needed to i ery stand, at a m curve following illing in lateral : o slide length < 2 ow-rate is 650 -	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, ist 9-5/8" casing flow-rate is 650 keep well on pla section, steering 20', when feasib 700 GPM, differ	sqft) ±6 that drying sha ine per tour to c ark's mud progra deg, 750 GPM, : ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar in. Keep DLS < 3 m landing target in and updated g as needed to k le. Take surveys rential is pressu	+300 kers are rigged u heck % ROC. Add im for additional 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR t, planned BUR t, planned start eep well on plan every stand, at a <b>re is 700 - 1,00</b>	80:20 p after the rig (2 d diesel and provi l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 eep slide length o for curve, and the targo and in the targo o psig, ROP 500	WBM as contingency nd set) of ducts as demand demand tes. - 1,000 psig. <10' until KOP, DP with 'joint during at window. <b>get rotating</b> - <b>600 ft/hr</b> ,
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOVC friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 when feasible. Geology and te curve. Land cur Keep DLS < 2 dd parameters / p torque 38K ft-I casing running	8.0 - 9.0 system will be b control will bur intain mud in p 77857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abc lowing directio ) - 600 ft/hr. Ste Take surveys even gineering. Drill rve. Continue dr seg/100' and keep berformance: fto bs (MAX drill pi unless shakers i	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 9 mm cutters, r d azimuth (surve oint) mud-log or cut ove); pressure te nal plan. Target er as needed to o curve following curve following curve following curve following solide length < 2 ow-rate is 650 - pe MUT). After ndicate additio	NC bus well. Ensure ttings samples o eference Newpa a tool spaced ~3 natrix body, tar ey every joint fro tings sampling, ist 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir g directional place inimum. Confir g direction, steering 20', when feasib 700 GPM, differ reaching TD, per nal cleaning nee	sqft) ±6 that drying sha ine per tour to c ark's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar in Add updated n and updated gas needed to k le. Take surveys rential is pressu reform no more to eded. TOOH & Ll	+300 kers are rigged u heck % ROC. Adv im for additional 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su <b>1,500</b> get differential i deg/100' and ke t, planned BUR 1 anding target. 1 anding target. 1 anding target. 1 are is 700 - 1,00 han one clean-u 0 drill pipe (ROC	80:20 p after the rig (2 d diesel and provi l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length o for curve, and KC ake survey every and in the targo minimum. <b>Targ</b> <b>0 psig, ROP 500</b> p cycle to condi iH, if required; sl	WBM as contingency nd set) of ducts as demand tes. 10' until KOP, DP with 'joint during et window. yet rotating - 600 ft/hr, ition hole for hould NOT be
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 when feasible. Geology and te Drill to KOP fol Target ROP 500 when feasible. Geology and te curve. Land cur Keep DLS < 2 de parameters / p torque 38K ft-1 casing running required with 0	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abc lowing directio ) - 600 ft/hr. Ste Take surveys even gineering. Drill rve. Continue dr eg/100' and keep eeformance: fto bs (MAX drill pi unless shakers i DBM system). W	120,000 CaCl uilt from previo retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surva 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to rry stand, at a m curve following rilling in lateral o slide length < 2 ow-rate is 650 - pe MUT). After ndicate additio hen pumping h	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, ist 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir gdirectional pla section, steering 20', when feasib 700 GPM, differ reaching TD, per nal cleaning nee ole cleaning swe	that drying sha ine per tour to c ark's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to - 700 GPM. Tar an. Keep DLS < 3 m landing targe n and updated le. Take surveys rential is pressu reform no more to eded. TOOH & LI geeps, fine LCM p	+300 kers are rigged u heck % ROC. Adv im for additional 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan every stand, at ar re is 700 - 1,00 han one clean-u 0 drill pipe (ROC roduct is to be u	80:20 p after the rig (2 d diesel and provi l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length for curve, and K( ake survey every and in the targe <b>0 psig, ROP 500</b> p cycle to condi UH, if required; sl used - <b>Do not use</b>	WBM as contingency nd set) of ducts as demand demand tes. 1 - 1,000 psig. 1 0' until KOP, P with joint during et window. yet rotating - 600 ft/hr, tion hole for hould NOT be barite for
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOVO friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land curve. Keep DLS < 2 de parameters / pt torque 38K ft-I casing running required with 0 sweeps. Run c	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, an d after Landing P titre section, no est (as noted abc lowing directio ) - 600 ft/hr. Ste Take surveys eve gineering. Drill rve. Continue d reg/100' and keep eeformance: flo bs (MAX drill pi unless shakers i DBM system). W asing as describe	120,000 CaCl uilt from previo retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve orint) mud-log or cut ove); pressure te nal plan. Target er as needed to ery stand, at a m curve following rilling in lateral o slide length < 2 oslide le	NC bus well. Ensure trings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint fro tings sampling, ist 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confir g directional pla section, steering 20', when feasib <b>700 GPM, diffe</b> reaching TD, pei nal cleaning nee ole cleaning swe RT for casing run	that drying sha ine per tour to c ark's mud progra deg, 750 GPM, 1 ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to 0 - 700 GPM. Tar an. Keep DLS < 3 m landing targe in and updated g as needed to k le. Take surveys <b>rential is pressu</b> form no more to eded. TOOH & LI eeps, fine LCM p noning only if need	+300 kers are rigged u heck % ROC. Adv im for additional 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan every stand, at ar re is 700 - 1,00 han one clean-u O drill pipe (ROC roduct is to be u cessary (should N	80:20 p after the rig (2 d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length for curve, and Ko ake survey every and in the targe minimum. Targ <b>0 psig, ROP 500</b> Ip sycle to condi UH, if required; sl used - <b>Do not use</b>	WBM as contingency and set) of ducts as demand dema
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cur Keep DLS < 2 de parameters / p torque 38K ft- casing running required with ( sweeps. Run c	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abd lowing directio ) - 600 ft/hr. Ste Take surveys even ingineering. Drill rve. Continue dr cg/100' and keep to ft/ and keep to	120,000 CaCl uilt from previc ra retorts on cui rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut by pressure te nal plan. Target er as needed to ery stand, at a m curve following filling in lateral o slide length < 2 oslide l	NC nus well. Ensure trings samples o eference Newpar a rev/gal, 1.83 o tool spaced ~3 natrix body, tar ey every joint from tings sampling, st 9-5/8" casing flow-rate is 650 keep well on plating inimum. Confir g directional plating section, steering 20', when feasib <b>700 GPM, differ</b> reaching TD, per nal cleaning new ole cleaning swo RT for casing run pace out casing	sqft) ±6 that drying sha one per tour to c ark's mud progra deg, 750 GPM, : ,000' behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to 0 - 700 GPM. Tar an. Keep DLS < 3 m landing target in and updated g as needed to k le. Take surveys rential is pressu rform no more ta dede. TOOH & LI seps, fine LCM p nning only if net getting the toes	+300 kers are rigged u heck % ROC. Adv im for additional L,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ket t, planned BUR 1 anding target. T eep well on plan every stand, at at re is 700 - 1,00 han one clean-u ) drill pipe (ROC roduct is to be u tessary (should N sleeve as close to	80:20 p after the rig (2 d diesel and provi al details. (or similar); on of rvey every 100' psi for 30 minu s pressure is 700 ep slide length - for curve, and K0 ake survey every and in the targe minimum. Targe 0 psig, ROP 500 pp cycle to condi HI, if required; sl used -Do not use NOT be required p LTP as possible	WBM as contingency and set) of ducts as demand demand demand tes. 10' until KOP DP with joint during et window. get rotating - 600 ft/hr, tion hole for hould NOT be barite for with OBM). Land casing
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP for Target ROP 500 when feasible. Geology and Er curve. Land cur Keep DLS < 2 do parameters / p torque 38K ft-1 casing running required with o sweeps. Run c	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/- ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing direction 0 - 600 ft/hr. Ste Take surveys ever agineering. Drill rve. Continue dr eg/100' and keep terformance: fto bs (MAX drill pi unless shakers i DBM system). W asing as describut	120,000 CaCl uilt from previc ro retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te ras needed to rry stand, at a m curve following rilling in lateral o slide length < 2 ow-rate is 650 - pe MUT). After ndicate additio hen pumping h ed below. Use C inning casing. Sp ion sub, fill casin	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 ( tool spaced ~3 natrix body, tar ey every joint fro ttings sampling, sts 9-5/8" casing flow-rate is 6500 flow-rate is 65000 flow-rate is 65000 flow-rate is 65000 flow-rate is 65000 flow-rate is 6	sqft) ±6 that drying sha one per tour to c ark's mud progra deg, 750 GPM, 1 ,000'behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar an. Keep DLS < 3 m landing target in and updated g as needed to k le. Take surveys rential is pressu rform no more t eded. TOOH & Ll eeps, fine LCM p nning only if ner getting the toes e as required. Por	+300 kers are rigged u heck % ROC. Adi am for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u D drill pipe (ROC roduct is to be u essary (should h sleeve as close to ump cement as c	80:20 p after the rig (2 d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length - for curve, and K0 ake survey every and in the targe minimum. Targe 0 psig, ROP 500 pp cycle to condi HI, if required; sl used -Do not use NOT be required p LTP as possible	WBM as contingency and set) of ducts as demand demand demand tes. 10' until KOP, DP with joint during et window. get rotating - 600 ft/hr, tion hole for hould NOT be barite for with OBM). Land casing
Hol Bit / N Bit / N MWD / S Lou Pressur	Notes: le Size: Motor: Motor: Survey: gging: re Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP for Target ROP 500 when feasible. Geology and Er curve. Land cur Keep DLS < 2 do parameters / p torque 38K ft-1 casing running required with o sweeps. Run c	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abd lowing directio ) - 600 ft/hr. Ste Take surveys even ingineering. Drill rve. Continue dr cg/100' and keep to ft/ and keep to	120,000 CaCl uilt from previc ro retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te ras needed to rry stand, at a m curve following rilling in lateral o slide length < 2 ow-rate is 650 - pe MUT). After ndicate additio hen pumping h ed below. Use C inning casing. Sp ion sub, fill casin	NC bus well. Ensure ttings samples o eference Newpa 3 rev/gal, 1.83 ( tool spaced ~3 natrix body, tar ey every joint fro ttings sampling, sts 9-5/8" casing flow-rate is 6500 flow-rate is 65000 flow-rate is 65000 flow-rate is 65000 flow-rate is 65000 flow-rate is 6	sqft) ±6 that drying sha one per tour to c ark's mud progra deg, 750 GPM, 1 ,000'behind th get TFA = 1.0 - 1 om KOP to Land no OH WL logs to -700 GPM. Tar an. Keep DLS < 3 m landing target in and updated g as needed to k le. Take surveys rential is pressu rform no more t eded. TOOH & Ll eeps, fine LCM p nning only if ner getting the toes e as required. Por	+300 kers are rigged u heck % ROC. Adi am for additiona 1,580 DIFF PSIG e bit. .5 sq-in ing Point and su 1,500 get differential i deg/100' and ke t, planned BUR i anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u D drill pipe (ROC roduct is to be u essary (should h sleeve as close to ump cement as c	80:20 p after the rig (2 d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length - for curve, and K0 ake survey every and in the targe minimum. Targe 0 psig, ROP 500 pp cycle to condi HI, if required; sl used -Do not use NOT be required p LTP as possible	WBM as contingency and set) of ducts as demand demand demand tes. 10' until KOP DP with joint during et window. get rotating - 600 ft/hr, tion hole for hould NOT be barite for with OBM). Land casing
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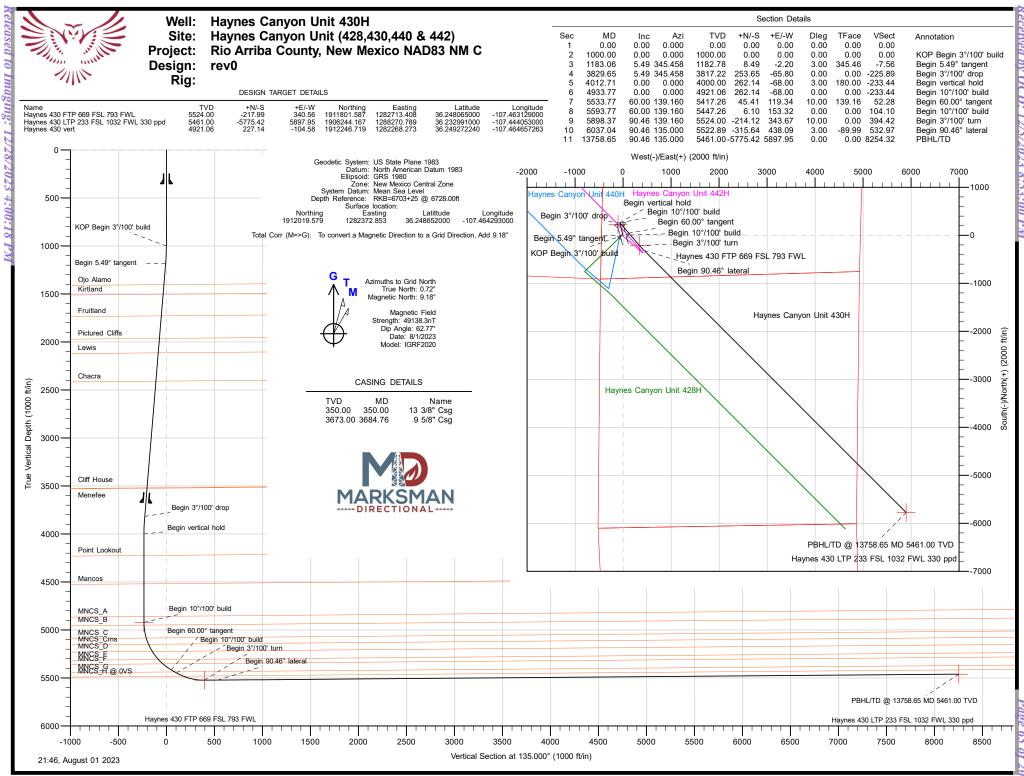
							Tens. Body	Tens. Conn
Casing Specs:	Size (in)	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	(lbs)	(lbs)
Specs	5.500	17.0	P-110	LTC	7,460	10,640	546,000	445,000
Loading					2,698	9,011	301,837	301,837
Min. S.F.					2.77	1.18	1.81	1.47
		o 11 - C 11			a	1 10		

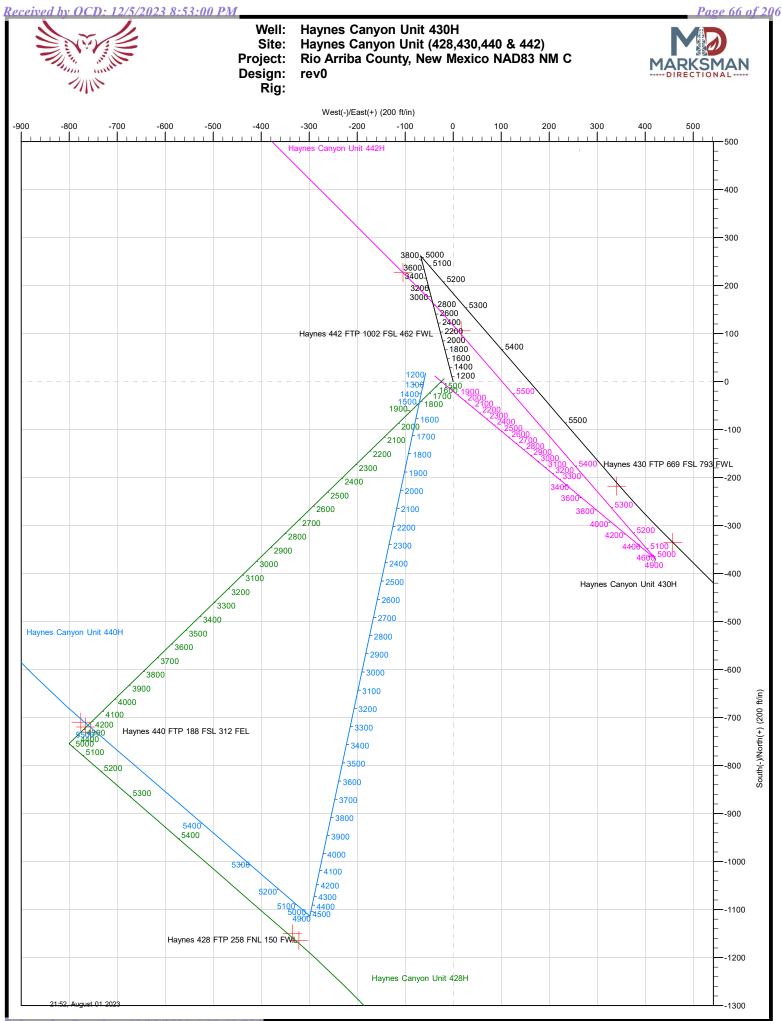
Assumptions: Collapse: fully evacuated casing with 9.5 ppg fluid in the annulus (floating casing during running) Burst: 8,500 psi maximum surface treating pressure with 10.2 ppg equivalent mud weight sand laden fluid with 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 9.0 ppg fluid with 100,000 lbs over-pull

MU Torque (ft lbs): Casing Summary:	spaced evenly i	in lateral every 2	<i>Optimum:</i> ing, float collar, 2,000', floatatio 30' to the unit b	n sub at KOP, ca	sing to surface.	The toe-initiatio	on sleeve (last-ta	
Casing Summary:	intitiation slee sub <b>(NCS Air-Lo</b> boundary than Wellbore path <i>sleeve and is n</i>	we (WFT RD 8,50 ock 2,500 psi fro 300' measured must be no clos oted on the Wel	is catcher, 1 jt c. 00 psi), casing to om WFT), casing perpendicular t ser than 600' fro 11 Plan. Drill pase not past) the pla	KOP with 20'n to surface. The o the East or W m the parallel le <b>t the LTP as requ</b>	narker joints spa toe-initiation slu 'est lease lines fo ease lines. <b>Note:</b> uired for necesso	iced evenly in la eeve shall be pla or a East-West az the LTP is the m	teral every ~2,00 aced no closer to imuth drilled w aximum depth	00', floatation the unit ellbore. of the toe
Centralizers:	Lateral: 1 cent Top of curve to	ralizer per 3 joir 9-5/8" shoe: 1	ent may be adju nts (purchase cer centralizer per 5 ralizer per 5 joir	ntralizers from e 5 joints				
Cement:	Туре	Weight (ppg)		Water (gal/sk)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)	Total Cmt (cu ft)
Spacer	IntegraGuard Star	11	2.270	31.6	5.0%	0	60 bbls	1 202
Lead	ASTM type I/II	12.4	2.370	13.40	50%	0	541	1,283
Tail	G:POZ blend	13.3	1.570	7.70	10%	4,533	1,481	2,325
Displacement	119	est bbls	<u> </u>					
Annular Capacity	0.2691	cuft/ft	5-1/2" casing x	(9-5/8" casing (	annulus			
	0.2291	cuft/ft	5-1/2" casing x	(8-1/2" hole an	nulus			
	0.1245	cuft/ft	5-1/2" casing v	ol	est shoe jt ft	100		
	Calculated cer	nent volumes a	ssume gauge ho	le and the exce	ss noted in table	2		
	American Cem	enting Liner & F	Production Blen					
	S-8 Silica Flour	Auto CAC utomother	5024 Defermen 5	IntegraGuard Star	66201 Curfe de et 1			
Spacer	163.7 lbs/bbl	Avis 616 viscosifier 11.6 lb/bbl	lb/bbl	Plus 3K LCM 15 Ib/bbl	SS201 Surfactant 1 gal/bbl		500 / D /	
Lead	ASTM Type I/II	BA90 Bonding Agent 5.0 lb/sx	Bentonite Viscosifier 8% BWOB	FL24 Fluid Loss .5% BWOB	IntegraGuard GW86 Viscosifier .1% BWOB	R7C Retarder .2% BWOB IntegraGuard GW86	Static .01 lb/sx	FP24 Defoamer .3%
Tail	Type G 50%	Pozzolan Fly Ash Extender 50%	BA90 Bonding Agent 3.0 lb/sx	Bentonite Viscosifier 4% BWOB	FL24 Fluid Loss .4% BWOB	Viscosifier .1% BWOB	R3 Retarder .5% BWOB	BWOB, IntegraSeal 0.25 lb/sx
Note	Notify NMOCD	& BLM if ceme	ssume gauge ho nt is not circula d an unorthodo	ted to surface.			5 C 5 As define	d in NMAC
Note.			16.15.C.1.b, no					
			f the well or 330					
		-	by NMAC 19.15					
			5.16.7.J, respect					
			take point will b					
			the unit bounda					
		to the azimuth		,				
	perpendicut							
EINICH WELL								
FINISH WELL:			and cover well. C	ontinuo deillie	operations	subsequent	ls on pad	
Flocedule.	Alter Oll-Illie Ce	ement job, cap a	ind cover wen. C	.ontinue unining	goperations on	subsequent wei	iis oli pau.	
COMPLETION AND SS		A.N.						
COMPLETION AND PR								
Est Lateral Length:	7,965							
Est Frac Inform:	33	Frac Stages	128,000	bbls slick wate	er	10,360,000	lbs proppant	
		0 1	n tubing as press cubing via gas-lif		nt production a	nd storage facili	ties	
ESTIMATED START D								
Drilling:								
Completion:								
Production:	2/14/24							
Prepared by:	Alec Bridge	12/20/21						

Prepared by:	Alec Bridge	12/20/21
Updated:	Greg Olson	2/20/23
	Greg Olson	3/27/23
	G Olson	8/8/23







Database: Company: Project: Site: Well: Wellbore: Design:		lew Mexico NAD83 NM C t (428,430,440 & 442)	Local Co-ordin TVD Reference MD Reference North Referen Survey Calcul	: ce:	Well Haynes Canyon L RKB=6703+25 @ 6728 RKB=6703+25 @ 6728 Grid Minimum Curvature	3.00ft
Project	Rio Arriba County, Ne	ew Mexico NAD83 NM C				
Map System: Geo Datum: Map Zone:	US State Plane 1983 North American Datum New Mexico Central Zo		System Datum:		Mean Sea Level	
Site	Haynes Canyon Unit	(428,430,440 & 442)				
Site Position: From: Position Uncertainty:	Lat/Long 0.00	Northing: Easting: ft Slot Radius:	1,912,025.28 1,282,353.79 13-3/	55 usft Longitude:		36.248667000 -107.464358000
Well	Haynes Canyon Unit	430H, Surf loc: 897 FSL 4	48 FWL Section 03-T23	N-R06W		
Well Position	+ <b>E</b> /- <b>W</b> 0.	00 ft Northing: 00 ft Easting: 00 ft Wellhead Ele	1,282	2,372.853 usft L	atitude: ongitude: Ground Level:	36.248652000 -107.464293000 6,703.00 ft
Position Uncertainty Grid Convergence:		72 °	vation.	n G	siound Level.	0,703.00 11
Wellbore	Original Hole					
Magnetics	Model Name	Sample Date	Declination (°)	Dip	o Angle (°)	Field Strength (nT)
	IGRF2020	8/1/2023		8.46	62.77	49,138.30656079
Design	rev0					
Audit Notes:						
Version:		Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	I	Depth From (TVD) (ft) 0.00	+N/-S (ft) 0.00	+E/-W (ft) 0.00	Direction (°) 135.000	
		0.00	0.00	0.00		
Plan Survey Tool Pro Depth From (ft)	Depth To	8/1/2023 / (Wellbore)	Tool Name	Remarks		
1 0.00	13,758.64 rev0 (C	)riginal Hole)	MWD			



Database:	DB Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.000	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,183.06	5.49	345.458	1,182.78	8.49	-2.20	3.00	3.00	0.00	345.46	
3,829.65	5.49	345.458	3,817.22	253.65	-65.80	0.00	0.00	0.00	0.00	
4,012.71	0.00	0.000	4,000.00	262.14	-68.00	3.00	-3.00	0.00	180.00	
4,933.77	0.00	0.000	4,921.06	262.14	-68.00	0.00	0.00	0.00	0.00	
5,533.77	60.00	139.160	5,417.26	45.41	119.34	10.00	10.00	0.00	139.16	
5,593.77	60.00	139.160	5,447.26	6.10	153.32	0.00	0.00	0.00	0.00	
5,898.37	90.46	139.160	5,524.00	-214.12	343.67	10.00	10.00	0.00	0.00	
6,037.04	90.46	135.000	5,522.89	-315.64	438.09	3.00	0.00	-3.00	-89.99	
13,758.65	90.46	135.000	5,461.00	-5,775.42	5,897.95	0.00	0.00	0.00	0.00	Haynes 430 LTP 23

Received by OCD: 12/5/2023 8:53:00 PM



Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey

0.00 100.00 200.00 300.00 350.00 <b>13 3/8" Csg</b> 400.00 500.00 600.00 700.00 800.00 900.00 1,000.00 <b>KOP Begin 3°/100</b> 1,100.00 1,100.00 1,300.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,731.22 <b>Fruitland</b> 1,600.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,900.00 2,100.00 2,100.00 2,100.00 2,100.00 2,100.00 2,300.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00 3,000.00 3,000.00 3,000.00 3,100.00	clination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
100.00 200.00 300.00 350.00 <b>13 3/8" Csg</b> 400.00 500.00 600.00 700.00 800.00 900.00 1,000.00 <b>KOP Begin 3°/100</b> 1,100.00 1,183.06 <b>Begin 5.49° tange</b> 1,200.00 1,300.00 1,400.00 1,400.00 1,505.03 <b>Kirtland</b> 1,600.00 1,505.03 <b>Kirtland</b> 1,600.00 1,731.22 <b>Fruitland</b> 1,800.00 1,731.22 <b>Fruitland</b> 1,800.00 1,900.00 2,100.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,500.00 2,500.00 2,700.00 2,800.00 2,900.00 3,000.00 3,000.00 3,000.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00 350.00 13 3/8" Csg 400.00 500.00 600.00 700.00 800.00 900.00 1,000.00 <b>KOP Begin 3°/100</b> 1,100.00 1,183.06 <b>Begin 5.49° tange</b> 1,200.00 1,300.00 1,400.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,900.00 1,907.46 <b>Pictured Cliffs</b> 2,000.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,414.81 <b>Chacra</b> 2,500.00 2,700.00 2,800.00 2,900.00 3,000.00	0.00	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
350.00 13 3/8" Csg 400.00 500.00 600.00 700.00 800.00 900.00 1,000.00 <b>KOP Begin 3°/100</b> 1,100.00 1,183.06 <b>Begin 5.49° tange</b> 1,200.00 1,300.00 1,400.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,900.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00 3,000.00	0.00		200.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8" Csg           400.00           500.00           600.00           700.00           800.00           900.00           1,000.00           KOP Begin 3°/100'           1,100.00           1,183.06           Begin 5.49° tanget           1,200.00           1,300.00           1,400.00           1,400.00           1,500.00           1,505.03           Kirtland           1,600.00           1,701.00           1,702.00           1,703.22           Fruitland           1,800.00           1,900.00           2,100.00           2,100.00           2,100.00           2,118.25           Lewis           2,200.00           2,414.81           Chacra           2,500.00           2,600.00           2,700.00           2,800.00           2,900.00           3,000.00	0.00		300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00 500.00 600.00 700.00 800.00 900.00 1,000.00 <b>KOP Begin 3'/100</b> 1,100.00 1,183.06 <b>Begin 5.49° tange</b> 1,200.00 1,300.00 1,400.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,900.00 1,900.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,414.81 <b>Chacra</b> 2,500.00 2,700.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00 3,000.00	0.00	0.000	350.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00 600.00 700.00 800.00 900.00 1,000.00 <b>KOP Begin 3°/100</b> 1,100.00 1,183.06 <b>Begin 5.49° tange</b> 1,200.00 1,400.00 1,400.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,701.00 1,701.00 1,907.46 <b>Pictured Cliffs</b> 2,000.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,700.00 2,700.00 2,800.00 2,900.00 3,000.00									
600.00 700.00 800.00 900.00 1,000.00 KOP Begin 3°/100 1,100.00 1,183.06 Begin 5.49° tanget 1,200.00 1,300.00 1,400.00 1,404.50 Ojo Alamo 1,500.00 1,505.03 Kirtland 1,600.00 1,700.00 1,701.00 1,701.00 1,900.00 1,900.00 1,907.46 Pictured Cliffs 2,000.00 2,100.00 2,118.25 Lewis 2,200.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 2,900.00 3,000.00	0.00	0.000	400.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00 800.00 900.00 1,000.00 KOP Begin 3'/100 1,100.00 1,183.06 Begin 5.49° tanget 1,200.00 1,300.00 1,400.00 1,404.50 Ojo Alamo 1,505.03 Kirtland 1,600.00 1,505.03 Kirtland 1,600.00 1,700.00 1,700.00 1,731.22 Fruitland 1,800.00 1,900.00 1,967.46 Pictured Cliffs 2,000.00 2,118.25 Lewis 2,200.00 2,118.25 Lewis 2,200.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	0.00		500.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00 900.00 1,000.00 <b>KOP Begin 3°/100</b> 1,100.00 1,183.06 <b>Begin 5.49° tange</b> 1,200.00 1,300.00 1,400.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,907.46 <b>Pictured Cliffs</b> 2,000.00 2,118.25 <b>Lewis</b> 2,200.00 2,118.25 <b>Lewis</b> 2,200.00 2,400.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	0.00	0.000 0	600.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00 1,000.00 <b>KOP Begin 3°/100</b> 1,100.00 1,183.06 <b>Begin 5.49° tange</b> 1,200.00 1,300.00 1,400.00 1,404.50 <b>Ojo Alamo</b> 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,907.46 <b>Pictured Cliffs</b> 2,000.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	0.00	0.000	700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00 KOP Begin 3°/100 1,100.00 1,183.06 Begin 5.49° tanger 1,200.00 1,300.00 1,400.00 1,404.50 Ojo Alamo 1,505.03 Kirtland 1,600.00 1,700.00 1,700.00 1,701.22 Fruitland 1,800.00 1,900.00 1,907.46 Pictured Cliffs 2,000.00 2,118.25 Lewis 2,200.00 2,300.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	0.00	0.000	800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00 KOP Begin 3°/100 1,100.00 1,183.06 Begin 5.49° tanger 1,200.00 1,300.00 1,400.00 1,404.50 Ojo Alamo 1,505.03 Kirtland 1,600.00 1,700.00 1,700.00 1,701.22 Fruitland 1,800.00 1,900.00 1,907.46 Pictured Cliffs 2,000.00 2,118.25 Lewis 2,200.00 2,400.00 2,400.00 2,400.00 2,400.00 2,400.00 2,400.00 2,400.00 2,600.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	0.00	0.000	900.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Begin 3°/100           1,100.00           1,183.06           Begin 5.49° tanget           1,200.00           1,300.00           1,400.00           1,400.00           1,400.00           1,400.00           1,400.00           1,500.00           1,505.03           Kirtland           1,600.00           1,700.00           1,731.22           Fruitland           1,800.00           1,907.46           Pictured Cliffs           2,000.00           2,118.25           Lewis           2,200.00           2,400.00           2,414.81           Chacra           2,500.00           2,600.00           2,700.00           2,800.00           2,900.00           2,900.00	0.00		1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00 1,183.06 Begin 5.49° tanger 1,200.00 1,300.00 1,400.00 1,404.50 Ojo Alamo 1,505.03 Kirtland 1,600.00 1,700.00 1,700.00 1,731.22 Fruitland 1,800.00 1,907.46 Pictured Cliffs 2,000.00 2,118.25 Lewis 2,200.00 2,118.25 Lewis 2,200.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	0' build								
Begin 5.49° tanger           1,200.00           1,300.00           1,400.00           1,400.00           1,404.50           Ojo Alamo           1,500.00           1,500.00           1,500.00           1,500.00           1,500.00           1,500.00           1,500.00           1,500.00           1,700.00           1,71.22           Fruitland           1,800.00           1,907.46           Pictured Cliffs           2,000.00           2,118.25           Lewis           2,200.00           2,400.00           2,414.81           Chacra           2,500.00           2,600.00           2,700.00           2,800.00           2,900.00           3,000.00	3.00	345.458	1,099.95	2.53	-0.66	-2.26	3.00	3.00	0.00
1,200.00 1,300.00 1,400.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,907.46 <b>Pictured Cliffs</b> 2,000.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,400.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49		1,182.78	8.49	-2.20	-7.56	3.00	3.00	0.00
1,300.00 1,400.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,770.00 1,771.22 <b>Fruitland</b> 1,800.00 1,907.46 <b>Pictured Cliffs</b> 2,000.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,400.00 2,444.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	ent								
1,400.00 1,404.50 <b>Ojo Alamo</b> 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,900.00 1,967.46 <b>Pictured Cliffs</b> 2,000.00 2,118.25 <b>Lewis</b> 2,200.00 2,414.81 <b>Chacra</b> 2,500.00 2,400.00 2,414.81	5.49	345.458	1,199.64	10.05	-2.61	-8.95	0.00	0.00	0.00
1,400.00 1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,900.00 1,967.46 <b>Pictured Cliffs</b> 2,000.00 2,118.25 <b>Lewis</b> 2,200.00 2,414.81 <b>Chacra</b> 2,500.00 2,400.00 2,414.81	5.49	9 345.458	1.299.18	19.32	-5.01	-17.20	0.00	0.00	0.00
1,404.50 <b>Ojo Alamo</b> 1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,907.46 <b>Pictured Cliffs</b> 2,000.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,300.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49		1,398.72	28.58	-7.41	-25.45	0.00	0.00	0.00
1,500.00 1,505.03 <b>Kirtland</b> 1,600.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,900.00 1,967.46 <b>Pictured Cliffs</b> 2,000.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,300.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49		1,403.21	29.00	-7.52	-25.82	0.00	0.00	0.00
1,505.03 Kirtland 1,600.00 1,700.00 1,731.22 Fruitland 1,800.00 1,967.46 Pictured Cliffs 2,000.00 2,100.00 2,118.25 Lewis 2,200.00 2,300.00 2,300.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00									
Kirtland           1,600.00           1,700.00           1,731.22           Fruitland           1,800.00           1,900.00           1,967.46           Pictured Cliffs           2,000.00           2,100.00           2,100.00           2,118.25           Lewis           2,200.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,400.00           2,600.00           2,600.00           2,700.00           2,800.00           2,900.00           3,000.00	5.49	345.458	1,498.27	37.85	-9.82	-33.70	0.00	0.00	0.00
1,600.00 1,700.00 1,731.22 <b>Fruitland</b> 1,800.00 1,907.46 <b>Pictured Cliffs</b> 2,000.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,400.00 2,400.00 2,400.00 2,400.00 2,600.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49	9 345.458	1,503.27	38.31	-9.94	-34.12	0.00	0.00	0.00
1,700.00 1,731.22 Fruitland 1,800.00 1,900.00 1,967.46 Pictured Cliffs 2,000.00 2,118.25 Lewis 2,200.00 2,300.00 2,400.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00									
1,700.00 1,731.22 Fruitland 1,800.00 1,900.00 1,967.46 Pictured Cliffs 2,000.00 2,100.00 2,118.25 Lewis 2,200.00 2,300.00 2,300.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49	9 345.458	1,597.81	47.11	-12.22	-41.95	0.00	0.00	0.00
1,731.22  Fruitland  1,800.00  1,900.00  1,967.46  Pictured Cliffs  2,000.00  2,118.25  Lewis  2,200.00  2,300.00  2,400.00  2,414.81  Chacra  2,500.00  2,600.00  2,700.00  2,800.00  2,900.00  3,000.00	5.49		1,697.35	56.37	-14.62	-50.20	0.00	0.00	0.00
Fruitland 1,800.00 1,900.00 1,967.46 Pictured Cliffs 2,000.00 2,118.25 Lewis 2,200.00 2,300.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49		1,728.42	59.26	-15.37	-52.78	0.00	0.00	0.00
1,800.00 1,900.00 1,967.46 <b>Pictured Cliffs</b> 2,000.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00									
1,967.46 Pictured Cliffs 2,000.00 2,100.00 2,118.25 Lewis 2,200.00 2,300.00 2,400.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49	9 345.458	1,796.89	65.64	-17.03	-58.45	0.00	0.00	0.00
Pictured Cliffs           2,000.00           2,100.00           2,118.25           Lewis           2,200.00           2,300.00           2,400.00           2,414.81           Chacra           2,500.00           2,600.00           2,700.00           2,800.00           2,900.00           3,000.00	5.49		1,896.43	74.90	-19.43	-66.70	0.00	0.00	0.00
Pictured Cliffs           2,000.00           2,100.00           2,118.25           Lewis           2,200.00           2,300.00           2,400.00           2,414.81           Chacra           2,500.00           2,600.00           2,700.00           2,800.00           2,900.00           3,000.00	5.49	9 345.458	1,963.58	81.15	-21.05	-72.27	0.00	0.00	0.00
2,000.00 2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,300.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.45	9 343.430	1,905.50	01.15	-21.05	-12.21	0.00	0.00	0.00
2,100.00 2,118.25 <b>Lewis</b> 2,200.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49	9 345.458	1,995.97	84.16	-21.83	-74.95	0.00	0.00	0.00
2,118.25 Lewis 2,200.00 2,300.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49		2,095.51	93.43	-21.03	-83.20	0.00	0.00	0.00
Lewis 2,200.00 2,300.00 2,400.00 2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49		2,113.68	95.12	-24.67	-84.71	0.00	0.00	0.00
2,200.00 2,300.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00			,						
2,300.00 2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49	9 345.458	2,195.05	102.69	-26.64	-91.45	0.00	0.00	0.00
2,400.00 2,414.81 <b>Chacra</b> 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49		2,294.59	111.95	-29.04	-99.70	0.00	0.00	0.00
2,414.81 Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49 5.49		2,294.59	121.22	-29.04 -31.44	-99.70	0.00	0.00	0.00
Chacra 2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49		2,408.88	122.59	-31.80	-109.17	0.00	0.00	0.00
2,500.00 2,600.00 2,700.00 2,800.00 2,900.00 3,000.00			,						
2,600.00 2,700.00 2,800.00 2,900.00 3,000.00	5.49	9 345.458	2,493.68	130.48	-33.85	-116.20	0.00	0.00	0.00
2,700.00 2,800.00 2,900.00 3,000.00	5.49		2,593.22	139.74	-36.25	-124.45	0.00	0.00	0.00
2,800.00 2,900.00 3,000.00	5.49	9 345.458	2,692.76	149.01	-38.65	-132.70	0.00	0.00	0.00
2,900.00 3,000.00	5.49 5.49		2,692.76 2,792.30	149.01	-38.65 -41.06	-132.70 -140.95	0.00	0.00	0.00
3,000.00	5.49		2,891.84	167.54	-41.00	-140.95	0.00	0.00	0.00
	5.49		2,991.38	176.80	-45.86	-149.20	0.00	0.00	0.00
-,	5.49		3,090.92	186.06	-48.27	-165.70	0.00	0.00	0.00
3 200 00									
3,200.00 3,300.00	5.49		3,190.46	195.33	-50.67	-173.94 -182.19	0.00	0.00	0.00
3,400.00	5.49 5.49		3,290.00 3,389.54	204.59 213.85	-53.07 -55.47	-182.19 -190.44	0.00 0.00	0.00 0.00	0.00 0.00
3,500.00	5.49		3,489.09	213.85	-57.88	-190.44	0.00	0.00	0.00

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Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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)
3,530.67	5.49	345.458	3,519.62	225.96	-58.61	-201.22	0.00	0.00	0.00
Cliff House									
3,535.70	5.49	345.458	3,524.62	226.42	-58.74	-201.64	0.00	0.00	0.00
Menefee									
3,600.00	5.49	345.458	3,588.63	232.38	-60.28	-206.94	0.00	0.00	0.00
3,684.76	5.49	345.458	3,673.00	240.23	-62.32	-213.94	0.00	0.00	0.00
9 5/8" Csg 3.700.00	E 40	245 459	2 699 17	241.64	60.69	215 10	0.00	0.00	0.00
3,800.00	5.49 5.49	345.458 345.458	3,688.17 3,787.71	241.64 250.91	-62.68 -65.09	-215.19 -223.44	0.00 0.00	0.00 0.00	0.00 0.00
3,829.65	5.49	345.458	3,817.22	253.65	-65.80	-225.89	0.00	0.00	0.00
Begin 3°/100		545.450	5,017.22	233.03	-05.00	-225.09	0.00	0.00	0.00
3,900.00	3.38	345.458	3,887.36	258.92	-67.17	-230.58	3.00	-3.00	0.00
4,000.00	0.38	345.458	3,987.29	262.10	-67.99	-233.41	3.00	-3.00	0.00
4,012.71	0.00	0.000	4,000.00	262.14	-68.00	-233.44	3.00	-3.00	0.00
Begin vertica		0.000	4 007 00	000.44	00.00	000.44	0.00	0.00	0.00
4,100.00	0.00	0.000	4,087.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,200.00	0.00	0.000	4,187.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,237.58	0.00	0.000	4,224.87	262.14	-68.00	-233.44	0.00	0.00	0.00
4,300.00	ut 0.00	0.000	4,287.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,400.00	0.00	0.000	4,387.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,500.00	0.00	0.000	4,487.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,532.58	0.00	0.000	4,519.87	262.14	-68.00	-233.44	0.00	0.00	0.00
Mancos									
4,600.00	0.00	0.000	4,587.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,700.00 4,800.00	0.00 0.00	0.000 0.000	4,687.29 4,787.29	262.14 262.14	-68.00 -68.00	-233.44 -233.44	0.00 0.00	0.00 0.00	0.00 0.00
4,800.00	0.00	0.000	4,859.87	262.14	-68.00	-233.44	0.00	0.00	0.00
MNCS_A			*						
4,900.00	0.00	0.000	4,887.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,933.77	0.00	0.000	4,921.06	262.14	-68.00	-233.44	0.00	0.00	0.00
Begin 10°/10	0' build								
4,950.00	1.62	139.160	4,937.29	261.97	-67.85	-233.21	10.00	10.00	0.00
4,962.59	2.88	139.160	4,949.87	261.59	-67.53	-232.72	10.00	10.00	0.00
MNCS_B 5,000.00	6.62	139.160	4,987.14	259.25	-65.50	-229.63	10.00	10.00	0.00
5,050.00 5,099.70	11.62 16.59	139.160 139.160	5,036.50 5,084.68	253.25 244.09	-60.32 -52.40	-221.73 -209.65	10.00 10.00	10.00 10.00	0.00 0.00
MNCS_C	10.00	100.100	0,004.00	L 17.00	02.70	200.00	10.00	10.00	0.00
5,100.00	16.62	139.160	5,084.97	244.02	-52.34	-209.56	10.00	10.00	0.00
5,150.00	21.62	139.160	5,132.20	231.64	-41.63	-193.23	10.00	10.00	0.00
5,168.73	23.50	139.160	5,149.49	226.20	-36.93	-186.06	10.00	10.00	0.00
MNCS_Cms									
5,200.00	26.62	139.160	5,177.81	216.18	-28.27	-172.86	10.00	10.00	0.00
5,250.00	31.62	139.160	5,221.48	197.78	-12.36	-148.59	10.00	10.00	0.00
5,253.18 MNCS_D	31.94	139.160	5,224.18	196.51	-11.27	-146.92	10.00	10.00	0.00
5,300.00	36.62	139.160	5,262.86	176.56	5.97	-120.63	10.00	10.00	0.00
5,350.00	41.62	139.160	5,301.64	152.70	26.60	-89.17	10.00	10.00	0.00
5,359.47	42.57	139.160	5,308.67	147.90	30.75	-82.84	10.00	10.00	0.00
MNCS_E			,						
5,400.00	46.62	139.160	5,337.52	126.38	49.35	-54.46	10.00	10.00	0.00

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Received by OCD: 12/5/2023 8:53:00 PM



Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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)
5,423.50	48.97	139.160	5,353.30	113.21	60.74	-37.10	10.00	10.00	0.00
MNCS_F									
5,450.00	51.62	139.160	5,370.23	97.78	74.07	-16.77	10.00	10.00	0.00
5,500.00	56.62	139.160	5,399.52	67.14	100.55	23.63	10.00	10.00	0.00
5,533.77	60.00	139.160	5,417.26	45.41	119.34	52.28	10.00	10.00	0.00
Begin 60.00		100.100	0,111.20	10.11	110.01	02.20	10.00	10.00	0.00
5,573.86	60.00	139.160	5,437.30	19.14	142.05	86.91	0.00	0.00	0.00
MNCS_G	00.00	100.100	0,407.00	10.14	142.00	00.01	0.00	0.00	0.00
5,593.77	60.00	139.160	5,447.26	6.10	153.32	104.10	0.00	0.00	0.00
Begin 10°/10		100.100	0,111.20	0.10	100.02	101.10	0.00	0.00	0.00
5,600.00	60.62	139.160	5,450.34	2.00	156.86	109.50	10.00	10.00	0.00
5,650.00	65.62	139.160	5,472.94	-31.73	186.02	153.97	10.00	10.00	0.00
5,671.92	67.82	139.160	5,481.60	-46.96	199.19	174.05	10.00	10.00	0.00
MNCS_H @									
5,700.00	70.62	139.160	5,491.56	-66.82	216.35	200.23	10.00	10.00	0.00
5,750.00	75.62	139.160	5,506.08	-103.01	247.63	247.94	10.00	10.00	0.00
5,800.00	80.62	139.160	5,516.36	-140.01	279.62	296.72	10.00	10.00	0.00
5,850.00	85.62	139.160	5,522.35	-177.56	312.07	346.22	10.00	10.00	0.00
5,898.37	90.46	139.160	5,524.00	-214.12	343.67	394.42	10.00	10.00	0.00
Begin 3°/100	)' turn								
5,900.00	90.46	139.111	5,523.99	-215.35	344.74	396.04	3.00	0.00	-3.00
6,000.00	90.46	136.111	5,523.18	-289.20	412.15	495.93	3.00	0.00	-3.00
6,037.04	90.46	135.000	5,522.89	-315.64	438.09	532.97	3.00	0.00	-3.00
Begin 90.46	° lateral								
6,100.00	90.46	135.000	5,522.38	-360.16	482.60	595.92	0.00	0.00	0.00
6,200.00	90.46	135.000	5,521.58	-430.87	553.31	695.92	0.00	0.00	0.00
6,300.00	90.46	135.000	5,520.78	-501.57	624.02	795.92	0.00	0.00	0.00
6,400.00	90.46	135.000	5,519.98	-572.28	694.73	895.91	0.00	0.00	0.00
6,500.00	90.46	135.000	5,519.18	-642.99	765.44	995.91	0.00	0.00	0.00
6,600.00	90.46	135.000	5,518.37	-713.70	836.15	1,095.90	0.00	0.00	0.00
6,700.00	90.46	135.000	5,517.57	-784.41	906.85	1,195.90	0.00	0.00	0.00
6,800.00	90.46	135.000	5,516.77	-855.11	977.56	1,295.90	0.00	0.00	0.00
6,900.00 7,000.00	90.46 90.46	135.000 135.000	5,515.97 5,515.17	-925.82 -996.53	1,048.27 1,118.98	1,395.89 1,495.89	0.00 0.00	0.00 0.00	0.00 0.00
7,000.00	90.46	135.000	5,515.17 5,514.37	-1,067.24	1,189.69	1,495.89	0.00	0.00	0.00
				,					
7,200.00	90.46	135.000	5,513.57	-1,137.94	1,260.40	1,695.88	0.00	0.00	0.00
7,300.00	90.46	135.000	5,512.76	-1,208.65	1,331.11	1,795.88	0.00	0.00	0.00
7,400.00	90.46	135.000	5,511.96	-1,279.36	1,401.82	1,895.88	0.00	0.00	0.00
7,500.00	90.46	135.000	5,511.16	-1,350.07	1,472.53	1,995.88	0.00	0.00	0.00
7,600.00	90.46	135.000	5,510.36	-1,420.78	1,543.23	2,095.87	0.00	0.00	0.00
7,700.00	90.46	135.000	5,509.56	-1,491.48	1,613.94	2,195.87	0.00	0.00	0.00
7,800.00	90.46	135.000	5,508.76	-1,562.19	1,684.65	2,295.87	0.00	0.00	0.00
7,900.00	90.46	135.000	5,507.96	-1,632.90	1,755.36	2,395.86	0.00	0.00	0.00
8,000.00	90.46	135.000	5,507.15	-1,703.61	1,826.07	2,495.86	0.00	0.00	0.00
8,100.00	90.46	135.000	5,506.35	-1,774.32	1,896.78	2,595.86	0.00	0.00	0.00
8,200.00	90.46	135.000	5,505.55	-1,845.02	1,967.49	2,695.85	0.00	0.00	0.00
8,300.00	90.46	135.000	5,504.75	-1,915.73	2,038.20	2,795.85	0.00	0.00	0.00
8,400.00	90.46	135.000	5,503.95	-1,986.44	2,108.91	2,895.85	0.00	0.00	0.00
8,500.00	90.46	135.000	5,503.15	-2,057.15	2,179.62	2,995.84	0.00	0.00	0.00
8,600.00	90.46	135.000	5,502.35	-2,127.85	2,250.32	3,095.84	0.00	0.00	0.00
8,700.00	90.46	135.000	5,501.54	-2,198.56	2,321.03	3,195.84	0.00	0.00	0.00
8,800.00	90.46	135.000	5,500.74	-2,269.27	2,391.74	3,295.83	0.00	0.00	0.00
2,000.00	90.46	135.000	5,499.94	-2,339.98	2,462.45	3,395.83	0.00	0.00	0.00

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Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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)
9,000.00	90.46	135.000	5,499.14	-2,410.69	2,533.16	3,495.83	0.00	0.00	0.00
9,100.00	90.46	135.000	5,498.34	-2,481.39	2,603.87	3,595.82	0.00	0.00	0.00
				,	,	,			
9,200.00	90.46	135.000	5,497.54	-2,552.10	2,674.58	3,695.82	0.00	0.00	0.00
9,300.00	90.46	135.000	5,496.73	-2,622.81	2,745.29	3,795.82	0.00	0.00	0.00
9,400.00	90.46	135.000	5,495.93	-2,693.52	2,816.00	3,895.81	0.00	0.00	0.00
9,500.00	90.46	135.000	5,495.13	-2,764.23	2,886.70	3,995.81	0.00	0.00	0.00
9,600.00	90.46	135.000	5,494.33	-2,834.93	2,957.41	4,095.81	0.00	0.00	0.00
9,700.00	90.46	135.000	5,493.53	-2,905.64	3,028.12	4,195.80	0.00	0.00	0.00
9,800.00	90.46	135.000	5,492.73	-2,976.35	3,098.83	4,295.80	0.00	0.00	0.00
9,900.00	90.46	135.000	5,491.93	-3,047.06	3,169.54	4,395.80	0.00	0.00	0.00
10,000.00	90.46	135.000	5,491.12	-3,117.77	3,240.25	4,495.79	0.00	0.00	0.00
10,100.00	90.46	135.000	5,490.32	-3,188.47	3,310.96	4,595.79	0.00	0.00	0.00
10,200.00	90.46	135.000	5,489.52	-3,259.18	3,381.67	4,695.79	0.00	0.00	0.00
10,300.00	90.46	135.000	5,488.72	-3,329.89	3,452.38	4,795.79	0.00	0.00	0.00
10,400.00	90.46	135.000	5,487.92	-3,400.60	3,523.08	4,895.78	0.00	0.00	0.00
10,500.00	90.46	135.000	5,487.12	-3,471.30	3,593.79	4,995.78	0.00	0.00	0.00
10,600.00	90.46	135.000	5,486.32	-3,542.01	3,664.50	5,095.78	0.00	0.00	0.00
	90.46					,	0.00	0.00	0.00
10,700.00		135.000	5,485.51	-3,612.72	3,735.21	5,195.77			
10,800.00	90.46	135.000	5,484.71	-3,683.43	3,805.92	5,295.77	0.00	0.00	0.00
10,900.00	90.46	135.000	5,483.91	-3,754.14	3,876.63	5,395.77	0.00	0.00	0.00
11,000.00	90.46	135.000	5,483.11	-3,824.84	3,947.34	5,495.76	0.00	0.00	0.00
11,100.00	90.46	135.000	5,482.31	-3,895.55	4,018.05	5,595.76	0.00	0.00	0.00
11,200.00	90.46	135.000	5,481.51	-3,966.26	4,088.76	5,695.76	0.00	0.00	0.00
11,300.00	90.46	135.000	5,480.71	-4,036.97	4,159.47	5,795.75	0.00	0.00	0.00
11,400.00	90.46	135.000	5,479.90	-4,107.68	4,230.17	5,895.75	0.00	0.00	0.00
11,500.00	90.46	135.000	5,479.10	-4,178.38	4,300.88	5,995.75	0.00	0.00	0.00
11,600.00	90.46	135.000	5,478.30	-4,249.09	4,371.59	6,095.74	0.00	0.00	0.00
11,700.00	90.46	135.000	5,477.50	-4,319.80	4,442.30	6,195.74	0.00	0.00	0.00
11,800.00	90.46	135.000	5,476.70	-4,390.51	4,513.01	6,295.74	0.00	0.00	0.00
11,900.00	90.46	135.000	5,475.90	-4,461.21	4,583.72	6,395.73	0.00	0.00	0.00
12,000.00	90.46	135.000	5,475.10	-4,531.92	4,654.43	6,495.73	0.00	0.00	0.00
12,100.00	90.46	135.000	5,474.29	-4,602.63	4,725.14	6,595.73	0.00	0.00	0.00
12,200.00	90.46	135.000	5,473.49	-4,673.34	4,795.85	6,695.72	0.00	0.00	0.00
12,300.00	90.46	135.000	5,472.69	-4,744.05	4,866.55	6,795.72	0.00	0.00	0.00
12,400.00	90.46	135.000	5,471.89	-4,814.75	4,937.26	6,895.72	0.00	0.00	0.00
12,500.00	90.46	135.000	5,471.09	-4,885.46	5,007.97	6,995.71	0.00	0.00	0.00
12,600.00	90.46	135.000	5,470.29	-4,956.17	5,078.68	7,095.71	0.00	0.00	0.00
						,	0.00	0.00	0.00
12,700.00	90.46	135.000	5,469.48	-5,026.88	5,149.39	7,195.71			
12,800.00	90.46	135.000	5,468.68	-5,097.59	5,220.10	7,295.71	0.00	0.00	0.00
12,900.00	90.46	135.000	5,467.88	-5,168.29	5,290.81	7,395.70	0.00	0.00	0.00
13,000.00	90.46	135.000	5,467.08	-5,239.00	5,361.52	7,495.70	0.00	0.00	0.00
13,100.00	90.46	135.000	5,466.28	-5,309.71	5,432.23	7,595.70	0.00	0.00	0.00
13,200.00	90.46	135.000	5,465.48	-5,380.42	5,502.94	7,695.69	0.00	0.00	0.00
13,300.00	90.46	135.000	5,464.68	-5,451.13	5,573.64	7,795.69	0.00	0.00	0.00
13,400.00	90.46	135.000	5,463.87	-5,521.83	5,644.35	7,895.69	0.00	0.00	0.00
13,500.00	90.46	135.000	5,463.07	-5,592.54	5,715.06	7,995.68	0.00	0.00	0.00
13,600.00	90.46	135.000	5,462.27	-5,663.25	5,785.77	8,095.68	0.00	0.00	0.00
13,700.00	90.46	135.000	5,461.47	-5,733.96	5,856.48	8,195.68	0.00	0.00	0.00
13,758.65	90.46	135.000	5,461.00	-5,775.42	5,897.95	8,254.32	0.00	0.00	0.00

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Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

#### 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
Haynes 430 vert - plan misses target co - Point	0.00 enter by 50.6	0.000 63ft at 4933.8	4,921.06 30ft MD (492	227.14 1.10 TVD, 26	-104.58 2.14 N, -68.00	1,912,246.719 ) E)	1,282,268.273	36.249272240	-107.464657263
Haynes 430 LTP 233 FS - plan hits target cente - Point	0.00 er	0.000	5,461.00	-5,775.42	5,897.95	1,906,244.167	1,288,270.789	36.232991000	-107.444053000
Haynes 430 FTP 669 FS - plan misses target co - Point	0.00 enter by 4.89	0.000 9ft at 5899.26	5,524.00 6ft MD (5523	-217.99 6.99 TVD, -214	340.56 1.79 N, 344.26	1,911,801.587 6 E)	1,282,713.408	36.248065000	-107.463129000

#### Casing Points

Measured	Vertical	Name	Casing	Hole
Depth	Depth		Diameter	Diameter
(ft)	(ft)		(")	(")
350.00		13 3/8" Csg	13-3/8	17-1/2
3,684.76		9 5/8" Csg	9-5/8	12-1/4

#### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,404.50	1,403.21	Ojo Alamo		-0.46	135.000
1,505.03	1,503.27	Kirtland		-0.46	135.000
1,731.22	1,728.42	Fruitland		-0.46	135.000
1,967.46	1,963.58	Pictured Cliffs		-0.46	135.000
2,118.25	2,113.68	Lewis		-0.46	135.000
2,414.81	2,408.88	Chacra		-0.46	135.000
3,530.67	3,519.62	Cliff House		-0.46	135.000
3,535.70	3,524.62	Menefee		-0.46	135.000
4,237.58	4,224.87	Point Lookout		-0.46	135.000
4,532.58	4,519.87	Mancos		-0.46	135.000
4,872.58	4,859.87	MNCS_A		-0.46	135.000
4,962.59	4,949.87	MNCS_B		-0.46	135.000
5,099.70	5,084.68	MNCS_C		-0.46	135.000
5,168.73	5,149.49	MNCS_Cms		-0.46	135.000
5,253.18	5,224.18	MNCS_D		-0.46	135.000
5,359.47	5,308.67	MNCS_E		-0.46	135.000
5,423.50	5,353.30	MNCS_F		-0.46	135.000
5,573.86	5,437.30	MNCS_G		-0.46	135.000
5,671.92	5,481.60	MNCS H @ 0VS		-0.46	135.000



Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Plan Annotations

Measured	Vertical	Local Coor	dinates	
Depth (ft)	Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,000.00	1,000.00	0.00	0.00	KOP Begin 3°/100' build
1,183.06	1,182.78	8.49	-2.20	Begin 5.49° tangent
3,829.65	3,817.22	253.65	-65.80	Begin 3°/100' drop
4,012.71	4,000.00	262.14	-68.00	Begin vertical hold
4,933.77	4,921.06	262.14	-68.00	Begin 10°/100' build
5,533.77	5,417.26	45.41	119.34	Begin 60.00° tangent
5,593.77	5,447.26	6.10	153.32	Begin 10°/100' build
5,898.37	5,524.00	-214.12	343.67	Begin 3°/100' turn
6,037.04	5,522.89	-315.64	438.09	Begin 90.46° lateral
13,758.65	5,461.00	-5,775.42	5,897.95	PBHL/TD @ 13758.65 MD 5461.00 TVD



1 0.00	13,758.64	rev0 (Origina	l Hole)	MWD OWSG MWD - Si	andard			
Plan Survey Tool Pro Depth From (ft)	Depth To (ft)	Survey (Well		Tool Name	Rema	arks		
			0.00	0.00	0.00	1	35.000	
Vertical Section:		Depth	From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)		irection (°)	
Version:			Phase:	PLAN	Tie On De		0.00	
Audit Notes:								
Design	rev0							
	IG	RF2020	8/1/2023		8.46	62.77		8.30656079
Magnetics	Model Na	ame	Sample Date	Declination (°)	I	Dip Angle (°)	Field St (n1	-
Wellbore	Original Hole	9						
Grid Convergence:		-0.72 °						-,
Position Uncertainty	+E/-W	0.00 ft 0.00 ft	Easting: Wellhead Ele		2,372.853 usft ft	Longitude: Ground Level:		-107.4642930 6,703.00 ft
Well Well Position	Haynes Canyo	on Unit 430H, 0.00 ft	Surf loc: 897 FSL 44 Northing:	48 FWL Section 03-T2 1,91	3N-R06W 2,019.579 usft	Latitude:		36.2486520
Position Uncertainty		0.00 ft	Slot Radius:	13-3				
From:	Lat/Long		Easting:	1,282,353.7	55 usft Longit			-107.4643580
Site Position:	They need burry	011 0111 (120, 1	Northing:	1,912,025.2	80 usft Latitud	œ.		36.2486670
Site	Havnes Canv	on Unit (128 /	30,440 & 442)					
Map System: Geo Datum: Map Zone:	US State Plane North American New Mexico Ce	n Datum 1983		System Datum		Mean Sea Level		
Project			xico NAD83 NM C					
Design:	rev0							
Vell: Vellbore:	Haynes Can Original Hole	yon Unit 430H	l	Survey Calcu	ation Method:	Minimum Curv	ature	
Project: Site:			430,440 & 442)	MD Reference North Reference	-	RKB=6703+25 Grid	ω 6728.00π	
Company:	Ű	sources LLC	exico NAD83 NM C	TVD Reference		RKB=6703+25	0	



### Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.000	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,183.06	5.49	345.458	1,182.78	8.49	-2.20	3.00	3.00	0.00	345.46	
3,829.65	5.49	345.458	3,817.22	253.65	-65.80	0.00	0.00	0.00	0.00	
4,012.71	0.00	0.000	4,000.00	262.14	-68.00	3.00	-3.00	0.00	180.00	
4,933.77	0.00	0.000	4,921.06	262.14	-68.00	0.00	0.00	0.00	0.00	
5,533.77	60.00	139.160	5,417.26	45.41	119.34	10.00	10.00	0.00	139.16	
5,593.77	60.00	139.160	5,447.26	6.10	153.32	0.00	0.00	0.00	0.00	
5,898.37	90.46	139.160	5,524.00	-214.12	343.67	10.00	10.00	0.00	0.00	
6,037.04	90.46	135.000	5,522.89	-315.64	438.09	3.00	0.00	-3.00	-89.99	
13,758.65	90.46	135.000	5.461.00	-5,775.42	5,897.95	0.00	0.00	0.00	0.00	Haynes 430 LTP 23



#### Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.000	0.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
100.00	0.00	0.000	100.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
200.00	0.00	0.000	200.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
300.00	0.00	0.000	300.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
350.00	0.00	0.000	350.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
13 3/8" 0	Csq								
400.00	0.00	0.000	400.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
500.00	0.00	0.000	500.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
600.00	0.00	0.000	600.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
700.00	0.00	0.000	700.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
800.00	0.00	0.000	800.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
900.00	0.00	0.000	900.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
1,000.00	0.00	0.000	1,000.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
	gin 3°/100' bui		4 000 05	0.50	0.00	4 0 4 0 0 0 0 4 4 0	4 000 070 400	00.040050000	407 404005000
1,100.00	3.00 5.49	345.458	1,099.95	2.53	-0.66	1,912,022.113	1,282,372.196	36.248658936	-107.464295336
1,183.06		345.458	1,182.78	8.49	-2.20	1,912,028.064	1,282,370.652	36.248675229	-107.464300824
1,200.00	<b>49° tangent</b> 5.49	345.458	1,199.64	10.05	-2.61	1,912,029.634	1,282,370.245	36.248679526	-107.464302272
1,300.00	5.49	345.458	1,299.18	19.32	-5.01	1,912,038.898	1,282,367.842	36.248704886	-107.464310813
1,400.00	5.49	345.458	1,398.72	28.58	-7.41	1,912,048.161	1,282,365.439	36.248730245	-107.464319355
1,404.50	5.49	345.458	1,403.21	29.00	-7.52	1,912,048.578	1,282,365.331	36.248731388	-107.464319740
Ojo Alan			,			,- ,	, - ,		
1,500.00	5.49	345.458	1,498.27	37.85	-9.82	1,912,057.425	1,282,363.036	36.248755605	-107.464327897
1,505.03	5.49	345.458	1,503.27	38.31	-9.94	1,912,057.891	1,282,362.915	36.248756881	-107.464328327
Kirtland									
1,600.00	5.49	345.458	1,597.81	47.11	-12.22	1,912,066.688	1,282,360.633	36.248780965	-107.464336439
1,700.00	5.49	345.458	1,697.35	56.37	-14.62	1,912,075.952	1,282,358.230	36.248806325	-107.464344980
1,731.22	5.49	345.458	1,728.42	59.26	-15.37	1,912,078.844	1,282,357.480	36.248814242	-107.464347647
Fruitland									
1,800.00	5.49	345.458	1,796.89	65.64	-17.03	1,912,085.215	1,282,355.827	36.248831684	-107.464353522
1,900.00	5.49	345.458	1,896.43	74.90	-19.43	1,912,094.479	1,282,353.424	36.248857044	-107.464362064
1,967.46	5.49	345.458	1,963.58	81.15	-21.05	1,912,100.728	1,282,351.803	36.248874152	-107.464367826
Pictured		245 450	1 005 07	94.16	01.02	1 010 100 740	1 000 051 001	26.040000404	107 464270606
2,000.00 2,100.00	5.49 5.49	345.458 345.458	1,995.97 2,095.51	84.16 93.43	-21.83 -24.24	1,912,103.743 1,912,113.006	1,282,351.021 1,282,348.618	36.248882404 36.248907764	-107.464370606 -107.464379147
2,118.25	5.49	345.458	2,093.51	95.43 95.12	-24.24	1,912,114.697	1,282,348.179	36.248912392	-107.464380706
Lewis	0.10	010.100	2,110.00	00.12	21.07	1,012,111.001	1,202,010.110	00.210012002	101.101000100
2,200.00	5.49	345.458	2,195.05	102.69	-26.64	1,912,122.270	1,282,346.215	36.248933123	-107.464387689
2,300.00	5.49	345.458	2,294.59	111.95	-29.04	1,912,131.533	1,282,343.812	36.248958483	-107.464396231
2,400.00	5.49	345.458	2,394.13	121.22	-31.44	1,912,140.797	1,282,341.409	36.248983843	-107.464404773
2,414.81	5.49	345.458	2,408.88	122.59	-31.80	1,912,142.169	1,282,341.053	36.248987599	-107.464406038
Chacra									
2,500.00	5.49	345.458	2,493.68	130.48	-33.85	1,912,150.060	1,282,339.006	36.249009202	-107.464413315
2,600.00	5.49	345.458	2,593.22	139.74	-36.25	1,912,159.324	1,282,336.603	36.249034562	-107.464421856
2,700.00	5.49	345.458	2,692.76	149.01	-38.65	1,912,168.587	1,282,334.200	36.249059922	-107.464430398
2,800.00	5.49	345.458	2,792.30	158.27	-41.06	1,912,177.851	1,282,331.797	36.249085282	-107.464438940
2,900.00	5.49	345.458	2,891.84	167.54	-43.46	1,912,187.115	1,282,329.394	36.249110641	-107.464447482
3,000.00	5.49	345.458	2,991.38	176.80	-45.86	1,912,196.378	1,282,326.991 1,282,324.588	36.249136001	-107.464456024
3,100.00 3,200.00	5.49 5.49	345.458 345.458	3,090.92 3,190.46	186.06 195.33	-48.27 -50.67	1,912,205.642 1,912,214.905	1,282,324.588	36.249161361 36.249186720	-107.464464565 -107.464473107
3,300.00	5.49	345.458	3,290.00	204.59	-53.07	1,912,224.169	1,282,319.782	36.249212080	-107.464481649
3,400.00	5.49	345.458	3,389.54	213.85	-55.47	1,912,233.432	1,282,317.379	36.249237440	-107.464490191
3,500.00	5.49	345.458	3,489.09	223.12	-57.88	1,912,242.696	1,282,314.976	36.249262800	-107.464498733
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#### Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey

3,530.87         5,49         345.458         3,519.62         225.96         -48.81         1,912,245.537         1,282,314.239         36.249270578         -107.464501353           Criff House	Measur Depti (ft)		Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
33.37.0       5.49       345.458       3.524.62       2.26.42       -9.8.4       1.912.261.003       1.282.314.118       36.249271822       -1077.4465107782         368.07.60       5.49       345.458       3.673.00       240.23       1.912.259.812       1.282.316.258       36.249030655       -1077.446514515         3700.00       5.49       345.458       3.673.00       240.23       1.912.271.228       1.282.310.170       36.249031519       -1077.446514515         3700.00       5.49       345.458       3.887.36       255.90       -67.17       1.912.271.233       1.282.301.170       36.249313519       -1077.446543483         3.800.00       3.83       345.458       3.887.36       2.559.90       -67.17       1.912.278.500       1.282.307.658       36.249390617       -1077.44653478         4.000.0       0.38       345.458       3.887.36       2.559.90       -67.17       1.912.28.178       1.282.304.653       36.249390617       -1077.446534715         4.000.0       0.000       4.607.29       262.14       -68.00       1.912.28.178       1.282.304.653       36.249390627       -1077.446534715         4.200.00       0.000       4.807.29       262.14       -68.00       1.912.28.1719       1.282.304.653       36.249390627<	3,53	80.67	5.49	345.458	3,519.62	225.96	-58.61	1,912,245.537	1,282,314.239	36.249270578	-107.464501353
Nervefee         1.912_251.959         1.282.312_573         36.249288159         1.077_44507273           3.680.76         5.49         345.458         3.673.00         240.23         -62.32         1.912_251.959         1.282.312_573         36.249288159         -107.446574515           9.87_Cost         3.60.00         5.49         345.458         3.871,72         253.65         -65.69         1.912_270.427         1.282.307.075         36.249383879         -107.446524891           3.820.85         5.49         345.458         3.817.22         253.65         -65.69         1.912_271.637         1.282.307.075         36.24934839879         -107.44452748           3.000.00         3.38         345.458         3.87.72         253.65         -65.80         1.912_278.157         1.282.305.888         36.2493483987         -107.444537178           4.000.00         3.38         345.458         3.89.72         220.10         -67.19         1.912_281.719         1.282.304.853         36.249369627         -107.44453715           4.000.00         0.00         4.000.00         0.00         4.000.40         0.00         1.017.44537179         1.282.304.853         36.249369627         -107.44453715           4.200.00         0.000         4.007.29         262.14	Clif	f Hous	е								
3.800.00       5.49       345.458       3.683.63       222.38       -40.28       1.912.251.969       1.282.316.538       36.244928199       -107.446516515         9.80° Cag       5.40       345.458       3.673.00       240.23       1.912.251.812       1.282.316.578       36.2449309665       -107.446516515         9.80° Cag       3.800.00       5.44       345.458       3.817.22       253.65       456.00       1.912.270.487       1.282.307.767       36.2449318519       -107.44551458891         3.809.00       3.38       345.458       3.817.22       253.65       456.00       1.912.278.500       1.282.306.878       36.244934598       -107.4455458891         Begin 3'100' drop       -       -       -       -       -       -       -       -       -       -       -       -       -       -       1.07.44554174       -       <	3,53	85.70	5.49	345.458	3,524.62	226.42	-58.74	1,912,246.003	1,282,314.118	36.249271852	-107.464501782
3.88.47.6         5.49         3.45.458         3.67.300         2.40.23         -62.32         1.912.289.812         1.282.310.536         38.24330855         -107.446454515           9.67         9.67         9.11         2.223.05         38.24330855         -107.446454515           3.800.00         5.40         345.458         3.87.71         2.250.65         -66.00         1.912.270.423         1.282.307.055         38.249348398         -107.446454358           3.800.00         3.33         345.458         3.887.36         2.58.92         -47.17         1.912.278.800         1.282.304.868         38.249308917         -107.44643746           4.000.00         3.33         345.458         3.887.36         2.58.92         -47.17         1.912.281.719         1.282.304.853         38.249308927         -107.446453476           4.100.00         0.000         4.087.29         2.62.14         -68.00         1.912.281.719         1.282.304.853         36.249308927         -107.464534715           4.200.00         0.000         4.287.29         2.62.14         -68.00         1.912.281.719         1.282.304.853         36.249308927         -107.464534715           4.200.00         0.000         4.877.29         2.62.14         -68.00         1.912.281.719 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>											
9 B° Ccg         3.700.00         5.49         345.458         3.688.17         241.64         -02.68         1.912.201.223         1.282.310.170         36.249338879         -107.464518917           3.839.65         5.49         345.468         3.787.71         250.91         -65.09         1.912.273.233         1.282.307.767         36.249338879         -107.46452888           3.839.65         5.49         345.458         3.87.29         253.65         -66.00         1.912.278.500         1.282.305.688         36.249389807         -107.46453478           4.000.00         0.33         345.458         3.887.29         282.10         -67.17         1.912.281.670         1.282.304.884         36.249398957         -107.464534715           Begin vertical hold         4.000.00         4.007.29         282.14         -68.00         1.912.281.719         1.282.304.853         36.249398957         -107.464534715           4.200.00         0.000         4.087.29         282.14         -68.00         1.912.281.719         1.282.304.853         36.2493989627         -107.464534715           4.200.00         0.000         4.287.29         282.14         -68.00         1.912.281.719         1.282.304.853         36.2493989627         -107.464534715           4.000.00	,				,			, ,			
3.700.00       5.49       345.458       3.888.17       241.64       -062.08       1.912.270.427       1.282.307.170       38.2493.531319       -107.446543478         3.820.05       5.49       345.458       3.87.72       255.65       -66.80       1.912.270.437       1.282.307.055       38.249346398       -107.464524388         3.800.00       3.38       345.458       3.887.36       258.92       -67.17       1.912.281.678       1.282.305.688       38.249368915       -107.464534715         4.000.00       3.38       345.458       3.887.36       258.92       -67.17       1.912.281.719       1.282.304.853       36.249368915       -107.464534715         4.000.00       0.000       4.067.29       262.14       -68.00       1.912.281.719       1.282.304.853       36.249368627       -107.464534715         4.200.00       0.000       4.187.29       262.14       -68.00       1.912.281.719       1.282.304.853       36.249368627       -107.464534715         4.200.00       0.000       4.287.29       262.14       -68.00       1.912.281.719       1.282.304.853       36.249368627       -107.464534715         4.300.00       0.000       4.287.29       262.14       -68.00       1.912.281.719       1.282.304.853       36.249368627				343.430	3,073.00	240.23	-02.32	1,912,259.012	1,202,310.530	30.249309055	-107.404514515
3.800.00       5.49       345.458       3.787.71       250.91       -65.09       1.912.270.487       1.282.307.0757       36.2493.45898       -107.464524388         3.800.00       3.83       345.458       3.817.36       255.852       -65.80       1.912.278.500       1.282.307.057       36.2493.45898       -107.464524878         4.000.00       0.38       345.458       3.887.36       255.92       -67.17       1.912.281.570       1.282.304.868       36.249369817       -107.46453478         4.000.00       0.388       3.45.458       3.887.28       282.10       -67.17       1.912.281.718       1.282.304.853       35.249369827       -107.464534715 <b>Begin vortical hold</b> -       -       -       -       -107.464534715       -107.464534715         4.200.00       0.000       4.087.29       282.14       -68.00       1.912.281.719       1.282.304.853       35.249369827       -107.464534715         4.300.00       0.000       4.487.29       282.14       -68.00       1.912.281.719       1.282.304.853       35.249369827       -107.464534715         4.400.00       0.000       4.487.29       282.14       -68.00       1.912.281.719       1.282.304.853       35.249369827       -107.464534715         4.				345.458	3.688.17	241.64	-62.68	1.912.261.223	1.282.310.170	36.249313519	-107.464515817
Begin 3*100*cop         Second 3.38         34.64.58         3.887.36         256.02         -67.17         1.912.278.500         1.282.306.688         36.2493805877         -107.464531748           4.000.00         0.38         345.458         3.887.29         252.10         -67.99         1.912.281.718         1.282.304.883         36.2493805627         -107.464534715           Begin vertical hold         200.00         0.000         4.087.29         252.14         -68.00         1.912.281.719         1.282.304.883         36.249389627         -107.464534715           4.200.00         0.00         0.000         4.287.29         252.14         -68.00         1.912.281.719         1.282.304.853         36.249396627         -107.464534715           4.200.00         0.00         0.000         4.287.29         252.14         -68.00         1.912.281.719         1.282.304.853         36.249396627         -107.464534715           4.000.00         0.00         0.000         4.872.29         252.14         -68.00         1.912.281.719         1.282.304.853         36.249396627         -107.464534715           4.500.00         0.000         4.872.29         252.14         -68.00         1.912.281.719         1.282.304.853         36.249396627         -107.464534715											
3.900.00 3.38 345.458 3.887.36 258.92 +67.17 1.912.276.00 1.282.305.688 36.24930617 -107.464531748 4.000 0.038 345.458 3.887.36 225.10 -67.78 1.912.281.719 1.282.304.853 36.249306615 -107.464534715 4.012.71 0.00 0.000 4.000.02 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.200.00 0.000 0.000 4.087.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.200.00 0.000 0.000 4.287.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.200.00 0.000 0.000 4.287.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.200.00 0.000 4.287.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.500.00 0.000 0.000 4.287.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.500.00 0.000 0.000 4.387.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.500.00 0.000 0.000 4.587.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.500.00 0.000 0.000 4.587.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.500.00 0.000 0.000 4.587.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.700.00 0.000 0.4587.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.800.00 0.000 0.000 4.587.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.800.00 0.00 0.000 4.587.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.872.58 0.00 0.000 4.857.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.800.00 0.00 0.000 4.857.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.800.00 0.00 0.000 4.857.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.890.00 0.00 0.000 4.857.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.890.00 0.000 0.000 4.857.29 262.14 -68.00 1.912.281.719 1.282.304.853 36.249306627 -107.464534715 4.890.00 0.000 0.000 4.857.29 262.14 -68.00 1.912.281.719 1.282.	3,82	9.65	5.49	345.458	3,817.22	253.65	-65.80	1,912,273.233	1,282,307.055	36.249346398	-107.464526891
4 000 00       0.38       345.458       3.987.29       282.10       -67.99       1.912.281.678       1.282.304.864       362.49369627       -107.464534715         Heigh vertical hold       -000       0.000       4.087.29       262.14       -68.00       1.912.281.719       1.282.304.853       362.49369627       -107.464534715         4.100 0.00       0.000       4.087.29       262.14       -68.00       1.912.281.719       1.282.304.853       362.49369627       -107.464534715         4.200 0.00       0.000       4.187.29       262.14       -68.00       1.912.281.719       1.282.304.853       362.49369627       -107.464534715         4.300 0.00       0.000       4.287.29       262.14       -68.00       1.912.281.719       1.282.304.853       362.49369627       -107.464534715         4.500 0.0       0.000       4.487.29       262.14       -68.00       1.912.281.719       1.282.304.853       362.49369627       -107.464534715         4.500 0.0       0.000       4.587.29       262.14       -68.00       1.912.281.719       1.282.304.853       362.49369627       -107.464534715         4.600 0.0       0.000       4.587.29       262.14       -68.00       1.912.281.719       1.282.304.853       362.49369627       -107.464534715 <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	-	-	-								
4.012.71         0.00         0.000         4.000.00         262.14         -68.00         1.912.281.719         1.282.304.853         36.249369627         -107.464534715           Begin vartical hold         -											
Begin vertical hold         4         100.00         0.000         4.087.29         262.14         -68.00         1.912.281.719         1.282.304.853         36.249369627         -107.464534715           4.200.00         0.000         4.224.87         262.14         -68.00         1.912.281.719         1.282.304.853         36.249369627         -107.464534715           Point Lookaut         1.382.304.853         36.249369627         -107.464534715         -107.464534715           4,300.00         0.00         4.287.29         262.14         -68.00         1.912.281.719         1.282.304.853         36.249369627         -107.464534715           4,500.00         0.00         4.887.29         262.14         -68.00         1.912.281.719         1.282.304.853         36.249369627         -107.464534715           Mances         1.912.281.719         1.282.304.853         36.249369627         -107.464534715           4,500.00         0.00         4.687.29         262.14         -68.00         1.912.281.719         1.282.304.853         36.249369627         -107.464534715           4,500.00         0.000         4.687.29         262.14         -68.00         1.912.281.719         1.282.304.853         36.249369627         -107.464534715           4,900.00         0.000 <td>-</td> <td></td>	-										
4,100.00       0.00       4,087.29       262.14       -68.00       1,912.281.719       1.282.304.853       36.249369627       -107.464534715         4,230.00       0.000       4,187.29       262.14       -68.00       1,912.281.719       1.282.304.853       36.249369627       -107.464534715         4,300.00       0.000       4,287.29       262.14       -68.00       1,912.281.719       1.282.304.853       36.249369627       -107.464534715         4,000.00       0.000       4,287.29       262.14       -68.00       1,912.281.719       1.282.304.853       36.249369627       -107.464534715         4,500.00       0.000       4,487.29       262.14       -68.00       1,912.281.719       1.282.304.853       36.249369627       -107.464534715         Mances				0.000	4,000.00	202.14	-00.00	1,912,201.719	1,202,304.033	30.249309027	-107.404334713
4,200.00       0.000       4,187.29       282,14       -68.00       1,912,281.719       1,282,304.853       362,49369627       -107,464534715         Point Lookout	-			0.000	4,087.29	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
Point Lookout         4.300.00         0.000         4.287.29         262.14         -68.00         1.912,281.719         1.282.304.853         36.249369627         -107.464534715           4.500.00         0.000         4.387.29         262.14         -68.00         1.912,281.719         1.282.304.853         36.249369627         -107.464534715           4.500.00         0.000         4.872.99         262.14         -68.00         1.912,281.719         1.282.304.853         36.249369627         -107.464534715           Marcos	,										
4,300.00       0.00       4,287.29       282.14       -68.00       1,912,281.719       1,282.304.853       36.249369627       -107.464534715         4,500.00       0.00       0.000       4,387.29       262.14       -68.00       1,912,281.719       1,282.304.853       36.249369627       -107.464534715         4,532.58       0.00       0.000       4,487.29       262.14       -68.00       1,912,281.719       1,282.304.853       36.249369627       -107.464534715         4,600.00       0.000       4,587.29       262.14       -68.00       1,912,281.719       1,282.304.853       36.249369627       -107.464534715         4,600.00       0.00       4,587.29       262.14       -68.00       1,912,281.719       1,282.304.853       36.249369627       -107.464534715         4,800.00       0.00       4,857.29       262.14       -68.00       1,912,281.719       1,282.304.853       36.249369627       -107.464534715         4,800.00       0.00       4,857.29       262.14       -68.00       1,912,281.719       1,282.304.853       36.249369627       -107.464534715         4,900.00       0.00       4,857.29       262.14       -68.00       1,912,281.719       1,282.304.853       36.249369627       -107.464534715	4,23	87.58	0.00	0.000	4,224.87	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
4,400,00       0.000       4,387,29       262,14       -66,00       1,912,281,719       1,282,304,853       36,249369627       -107,464534715         4,550,00       0.000       4,617,29       262,14       -66,00       1,912,281,719       1,282,304,853       36,249369627       -107,464534715         Mancos											
4,500.00       0.000       4,487.29       262.14       -68.00       1,912.281.719       1,282,304.853       36.249369627       -107.464534715         4,502.00       0.000       4,587.29       262.14       -68.00       1,912.281.719       1,282,304.853       36.249369627       -107.464534715         4,600.00       0.00       0.000       4,587.29       262.14       -68.00       1,912.281.719       1,282,304.853       36.249369627       -107.464534715         4,700.00       0.000       4,687.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,872.58       0.00       0.000       4,859.87       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         MNCS_A       -       -       -       -       -       -107.464534715       -         4,900.00       0.000       4,887.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,933.77       0.00       0.000       4,937.29       261.97       -67.53       1,912,281.745       1,282,304.853       36.249369627       -107.464534715         4,962.59       2.88       13											
4,532.58       0.00       0.000       4,519.87       262.14       -66.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,600.00       0.000       0.000       4,587.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,700.00       0.000       0.000       4,687.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,800.00       0.000       0.000       4,687.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,900.00       0.000       4,887.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,900.00       0.000       4,887.29       261.97       -67.53       1,912,281.719       1,282,304.853       36.2493696527       -107.464534715         4,900.00       0.000       4,987.29       261.97       -67.53       1,912,281.719       1,282,304.853       36.249369627       -107.464534718         4,902.59       2.88       139.160       4,987.29       261.97       -67.53       1,912,281.719       1,282,304.853       36								, ,			
Mancos           4,600.00         0.000         4,587.29         262.14         -68.00         1,912,281.719         1,282,304.853         36.249369627         -107.464534715           4,700.00         0.000         4,687.29         262.14         -68.00         1,912,281.719         1,282,304.853         36.249369627         -107.464534715           4,800.00         0.00         4,689.97         262.14         -68.00         1,912,281.719         1,282,304.853         36.249369627         -107.464534715           4,872.58         0.00         0.000         4,889.97         262.14         -68.00         1,912,281.719         1,282,304.853         36.249369627         -107.464534715           4,900.00         0.00         4,887.29         262.14         -68.00         1,912,281.719         1,282,304.853         36.249369627         -107.464534715           Begin 10*/100* buid         -         -         -         -         -67.85         1,912,281.719         1,282,305.04         36.249369155         -107.464534715           Job 10         4,937.29         261.97         -67.85         1,912,281.45         1,282,305.327         36.249369155         -107.464534718           Job 20.00         6.62         139.160         4,987.14         259.25											
4,600.00       0.00       4,587.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,700.00       0.00       0.000       4,687.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,800.00       0.00       4,687.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         MNCS_A					.,			.,	.,,		
4,800.00       0.00       4,787.29       262.14       -68.00       1,912,281.719       1,282,304.853       362.49369627       -107.464534715         MNCS_A       -       -       -68.00       1,912,281.719       1,282,304.853       362.49369627       -107.464534715         4,900.00       0.00       4,887.29       262.14       -68.00       1,912,281.719       1,282,304.853       362.49369627       -107.464534715         4,900.00       0.00       4,921.06       262.14       -68.00       1,912,281.719       1,282,304.853       362.49369627       -107.464534715         4,930.00       1.62       139.160       4,937.29       261.97       -67.85       1,912,281.719       1,282,304.853       362.49369155       -107.464534718         4,962.59       2.88       139.160       4,949.87       261.59       -67.53       1,912,281.710       1,282,307.354       362.49369155       -107.464534718         4,962.59       2.88       139.160       4,949.87       261.59       -65.50       1,912,278.826       1,282,307.354       362.49361768       -107.46453085         MNCS_C       -       -       -       -       -107.464526113       5,050.00       1.62       139.160       5,084.68       244.09       -52.40       <			0.00	0.000	4,587.29	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
4,872.58       0.00       0.000       4,859.87       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         MNCS_A       -       -       -       -       -107.464534715         4,900.00       0.000       4,887.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         Begin 10°/100' build       -       -       -       -       -       -       -       -107.464534715         4,950.00       1.62       139.160       4,937.29       261.97       -67.53       1,912,281.710       1,282,305.004       36.249369155       -107.464534198         4,962.59       2.88       139.160       4,949.87       261.59       -67.53       1,912,281.745       1,282,307.354       36.249366138       -107.464534198         5,000.00       6.62       139.160       5,036.50       253.25       -65.50       1,912,278.826       1,282,307.354       36.24936057       -107.464508285         5,009.00       16.62       139.160       5,084.68       244.09       -52.40       1,912,278.806       1,282,302.513       36.249320587       -107.464480848       5,150.00       16.59       139.160       5,148.49       262	4,70	00.00	0.00	0.000	4,687.29	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
MNCS_A           4,900.00         0.000         4,887.29         262.14         -68.00         1,912,281.719         1,282,304.853         36.249369627         -107.464534715           4,933.77         0.00         0.000         4,921.06         262.14         -68.00         1,912,281.719         1,282,304.853         36.249369627         -107.464534715           Begin 10°/100° build         4         4950.00         1.62         139.160         4,937.29         261.59         -67.53         1,912,281.545         1,282,305.004         36.249369155         -107.464534198           4,962.59         2.88         139.160         4,997.14         259.25         -65.50         1,912,278.826         1,282,307.354         36.2493691768         -107.464526113           5,050.00         11.62         139.160         5,036.50         253.25         -60.32         1,912,278.830         1,282,312.537         36.2493691768         -107.464508285           5,050.00         11.62         139.160         5,084.97         244.02         -52.34         1,912,263.667         1,282,312.53         36.249320411         -107.464508285           5,100.00         16.62         139.160         5,149.49         226.20         -36.93         1,912,251.78         1,282,331.221 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>											
4,900.00       0.00       4,887.29       262.14       -68.00       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         Begin 10'/100' build       -       -       -       -67.85       1,912,281.719       1,282,304.853       36.249369627       -107.464534715         4,950.00       1.62       139.160       4,937.29       261.97       -67.85       1,912,281.719       1,282,305.004       36.249369155       -107.464534198         4,962.59       2.88       139.160       4,949.87       261.59       -67.53       1,912,281.170       1,282,307.354       36.2493691676       -107.464533085         MNCS_B       -       -       -       -       -       -67.85       1,912,278.826       1,282,307.354       36.249361768       -107.464526113         5,000.00       6.62       139.160       5,086.62       253.25       -60.32       1,912,278.826       1,282,307.354       36.2493647676       -107.464526113         5,000.01       16.62       139.160       5,084.68       244.09       -52.40       1,912,263.667       1,282,302.513       36.249320587       -107.464526113         5,100.00       16.62       139.160       5,182.20       231.64       -41.63       1,912,263.603       1,282,302.05			0.00	0.000	4,859.87	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
4,933.77         0.00         0.000         4,921.06         262.14         -68.00         1,912,281.719         1,282,304.853         36.249369627         -107.464534715           Begin 10°/100' build         4,950.00         1.62         139.160         4,937.29         261.97         -67.53         1,912,281.170         1,282,305.004         36.249369155         -107.464534198           4,962.59         2.88         139.160         4,998.72         261.59         -67.53         1,912,281.170         1,282,307.354         36.249368138         -107.464534085           MNCS_B         5000.00         6.62         139.160         4,987.14         259.25         -65.50         1,912,278.826         1,282,307.354         36.249361768         -107.464508285         5,099.70         16.59         139.160         5,086.60         253.25         -60.32         1,912,278.826         1,282,302.457         36.249320411         -107.464508285         5,099.70         16.52         139.160         5,084.67         22.40         1,912,263.603         1,282,302.513         36.249320411         -107.464480848           5,150.00         21.62         139.160         5,132.20         231.64         -41.63         1,912,251.215         1,282,335.920         36.249247686         -107.464480848         5,150.00		_	0.00	0.000	1 887 20	262 14	-68.00	1 012 281 710	1 282 304 853	36 2/0360627	-107 /6/53/715
Begin 10°/100' build           4,950.00         1.62         139.160         4,937.29         261.97         -67.85         1,912.281.545         1,282,305.004         36.249369155         -107.464534188           4,962.59         2.88         139.160         4,949.87         261.59         -67.53         1,912.281.170         1,282,305.327         36.249368138         -107.464533085           MNCS_B         5000.00         6.62         139.160         4,987.14         259.25         -65.50         1,912,278.826         1,282,307.354         36.249361768         -107.464526113           5,050.00         11.62         139.160         5,036.50         253.25         -60.32         1,912,278.826         1,282,307.354         36.249320477         -107.4644508285           5,099.70         16.59         139.160         5,084.68         244.09         -52.40         1,912,263.667         1,282,320.457         36.249320411         -107.464480848           5,150.00         21.62         139.160         5,084.97         244.02         -52.34         1,912,251.215         1,282,331.221         36.249320411         -107.464480848           5,150.00         21.62         139.160         5,149.49         226.20         -36.93         1,912,257.78         1,282,331.221	-										
4,950.00       1.62       139.160       4,937.29       261.97       -67.85       1,912,281.545       1,282,305.004       36.249369155       -107.464534198         4,962.59       2.88       139.160       4,949.87       261.59       -67.53       1,912,281.170       1,282,305.327       36.249368138       -107.464533085         MNCS_B       -107.464526113       -       -       -       -       -       -       -       -       -       107.464508265       -       -       -       -       -       -       139.160       5,084.68       244.09       -       -       -       1,912,263.607       1,282,320.457       36.249320411       -107.464480848       -       -       139.160       5,132.20       231.64       -41.63       1,912,251.215       1,282,331.221       36.249320411       -107.46444012       5,168.73       23.50       139.160       5,149.49       226.20       -50.93       1,912,255.760       1,282,344.580       36.249224768       -107.464498056       5,250.00       31.62       139.160 </td <td></td> <td></td> <td></td> <td></td> <td>,</td> <td></td> <td></td> <td>,- ,</td> <td>, - ,</td> <td></td> <td></td>					,			,- ,	, - ,		
MNCS_B           5,000.00         6.62         139.160         4,987.14         259.25         -65.50         1,912,278.826         1,282,307.354         36.249361768         -107.464526113           5,050.00         11.62         139.160         5,036.50         253.25         -60.32         1,912,278.826         1,282,312.537         36.249345479         -107.464508285           5,099.70         16.59         139.160         5,084.68         244.09         -52.40         1,912,263.667         1,282,320.457         36.249320411         -107.464480848           5,100.00         16.62         139.160         5,084.97         244.02         -52.34         1,912,263.603         1,282,320.513         36.249320411         -107.464480848           5,150.00         21.62         139.160         5,149.49         226.20         -36.93         1,912,245.778         1,282,331.221         36.249320411         -107.464480848           5,150.00         26.62         139.160         5,177.81         216.18         -28.27         1,912,235.760         1,282,344.580         36.249244768         -107.464398056           5,250.00         31.62         139.160         5,221.48         197.78         -12.36         1,912,217.356         1,282,360.489         36.249194769	-			139.160	4,937.29	261.97	-67.85	1,912,281.545	1,282,305.004	36.249369155	-107.464534198
5,000.00       6.62       139.160       4,987.14       259.25       -65.50       1,912,278.826       1,282,307.354       36.249361768       -107.464526113         5,050.00       11.62       139.160       5,036.50       253.25       -60.32       1,912,272.830       1,282,312.537       36.249320587       -107.464508285         5,099.70       16.59       139.160       5,084.68       244.09       -52.40       1,912,263.667       1,282,320.457       36.249320587       -107.464480848         5,100.00       16.62       139.160       5,084.97       244.02       -52.34       1,912,251.215       1,282,320.513       36.249320411       -107.464480848         5,150.00       21.62       139.160       5,132.20       231.64       -41.63       1,912,251.215       1,282,331.221       36.249286756       -107.464480848         5,150.00       21.62       139.160       5,177.81       226.20       -36.93       1,912,235.760       1,282,344.580       36.24924768       -107.464498056         5,200.00       26.62       139.160       5,221.48       197.78       -28.27       1,912,235.760       1,282,346.583       36.24914768       -107.464398056         5,250.00       31.62       139.160       5,221.48       197.78       -12.36<	4,96	62.59	2.88	139.160	4,949.87	261.59	-67.53	1,912,281.170	1,282,305.327	36.249368138	-107.464533085
5,050.00       11.62       139.160       5,036.50       253.25       -60.32       1,912,272.830       1,282,312.537       36.249345479       -107.464508285         5,099.70       16.59       139.160       5,084.68       244.09       -52.40       1,912,263.667       1,282,320.457       36.249320587       -107.464480848         5,100.00       16.62       139.160       5,084.97       244.02       -52.34       1,912,263.603       1,282,320.513       36.249320411       -107.464480848         5,150.00       21.62       139.160       5,132.20       231.64       -41.63       1,912,251.215       1,282,331.221       36.249286756       -107.46444012         5,168.73       23.50       139.160       5,177.81       216.18       -28.27       1,912,235.760       1,282,344.580       36.24924768       -107.4643498056         MNCS_Cms       -       -       -       -       -       -       -28.27       1,912,235.760       1,282,344.580       36.249244768       -107.464398056         5,250.00       31.62       139.160       5,221.48       197.78       -12.36       1,912,217.356       1,282,361.583       36.249191330       -107.464343332         5,255.18       31.94       139.160       5,224.18       196.51		_									
5,099.70       16.59       139.160       5,084.68       244.09       -52.40       1,912,263.667       1,282,320.457       36.249320587       -107.464481040         MNCS_C       5,100.00       16.62       139.160       5,084.97       244.02       -52.34       1,912,263.603       1,282,320.513       36.249320411       -107.464480848         5,150.00       21.62       139.160       5,132.20       231.64       -41.63       1,912,251.215       1,282,331.221       36.2493204756       -107.464444012         5,168.73       23.50       139.160       5,149.49       226.20       -36.93       1,912,245.778       1,282,335.920       36.2492471985       -107.4644427845         MNCS_Cms       5,200.00       26.62       139.160       5,177.81       216.18       -28.27       1,912,235.760       1,282,344.580       36.249244768       -107.464398056         5,250.00       31.62       139.160       5,221.48       197.78       -12.36       1,912,217.356       1,282,360.489       36.249144769       -107.464398056         5,253.18       31.94       139.160       5,262.86       176.56       5.97       1,912,216.090       1,282,361.583       36.249147138       -107.464380255         5,300.00       36.62       139.160       5,2					,				, ,		
MNCS_C           5,100.00         16.62         139.160         5,084.97         244.02         -52.34         1,912,263.603         1,282,320.513         36.249320411         -107.464480848           5,150.00         21.62         139.160         5,132.20         231.64         -41.63         1,912,251.215         1,282,331.221         36.249286756         -107.46444012           5,168.73         23.50         139.160         5,149.49         226.20         -36.93         1,912,245.778         1,282,335.920         36.249271985         -107.464427845           MNCS_Cms	-							, ,			
5,100.00       16.62       139.160       5,084.97       244.02       -52.34       1,912,263.603       1,282,320.513       36.249320411       -107.464480848         5,150.00       21.62       139.160       5,132.20       231.64       -41.63       1,912,251.215       1,282,331.221       36.249286756       -107.46444012         5,168.73       23.50       139.160       5,149.49       226.20       -36.93       1,912,245.778       1,282,335.920       36.249271985       -107.4644427845         MNCS_Cms       5,200.00       26.62       139.160       5,177.81       216.18       -28.27       1,912,235.760       1,282,344.580       36.249244768       -107.464398056         5,250.00       31.62       139.160       5,221.48       197.78       -12.36       1,912,217.356       1,282,360.489       36.24914769       -107.464393326         5,253.18       31.94       139.160       5,224.18       196.51       -11.27       1,912,216.090       1,282,378.825       36.249137138       -107.464280255         5,300.00       36.62       139.160       5,262.86       176.56       5.97       1,912,196.143       1,282,378.825       36.249137138       -107.464280255         5,350.00       41.62       139.160       5,301.64       152.7			10.00	100.100	0,004.00	244.00	-02.40	1,012,200.007	1,202,020.407	00.240020007	-107.404401040
5,168.73       23.50       139.160       5,149.49       226.20       -36.93       1,912,245.778       1,282,335.920       36.249271985       -107.464427845         MNCS_Cms       5,200.00       26.62       139.160       5,177.81       216.18       -28.27       1,912,235.760       1,282,344.580       36.249244768       -107.464398056         5,250.00       31.62       139.160       5,221.48       197.78       -12.36       1,912,217.356       1,282,360.489       36.249194769       -107.464393026         5,253.18       31.94       139.160       5,224.18       196.51       -11.27       1,912,216.090       1,282,361.583       36.249191330       -107.464393568         MNCS_D       5,300.00       36.62       139.160       5,262.86       176.56       5.97       1,912,196.143       1,282,378.825       36.249137138       -107.464280255         5,350.00       41.62       139.160       5,301.64       152.70       26.60       1,912,172.282       1,282,399.450       36.249072314       -107.464209305         5,359.47       42.57       139.160       5,308.67       147.90       30.75       1,912,167.477       1,282,403.604       36.249072314       -107.464209305         5,359.47       42.57       139.160       5,308.67			16.62	139.160	5,084.97	244.02	-52.34	1,912,263.603	1,282,320.513	36.249320411	-107.464480848
MNCS_Cms           5,200.00         26.62         139.160         5,177.81         216.18         -28.27         1,912,235.760         1,282,344.580         36.249244768         -107.464398056           5,250.00         31.62         139.160         5,221.48         197.78         -12.36         1,912,217.356         1,282,360.489         36.249194769         -107.46439332           5,253.18         31.94         139.160         5,224.18         196.51         -11.27         1,912,216.090         1,282,361.583         36.249191330         -107.464339568           MNCS_D                1,282,378.825         36.249137138         -107.464280255            5,300.00         36.62         139.160         5,262.86         176.56         5.97         1,912,196.143         1,282,378.825         36.249137138         -107.464280255         5,350.00         41.62         139.160         5,301.64         152.70         26.60         1,912,172.282         1,282,399.450         36.249072314         -107.464209305         5,359.47         42.57         139.160         5,308.67         147.90         30.75         1,912,167.477         1,282,403.604         36.249059260         -107.464195017         MNCS_E	5,15	0.00	21.62	139.160	5,132.20	231.64	-41.63	1,912,251.215	1,282,331.221	36.249286756	-107.464444012
5,200.00       26.62       139.160       5,177.81       216.18       -28.27       1,912,235.760       1,282,344.580       36.249244768       -107.464398056         5,250.00       31.62       139.160       5,221.48       197.78       -12.36       1,912,217.356       1,282,360.489       36.249194769       -107.464393026         5,253.18       31.94       139.160       5,224.18       196.51       -11.27       1,912,216.090       1,282,361.583       36.249191330       -107.464339568         MNCS_D       5,300.00       36.62       139.160       5,262.86       176.56       5.97       1,912,196.143       1,282,378.825       36.249137138       -107.464280255         5,350.00       41.62       139.160       5,301.64       152.70       26.60       1,912,172.282       1,282,399.450       36.249072314       -107.464209305         5,359.47       42.57       139.160       5,308.67       147.90       30.75       1,912,167.477       1,282,403.604       36.249059260       -107.464195017         MNCS_E       E       E       E       E       E       E       E	5,16	68.73	23.50	139.160	5,149.49	226.20	-36.93	1,912,245.778	1,282,335.920	36.249271985	-107.464427845
5,250.00       31.62       139.160       5,21.48       197.78       -12.36       1,912,217.356       1,282,360.489       36.249194769       -107.464343332         5,253.18       31.94       139.160       5,224.18       196.51       -11.27       1,912,216.090       1,282,361.583       36.249191330       -107.4643433568         MNCS_D       5,300.00       36.62       139.160       5,262.86       176.56       5.97       1,912,196.143       1,282,378.825       36.249137138       -107.464280255         5,350.00       41.62       139.160       5,301.64       152.70       26.60       1,912,172.282       1,282,399.450       36.249072314       -107.464280255         5,359.47       42.57       139.160       5,308.67       147.90       30.75       1,912,167.477       1,282,403.604       36.249059260       -107.464195017         MNCS_E       K		_									
5,253.18       31.94       139.160       5,224.18       196.51       -11.27       1,912,216.090       1,282,361.583       36.249191330       -107.464339568         MNCS_D       5,300.00       36.62       139.160       5,262.86       176.56       5.97       1,912,196.143       1,282,378.825       36.249137138       -107.464280255         5,350.00       41.62       139.160       5,301.64       152.70       26.60       1,912,172.282       1,282,399.450       36.249072314       -107.464280255         5,359.47       42.57       139.160       5,308.67       147.90       30.75       1,912,167.477       1,282,403.604       36.249059260       -107.464195017         MNCS_E       K	-							, ,			
MNCS_D           5,300.00         36.62         139.160         5,262.86         176.56         5.97         1,912,196.143         1,282,378.825         36.249137138         -107.464280255           5,350.00         41.62         139.160         5,301.64         152.70         26.60         1,912,172.282         1,282,399.450         36.249072314         -107.464209305           5,359.47         42.57         139.160         5,308.67         147.90         30.75         1,912,167.477         1,282,403.604         36.249059260         -107.464195017           MNCS_E         K         K         K         K         K         K         K	-										
5,300.00       36.62       139.160       5,262.86       176.56       5.97       1,912,196.143       1,282,378.825       36.249137138       -107.464280255         5,350.00       41.62       139.160       5,301.64       152.70       26.60       1,912,172.282       1,282,399.450       36.249072314       -107.464209305         5,359.47       42.57       139.160       5,308.67       147.90       30.75       1,912,167.477       1,282,403.604       36.249059260       -107.464195017         MNCS_E	,		01.04	100.100	0,227.10	100.01	- 11.27	1,012,210.030	1,202,001.000	00.270101000	107.40400000
5,350.00       41.62       139.160       5,301.64       152.70       26.60       1,912,172.282       1,282,399.450       36.249072314       -107.464209305         5,359.47       42.57       139.160       5,308.67       147.90       30.75       1,912,167.477       1,282,403.604       36.249059260       -107.464195017         MNCS_E			36.62	139.160	5,262.86	176.56	5.97	1,912,196.143	1,282,378.825	36.249137138	-107.464280255
MNCS_E											
	5,35	9.47	42.57	139.160	5,308.67	147.90	30.75	1,912,167.477	1,282,403.604	36.249059260	-107.464195017
5,400.00 40.02 139.100 5,337.52 120.38 49.35 1,912,145.955 1,282,422.207 36.249000791 -107.464131023		_	40.00	100,100		400.00	40.05	4 040 445 055	4 000 400 007	00.040000704	407 404404000
	5,40	00.00	46.62	139.160	5,337.52	126.38	49.35	1,912,145.955	1,282,422.207	36.249000791	-107.464131023

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#### Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

#### Planned Survey

V/V         (1) <th(1)< th=""> <th(1)< th=""> <th(1)< th=""></th(1)<></th(1)<></th(1)<>	Measured Depth (ft)		Azimuth	Vertical Depth (ft)	+N/-S	+E/-W	Map Northing (usft)	Map Easting (usft)	l stitude	Laurituda
Mescs_F		(°)	(°)		(ft)	(ft)	. ,		Latitude	Longitude
5.450.00         516.2         139.160         5.570.23         97.78         74.07         1.912,117.362         1.282,444.922         36.24487022         1.017,446146005           5.550.00         5.650.00         139.160         5.471.22         45.41         119.34         1.912,064.927         1.282,442.196         36.244870820         1.077.43896296           Beigin 60.07 tangent         -         <			139.160	5,353.30	113.21	60.74	1,912,132.788	1,282,433.588	36.248965020	-107.464091872
Begin 60.0° tangent	5,450.00 5,500.00	51.62 56.62	139.160	5,399.52	67.14	100.55	1,912,086.722	1,282,473.408	36.248839869	-107.463954894
5.73 //a 6         6.00         139 / 100         5.437 //a 0         19.14         14.20         1.912 / 0.28 / 19         3.82 / 487 / 0.456         -107 / 433812160           MNCS, C         -			100.100	0,111.20	10.11	110.01	1,012,001.001	1,202,102.100	00.210100020	101.100000200
5.93.77         60.00         139.160         5.447.26         6.10         153.22         1,912.025.876         1.282.582.176         38.246674022         -107.46377337           5.600.00         65.62         139.160         5.47.20         -31.86         5.17.152         67.82         139.160         5.47.192         -31.86.02         1.282.557.16         36.246671237         -107.463365003           5.671.92         67.82         139.160         5.481.60         -46.96         199.19         1,911.972.617         1.282.557.040         36.248571857         -107.463365660           5.700.00         70.62         139.160         5.491.56         -66.82         216.35         1,211.952.75         1.282.692.05         36.248477071         -107.463365660           5.700.00         70.62         139.160         5.520.40         -211.31.679.567         1.282.693.026         36.248072402         -107.463318390           5.800.00         80.62         139.160         5.523.90         -217.55         34.74         1.911.804.204         1.282.717.594         36.248072402         -107.46311891           5.900.00         90.46         136.111         5.523.99         -215.35         34.74         1.911.804.203         1.282.775.540         36.248072402         -107.462841256	5,573.86	60.00	139.160	5,437.30	19.14	142.05	1,912,038.719	1,282,514.901	36.248709456	-107.463812160
5,600.00         60.62         139.160         5,450.24         -107.433761198         1282.2858.87         -32.44662894         -107.433761198           5,671.02         67.82         139.160         5,471.92         67.82         139.160         5,471.92         67.82         139.160         5,481.60         -46.96         199.19         1,911.972.617         1.282.572.00         36.2485727         -107.436356589           5,700.00         70.62         139.160         5,516.36         -100.01         27.463         1,911.972.617         1.282.582.82         36.248475021         -107.435356589           5,800.00         86.52         139.160         5,516.35         -100.01         27.463         1,911.945.758         1.282.692.4452         36.248177612         -107.46344893           5,800.00         80.62         139.160         5,522.35         -177.56         312.07         1,911.842.024         1.282.717.544         32.24817601         -107.4632471659           5,900.00         90.46         135.010         5,522.38         -215.55         344.74         1,911.703.382         1.282.110.933         32.247807402         -107.462843294           6.000.0         90.46         135.000         5,522.38         -30.01         42.20         1.282.86.43         32	_		139.160	5,447.26	6.10	153.32	1,912,025.676	1,282,526.176	36.248674022	-107.463773377
5.680.00         66.52         139.160         5.472.94         -31.73         189.02         1.911.997.860         1.282.582.92         32.24857227         -107.46366000           5.671.02         67.82         139.160         5.481.60         -46.96         199.19         1.911.997.617         1.282.582.04         36.24857221         -107.46356660           5.700.00         76.62         139.160         5.506.08         -103.01         247.63         1.911.952.763         1.282.582.04         35.248377076         -107.463356560           5.800.00         86.52         139.160         5.522.35         -177.56         1.207.765         1.282.584.72         32.24807755         -107.4633183910           5.800.00         90.46         139.160         5.522.39         -177.56         12.07         1.118.05.44         1.282.716.526         32.24807755         -107.463148190           6.000.00         90.46         139.110         5.52.38         -215.35         344.74         1.911.804.230         1.282.716.50         32.247878178         -107.462314219           6.000.00         90.46         135.000         5.522.88         -316.64         438.09         1.911.916.80         2.282.785.453         36.247679427         -107.462314219           6.000.00 <t< td=""><td>Begin 1</td><td>0°/100' build</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Begin 1	0°/100' build								
5671 92         67.82         139.160         5.481.60         -46.96         199.19         1,911.972.617         1.282,572.040         36.24852987.3         -107.463615608           MNCS H @ OVS         70.62         139.160         5.500.08         -103.01         247.63         1,911.952.758         1.282,589.205         36.248475921         -107.463356560           5.800.00         80.62         139.160         5.522.35         -177.56         312.07         1,911.976.07         1.282.652.445         36.248377016         -107.4633148963           5.800.00         80.62         139.160         5.522.40         -211.2         343.67         1,911.842.024         1.282.715.26         36.248072402         -107.4631489163           5.800.00         90.46         133.111         5.523.89         -215.35         344.74         1.911.804.201         1.282.717.544         36.248702402         -107.463143916           6.000.00         90.46         135.000         5.522.89         -316.64         4136.00         1.911.659.422         1.282.755.43         36.247679427         -107.462348271           6.200.00         90.46         135.000         5.521.88         -30.757         1.911.894.221         236.247679427         -107.46254517           6.400.00         90.46<									36.248662894	
MNCS H @ 0vs           5,700.00         70.62         139.160         5,491.56         -66.82         216.35         1.911.952.758         1.282.589.205         36.244375921         -107.453358930           5,800.00         86.62         139.160         5,516.36         -140.01         276.62         1.911.979.677         1.282.662.472         36.244277076         -107.453358930           5,800.00         86.62         139.160         5,522.35         -177.756         312.07         1.911.842.024         1.282.663.472         36.244277076         -107.463327295           5,898.37         90.46         139.160         5,522.30         -215.35         344.74         1.911.805.444         1.282.716.504         36.244072402         -107.4633718691           6,000.00         90.46         135.000         5,522.18         -248.02         412.15         1.911.703.397         1.282.716.504         36.247671467         -107.46284328571           6,000.00         90.46         135.000         5,522.18         -360.16         482.60         1.911.659.422         1.282.861.62         36.247679427         -107.462843286           6,000.00         90.46         135.000         5,521.88         -490.87         5,518.107         1.282.881.76         38.247679427         -107.462										
5,700.00         70.62         139.160         5,441.56         -66.82         213.35         1,111,1952.758         1,282,620.465         36,244776221         -107.463566660           5,750.00         86.62         139.160         5,550.08         -103.10         247.83         1,111,1956.757         1,282,662.472         36,24877024         -107.463338939           5,850.00         86.62         139.160         5,552.35         -177.56         312.07         1,191.842.024         1,282,761.52         36,248075755         -107.4631727295           5,868.37         90.46         139.111         5,523.18         -280.20         1,111,730.322         1,282,715.594         36,248075402         -107.462388227           6,007.00         90.46         135.000         5,522.38         -360.16         422.0         1,281,1659.422         1,282,810.938         36,247679427         -107.4628483227           6,007.00         90.46         135.000         5,522.38         -360.16         1,911,863.007         1,282,855.453         36,247679427         -107.462841326           6,200.00         90.46         135.000         5,520.78         -90.17         1,911,882.007         1,282,855.453         36,24476768         -107.462398571           6,400.00         90.46         135			139.160	5,481.60	-46.96	199.19	1,911,972.617	1,282,572.040	36.248529873	-107.463615609
5,750.00         756.20         139.160         5,500.08         -103.01         247.63         1,911.916.572         1282.650.485         36.248377612         -107.46334893           5,850.00         85.62         139.160         5,513.68         -140.01         277.62         1,911.875.657         1.282.650.422         36.248277076         -107.46333893           5,850.00         85.62         139.160         5,524.00         -214.12         343.67         1,911.805.404         1,282.716.528         36.248072402         -107.463148919           6,000.00         90.46         136.111         5,522.89         -280.20         412.15         1,911.703.392         1,282.717.594         36.2476719427         -107.46214963           6,000.00         90.46         135.000         5,522.88         -360.16         482.60         1,911.659.422         1,282.856.453         36.2476719427         -107.462241326           6,000.00         90.46         135.000         5,522.88         -360.16         482.60         1,911.858.714         1,282.856.453         36.247679427         -107.462241326           6,000.00         90.46         135.000         5,521.88         -360.16         482.60         1,911.818.07         1,828.966.757         36.2471691418         -107.461913065	_	-	100,100	5 404 50		040.05	4 0 44 0 50 750	4 000 500 005	00.040475004	407 400550500
5,800.00         80.62         139.160         5,512.35         -177.56         312.07         1,911,822.024         1,282,682.472         36.24827706         -107.46338830           5,850.00         85.62         139.160         5,522.35         -177.56         312.07         1,911,820.24         1,282,684.924         36.24807755         -107.46331830           5,889.37         90.46         139.111         5,523.99         -215.35         344.74         1,911,804.230         1,282,717.594         36.248072402         -107.463114919           6,000.00         90.46         138.111         5,523.99         -215.35         344.74         1,911,703.382         1,822,717.594         36.248072402         -107.46281326           6,000.00         90.46         135.000         5,522.89         -315.64         432.60         1,911,703.397         1,282,856.453         36.247670427         -107.46284326           6,100.00         90.46         135.000         5,521.58         40.30         757         62.402         1,811,850.422         1,822,856.453         36.247670427         -107.462841326           6,000.00         90.46         135.000         5,521.58         40.30         755         1,911,569         1,222,966.870         36.247295888         -107.461710313										
5,850.00         85.62         139.160         5,524.00         -214.12         343.67         1,911,805.464         1,282,716.526         36.248075755         -107.463227290           5,989.37         90.46         139.110         5,524.00         -214.12         343.67         1,911,805.464         1,282,716.526         36.248072402         -107.463114591           6,000.00         90.46         135.111         5,523.89         -215.35         344.74         1,911,703.382         1,282,717.594         36.248072402         -107.46283227           6,037.04         90.46         135.000         5,522.89         -315.64         438.09         1,911,703.382         1,282,718.580         36.24780195         -107.462841326           6,100.00         90.46         135.000         5,522.78         -360.16         482.60         1,911,659.422         1,282,958.162         36.24780198         -107.462841326           6,200.00         90.46         135.000         5,527.78         -501.57         654.41         1,911,589.71         1283,967.579         36.24796198         -107.46193065           6,400.00         90.46         135.000         5,517.57         778.41         906.85         1,911,365.91         1,283,475.97         36.246912347         -107.4614670813										
5,896.37         90.46         139.160         5,524.00         -214.12         343.67         1,911,805.464         1,282,716.526         36.248075755         -107.463118591           Bogin 3'/100' turn         - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>, ,</td> <td></td> <td></td> <td></td>							, ,			
Begin 3'/100' turn           5,900.00         90.46         139,111         5,523.99         -215.35         344.74         1,911,804.230         1,282,715.594         36,248072402         -107.463114919           6,000.00         90.46         135.000         5,522.89         -315.64         438.09         1,911,730.382         1,282,785.000         36,247871897         -107.462883227           6,010.00         90.46         135.000         5,522.38         -360.16         422.60         1,911,599.422         1,282,810.938         36,2476019427         -107.462641326           6,100.00         90.46         135.000         5,522.78         -501.57         624.02         1,911,518.007         1,282,968.170         36,2476679427         -107.462641326           6,300.00         90.46         135.000         5,519.18         -642.29         694.73         1,911,305.894         1,283,0298.870         36,2467104118         -107.461913065           6,500.00         90.46         135.000         5,517.7         -784.41         906.85         1,283,208.997         36,24672076         -107.461427663           6,700.00         90.46         135.000         5,515.97         -925.82         1,911,935.76         1,283,325.74         36,24615259         -107.461427663				,						
5.900.00         90.46         138.111         5.523.89         -215.35         344.74         1.911,730.382         1.282,717.594         36.247871897         -107.463114919           6.007.04         90.46         135.000         5.522.89         -315.64         482.09         1.911,730.387         1.282,716.000         36.247871897         -107.462784152           Begin 90.46*         135.000         5.522.88         -360.16         482.60         1.911,659.422         1.282,785.000         36.247787018         -107.46274156           6,100.00         90.46         135.000         5.522.18         -300.17         624.02         1.911,659.422         1.282,986.870         36.247769427         -107.462641326           6,400.00         90.46         135.000         5.519.38         -572.28         694.73         1.911,472.99         1.283,108.286         36.24769427         -107.461673033           6,600.00         90.46         135.000         5.518.37         -713.70         836.15         1.911,365.841         1.283,208.97         36.247691427         -107.461427653           6,600.00         90.46         135.000         5.518.77         -784.41         906.85         1.911,365.844         1.283,208.97         36.244592364         -107.461427633           6,6			100.100	0,021.00	211.12	010.07	1,011,000.101	1,202,110.020	00.210010100	101.100110001
6.000.00         90.46         136.111         5.523.18         -289.20         412.15         1,911,730.382         1,282,785.000         38.247871897         -107.462283227           6.037.04         90.46         135.000         5,522.38         -360.16         482.60         1,911,593.422         1,282,855.453         36.247679427         -107.462641326           6,100.00         90.46         135.000         5,521.58         -430.87         553.31         1,911,584.41         1,282,926.162         36.24779427         -107.462641326           6,300.00         90.46         135.000         5,521.78         -501.57         624.02         1,911,578.414         1,282,926.162         36.247497658         -107.462155817           6,400.00         90.46         135.000         5,519.98         -672.28         694.73         1,911,376.591         1,283,138.288         36.246912347         -107.461427563           6,500.00         90.46         135.000         5,517.57         -784.41         906.85         1,911,365.884         1,283,208.997         36.246720576         -107.461427563           6,700.00         90.46         135.000         5,515.97         -925.82         1,941,973.40         1,283,281.433         36.24562804         -107.460049318           7,000.0	-		139.111	5.523.99	-215.35	344.74	1.911.804.230	1.282.717.594	36.248072402	-107.463114919
Begin 90.46° lateral           6,100.00         90.46         135.000         5,522.38         -360.16         482.60         1,911,659.422         1,282,855.453         36.247679427         -107.46241326           6,200.00         90.46         135.000         5,521.78         -501.57         624.02         1,911,588.714         1,282,958.670         36.247679427         -107.4624158617           6,400.00         90.46         135.000         5,519.98         -572.28         694.73         1,911,376.591         1.283,077.579         36.247679488         -107.46170313           6,600.00         90.46         135.000         5,518.37         -7713.70         836.15         1,911,376.591         1.283,138.288         36.246720576         -107.4614727663           6,700.00         90.46         135.000         5,515.97         -928.82         1,044.27         1,911,93.706         1.283,421.123         36.24652890         -107.461472763           6,800.00         90.46         135.000         5,515.97         -928.82         1,044.27         1,183.84         1.283,421.123         36.245569434         -107.460456573           7,00.00         90.46         135.000         5,515.77         -986.51         1,911,93.706         1.283,471.637         36.245569938         -				,				, ,		
6,100.00         90.46         135.000         5,522.38         -360.16         482.60         1,911,588.714         1,282,925,453         36,247679427         -107.46241326           6,200.00         90.46         135.000         5,521.58         430.87         563.31         1,911,588.714         1,282,926,162         36,247487658         -107.46215817           6,400.00         90.46         135.000         5,519.98         -572.28         694.73         1,911,472.99         1,283,067.579         36,247104118         -107.46147563           6,600.00         90.46         135.000         5,519.18         -642.99         765.44         1,911,376.591         1,283,067.579         36,246712057         -107.46147563           6,700.00         90.46         135.000         5,515.77         -784.41         906.85         1,911,325.776         1,283,3279.706         36,24672057         -107.46042065           6,900.00         90.46         135.000         5,515.77         -925.82         1,048.27         1,911,903.760         1,283,491.832         36,24678074         -107.460699318           7,000.00         90.46         135.000         5,515.77         -925.82         1,048.27         1,283,491.832         36,245761712         -107.46042055           7,000.00	6,037.04	90.46	135.000	5,522.89	-315.64	438.09	1,911,703.937	1,282,810.938	36.247800156	-107.462794155
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Begin 9	0.46° lateral								
6,300.00       90.46       135.000       5,520.76       -501.57       624.02       1,911,518.007       1,282,996.870       36.247295888       -107.46215817         6,400.00       90.46       135.000       5,519.98       -572.28       694.73       1,911,472.99       1,283,067.579       36.247104118       -107.46170313         6,600.00       90.46       135.000       5,518.37       -713.70       836.15       1,911,305.864       1,283,208.997       36.246720576       -107.461427563         6,700.00       90.46       135.000       5,516.77       -784.41       906.85       1,911,123.176       1,283,279.706       36.246720576       -107.461427563         6,900.00       90.46       135.000       5,516.77       -925.82       1,048.27       1,911,1023.053       1,283,421.123       36.246145259       -107.460969318         7,000.00       90.46       135.000       5,514.37       -1,067.24       1,189.96       1,910,932.54       1,283,562.541       36.2455761712       -107.460213282         7,200.00       90.46       135.000       5,511.97       -1,286.65       1,331.11       1,910,810.627       1,283,773.66       36.24558938       -107.45972833         7,400.00       90.46       135.000       5,511.96       -1,279.36	6,100.00	90.46	135.000	5,522.38	-360.16	482.60	1,911,659.422	1,282,855.453	36.247679427	-107.462641326
6,400.00         90.46         135.000         5,519.98         -572.28         694.73         1,911,447.299         1,283,067.579         36.247104118         -107.461913065           6,500.00         90.46         135.000         5,519.18         -642.99         765.44         1,911,376.591         1,283,138.288         36.246912347         -107.461470313           6,600.00         90.46         135.000         5,517.57         -784.41         906.85         1,911,235.176         1,283,279.706         36.246528804         -107.461184813           6,800.00         90.46         135.000         5,515.77         -855.11         977.56         1,911,937.60         1,283,491.832         36.2465259         -107.460942065           6,900.00         90.46         135.000         5,515.77         -96.53         1,118.98         1,911,023.053         1,283,491.832         36.245593486         -107.460456573           7,100.00         90.46         135.000         5,513.57         -1,087.24         1,189.69         1,910,982.345         1,283,491.832         36.245593486         -107.4509728343           7,200.00         90.46         135.000         5,511.46         -1,279.36         1,401.82         1,910,982.345         1,283,703.988         36.245578163         -107.4597284482	6,200.00	90.46	135.000	5,521.58	-430.87	553.31	1,911,588.714	1,282,926.162	36.247487658	-107.462398571
6,500.0090.46135.0005,519.18-642.99765.441,911,376.5911,283,138.28836.246912347-107.4616703136,600.0090.46135.0005,518.37-713.70836.151,911,305.8841,283,209.99736.246720576-107.46114275636,700.0090.46135.0005,516.77-855.11977.561,911,164.4681,283,320.41436.246337032-107.46109420556,900.0090.46135.0005,515.77-925.821,048.271,911,093.7601,283,421.12336.245953486-107.4609420557,000.0090.46135.0005,513.57-1,137.941,280.491,911,093.7601,283,421.12336.245953486-107.4609420557,200.0090.46135.0005,513.57-1,137.941,260.401,910,952.3451,283,625.4136.245963486-107.4602138287,200.0090.46135.0005,511.76-1,208.651,331.111,910,810.371,283,703.95836.245578163-107.4592728347,400.0090.46135.0005,511.76-1,208.651,331.111,910,810.9291,283,774.66736.2449186327-107.4592728347,600.0090.46135.0005,511.36-1,427.781,401.821,910,588.061,283,916.08536.244302855-107.459778667,600.0090.46135.0005,501.56-1,491.481,613.941,910,582.0981,283,946.37636.24490452-107.4587573867,600.0090.46135.0005,507.66-1,491.481,61									36.247295888	-107.462155817
6,600.0090.46135.0005,518.37-713.70836.151,911,305.8841,283,208.99736.246720576-107.4614275636,700.0090.46135.0005,517.57-784.41906.851,911,235.1761,283,3279.70636.246327032-107.461184136,800.0090.46135.0005,515.77-855.11977.561,911,033.7601,283,3421.12336.246145259-107.4609420656,900.0090.46135.0005,515.77-995.531,118.981,911,023.0531,283,491.83236.2455693846-107.4604565737,100.0090.46135.0005,513.57-1,137.941,260.401,910.952.3451,283,632.5036.245569938-107.450218287,200.0090.46135.0005,511.67-1,208.651,331.111,910,811.6371,283,633.25036.245569938-107.459710857,500.0090.46135.0005,511.66-1,279.361,401.821,910,740.2221,283,774.66736.245186387-107.4592488627,600.0090.46135.0005,510.36-1,420.781,543.231,910,582.0981,283,916.08536.244802835-107.4592428627,600.0090.46135.0005,510.36-1,420.781,543.231,910,582.0981,283,916.08536.24410284-107.4582428627,600.0090.46135.0005,507.96-1,632.901,755.361,910,366.6831,284,916.2936.24419284-107.4587437867,900.0090.46135.0005,507.96-1,632.901,755.										
6,700.0090.46135.0005,517.57-784.41906.851,911,235.1761,283,279.70636.246528804-107.4611848136,800.0090.46135.0005,516.77-855.11977.561,911,164.4681,283,350.41436.246337032-107.4609420656,900.0090.46135.0005,515.17-996.531,118.981,911,023.0531,283,421.12336.246145259-107.4606993187,000.0090.46135.0005,514.37-1,067.241,189.691,910,952.3451,283,633.25036.245569938-107.4602138287,200.0090.46135.0005,511.76-1,208.651,331.111,910,816.371,283,633.25036.245569938-107.4597283437,400.0090.46135.0005,511.96-1,279.361,401.821,910,740.2221,283,703.95836.24508163-107.4597284527,500.0090.46135.0005,511.36-1,279.361,401.821,910,740.2221,283,714.66736.244994612-107.4592428627,500.0090.46135.0005,501.36-1,420.781,543.231,910,598.061,283,945.37636.244994612-107.4592428627,600.0090.46135.0005,508.76-1,562.191,684.651,910,315.97536.244994612-107.459274867,900.0090.46135.0005,507.96-1,632.901,755.361,910,315.9751,284,057.50236.24440285-107.4587248627,900.0090.46135.0005,507.15-1,703.611,860.771,910,31										
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8,600.0090.46135.0005,502.35-2,127.852,250.321,909,891.7291,284,623.17336.242885042-107.4565728038,700.0090.46135.0005,501.54-2,198.562,321.031,909,821.0211,284,693.88136.242693260-107.4563300788,800.0090.46135.0005,500.74-2,269.272,391.741,909,750.3131,284,764.59036.242501477-107.4560873538,900.0090.46135.0005,499.94-2,339.982,462.451,909,679.6061,284,835.29936.242309694-107.455844630										
8,700.0090.46135.0005,501.54-2,198.562,321.031,909,821.0211,284,693.88136.242693260-107.4563300788,800.0090.46135.0005,500.74-2,269.272,391.741,909,750.3131,284,764.59036.242501477-107.4560873538,900.0090.46135.0005,499.94-2,339.982,462.451,909,679.6061,284,835.29936.242309694-107.455844630	-									
8,800.00         90.46         135.000         5,500.74         -2,269.27         2,391.74         1,909,750.313         1,284,764.590         36.242501477         -107.456087353           8,900.00         90.46         135.000         5,499.94         -2,339.98         2,462.45         1,909,679.606         1,284,835.299         36.242309694         -107.455844630										
8,900.00 90.46 135.000 5,499.94 -2,339.98 2,462.45 1,909,679.606 1,284,835.299 36.242309694 -107.455844630	,						, ,			
9,000.00 90.46 135.000 5,499.14 -2,410.69 2,533.16 1,909,608.898 1,284,906.008 36.242117910 -107.455601908										
	9,000.00	90.46	135.000	5,499.14	-2,410.69	2,533.16	1,909,608.898	1,284,906.008	36.242117910	-107.455601908

8/1/2023 9:51:33PM



#### Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey

Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Map Northing	Map Easting		
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)	Latitude	Longitude
9,100.00	90.46	135.000	5,498.34	-2,481.39	2,603.87	1,909,538.190	1,284,976.717	36.241926126	-107.455359188
9,200.00	90.46	135.000	5,497.54	-2,552.10	2,674.58	1,909,467.482	1,285,047.425	36.241734341	-107.455116468
9,300.00	90.46	135.000	5,496.73	-2,622.81	2,745.29	1,909,396.775	1,285,118.134	36.241542556	-107.454873750
9,400.00	90.46	135.000	5,495.93	-2,693.52	2,816.00	1,909,326.067	1,285,188.843	36.241350770	-107.454631032
9,500.00	90.46	135.000	5,495.13	-2,764.23	2,886.70	1,909,255.359	1,285,259.552	36.241158984	-107.454388316
9,600.00	90.46	135.000	5,494.33	-2,834.93	2,957.41	1,909,184.652	1,285,330.261	36.240967197	-107.454145602
9,700.00	90.46	135.000	5,493.53	-2,905.64	3,028.12	1,909,113.944	1,285,400.969	36.240775410	-107.453902888
9,800.00	90.46	135.000	5,492.73	-2,976.35	3,098.83	1,909,043.236	1,285,471.678	36.240583622	-107.453660175
9,900.00	90.46	135.000	5,491.93	-3,047.06	3,169.54	1,908,972.528	1,285,542.387	36.240391834	-107.453417464
10,000.00	90.46	135.000	5,491.12	-3,117.77	3,240.25	1,908,901.821	1,285,613.096	36.240200045	-107.453174754
10,100.00	90.46	135.000	5,490.32	-3,188.47	3,310.96	1,908,831.113	1,285,683.805	36.240008255	-107.452932045
10,200.00	90.46	135.000	5,489.52	-3,259.18	3,381.67	1,908,760.405	1,285,754.513	36.239816465	-107.452689337
10,300.00	90.46	135.000	5,488.72	-3,329.89	3,452.38	1,908,689.697	1,285,825.222	36.239624675	-107.452446631
10,400.00	90.46	135.000	5,487.92	-3,400.60	3,523.08	1,908,618.990	1,285,895.931	36.239432884	-107.452203926
10,500.00	90.46	135.000	5,487.12	-3,471.30	3,593.79	1,908,548.282	1,285,966.640	36.239241092	-107.451961221
10,600.00	90.46	135.000	5,486.32	-3,542.01	3,664.50	1,908,477.574	1,286,037.348	36.239049300	-107.451718518
10,700.00	90.46	135.000	5,485.51	-3,612.72	3,735.21	1,908,406.866	1,286,108.057	36.238857508	-107.451475817
10,800.00	90.46	135.000	5,484.71	-3,683.43	3,805.92	1,908,336.159	1,286,178.766	36.238665714	-107.451233116
10,900.00	90.46	135.000	5,483.91	-3,754.14	3,876.63	1,908,265.451	1,286,249.475	36.238473921	-107.450990417
11,000.00	90.46	135.000	5,483.11	-3,824.84	3,947.34	1,908,194.743	1,286,320.184	36.238282127	-107.450747718
11,100.00	90.46	135.000	5,482.31	-3,895.55	4,018.05	1,908,124.036	1,286,390.892	36.238090332	-107.450505021
11,200.00	90.46	135.000	5,481.51	-3,966.26	4,088.76	1,908,053.328	1,286,461.601	36.237898537	-107.450262325
11,300.00	90.46	135.000	5,480.71	-4,036.97	4,159.47	1,907,982.620	1,286,532.310	36.237706741	-107.450019631
11,400.00	90.46	135.000	5,479.90	-4,107.68	4,230.17	1,907,911.912	1,286,603.019	36.237514945	-107.449776937
11,500.00	90.46	135.000	5,479.10	-4,178.38	4,300.88	1,907,841.205	1,286,673.728	36.237323148	-107.449534245
11,600.00	90.46	135.000	5,478.30	-4,249.09	4,371.59	1,907,770.497	1,286,744.436	36.237131351	-107.449291554
11,700.00	90.46	135.000	5,477.50	-4,319.80	4,442.30	1,907,699.789	1,286,815.145	36.236939553	-107.449048864
11,800.00	90.46	135.000	5,476.70	-4,390.51	4,513.01	1,907,629.081	1,286,885.854	36.236747755	-107.448806175
11,900.00	90.46	135.000	5,475.90	-4,461.21	4,583.72	1,907,558.374	1,286,956.563	36.236555956	-107.448563487
12,000.00	90.46	135.000	5,475.10	-4,531.92	4,654.43	1,907,487.666	1,287,027.272	36.236364157	-107.448320801
12,100.00	90.46	135.000	5,474.29	-4,602.63	4,725.14	1,907,416.958	1,287,097.980	36.236172357	-107.448078116
12,200.00	90.46	135.000	5,473.49	-4,673.34	4,795.85	1,907,346.250	1,287,168.689	36.235980556	-107.447835432
12,300.00	90.46	135.000	5,472.69	-4,744.05	4,866.55	1,907,275.543	1,287,239.398	36.235788756	-107.447592749
12,400.00	90.46	135.000	5,471.89	-4,814.75	4,937.26	1,907,204.835	1,287,310.107	36.235596954	-107.447350067
12,500.00	90.46	135.000	5,471.09	-4,885.46	5,007.97	1,907,134.127	1,287,380.816	36.235405152	-107.447107387
12,600.00	90.46	135.000	5,470.29	-4,956.17	5,078.68	1,907,063.420	1,287,451.524	36.235213350	-107.446864708
12,700.00	90.46	135.000	5,469.48	-5,026.88	5,149.39	1,906,992.712	1,287,522.233	36.235021547	-107.446622029
12,800.00	90.46	135.000	5,468.68	-5,097.59	5,220.10	1,906,922.004	1,287,592.942	36.234829743	-107.446379353
12,900.00	90.46	135.000	5,467.88	-5,168.29	5,290.81	1,906,851.296	1,287,663.651	36.234637939	-107.446136677
13,000.00	90.46	135.000	5,467.08	-5,239.00	5,361.52	1,906,780.589	1,287,734.359	36.234446135	-107.445894002
13,100.00	90.46	135.000	5,466.28	-5,309.71	5,432.23	1,906,709.881	1,287,805.068	36.234254330	-107.445651329
13,200.00	90.46	135.000	5,465.48	-5,380.42	5,502.94	1,906,639.173	1,287,875.777	36.234062524	-107.445408657
13,300.00	90.46	135.000	5,464.68	-5,451.13	5,573.64	1,906,568.465	1,287,946.486	36.233870718	-107.445165986
13,400.00	90.46	135.000	5,463.87	-5,521.83	5,644.35	1,906,497.758	1,288,017.195	36.233678911	-107.444923316
13,500.00	90.46	135.000	5,463.07	-5,592.54	5,715.06	1,906,427.050	1,288,087.903	36.233487104	-107.444680647
13,600.00	90.46	135.000	5,462.27	-5,663.25	5,785.77	1,906,356.342	1,288,158.612	36.233295296	-107.444437980
13,700.00	90.46	135.000	5,461.47	-5,733.96	5,856.48	1,906,285.634	1,288,229.321	36.233103488	-107.444195314
13,758.65	90.46	135.000	5,461.00	-5,775.42	5,897.95	1,906,244.167	1,288,270.789	36.232991000	-107.444053000
PBHL/TC	0@13758.65	MD 5461.00 T	VD						



### Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		
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
Haynes 430 vert - plan misses target o - Point	0.00 enter by 50.6	0.000 63ft at 4933.8	4,921.06 30ft MD (492	227.14 1.10 TVD, 26	-104.58 2.14 N, -68.00	1,912,246.719 ) E)	1,282,268.273	36.249272240	-107.464657263
Haynes 430 LTP 233 FS - plan hits target cent - Point	0.00 er	0.000	5,461.00	-5,775.42	5,897.95	1,906,244.167	1,288,270.789	36.232991000	-107.444053000
Haynes 430 FTP 669 FS - plan misses target o - Point	0.00 enter by 4.89	0.000 9ft at 5899.20	5,524.00 6ft MD (5523	-217.99 9.99 TVD, -214	340.56 1.79 N, 344.26	1,911,801.587 ∂E)	1,282,713.408	36.248065000	-107.463129000

Casing Points							
	Measured Depth	Vertical Depth			Casing Diameter	Hole Diameter	
	(ft)	(ft)		Name	(")	(")	
	350.00	350.00	13 3/8" Csg		13-3/8	17-1/2	
	3,684.76	3,673.00	9 5/8" Csg		9-5/8	12-1/4	

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,404.50	1,403.21	Ojo Alamo		-0.46	135.000
1,505.03	1,503.27	Kirtland		-0.46	135.000
1,731.22	1,728.42	Fruitland		-0.46	135.000
1,967.46	1,963.58	Pictured Cliffs		-0.46	135.000
2,118.25	2,113.68	Lewis		-0.46	135.000
2,414.81	2,408.88	Chacra		-0.46	135.000
3,530.67	3,519.62	Cliff House		-0.46	135.000
3,535.70	3,524.62	Menefee		-0.46	135.000
4,237.58	4,224.87	Point Lookout		-0.46	135.000
4,532.58	4,519.87	Mancos		-0.46	135.000
4,872.58	4,859.87	MNCS_A		-0.46	135.000
4,962.59	4,949.87	MNCS_B		-0.46	135.000
5,099.70	5,084.68	MNCS_C		-0.46	135.000
5,168.73	5,149.49	MNCS_Cms		-0.46	135.000
5,253.18	5,224.18	MNCS_D		-0.46	135.000
5,359.47	5,308.67	MNCS_E		-0.46	135.000
5,423.50	5,353.30	MNCS_F		-0.46	135.000
5,573.86	5,437.30	MNCS_G		-0.46	135.000
5,671.92	5,481.60	MNCS_H @ 0VS		-0.46	135.000



#### Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

#### Plan Annotations

Measured	Vertical	Local Coor	dinates	
Depth (ft)	Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,000.00	1,000.00	0.00	0.00	KOP Begin 3°/100' build
1,183.06	1,182.78	8.49	-2.20	Begin 5.49° tangent
3,829.65	3,817.22	253.65	-65.80	Begin 3°/100' drop
4,012.71	4,000.00	262.14	-68.00	Begin vertical hold
4,933.77	4,921.06	262.14	-68.00	Begin 10°/100' build
5,533.77	5,417.26	45.41	119.34	Begin 60.00° tangent
5,593.77	5,447.26	6.10	153.32	Begin 10°/100' build
5,898.37	5,524.00	-214.12	343.67	Begin 3°/100' turn
6,037.04	5,522.89	-315.64	438.09	Begin 90.46° lateral
13,758.65	5,461.00	-5,775.42	5,897.95	PBHL/TD @ 13758.65 MD 5461.00 TVD

#### WELL NAME: Haynes Canyon Unit 430H

OBJECTIVE:	Drill, comple	ill, complete, and equip single lateral in the Mancos-H formation										
API Number:	Not yet assigned	ed					Sur TD (MD)					
AFE Number:	Not yet assigned	pt yet assigned										
ER Well Number:	Not yet assigned	ot yet assigned										
State:	New Mexico	lew Mexico										
County:	Rio Arriba						Target (TVD)					
Surface Elev.:	6,703	ft ASL (GL)	6,728	ft ASL (KB)			Curve BUR					
Surface Location:	3-23-6	Sec-Twn- Rng	897	ft FSL	448	ft FWL	POE (MD)					
BH Location:	11-23-6	Sec-Twn- Rng	233	ft FSL	1032	ft FWL	TD (MD)					
Driving Directions:	ns: FROM THE INTERSECTION OF US HWY 550 & US HWY 64 IN BLOOMFIELD, NM:											

> South on US Hwy 550 for 53.8 miles to MM 97.6; Left (North) on CR #379 (State Hwy 403) for 1.3 miles to fork; Right (North) remaining on CR #379 for 1.5 miles to location access on left; Haynes Canyon Unit 428H Pad. From East to West 430H, 428H, 442H, 440H).

QUICK REFERENCE

350 ft

3,685 ft

4,950 ft

4,937 ft

5,483 ft

5,694 ft

13,759 ft

8,065 ft

10 °/100 ft

#### WELL CONSTRUCTION SUMMARY:

	Hole (in)	TD MD (ft)	Csg (in)	Csg (lb/ft)	Csg (grade)	Csg (conn)	Csg Top (ft)	Csg Bot (ft)
Surface	17.500	350	13.375	54.5	J-55	BTC	0	350
Intermediate	12.250	3,685	9.625	36.0	J-55	LTC	0	3,685
Production	8.500	13,759	5.500	17.0	P-110	LTC	0	13,759

#### **CEMENT PROPERTIES SUMMARY:**

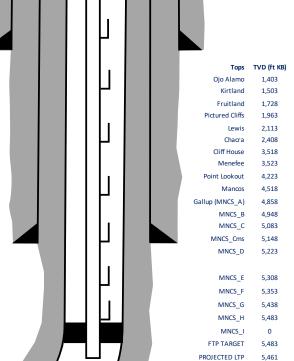
						TOC (ft		
	Туре	Wt (ppg)	Yd (cuft/sk)	Wtr (gal/sk)	% Excess	MD)	Total (sx)	Cu Ft Slurry
Surface	TYPE III	14.6	1.39	6.686	100%	0	364	505
Inter. (Lead)	0:10 Type III:P	12.5	2.14	12.05	70%	0	765	1,636
Inter. (Tail)	Type III	14.6	1.38	6.64	20%	3185	150	207
Prod. (Lead)	ASTM type I/II	12.4	2.370	13.4	50%	0	541	1,283
Prod. (Tail)	G:POZ blend	13.3	1.570	7.7	10%	4533	1481	2,325

#### **COMPLETION / PRODUCTION SUMMARY:**

Frac: 7965

Flowback: Flow back through production tubing as pressures allow

Production: Produce through production tubing via gas-lift into permanent production and storage facilities



MD (ft KB)

1,405

1,505

1,731

1,967

2,118

2,415

3,531

3,536

4,238

4,533

4,873

4,963

5,100

5,169

5,253

5,359

5,424

5,574

5,672

0

5,694

13,759

# AFMSS

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

APD ID: 10400093965

**Operator Name: ENDURING RESOURCES LLC** 

Well Name: HAYNES CANYON UNIT

Well Type: OIL WELL

# **Section 1 - Existing Roads**

Will existing roads be used? YES

**Existing Road Map:** 

HCU\_430\_Existing\_Access\_Road\_09282023\_20230928120215.pdf

Existing Road Purpose: ACCESS

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

**Existing Road Improvement Description:** 

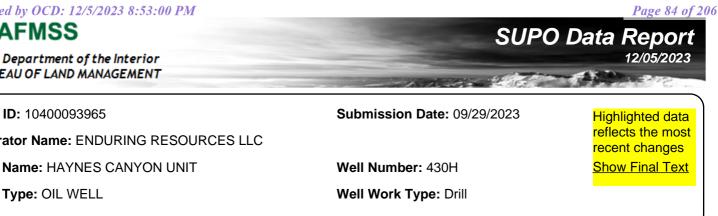
**Existing Road Improvement Attachment:** 

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

Section 3 - Location of Existing Wells

Existing Wells Map? YES Attach Well map:



Well Name: HAYNES CANYON UNIT

HCU\_430H\_Wells\_Within\_1Mile\_08222023\_20230917155719.pdf

### **Section 4 - Location of Existing and/or Proposed Production Facilities**

#### Submit or defer a Proposed Production Facilities plan? SUBMIT

#### **Production Facilities description:**

#### **Production Facilities map:**

Haynes\_Canyon\_Unit\_430H\_Facility\_Layout\_Rev\_A\_20230917155739.pdf Haynes\_Canyon\_Unit\_430H\_Proposed\_Reclamation\_Rev\_A\_09222023\_20230922110936.pdf Haynes\_Canyon\_Unit\_430H\_Facility\_and\_Rig\_Layout\_Rev\_A\_09222023\_20230922110945.pdf Haynes\_Canyon\_Unit\_430H\_Facility\_\_\_Completions\_Layout\_Rev\_A\_09222023\_20230922110952.pdf

### Section 5 - Location and Types of Water Supply

Water Source Tab	le		
Water source type: GW WELL			
Water source use type:	DUST CONT	ROL	
	SURFACE C	ASING	
	INTERMEDIA CASING	TE/PRODUCTION	
Source latitude: 36.069826			Source longitude: -107.04718
Source datum: NAD83			
Water source permit type:	WATER WEL	L	
Water source transport method:	TRUCI	KING	
Source land ownership: PRIVATE			
Source transportation land owner	ship: PRIVATE	E	
Water source volume (barrels): 17	558		Source volume (acre-feet): 2.26310499
Source volume (gal): 737436			

ceived by OCD: 12/5/2023 8:53:00 PM		Page 86 of
perator Name: ENDURING RESOU		<b>ber:</b> 430H
Water source type: GW WELL		
Water source use type:	DUST CONTROL	
	SURFACE CASING	
	INTERMEDIATE/PRODUCTION CASING	
Source latitude: 36.359802		Source longitude: -107.81031
Source datum: NAD83		
Water source permit type:	WATER WELL	
Water source transport method:	TRUCKING	
Source land ownership: STATE		
Source transportation land owner	ship: STATE	
	-	Source volume (acre-feet): 2.26310499
Source transportation land owner	-	Source volume (acre-feet): 2.26310499
Source transportation land owner Water source volume (barrels): 17	-	Source volume (acre-feet): 2.26310499
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436	-	Source volume (acre-feet): 2.26310499
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436 Water source type: RECYCLED	7558	Source volume (acre-feet): 2.26310499 Source longitude: -107.576013
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436 Water source type: RECYCLED Water source use type:	7558	
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436 Water source type: RECYCLED Water source use type: Source latitude: 36.143567	7558	
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436 Water source type: RECYCLED Water source use type: Source latitude: 36.143567 Source datum: NAD83	7558 STIMULATION	
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436 Water source type: RECYCLED Water source use type: Source latitude: 36.143567 Source datum: NAD83	7558 STIMULATION OTHER	
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436 Water source type: RECYCLED Water source use type: Source latitude: 36.143567 Source datum: NAD83 Water source permit type:	2558 STIMULATION OTHER WATER WELL	
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436 Water source type: RECYCLED Water source use type: Source latitude: 36.143567 Source datum: NAD83 Water source permit type: Water source transport method:	2558 STIMULATION OTHER WATER WELL TRUCKING	
Source transportation land owner Water source volume (barrels): 17 Source volume (gal): 737436 Water source type: RECYCLED Water source use type: Source latitude: 36.143567 Source datum: NAD83 Water source permit type: Water source transport method: Source land ownership: STATE	2558 STIMULATION OTHER WATER WELL TRUCKING	

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Dperator Name: ENDURING RESOL		
Vell Name: HAYNES CANYON UNIT		Well Number: 430H
Water source type: RECYCLED		
Water source use type:	STIMULATION	
Source latitude: 36.205932		Source longitude: -107.741568
Source datum: NAD83		
Water source permit type:	WATER WELL	
	OTHER	
Water source transport method:	TRUCKING	
Source land ownership: FEDERA	L	
Source transportation land owner	rship: FEDERAL	
Water source volume (barrels): 44	47760	Source volume (acre-feet): 57.71317281
Source volume (gal): 18805920		
Water source type: RECYCLED		
Water source use type:	STIMULATION	
Source latitude: 36.210181		Source longitude: -107.83776
Source datum: NAD83		
Water source permit type:	WATER WELL	
	OTHER	
Water source transport method:	TRUCKING	
Source land ownership: FEDERA	L	
Source transportation land owner	rship: FEDERAL	
Water source volume (barrels): 44	47760	Source volume (acre-feet): 57.71317281
Source volume (gal): 18805920		

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ell Name: HAYNES CANYON UNIT	-	Well Number: 430H
Water source type: RECYCLED		
Water source use type:	STIMULATION	
Source latitude: 36.117342		Source longitude: -107.488712
Source datum: NAD83		
Water source permit type:	WATER WELL	
	OTHER	
Water source transport method:	TRUCKING	
Source land ownership: FEDERA	L	
Source transportation land owner	ship: FEDERAL	
Water source volume (barrels): 44	17760	Source volume (acre-feet): 57.71317281
Source volume (gal): 18805920		
Water source type: RECYCLED		
Water source use type:	STIMULATION	
Source latitude: 36.310147		Source longitude: -107.651626
Source datum: NAD83		
Water source permit type:	WATER WELL	
	OTHER	
Water source transport method:	TRUCKING	
Source land ownership: FEDERA	L	
Source transportation land owner	ship: FEDERAL	
Water source volume (barrels): 44	17760	Source volume (acre-feet): 57.71317281
Source volume (gal): 18805920		

Water source comments:

New water well? N

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**Operator Name: ENDURING RESOURCES LLC** 

Well Name: HAYNES CANYON UNIT

Well Number: 430H

# **New Water Well Info**

Well latitude:	Well Longitude:	Well datum:
Well target aquifer:		
Est. depth to top of aquifer(ft):	Est thickness of aqu	uifer:
Aquifer comments:		
Aquifer documentation:		
Well depth (ft):	Well casing type:	
Well casing outside diameter (in.):	Well casing inside dia	meter (in.):
New water well casing?	Used casing source:	
Drilling method:	Drill material:	
Grout material:	Grout depth:	
Casing length (ft.):	Casing top depth (ft.):	
Well Production type:	Completion Method:	
Water well additional information:		
State appropriation permit:		
Additional information attachment:		

### **Section 6 - Construction Materials**

Using any construction materials: YES

Construction Materials description: Reference attached SUPO chapter 8 construction materials.

#### **Construction Materials source location**

MaterialSourceLocationMap\_191022\_20230917155823.pdf

### Section 7 - Methods for Handling

Waste type: DRILLING

Waste content description: Reference attached Enduring Resources Surface Use Plan of Operations Chapter 9 (Methods for Handling Waste). Section 9 (Drilling Fluids). Amount of waste: 12000 barrels

#### Waste disposal frequency : Weekly

Safe containment description: Drilling fluids would be stored onsite in above-ground storage tanks. Upon termination of drilling operations, the drilling fluids would be recycled and transferred to other permitted closed-loop systems or disposed of at one of the locations specified in the SUPO section 9. Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL **Disposal location ownership: PRIVATE** FACILITY

Disposal type description:

Disposal location description: Approved commercial disposal facility or land farm.

## Operator Name: ENDURING RESOURCES LLC

Well Name: HAYNES CANYON UNIT

Well Number: 430H

#### Waste type: FLOWBACK

**Waste content description:** Flowback transported off location/through temporary flowback equipment will consist of approximately 1,000 bbls of produced water per day per well for approximately 14 days. After this flow-back period, production will be sent to the permanent facility for processing **Amount of waste:** 1000 pounds

#### Waste disposal frequency : Daily

**Safe containment description:** Flowback fluid will be gathered, recycled, and reused as described in Section 5. If there are no foreseeable drilling and completion operations, flow back will be disposed of at one of the disposal wells listed in the attached SUPO. **Safe containmant attachment:** 

Waste disposal type: RECYCLE

Disposal location ownership: OTHER

Disposal type description:

**Disposal location description:** Produced water from flowback will be stored, treated, and recycled at any of Enduring's approved water recycling facilities. Containments are constructed, lined, and monitored per regulatory requirements. Flowback would be disposed of at one of the disposal wells listed in Section 9 of the SUPO.

#### Waste type: SEWAGE

Waste content description: Reference attached Enduring Resources Surface Use Plan of Operations Chapter 9 (Methods<br/>for Handling Waste). Section 9 (Sewage).Amount of waste: 500gallons

Waste disposal frequency : Weekly

Safe containment description: Portable toilets will be provided and maintained as needed during construction

#### Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL Disposal location ownership: PRIVATE FACILITY Disposal type description:

Disposal location description: Commercial facilities disposal

#### Waste type: GARBAGE

Waste content description: Reference attached Enduring Resources Surface Use Plan of Operations Chapter 9 (Methods<br/>for Handling Waste). Section 9 (Garbage and other waste material).Amount of waste: 1500pounds

Waste disposal frequency : Weekly

**Safe containment description:** All garbage and trash will be placed in enclosed metal trash containers. The trash and garbage will be hauled off-site and dumped in an approved landfill, as needed. **Safe containmant attachment:** 

Waste disposal type: HAUL TO COMMERCIAL Disposal location ownership: PRIVATE FACILITY Disposal type description:

Disposal location description: Approved landfill

Well Name: HAYNES CANYON UNIT

Well Number: 430H

### Waste type: PRODUCED WATER

**Waste content description:** Reference attached Enduring Resources Surface Use Plan of Operations Chapter 9 (Methods for Handling Waste). Section 9 (Produced Water). **Amount of waste:** 11000 barrels

Waste disposal frequency : Weekly

**Safe containment description:** Drilling fluids would be stored onsite in above-ground storage tanks. See SUPO section 9, Drilling Fluids **Safe containmant attachment:** 

Waste disposal type: OFF-LEASE INJECTION Disposal location ownership: PRIVATE

Disposal type description:

Disposal location description: Commercial UIC, See SUPO Chapter 9 disposal locations

<b>Reserve</b>	Pit
----------------	-----

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit? NO

Reserve pit length (ft.) Reserve pit width (ft.)

Reserve pit depth (ft.)

Reserve pit volume (cu. yd.)

Is at least 50% of the reserve pit in cut?

**Reserve pit liner** 

Reserve pit liner specifications and installation description

### **Cuttings Area**

Cuttings Area being used? NO

Are you storing cuttings on location? N

**Description of cuttings location** 

Cuttings area length (ft.)

Cuttings area depth (ft.)

Cuttings area width (ft.)

Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Operator Name: ENDURING RESOURCES LLC

Well Name: HAYNES CANYON UNIT

Well Number: 430H

### **Section 8 - Ancillary**

Are you requesting any Ancillary Facilities?: N

Ancillary Facilities

Comments:

Section 9 - Well Site

### Well Site Layout Diagram:

Haynes\_Canyon\_Unit\_430H\_Facility\_Layout\_Rev\_A\_20230917160026.pdf HCU\_430\_Topsoil\_and\_Cut\_09222023\_20230922112129.pdf Comments:

# **Section 10 - Plans for Surface**

Type of disturbance: No New Surface Disturbance Multiple Well Pad Name: Haynes Canyon Unit

### Multiple Well Pad Number: 428

### Recontouring

Haynes\_Canyon\_Unit\_430H\_Proposed\_Reclamation\_Rev\_A\_20230917160046.pdf

**Drainage/Erosion control construction:** REFERENCE ATTACHED ENDURING RESOURCES SURFACE RECLAMATION PLAN CHAPTER 4 (TECHNIQUES FOR SUCCESSFUL REVEGETATION), 4.5 AND THE CONSTRUCTION PLATS.

**Drainage/Erosion control reclamation:** REFERENCE ATTACHED ENDURING RESOURCES SURFACE RECLAMATION PLAN CHAPTER 4 (TECHNIQUES FOR SUCCESSFUL REVEGETATION) 4.5 AND THE CONSTRUCTION PLATS.

Well pad proposed disturbance (acres):	Well pad interim reclamation (acres): 0 Well pad long term disturbance (acres): 0			
Road proposed disturbance (acres):	Road interim reclamation (acres): 0	Road long term disturbance (acres): 0		
Powerline proposed disturbance (acres): Pipeline proposed disturbance (acres):	Powerline interim reclamation (acres): 0 Pipeline interim reclamation (acres): 0	(acres): 0		
Other proposed disturbance (acres):	Other interim reclamation (acres): 0	Other long term disturbance (acres): 0		
Total proposed disturbance: 0	Total interim reclamation: 0	Total long term disturbance: 0		

#### **Disturbance Comments:**

**Reconstruction method:** REFERENCE ATTACHED ENDURING RESOURCES SURFACE RECLAMATION PLAN CHAPTER 4 (TECHNIQUES FOR SUCCESSFUL REVEGETATION), 4.4. RECONTOURING **Topsoil redistribution:** REFERENCE ATTACHED ENDURING RESOURCES SURFACE RECLAMATION PLAN CHAPTER 4 (TECHNIQUES FOR SUCCESSFUL REVEGETATION), 4.3. Topsoil Stripping, Storage, and Replacement

**Soil treatment:** REFERENCE ATTACHED ENDURING RESOURCES SURFACE RECLAMATION PLAN CHAPTER 3 (TECHNIQUES FOR SUCCESSFUL REVEGETATION), 4.7. SOIL AMENDMENTS

**Operator Name: ENDURING RESOURCES LLC** 

Well Name: HAYNES CANYON UNIT

Existing Vegetation at the well pad: The existing well is void of vegetation Existing Vegetation at the well pad

Existing Vegetation Community at the road: N/A Existing Vegetation Community at the road Existing Vegetation Community at the pipeline: N/A Existing Vegetation Community at the pipeline

Existing Vegetation Community at other disturbances: N/A Existing Vegetation Community at other disturbances

Non native seed used? N

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? N

Seedling transplant description

Will seed be harvested for use in site reclamation? N Seed harvest description: Seed harvest description attachment:

#### Seed

### Seed Table

Seed type: PERENNIAL GRASS Seed name: Indian ricegrass Source name: Southwest Seed Inc Source phone: (970)565-8722 Seed cultivar: VNS Seed use location: WELL PAD PLS pounds per acre: 4 Seed source: COMMERCIAL

Source address: 13514 Road 29, Dolores, Colorado 81323

Proposed seeding season: AUTUMN

Operator Name: ENDURING RESOURCES LLC

Seed name: Rocky Mountain Bee plant

Source name: Southwest Seed Inc

Source phone: (970)565-8722

Seed use location: WELL PAD

Source name: Southwest Seed Inc

Source phone: (970)565-8722

Seed use location: WELL PAD

Seed type: PERENNIAL GRASS

Source name: Southwest Seed Inc

Seed name: Sand dropseed

Source phone: (970)565-8722

Seed use location: WELL PAD

Seed name: fourwing saltbrush

Source phone: (970)565-8722

Seed use location: WELL PAD

Source name: Southwest Seed Inc

Source phone: (970)565-8722

Seed use location: WELL PAD

PLS pounds per acre: 2

Source name: Southwest Seen Inc

PLS pounds per acre: 0

Seed cultivar: VNS

Seed type: SHRUB

Seed cultivar: VNS

Seed type: SHRUB Seed name: Winterfat

Seed cultivar: VNS

PLS pounds per acre: 0

PLS pounds per acre: 0

Well Name: HAYNES CANYON UNIT

Seed type: FORB

Seed cultivar: VNS

Seed type: FORB

Seed name: Blue flax

Seed cultivar: VNS

Well Number: 430H

Seed source: COMMERCIAL

Source address: 13514 Road 29, Dolores, Colorado 81323

Proposed seeding season: AUTUMN Seed source: COMMERCIAL

Source address: 13514 Road 29, Dolores, Colorado 81323

Proposed seeding season: AUTUMN Seed source: COMMERCIAL

Source address: 13514 Road 29, Dolores, Colorado 81323

Proposed seeding season: AUTUMN Seed source: COMMERCIAL

Source address: 13514 Road 29, Dolores, Colorado 81323

Proposed seeding season: AUTUMN Seed source: COMMERCIAL

Source address: 13514 Road 29, Dolores, Colorado 81323

Operator Name: ENDURING RESOURCES LLC Well Name: HAYNES CANYON UNIT

PLS pounds per acre: 2	Proposed seeding season: AUTUMN
Seed type: PERENNIAL GRASS	Seed source: COMMERCIAL
Seed name: Western Wheatgrass	
Source name: Southwest Seed Inc	Source address: 13514 Road 29, Dolores, Colorado, 81323
Source phone: (970)565-8722	
Seed cultivar: VNS	
Seed use location: WELL PAD	
PLS pounds per acre: 4	Proposed seeding season: AUTUMN
Seed type: PERENNIAL GRASS	Seed source: COMMERCIAL
Seed name: Blue grama	
Source name: Southwest Seed Inc	Source address: 13514 Road 29, Dolores, Colorado 81323
Source phone: (970)565-8722	
Seed cultivar: VNS	
Seed use location: WELL PAD	
PLS pounds per acre: 2	Proposed seeding season: AUTUMN
Seed type: PERENNIAL GRASS	Seed source: COMMERCIAL
Seed name: Bottle brush squirreltail	
Source name: Southwest Seed Inc	Source address: 13514 Road 29, Dolores, Colorado 81323
Source phone: (970)565-8722	
Seed cultivar: VNS	
Seed use location: WELL PAD	
PLS pounds per acre: 3	Proposed seeding season: AUTUMN

Total pounds/Acre: 17

Seed Summary				
Seed Type	Pounds/Acre			
SHRUB	4			
FORB	0			
PERENNIAL GRASS	13			

#### Seed reclamation

**Operator Contact/Responsible Official** 

First Name: TheresaLast Name: AncellPhone: (970)749-0124Email: tancell@enduringresources.com

**Seedbed prep:** REFERENCE ATTACHED ENDURING RESOURCES SURFACE RECLAMATION PLAN CHAPTER 4 (TECHNIQUES FOR SUCCESSFUL REVEGETATION), 4.6.

### Operator Name: ENDURING RESOURCES LLC

Well Name: HAYNES CANYON UNIT

Well Number: 430H

Seed BMP: REFERENCE ATTACHED ENDURING RESOURCES SURFACE RECLAMATION PLAN CHAPTER 4 (TECHNIQUES FOR SUCCESSFUL REVEGETATION). Seed method: REFERENCE ATTACHED ENDURING RESOURCES SURFACE RECLAMATION PLAN CHAPTER 4 (TECHNIQUES FOR SUCCESSFUL REVEGETATION), 4.8. Existing invasive species? N

Existing invasive species treatment description:

Existing invasive species treatment

Weed treatment plan description: N/A

Weed treatment plan

Monitoring plan description: N/A

Monitoring plan

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

### **Section 11 - Surface**

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

**BIA Local Office:** 

**BOR Local Office:** 

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

**Military Local Office:** 

**USFWS Local Office:** 

**Other Local Office:** 

**USFS** Region:

**USFS Forest/Grassland:** 

**USFS Ranger District:** 

Operator Name: ENDURING RESOURCES LLC

Well Name: HAYNES CANYON UNIT

Well Number: 430H

## Section 12 - Other

Right of Way needed? N ROW Type(s): Use APD as ROW?

SUPO Additional Information:

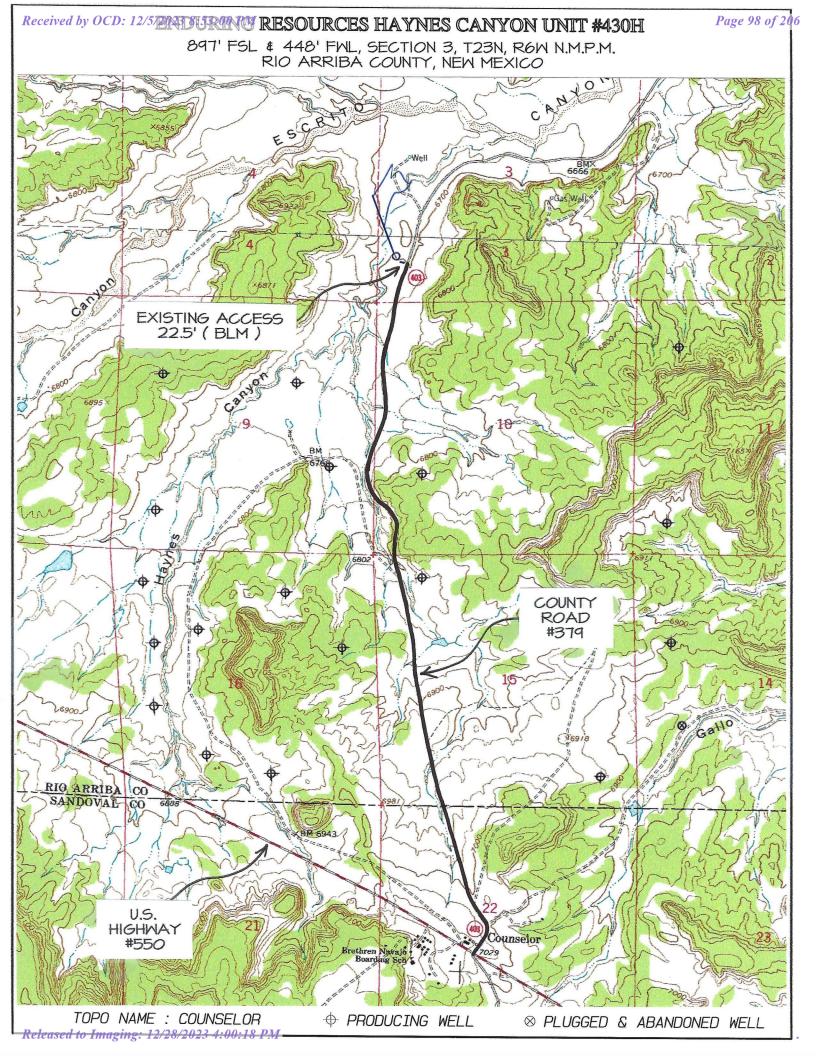
ROW

Use a previously conducted onsite? Y

Previous Onsite information: Conducted on June 27, 2023

## **Other SUPO**

HCU\_430H\_RD.Maint.Pln\_Final\_20230912\_20230917160154.pdf HCU\_430H\_RecPlan\_Final\_20230912\_20230917160158.pdf HCU\_430\_Onsite\_Notes\_20230924194557.pdf HCU\_430H\_SUPO\_Final\_20230928\_20230928130556.pdf



#### Directions from the Intersection of US Hwy 550 & US Hwy 64

### in Bloomfield, NM to Enduring Resources, LLC Haynes Canyon Unit #430H

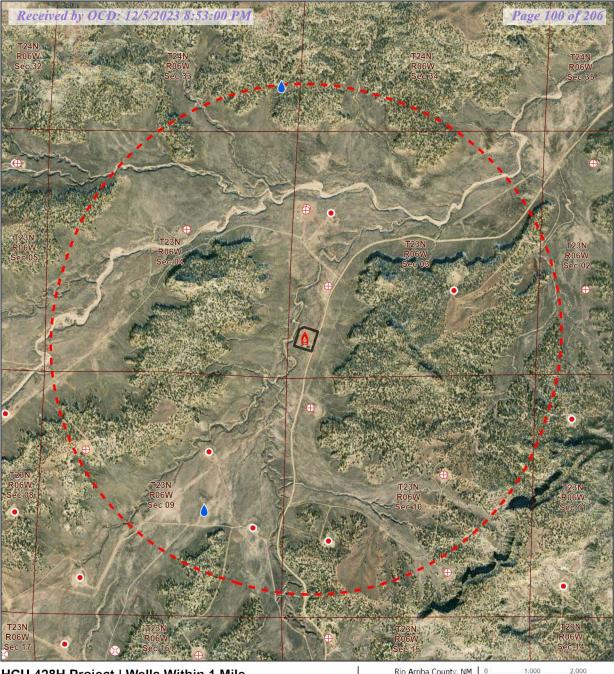
### 897' FSL & 448' FWL, Section 3, T23N, R6W, N.M.P.M., Rio Arriba County, NM

#### Latitude 36.248652°N Longitude -107.464293°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 53.8 miles to Mile Marker 97.6

Go Left (Northerly) on County Road #379 (aka State Highway #403) for 1.5 miles to fork in roadway;

Go Right (Northerly) which is straight remaining on County Road #379 (aka State Highway #403) for 1.4 miles to existing access road on left-hand side which continues for 22.5' to Enduring Haynes Canyon Unit #430H staked location.



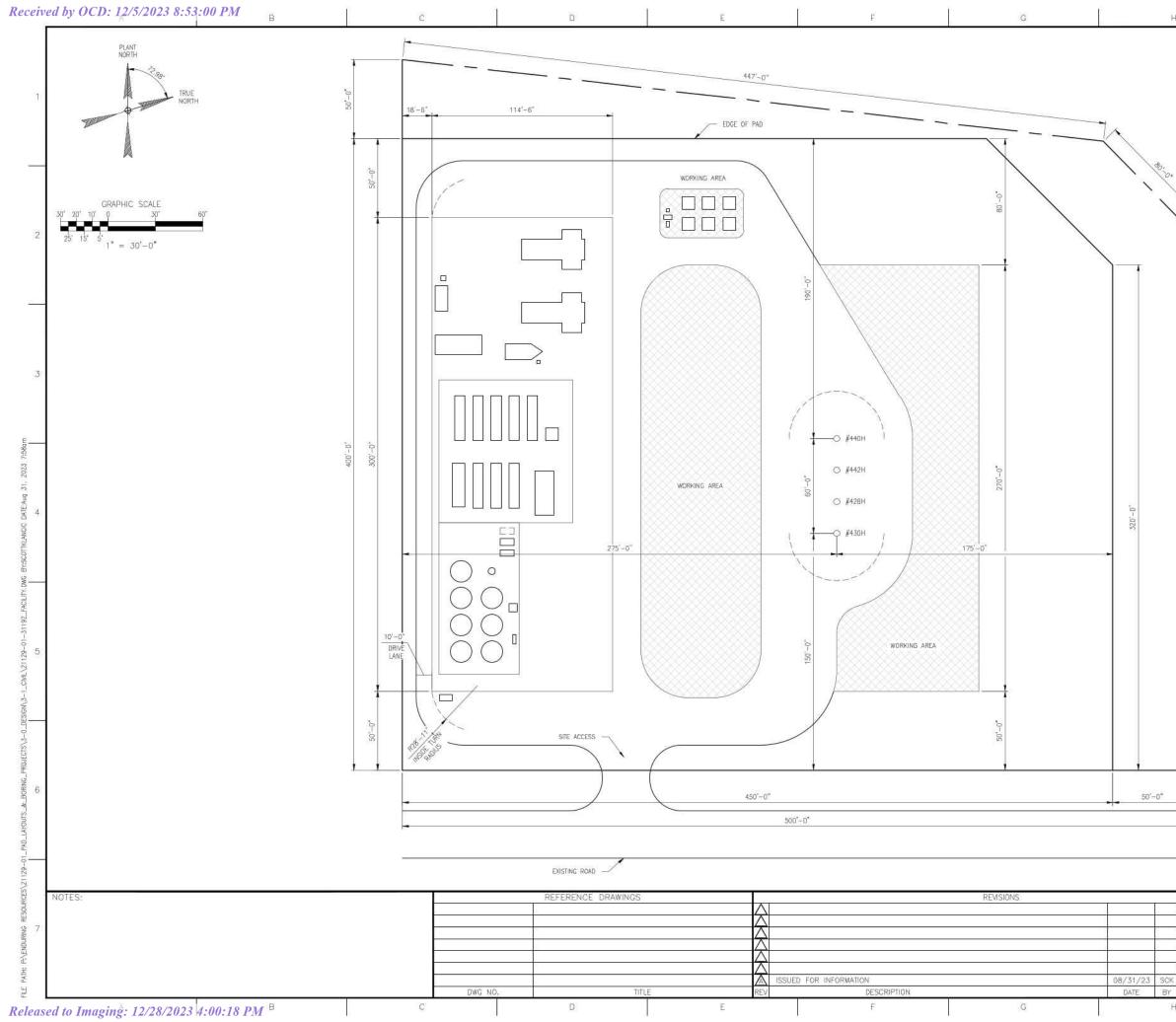
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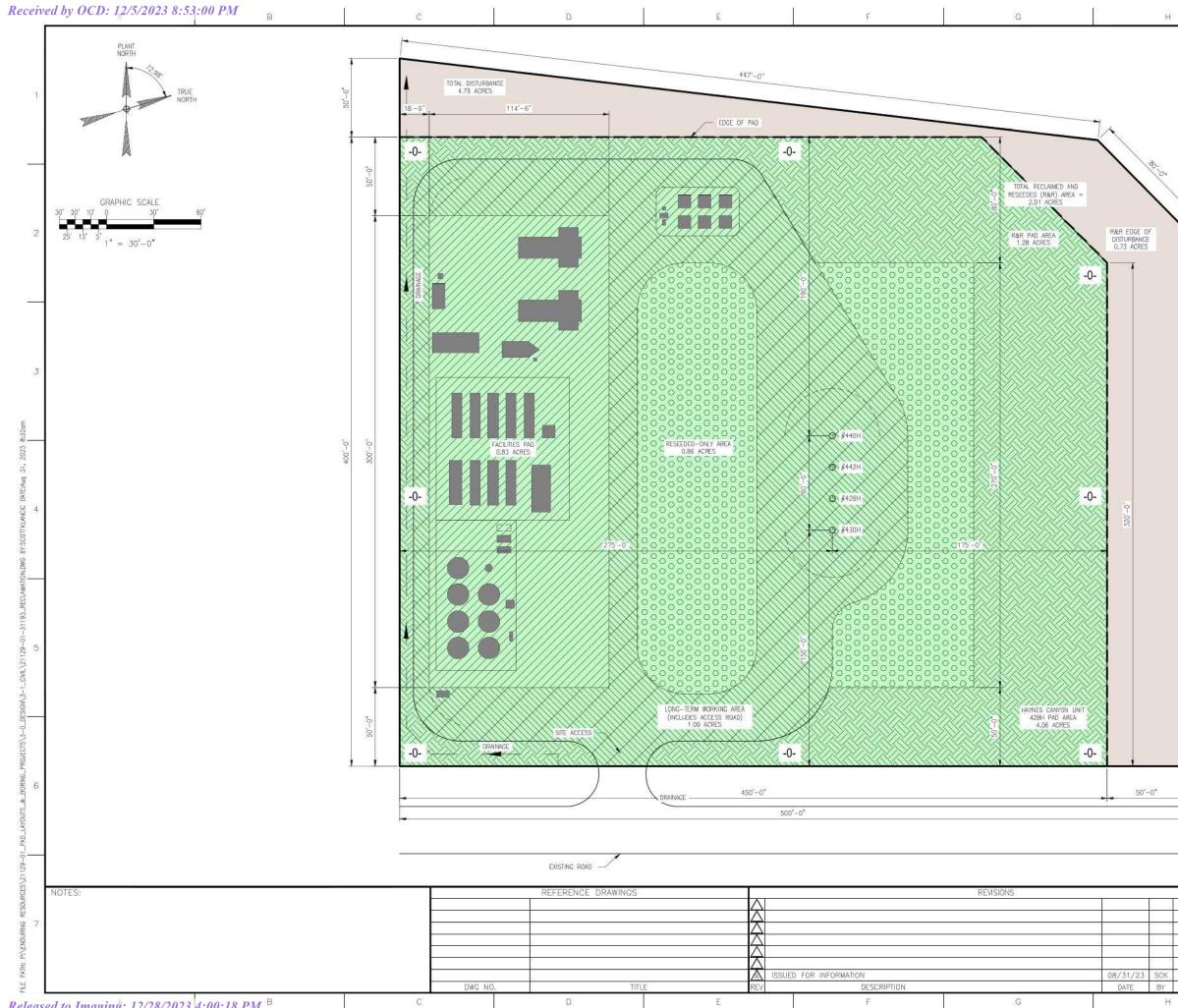
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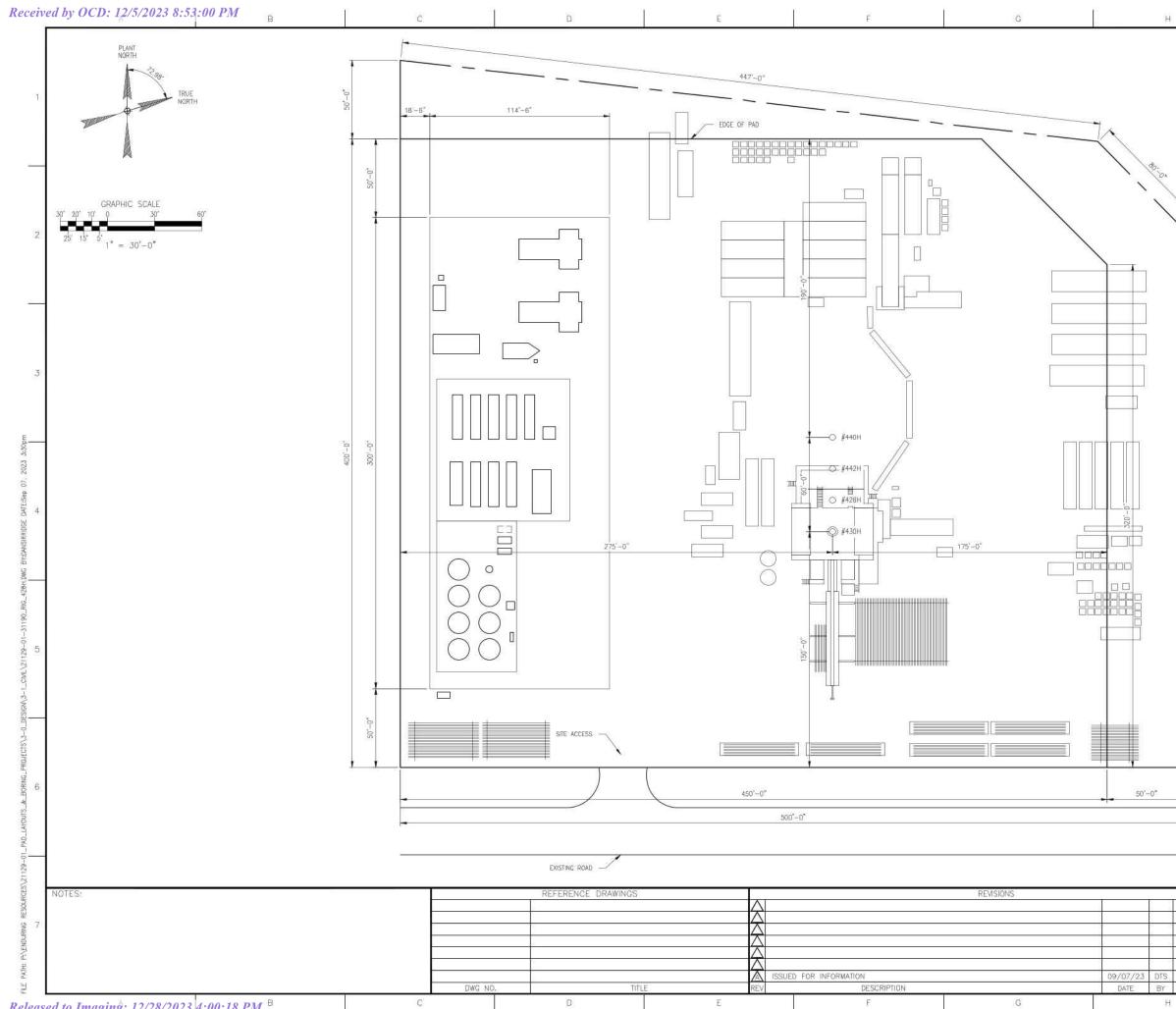
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	R&R EDGE OF DISTURBANCE 0.73 ACRES	6
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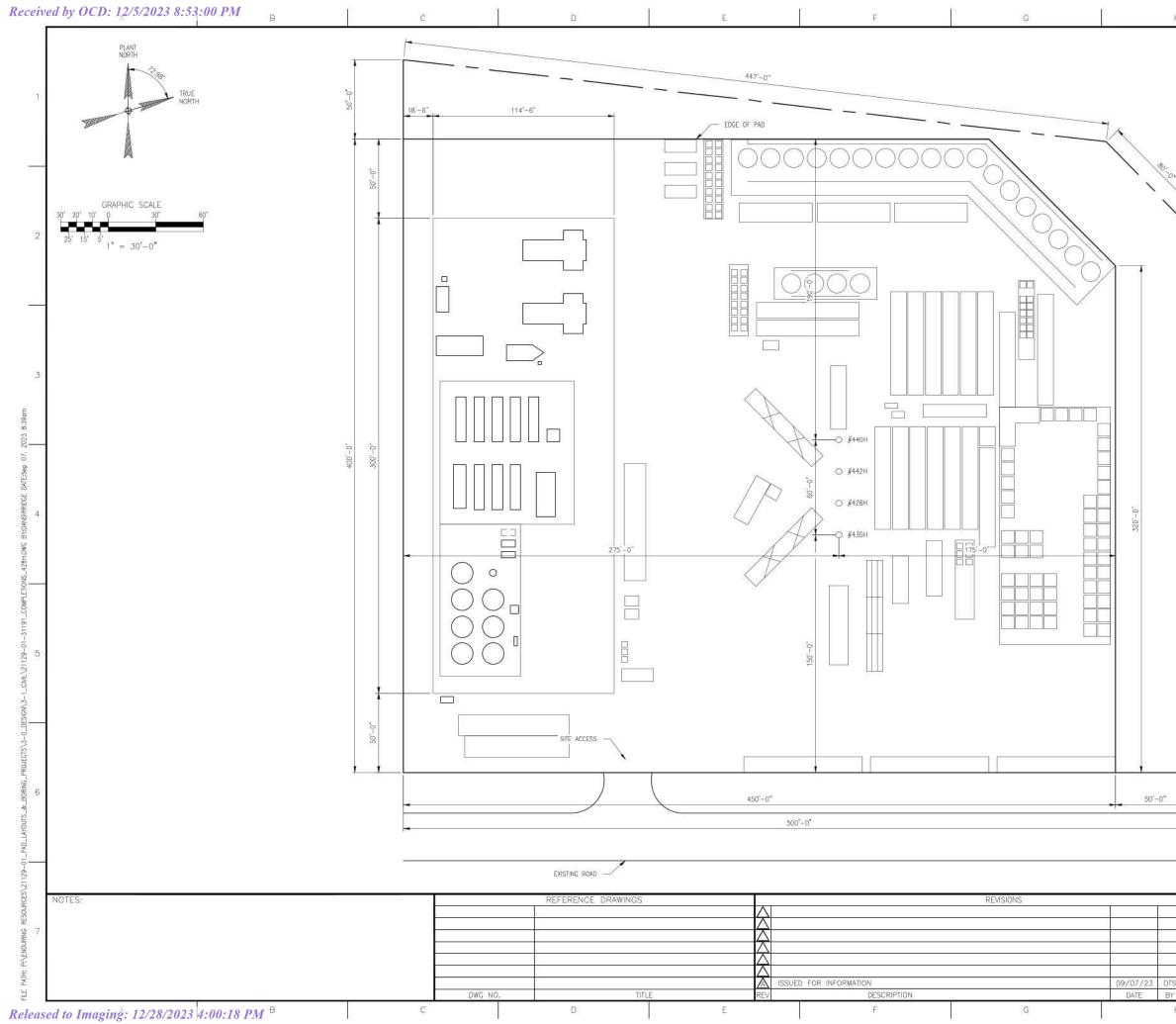
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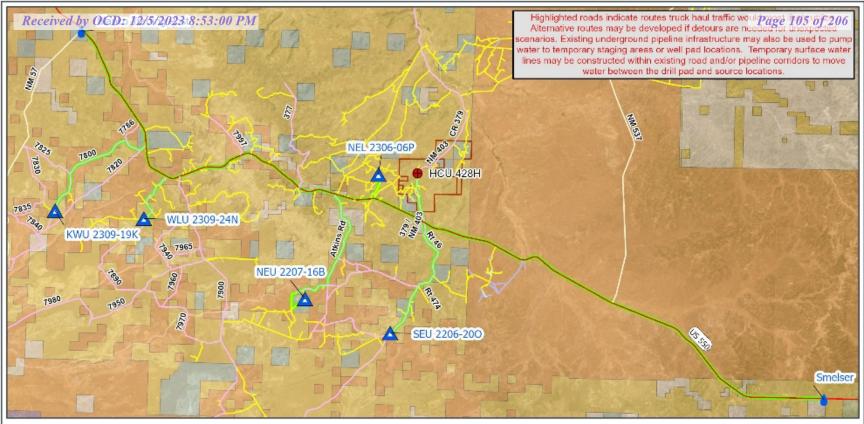
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#### HCU 428H Project | Water Transportation



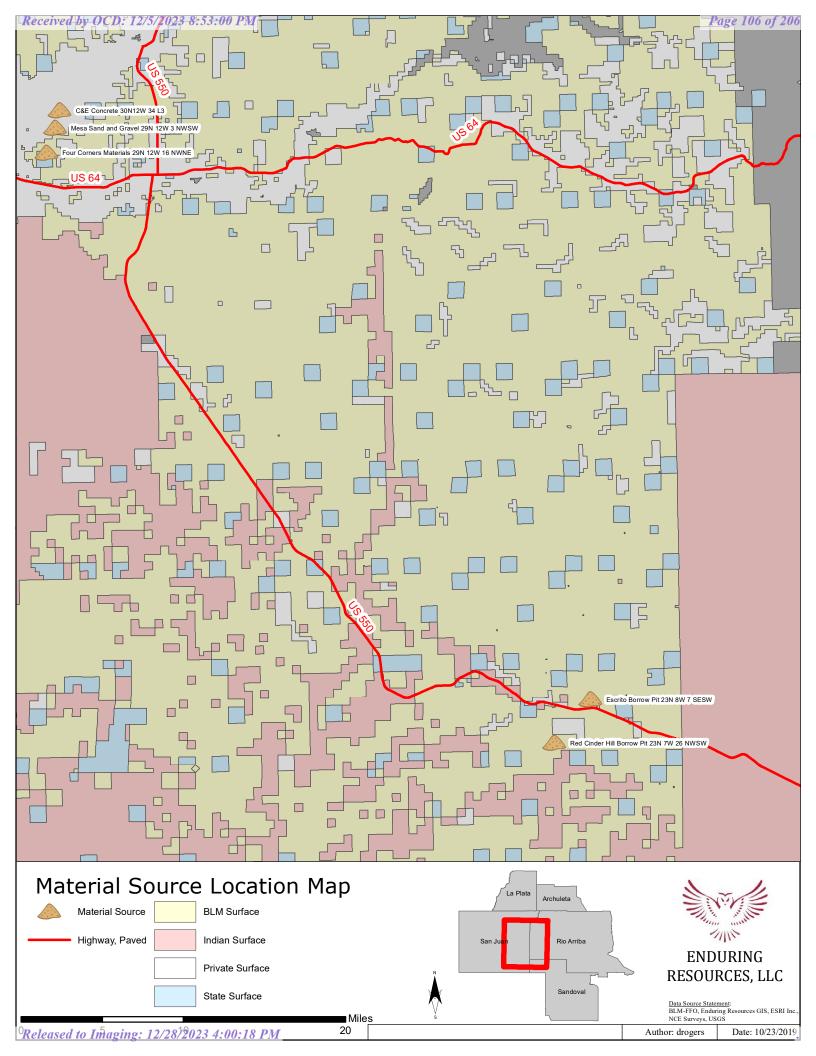
Unit Boundary

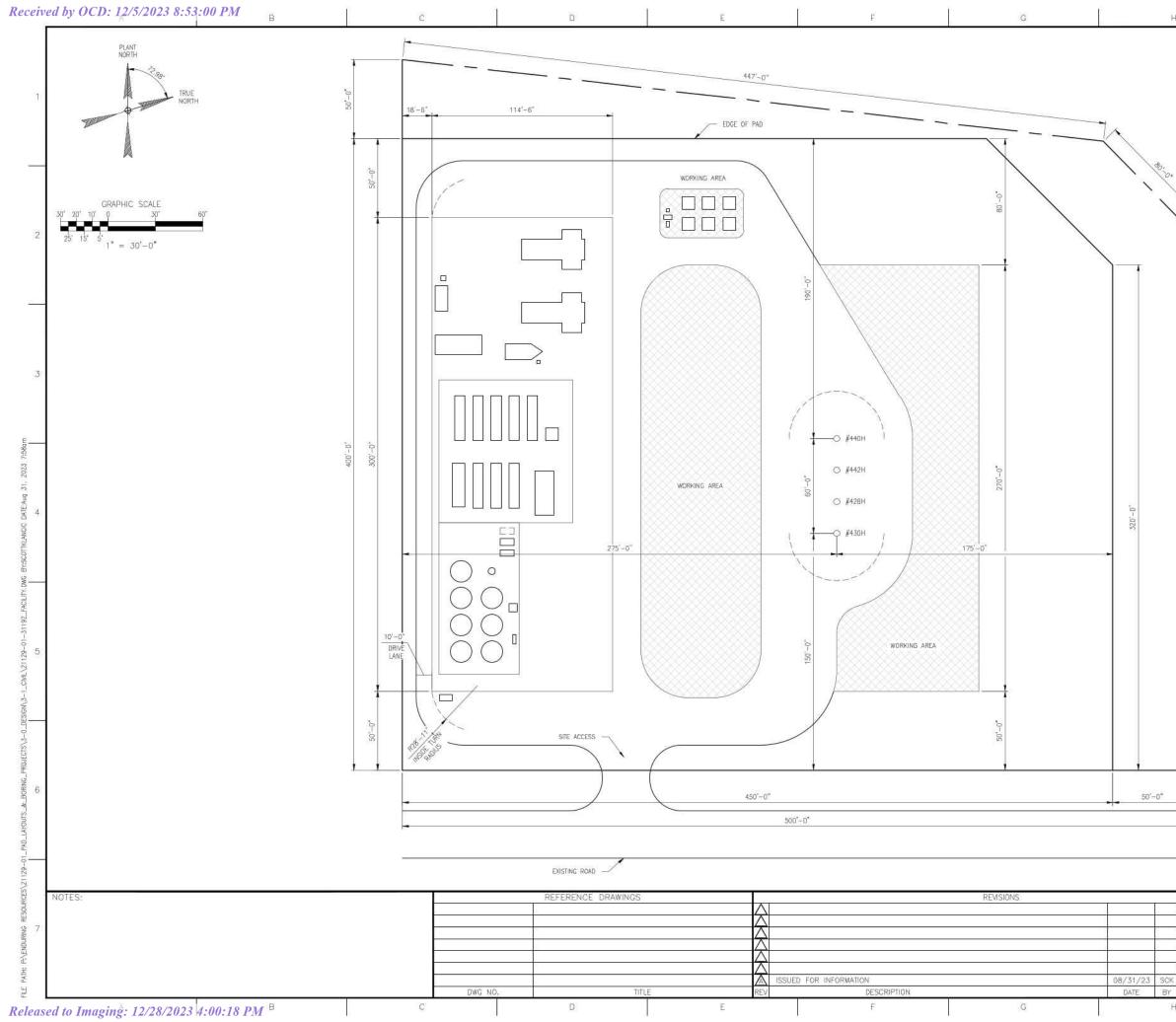


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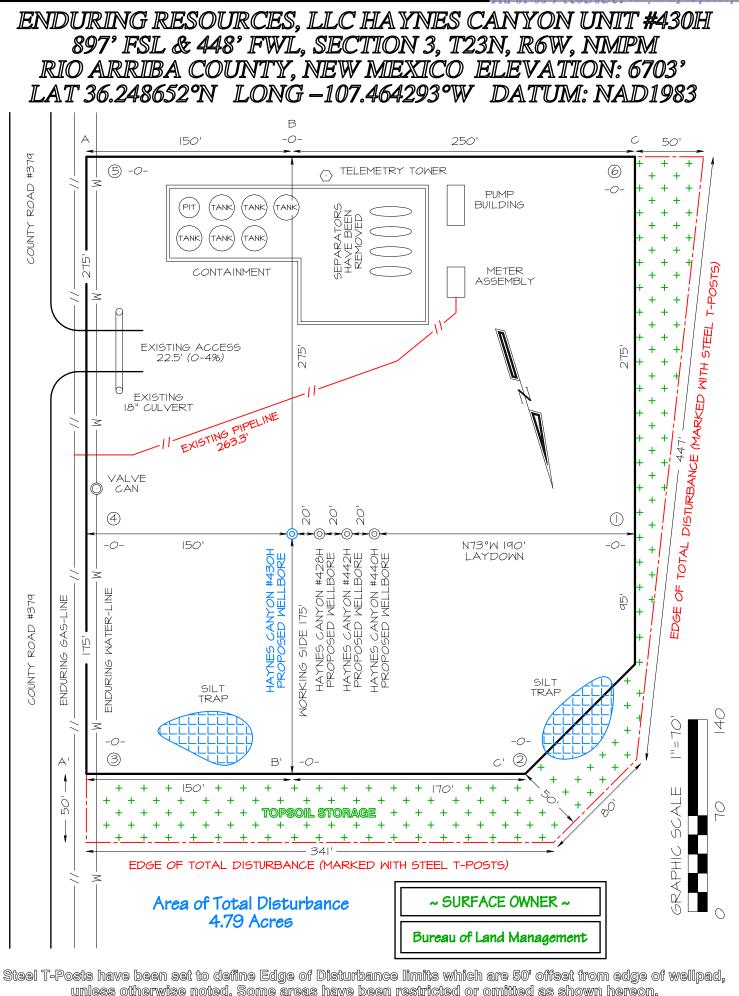
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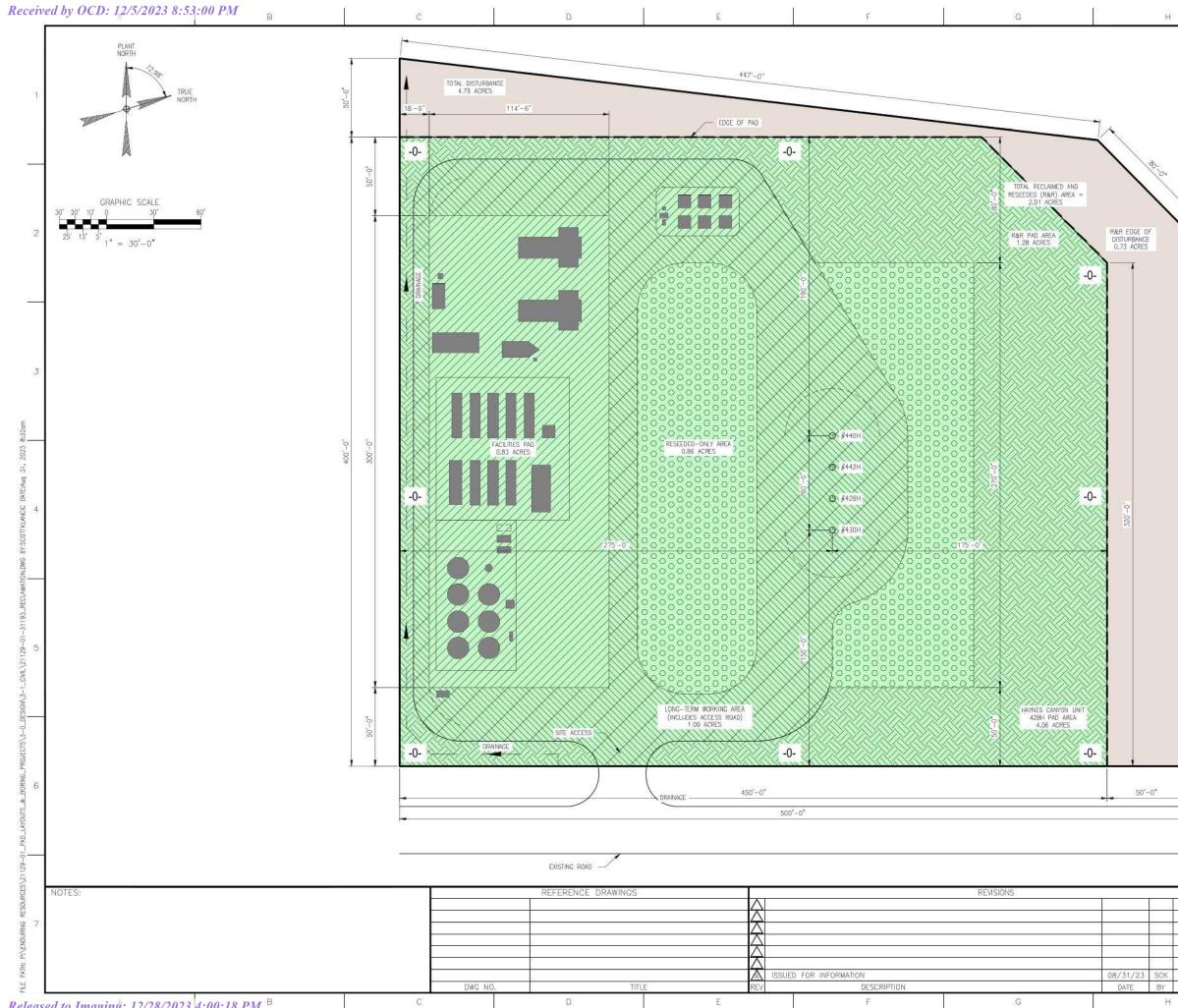
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NTE	ENDURING RI HAYNES CANYON PROPOSED RE	N UNIT 428H ECLAMATION	
	BBS         SCALE:         (FORMATTED 22X34)           APR         1"=30'-0"	DRAWING ND. 21129-01-31193	

1

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# **ROAD MAINTENANCE PLAN**

# <u>Haynes Canyon Unit (HCU) 428H-Four Well Site Reoccupation Project</u> <u>HCU 428H, 430H, HCU440H, HCU442H HCU</u>

September 2023



# **ENDURING RESOURCES IV, LLC**

200 Energy Court Farmington, New Mexico 87401 Phone: (505) 636-9720

## **1. INTRODUCTION**

Enduring Resources IV, LLC (Enduring) is providing this Road Maintenance Plan (Plan) to the Bureau of Land Management Farmington Field Office (BLM-FFO) as part of the Surface Use Plan of Operations (SUPO) for the Haynes Canyon Unit (HCU) Four Well (428H, 430H, 440H, 442H) Oil and Natural Gas Project (HCU 428H Project). The existing 22.5-foot road addressed in this Plan was previously permitted and constructed under the Applications for Permit to Drill (APD) for the HCU 414H. The coordinates for the access road is as follows:

- Start: N 72<sup>0</sup> 39'25W
- End: N 72<sup>0</sup> 37'03W

The road maintenance procedures provided in this Plan meet the standards established in The Gold Book: Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development and BLM Manual 9113. Per the HCU 428H Project APD's, Enduring will be responsible for road maintenance associated with the aforementioned wells. This responsibility will continue until Enduring transfers the permit or abandons the project and obtains a Final Abandonment Notice or relinquishment from the BLM-FFO. Refer to the SUPO or Conditions of Approval (COAs) attached to the approved APDs for any upgrades to existing roads.

## 2. ROAD INSPECTIONS

Enduring Representatives will formally inspect the road biannually, in the spring and fall, to assess the condition of the road. The formal road inspection will be recorded on a Road Inspection Form (blank form attached to this Plan). Completed Road Inspection Forms will be kept on file at Enduring and can be provided to the BLM-FFO, if requested.

Additionally, outside of the formal inspection period, Enduring Representatives driving to/from the project area will assess the condition of the road and notify the Enduring Construction Supervisor if maintenance is needed.

Road maintenance activities will be documented at Enduring and can be provided to the BLM-FFO, if requested.

## **3. ROAD MAINTENANCE**

The following maintenance may be performed on an as needed basis:

- Water control structures (such as culverts, ditches, and silt traps) and/or cattle guards may be cleaned. If this occurs, the soil/sediment material will be spread on area roads or locations.
- Bar ditches may be pulled.
- Low water crossings and drainage dips may be cleared and/or repaired.
- Crowning may be repaired.
- Litter may be collected.
- Noxious weeds may be treated or controlled following the BLM-FFO noxious weed guidelines.
- The access road may be bladed.

# **ROAD INSPECTION FORM**

Road Name:	County:
Date:	Time:
Weather:	
Inspector(s):	
Road Surface Type:	

Dood Condition Inspection Itoms	Road Condition					
Road Condition Inspection Items	Good	Poor	Comment			
Water Control Structure(s)						
Low Water Crossing(s)						
Road Crowning/Ruts/Potholes						
Road Surfacing						
Cattle Guard(s)						
Litter						
Noxious Weeds Within/Adjacent to Roadway						
Vegetation Within Roadway						

Additional Site Specific Inspection Notes:

# **SURFACE RECLAMATION PLAN**

# Haynes Canyon Unit (HCU) 428H-Four Well-Site Reoccupation Project

# <u>HCU 428H, HCU 430H, HCU 440H, HCU 442H</u>

SEPTEMBER 2023



**ENDURING RESOURCES IV, LLC** 

200 Energy Court

Farmington, New Mexico 87401

Phone: (505) 636-9720

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## 1. INTRODUCTION

This Surface Reclamation Plan (Plan) has been prepared for the Bureau of Land Management (BLM) Farmington Field Office (FFO) to support the Surface Use Plan of Operations (SUPO) for the Haynes Canyon Unit (HCU) 428H-Four Well-Site Reoccupation Project HCU 428H, HCU 430H, HCU 440H, HCU 442H (HCU 482H Project). Following the guidance provided in Appendix A (SUPO Procedure) of the *Farmington Field Office Bare Soil Reclamation Procedures* (Procedures) (BLM 2013), this Plan will be used to re-establish vegetation and control New Mexico Department of Agriculture (NMDA)–listed Class A and Class B noxious weeds (NMDA 2020) within the project area. Information associated with the project is provided in Table 1.

#### **Table 1. Project Information**

Applicant:	Enduring Resources IV, LLC	
Project Name:	Haynes Canyon Unit (HCU) 428H-Four Well-Site Reoccupation Project	
Project Features:	<ul> <li>Reoccupation of existing HCU 414H well pad and facilities</li> <li>Four proposed oil and gas wells (HCU 428H, HCU 430H, HCU 440H, HCU 442H)</li> </ul>	
Lease Number(s):	NMNM-028733	
Unit Number:	NMNM-142111X	
Land Manager(s):	BLM-FFO	
Mineral Manager(s):	BLM-FFO	
Associated Authorization Applications, Pending:	4 APDs	

Enduring may submit a request to the BLM-FFO to revise this reclamation plan at any time during the life of the project in accordance with page The Gold Book: Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (BLM and U.S. Forest Service 2007). Enduring would include justification for the revision request.

The Enduring contact person for this reclamation plan is:

Theresa Ancell Regulatory Manager Enduring Resources IV, LLC 200 Energy Court Farmington, New Mexico 87401 505-636-9720

## 2. PROJECT DESCRIPTION

#### 2.1. Location

The project area is in Rio Arriba County, New Mexico, approximately 60 miles south-southeast of Bloomfield, New Mexico. The project area can be accessed as follows:

- From Bloomfield (intersection of U.S. Highway 550 and U.S. Highway 64), travel south on U.S. Highway 550 for approximately 53.8 miles.
- Turn left on County Road 379 (State Highway 403) and continue for 1.5 miles.
- Turn right, remaining on County Road 379 for 1.4 miles.
- The access road is on the left side of the road and continues for 22.5 feet to the well pad.

The project area is located on lands managed by the BLM FFO. The legal location is provided below.

#### 2.1.1. Well Pad

#### BLM-managed surface

Enduring would utilize the existing 4.79-acre HCU 414H well pad located in the SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> of Section 3, Township (T) 23 North (N), Range 6 West (W), New Mexico Principal Meridian (NMPM).

#### 2.1.2. Access Road

Enduring will utilize an existing 22.5-foot-long access road. No new surface disturbance is anticipated.

### 2.2. Surface Disturbance

Enduring proposes to utilize the existing HCU 414H well pad, existing access road and existing pipeline/utilities corridor for the proposed HCU 428H four well project; no new surface disturbances are anticipated. During construction, the project working area would be lightly "skimmed" and cleared of vegetation and topsoil would be stored in designated areas. During interim reclamation, approximately 3.71 acres will be reclaimed. The remaining 1.09 acres of the project area will remain disturbed throughout the life of the project and will be reclaimed during final reclamation, when the project is abandoned.

Based on the amount of surface disturbance, Vegetation Reclamation Procedure B applies to this project (BLM 2013). Vegetation Reclamation Procedure B is described further in the Procedures (BLM 2013). Surface disturbance is summarized in Table 2 below.

#### Table 2. Surface Disturbance Associated with the Project

Project Feature	Summarized Description	Landowner/ Land Manager	Existing Surface Disturbance (acres)	Interim Reclamation (acres)	Final Reclamation (acres)
Access Road	Existing, preauthorized	BLM	0.01	NA	0.01

Project Feature	Summarized Description	Landowner/ Land Manager	Existing Surface Disturbance (acres)	Interim Reclamation (acres)	Final Reclamation (acres)
Well pad	Existing, Preauthorized The well pad measures approximately 500' × 450'	BLM	4.79	3.71	1.08
Total <sup>†</sup>		BLM	4.80	3.71	1.09

<sup>†</sup> Totals may vary due to rounding discrepancies.

### 2.3. Pre-Disturbance On-Site/ Site Visit Meeting

A pre-disturbance on-site meeting for the project was held with representatives from the BLM-FFO, Enduring, and SWCA Environmental Consultants (SWCA) on June 27, 2023. The BLM-FFO invited stakeholders and interested parties to the meeting. Aside from those listed, no private citizens or other groups attended.

## **3. SITE CONDITIONS**

The project area topography is fairly level. The elevation of the project area ranges from approximately 6,690 to 6,710 feet above mean sea level. Two soil types are mapped within the project area: Blancot-Notal association and Gypsiorthids-Badland-Stumble complex (Natural Resources Conservation Service 2023). Based on the climatic records for Lybrook, New Mexico (Station No. 295290), this area has an average annual maximum temperature of 61.1 degrees Fahrenheit and an average annual minimum temperature of 34.9 degrees Fahrenheit. The average annual rainfall is 10.8 inches, with the majority occurring between July and September. The average annual total snowfall is 25.3 inches, which largely occurs between October and April (Western Regional Climate Center 2023). Soil testing may be conducted prior to reclamation activities, if requested by the BLM.

### **3.1.** Vegetation Community

Reclamation standards are based on eight BLM FFO-designated vegetation communities that are outlined in the Farmington Field Office Bare Soil Reclamation Procedures (BLM 2013). During the on-site meeting on June 27, 2023, the BLM determined that the sagebrush community would best describe the project area prior to previous disturbances. Dominate species in the surrounding area include sagebrush (*Artemisia tridentata*), blue grama (*Bouteloua gracilis*), and fourwing saltbush (*Atriplex canescens*). Existing disturbances within the project area include the NELCA 176H well pad, an access road, and livestock grazing. There was no indication of current recreational activity.

During the pre-disturbance on-site meeting, SWCA and Enduring personnel conducted a noxious weed survey for New Mexico Department of Agriculture (NMDA)–listed Class A and Class B noxious weeds in the project area. No NMDA-listed noxious weed species were identified within the project area.

Please refer to the onsite noxious weed form in Appendix A for details.

### 3.2. Project Area Photographs

Photographs of the project area to be reclaimed are provided in Table 3.

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### Table 3. Project Area Photographs

Photograph Description	Photograph
Photograph taken from the center of the well pad; view facing north.	
Photograph taken from the center of the well pad; view facing south.	<image/>

•

Photograph Description	Photograph
Photograph taken from the center of the well pad; view facing east.	
Photograph taken from the center of the well pad; view facing west.	

## 4. RECLAMATION TECHNIQUES FOR SUCCESSFUL REVEGETATION

The BLM FFO will be notified at least 48 hours prior to the start of reclamation activities. Final facility layouts and placement were determined at the formal BLM facility on-site meeting with the BLM FFO.

## 4.1. Interim Reclamation

Interim reclamation will take place within 120 days of final construction. This phase will occur following the construction, drilling, and completion phases of the project. Areas that will be reclaimed during interim reclamation are described in Section 2.2.

## 4.2. Vegetation and Site Clearing

If present, trees and brush 3 inches in diameter or greater at ground level will be cut and stacked for wood gatherers. All other trees and brush will be mowed or mulched at ground level. Stumps and root balls will be hauled to an approved disposal site or stockpiled at the edge of the well pad and buried in the cut slopes of the well pad during interim reclamation. Any slash and brush will be chipped, shredded, or mulched, and incorporated into the topsoil for later use in interim reclamation. Vegetation that has re-established within the interim reclaimed portions of the disturbance area will be mulched and incorporated into the topsoil as additional organic matter.

## 4.3. Topsoil Stripping, Storage, and Replacement

The upper 6 inches of topsoil (if available) will be stripped following vegetation mulching. Topsoil would not be mixed with the underlying subsoil horizons and would be stockpiled as a berm/windrow along the interior perimeter of the construction buffer zone. Topsoil and sub-surface soils will be replaced in the proper order, prior to final seedbed preparation. Topsoil will be spread evenly over sub-soils upon completion of recontouring operations and prior to final seedbed preparation. Redistribution of topsoil shall not be done when the ground or topsoil is wet. Vehicle/equipment traffic will not be allowed to cross topsoil stockpiles. If topsoil is stored for a length of time such that nutrients are depleted from the topsoil, amendments would be added to the topsoil as advised by the Enduring environmental scientist or appropriate agent/contractor.

## 4.4. Recontouring

All disturbed areas related to the project area will be recontoured to blend with the surrounding landscape, emphasizing restoration of the existing drainage patterns and landforms to pre-construction condition to the extent practicable. Within areas that require recontouring, the surface will be recontoured to match pre-disturbance conditions (particularly drainage patterns) or to blend with the surrounding landform as closely as possible.

The well pad will be contoured to blend with the surrounding landforms, removing signs of cut/fill slopes. The fill slope on the northern sides of the location and stockpiled berm just northeast of the fill slope will be pushed (dozer)/excavated (excavator)/or carried (belly scraper) and placed within the cut slope on the southern sides of the location. Natural rolling contours will be implemented to break up the surface and aid in removing signs of the well pad once vegetation establishes.

## 4.5. Water Management/Erosion Control Features

The BLM-FFO and the Enduring would work in collaboration to develop site-specific erosion control or water management features and to identify installation locations. Potential erosion control or water management features that may be used include (but are not limited to) water bars or rolling dips for roads, sediment basins or sediment traps, check dams, silt fencing, bellholes upstream of culverts, outlet protection for culverts, erosion control blankets, straw bales, and straw wattles.

As determined during the on-site visit on June 27, 2023, the following water management/erosion control features would be implemented during construction of the project:

• Diversions will be constructed as needed.

During interim reclamation, areas of the project that are not needed for long-term operations and maintenance will be recontoured to reestablish disturbed terrain and blend into the surrounding landscape. The natural drainage network would be reestablished as practicable with necessary diversions around the long-term project footprint.

#### 4.6. Seedbed Preparation

For cut-and-fill slopes, initial seedbed preparation would consist of pushing (dozer)/excavating (excavator)/hauling (belly scraper) the unneeded fill slope material and placing it within the cut slopes. Natural rolling contours would be implemented to break up the surface and aid in removing signs of the sharp well pad corners once vegetation establishes. Emphasis would be placed on restoration of the existing drainage patterns and landforms to pre-construction conditions, to the extent practicable.

Within areas that would be reseeded, stockpiled topsoil would be evenly redistributed prior to final seedbed preparation. Seedbed preparation within compacted areas would include ripping to a minimum depth of 18 inches and spacing furrows 2 feet apart. Ripping would be conducted perpendicularly in two phases, where practicable. If large clumps/clods result from the ripping process, disking would be conducted perpendicular to slopes in order to provide terracing and minimize runoff and erosion. Final seedbed preparation would consist of raking or harrowing the spread topsoil prior to seeding to promote a firm (but not compacted) seedbed without surface crusting. Seedbed preparation may not be necessary for topsoil storage piles or other areas of temporary seeding.

#### 4.7. Soil Amendments

Soil amendments would be added to the topsoil, if needed, as advised by the Enduring environmental scientist or appropriate surface management agency. During the onsite meeting, no soil amendments were identified for use during reclamation.

#### 4.8. Seeding

Table 4 lists BLM FFO's sagebrush seed pick list was identified as suitable for the project area. The seed pick list components are listed in Table 5.

Common Name	Scientific Name	Pure live Seed lbs/acre <sup>1</sup>
Fourwing saltbush	Atriplex canescens	2.0
Winterfat	Krascheninnikovia lanata	2.0
Sand dropseed	Sporobolus cryptandrus	0.5
Western wheatgrass	Pascopyrum smithii	4.0
Indian ricegrass	Achnatherum hymenoides	4.0
Blue grama	Bouteloua gracilis	2.5
Bottle brush squirreltail	Elymus elymoides	3.0
Blue flax	Linum lewisii	0.25
Rocky Mountain bee plant	Cleome Serrulata	0.25

#### Table 4. BLM Farmington Field Office Sagebrush Community Seed Mix

<sup>1</sup>Based on 60 PLS per square foot, drill seeded; double this rate (120 PLS per square foot) if broadcast or hydro-seeded.

Seeding will occur immediately following recontouring and seedbed preparation. A disc-type seed drill with two boxes for various seed sizes will be utilized for seeding the disturbed areas of the site. Enduring or its reclamation subcontractor will ensure that perennial grasses and shrubs are planted at the appropriate depth. Intermediate-size seeds (such as wheatgrasses and shrubs) will be planted at a depth of 0.5-inch, larger seeds (such as Indian ricegrass) will be planted at a depth of 1 to 2 inches, and small seeds (such as sand dropseed) will be planted at a depth of 0.25 inch. In situations where differing planting depths are not practicable with the equipment being used, the entire mix will be planted no deeper than 0.25 inch. A drag, packer, or roller will follow the seeder to ensure uniform seed coverage and adequate compaction. Seeding will be run perpendicular to slopes in order to minimize runoff and erosion.

Drill seeding may be used on well-packed and stable soils on gentler slopes and where tractors and drills can safely operate. Where drill seeding is not practical, the contractor will hand broadcast seed using a "*cyclone*" hand seeder or similar broadcast seeder. Galleta seed may also be broadcast; due to the light fluffy nature of this seed, it does not seed well through a drill seeder. Broadcast application of seed requires a doubling of the drill-seeding rate. The seed will then be raked into the ground so that the seed is planted no deeper than 0.25 inch below the surface.

Upon completion of seeding, straw mulch will be spread across the reclaimed area and crimped into the soil. This will promote site stabilization and slightly increase moisture retention.

#### 4.9. Noxious and Invasive Weed Control

Should any noxious or invasive weeds be documented within the project area following the completion of reclamation activities, Enduring will follow the guidance outlined in their Pesticide Use Proposal approved by the BLM FFO. Enduring will submit all required documentation for weed treatments associated with the proposed project; this includes chemical and manual weed removal. Enduring will submit a Pesticide Use Report quarterly and annually or when requested by the BLM-FFO Authorized Officer or the BLM-FFO Noxious Weed Specialist.

## 5. MONITORING REQUIREMENTS

Reclamation monitoring is required to document attainment of the vegetation percent cover standard and reclamation success. The monitoring and reporting methods described below will apply to both interim and final reclamation. Monitoring and reporting requirements remain in effect as long as the permit, grant, or authorization is in force, and until all associated facilities and infrastructure are abandoned by BLM procedure and a FAN and/or relinquishment is issued. The vegetation percent cover referenced below is described in detail in Section 5.4 (Reclamation Attainment).

### 5.1. Initial Monitoring and Reporting

Monitoring sites will be established by the BLM FFO, in collaboration with Enduring, during the required earthwork and/or seeding inspections. Initial monitoring tasks will be conducted by the BLM FFO. The BLM FFO will submit the initial monitoring reports to Enduring within 60 days of conducting the initial monitoring tasks.

#### 5.2. Annual Monitoring and Reporting

Enduring will perform annual monitoring starting 2 calendar years after BLM FFO's approval of earthwork and/or seeding. Annual monitoring will continue until the vegetation percent cover standard has been attained. Annual monitoring reports will be submitted to the BLM FFO by December 31 of the year monitored.

#### 5.3. Long-Term Monitoring

After the required percent revegetation standard has been attained, Enduring will begin long-term monitoring. This includes, every fifth year after attainment as determined by the BLM FFO, Enduring will monitor the site at all established photo points to ensure the site remains productive and stable. Enduring will submit the monitoring report to the BLM by December 31 of the year monitored.

#### 5.4. Reclamation Attainment

Per the Procedures (BLM 2013), the following foliar percent cover standards listed in Table 5 must be attained for reclamation to be considered successful.

Functional Group	Percent (%) Foliar Cover	Common Species
Trees/Shrubs/ Grasses/ Forbs	≥ 35	Utah juniper, Piñon pine; big sagebrush, four-wing saltbush, antelope bitterbrush, alkali sacaton, Western wheatgrass, Indian ricegrass, galleta, sand dropseed, scarlet globemallow, wooly Indian wheat, fleabane, Penstemon spp., buckwheat, threadleaf groundsel.
Invasive/undesirables 10% allowed toward meeting standard of 35%	≤ 10	Plants that have the potential to become a dominant species on a site where its presence is a detriment to revegetation efforts or the native plant community. Examples of invasive species include cheatgrass, Russian thistle, halogeton.

#### Table 5. Reclamation Goal for Sagebrush Community

When vegetation meets the attainment standards listed in Table 4 and as required by the BLM-FFO Bare Soil Reclamation Procedure, Enduring may request BLM-FFO concurrence that vegetation percent cover standards have been attained any time after 2 calendar years of completion of earthwork and seeding. Enduring will submit a final abandonment notice (FAN), identifying that revegetation standards have been attained. The BLM-FFO will reply to the operator to confirm concurrence (or not) with a rationale for the determination within 60 days of receiving the

request. If the revegetation standards are not being attained, Enduring and the BLM-FFO will analyze the issues that may have contributed to vegetation reclamation failure or lack of meaningful progress. Remedial actions will be developed collaboratively if vegetation percent cover standards are not being attained. Details regarding this process can be found in the Procedures (BLM 2013).

## 6. REFERENCES

- Bureau of Land Management (BLM). 2013. Farmington Field Office Bare Soil Reclamation Procedures. Available at: http://www.emnrd.state.nm.us/MMD/AML/documents/FFOBareSoilReclamationProcedures2-1-13.pdf. Accessed July 2023.
- Bureau of Land Management (BLM) and U.S. Forest Service. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+307/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.
- Natural Resources Conservation Service. 2023. Web Soil Survey. Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed July 2023.
- New Mexico Department of Agriculture (NMDA). 2020. Memo: New Mexico Noxious Weed List Update. Available at: <u>https://nmdeptag.nmsu.edu/apr/noxious-weeds.html.</u> Accessed July 2023.
- Western Regional Climate Center. 2023. New Mexico Climate Summaries: Lybrook, New Mexico (295290). Available at: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?nm5290. Accessed July 2023.

#### **APPENDIX A. ONSITE NOXIOUS WEED FORM**

## **Onsite Noxious Weed Form**

If noxious weeds are found during the onsite, fill out form and submit to FFO weed coordinator Operator <u>Enderny</u> Well Name and Number <u>Haynes</u> Location: Township, Range, Section Surveyor(s) (angon 42817 Date 202

Location of Project NAD 83 Decimal Degrees 4. 1296"N 107 4635

<b>Class A Noxio</b>	us Weed – C	Check Box i	if Found
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Chubb II HOARdub II Chubb Don II I Cunu				
Alfombrilla	Diffuse knapweed	Hydrilla	Purple starthistle	Yellow toadflax
Black henbane	Dyer's woad	Leafy spurge	Ravenna grass	
Camelthorm	Eurasian watermilfoil	Oxeye daise	Scotch thistle	
Canada thistle	Giant salvinia	Parrotfeather	Spotted knapweed	
Dalmation toadflax	Hoary cress	Purple loosestrife	Yellow starthistle	

#### Class B Noxious Weed - Check Box if Found

African rue	Perennial pepperweed	Russian knapweed	Tree of heaven
Chicory	Musk thistle	Poison hemlock	
Halogeton	Malta starthistle	Teasel	

#### **Comments:**

6/27/23 **FFO Representative:** 

sign and date Operator Representative < sign and date

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# Onsite Notes for Enduring Resources IV, LLC's Proposed Haynes Canyon Unit 428H Pad

Will be located on an **existing** location. The APD's on said location have expired.

## Onsite Date: June 27, 2023

Attendees		
NAME	ORGANIZATION	
Harley Davis	BLM NRS	
Gary Smith	BLM-FFO NRS	
Jason Meininger	Division of Conservation Archaeology (DCA)	
Jason Edwards	NCE Surveys	
Johnny Stinson	Enduring Resources	
Lena Wilson	Enduring Resources	
Casey Haga	Enduring Resources	

Notes that require change in plats are identified in Red.

Notes that Enduring needs to answer and consider are in Blue.

<u>Please review all onsite notes and reply to the entire group if there are</u> <u>changes, mistakes, or additional notes I may have missed. If there are replies</u> <u>with changes, I will update these notes with them accordingly. If you have</u> <u>questions or concerns, please contact me at:</u>

(970)-769-8814 or at chaga@enduringresources.com



# **ENDURING RESOURCES IV, LLC**

200 Energy Court Farmington, New Mexico 87401 Phone: (505) 636-9720

### Project Name: Haynes Canyon Unit 428H, 430H, 440H, and 442H

On/Off lease: On Lease

Surface: <b>BLM</b>	Mineral: Federal	

## **Onsite Notes**

### **Project Scope and Region**

- ▲ These wells are being proposed on an existing location that has two expired APDs. The wells were never drilled however the pad, road, and pipe were all constructed. The facilities were also constructed and then partially reallocated to another location (some facilities remain). The SUPO needs to reflect that this "disturbance" exists but written in a level of detail as a new project since we currently hold no active APD to the location.
- Region dominated by sagebrush shrublands. Ephemeral wash adjacent to the western edge of the existing well pad. Location sits within a canyon surrounded by small mesas with sandstone outcrops.

### Access Road

 Well pad is located adjacent to county road 379 with existing access onto location. Reestablish/improve.

### Well Pad

• Well pad is existing but we don't hold active APD. The well pad was interim reclaimed but never fully reclaimed. We will permit the original footprint as seen in the plats.

### Well Connect Pipeline

- Whiptail has existing pipe to location and the GL Trunk Line B Survey is to this location if needed.
- Need to plan layflat route.
- Need to survey layflat route.

#### **Topsoil Storage**

• Mulch vegetation into topsoil then strip and windrow along perimeter of location within the EOD.

#### Production Facilities

- Facilities are/will be located on the southwestern end of location.
- This location will serve as a remote facility to the HCU 432H location as well.

#### **Facilities** Color

Juniper Green

### <u>Seed Mix</u>

Sagebrush seed mix

### **Other Notes**

None



# **SURFACE USE PLAN OF OPERATIONS**

## Haynes Canyon Unit (HCU) 428H-Four Well-Site Reoccupation Project

<u>HCU 428H, HCU 430H, HCU 440H, HCU 442H</u>

SEPTEMBER 2023



# **ENDURING RESOURCES IV, LLC**

200 Energy Court Farmington, New Mexico 87401 Phone: (505) 636-9720

Released to Imaging: 12/28/2023 4:00:18 PM

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## **1. INTRODUCTION**

### 1.1. Purpose and Intent

The purpose of the Proposed Project is to allow Enduring Resources IV, LLC's (Enduring) reasonable access to public lands to develop federal minerals administered by the Bureau of Land Management's (BLM's) Farmington Field Office (FFO) and New Mexico Oil Conservation Division (NMOCD) for Enduring's valid mineral lease (NMNM-028733) within the Haynes Canyon Unit (NMNM-142111).

The need for the Proposed Project is BLM's requirement to respond to Enduring's Application for Permit to Drill (APD). Per Onshore Oil and Gas Operating Regulations (43 Code of Federal Regulations [CFR] 3160); the Mineral Leasing Act (MLA) of 1920, as amended (30 United States Code [USC] 181 et seq); and the Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.).

In accordance with Onshore Oil and Gas Order No. 1 (43 CFR 3160), this Surface Use Plan of Operations (SUPO) has been prepared for Enduring's proposed Haynes Canyon Unit (HCU) 428H-Four Well-Site Reoccupation Project HCU 428H, HCU 430H, HCU 440H, HCU 442H (HCU 428H Project). The project as proposed would provide for the drilling, development, transportation, operation, and maintenance of the HCU 428H Project.

The proposed action is not known to cross or impact any U.S. Army Corps of Engineers (USACE) jurisdictional Waters of the U.S. (WOUS).

The information is provided to the surface management agency to give an accurate account of the proposed action for National Environmental Policy Act (NEPA) disclosure. This SUPO details only the proposed action, any alternatives considered in detail are described in the associated Environmental Analysis (EA) document.

Enduring will comply with all applicable laws, regulations, Onshore Orders, Conditions of Approval (COA) attached to the approved APDs, and this SUPO. No additional surface disturbance beyond that authorized by the approved APDs will be initiated without prior approval by the Authorized Officer (AO).

Enduring Resource IV, LLC (Enduring) may submit a request to the BLM-FFO to revise this SUPO at any time during the life of the project in accordance with The Gold Book: Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (BLM and U.S. Forest Service 2007). Enduring would include justification for the revision request.

The Enduring representative for this reclamation plan is: Theresa Ancell Regulatory Manager Enduring Resources IV, LLC 200 Energy Court Farmington, New Mexico 87401 505-636-9720

## **2. PROJECT DESCRIPTION**

Table 2.1. Project Information			
Applicant:	Enduring Resources IV, LLC		
Project Name:	Haynes Canyon Unit (HCU) 428H-Four Well-Site Reoccupation Project HCU 428H, HCU 430H, HCU 440H, HCU 442H (HCU 428H Project)		
Project Features:         One well pad with four wells and (production facilities if present) road corridor, co-located well tie pipeline, and utility corridor.			
Lease Number(s): NMNM-028733, New BLM System MLRS # NMNM105770949			
Land Manager(s):	BLM-FFO		
Mineral Manager(s):	BLM-FFO		

### **Table 2.1. Project Information**

Infrastructure proposed to be constructed, operated, subsequently interim reclaimed, and eventually fully reclaimed as part of the HCU 428H Project would be located on lease, located on BLM-FFO administered lands with Federal minerals. The project would be permitted, built, and operated per lease authority for the term of the proposed wells served in Enduring's surface lease (NMNM-028733, New BLM System MLRS # NMNM105770949) within the HCU (NMNM-142111).

The HCU 428H Project would be constructed within existing disturbance associated with previously permitted but un-drilled and developed HCU 414H well. The existing well pad, access road, and pipeline/utility corridor for the HCU 414H were permitted and constructed by a previous operator, WPX, however, the well was subsequently never drilled.

#### Existing on-lease infrastructure includes:

The 4.79-acre existing well pad proposed to be utilized for the HCU 428H Project well pad is irregularly shaped measuring approximately 500-foot by 450-foot at its longest sides which includes an irregular construction buffer zone/edge of disturbance (EOD) of 50 feet.

One existing 22.5-foot-long by 30-foot-wide access road corridor would be utilized to accommodate access for construction, drilling, completion, and long-term operation of the wells mentioned above; no new access road or upgrades are proposed.

The proposed wells would connect to the existing pipeline/utilities infrastructure on the existing HCU 414H well pad; no new pipeline/utility infrastructure corridors are proposed.

Separate permitting not associated with the HCU 428H proposed action, the HCU 432H proposed project located north of the proposed HCU 428H would include a 3383.8 pipeline/utilities corridor connecting HCU 432H to HCU 428H facilities and infrastructure.

#### Proposed HCU 428H Project infrastructure includes:

• The well pad would accommodate the development of four wells to produce Federal minerals within Enduring's HCU (NMNM-142111).

#### 2.1. Location

The HCU 428H Project is in the Southwest <sup>1</sup>/<sub>4</sub> of Southwest <sup>1</sup>/<sub>4</sub> of Section 3, Township 23 North, Range 6 West, New Mexico Principal Meridian (NMPM), 903 Feet from the south and 429 feet from the west line in Rio Arriba County, New Mexico.

See the existing road map and written directions in the survey plat package in Appendix A. Directions are from the intersection of US Hwy 550 and US Hwy 64 in Bloomfield, New Mexico.

## 3. Well site Construction and Layout

Drilling of the proposed HCU 428H Project would require utilizing a 4.79-acre existing well pad. This entire area would be utilized during construction, setting of production equipment, drilling, and completion phases. The Surface Hole Locations for the four wells associated with the HCU 428H Project are located below in Table 3.1.

Well flag	Footages	Latitude (NAD 83)	Longitude (NAD 83)
HCU 428H	903' FSL, 429' FWL	36.248667°N	-107.464358°W
HCU 430H	897' FSL, 448' FWL	36.248652°N	-107.464293°W
HCU 440H	916' FSL, 390' FWL	36.248698°N	-107.464489°W
HCU 442H	910' FSL, 409' FWL	36.248682°N	-107.464423°W

**Table 3.1. Surface Hole Locations** 

During construction, the existing well pad would be leveled to provide adequate space and a level working surface for vehicles and equipment. Excavated materials from cuts are used to fill portions of the well pad to level the surface. The approximate cuts, fills, and well pad orientation are shown on the cut/fill worksheet and cross-section diagrams in the survey plats found in Appendix A.

See Appendix E for the proposed Well Pad Facility Diagram showing the long-term well pad layout, areas to be reclaimed, and anticipated utilization of existing disturbance acreage; Well Pad Drilling Diagrams showing the location and orientation of the drill rig; and the Well Pad Completion Diagram, showing the location and orientation of the completion equipment.

#### **3.1. 3.1 Production Facilities**

Current plans include collocating facilities for the proposed HCU 428H and HCU 432H projects. Due to existing infrastructure present at the HCU 428H project location, current plans are for collocated production facilities to exist only at the HCU 428H project location. Existing production facilities for the HCU 428H Project are currently located on the north end of the well pad. However, due to the changing nature of projects, each project is being proposed with separate facilities to account for the potential changes in drilling sequence and schedule. Potential facilities on location may include but are not limited to (including facilities that may occur through the life of the four wells) and Temporary equipment during drilling, completion, and flowback operations may be placed anywhere within the permitted location. During road construction, production-associated equipment would be delivered and left within the permitted area until construction is complete.

#### 3.2. Best Practices and Mitigation Measures

Topsoil removal, storage, and protection are described in detail in the associated Surface Reclamation Plan.

## 4. PROPOSED NEW OR RECONSTRUCTED ACCESS ROAD(S)

During the June 27, 2023, onsite visit, it was determined by the operator and surface managing agency that County Road 379 (CR 379) and 22.5 feet of existing access road corridor would be utilized to access the proposed project location.

Upon approval, CR 379 and the project access road will be maintained, upgraded, or reconstructed to meet anticipated traffic volumes and all-weather access needs.

Any site-specific stipulations, design features, and Best /Management Practices (BMPs) discussed to be implemented on this section of the existing roadway are listed below (4.2 Best Practices and Mitigation Measures) and in Enduring's Road Maintenance Plan. See the construction plats in Appendix A for the access road length and location from existing established roads.

#### 4.1. 4.2 Best Practices and Mitigation Measures

- A. Enduring will construct, improve, and maintain roads in accordance with The Gold Book: Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. Enduring will defer to the county or the Roads Committee, when formed, for maintenance determinations for any existing County Roads or roads that are considered collector roads, utilized for the project. See Enduring's associated Road Maintenance Plan for more details.
- B. Any pre-existing water management and erosion control structures will be inspected and maintained to accommodate long-term stormwater control.
- C. If found to be necessary, additional water management features such as water bars, rolling dips, or culverts will be installed within the existing roadway if found to be necessary for maintaining a safe stable roadway allowing all-weather access.
- D. No construction or routine maintenance activities will be performed during periods when the soil is too wet to adequately support construction equipment. If equipment creates ruts deeper than six inches, the soil will be deemed too wet for construction or maintenance.
- E. Before any soil disturbing road or well pad construction-related activities, if present and warranted, the project area including the proposed access road and pipeline/utility corridor would be cleared of trees and vegetation. A compact track loader with a mulching attachment will mulch and incorporate all trees that measure less than 3 inches in diameter at ground level (if present) and slash/brush into the topsoil. A woodcutting crew will clear all trees three inches or greater at ground level (if present) with chainsaws. The mean height of any stump will not exceed one-half its diameter and in no case exceed six inches on the uphill side. Tree trunks (left whole) and large limbs will be stacked and made available to the public unless stipulated otherwise by the AO.
- F. Material will be imported only if necessary to establish a safe all-weather roadway. Once the roadway has been established, the driving surface may be capped if needed and deemed economically viable. Sandstone from a nearby permitted location would be the preferred surfacing material and would be laid approximately 8-12 inches thick.
- G. Maintenance of existing roads will be restricted to the existing disturbed footprint; no new surface disturbance will be created. Maintenance will continue until wells accessed by the existing roadway have been Plugged and Abandoned (P&A) and a Final Abandonment Notice (FAN) has been approved.
- H. During interim reclamation, once drilling and completion phases are complete for all wells on location, the roadway will be reduced in size to a 14-foot-wide running surface with 0 pullouts, and appropriate water/erosion control on each side of the roadway. The roadway will measure approximately 22 feet wide from the bottom of the borrow ditch to the bottom of the barrow ditch assuming a 24-inch lift on the road with 2:1 shoulder to the bottom of the ditch (silt traps, culvert bell holes, and turnout ditches will extend beyond this). All remaining disturbed areas within the 30-foot access road corridor and exterior to borrow ditches and back slopes anticipated to be needed for long-term maintenance will be reseeded in efforts to reduce erosion. Any established cut and fill slopes (including any Temporary Use Areas (TUAS) used for cut and fill) will be reseeded only to preserve safe and stable slopes.
- I. There are no steep slopes, side slopes, or large wash crossings requiring the need for additional TUAs beyond the 30-foot access road corridor.

- J. Due to the short nature of the proposed roadway and lack of foreseen drainage concerns, no new culverts are anticipated to be needed. If culverts exist or are found to be needed to maintain a safe and stable roadway, they would be installed during construction and/or interim reclamation. There are no pullouts necessary for the proposed access road due to its short nature and full sight distance from the new access road takeoff to the well pad.
- K. There are no Army Corps of Engineers designated Waters of the United States impacted by the proposed access road. No low water crossings would be required associated with the proposed action.
- L. The existing access road does not cross any existing fence lines.
- M. Enduring would maximize the use of native material within the project area to reduce or eliminate the need to haul in foreign material. This includes the use of sandstone surfacing material as opposed to foreign rock in this area. However, foreign materials such as pit run, gravel, road base, rip-rap cobblestone, and large boulders may be imported and used for reasons such as but not limited to elevating roadways, low water crossings, road surfacing, erosion control, culvert and cattle guard installations, natural barricade, surface replacement, and spot repairs. A map of potential borrowing sites where Enduring may obtain material can be found in Appendix D. The material sources have been labeled with the operator's name (if applicable) and legal location to the quarter-quarter. Material excavated during the establishment of silt traps and erosion control may also be used in construction project features.
- N. BMPs for dust abatement will be utilized along the roads to reduce fugitive dust during construction, drilling, completion, and any other heavy traffic activities during the life of the project. Water application using a rearspraying truck or other suitable means will be the primary method of dust suppression. If it is found to be necessary to apply commercial dust mitigation materials such as magnesium chloride, organic-based compounds, or polymer compounds; Enduring will seek approval from the appropriate surface managing agency. These dust mitigation measures may also be included as COAs attached to the approved APDs.
- O. The final reclamation of the proposed access road is discussed in the associated Surface Reclamation Plan.
- P. Topsoil removal, storage, and protection are described in detail in the associated Surface Reclamation Plan.

# **5. LOCATION OF EXISTING WELLS**

Water wells and oil and gas wells (plugged and abandoned, active, and proposed) within a one-mile radius of the HCU 428H Project are depicted in Appendix B. There are 2 water wells, 14 oil and gas wells (plugged and abandoned, active, or proposed) within a one-mile radius of the proposed well pad location.

## 6. WATER USE AND APPLICATIONS

Please see Appendix C for the water transportation map identifying the locations of the supply wells.

During construction, freshwater sources would be used for the drill point and concrete casing. Fresh water would be used to dampen native soils as fill material is placed in lifts. This would promote adequate compaction on the fill slopes of the access road and well pad, as well as control fugitive dust.

During initial drilling, and post completion drill out operations, construction activities, dust abatement, pad and road improvements; Enduring estimates using a consolidated 17,558 bbls of fresh water. This is inclusive for the four proposed wells for HCU 428H project.

The estimates are general and predicted using average past water volume usage for similar activities. Variables that can significantly affect these volumes include but are not limited to, soil type, grain size, grain shape, recent weather events, relative humidity, time of year, and soil moisture holding capacity.

Fresh water is additionally used on an as-needed basis for dampening native soils to maximum dry density using American Society for Testing and Materials (ASTM) standards to achieve acceptable engineered compaction, dust

suppression along dirt roadways during drilling, completion, and any other operations where heavy traffic may be anticipated. The total amount applied during these activities is all dependent upon, but not limited to, the length of the dirt road, weather conditions, relative humidity, density of traffic, and duration of traffic.

During completion operations, Enduring predicts using a consolidated 447,760 bbls of non-potable brine water from a non-potable formation, produced water, and recycled water. This is inclusive for the four HCU 428H project wells. Sources of these fluids and the process of recycling are discussed further below.

During completion operations, Enduring would use non-potable water from a non-potable water-bearing formation. Enduring may also utilize produced water gathered from their existing wells within the Mancos Gallup area. Produced water may be gathered and delivered to the HCU 482H Project via existing underground pipeline infrastructure and trucks. Produced water gathered at Shiprock San Juan, LLC's 4-1 CDP may also be tracked and used during completion operations. Flowback water from completion operations will be recycled for reuse. These non-potable sources will be gathered, stored, treated, and recycled at any of Enduring's Water Recycling Facilities.

Enduring filters and separates water contained within their recycling facilities in three phases. Phase one includes the retention of water within a 750 bbl water leg that separates 100-micron oil droplets and sediment/particles. Phase two, downstream of the water leg, water passes through a large coalesquer filter with estimated 30-micron oil droplet removal capabilities. The final phase of filtration before entering the containment includes passing through two filter pots in parallel containing bag or cartridge filters. These filters can vary in micron filtration sizing dictated by the solids recovered, likely, a range between 10-50 microns. Enduring will size bag or cartridge filters as necessary during operations. The average Entrada water supply well total dissolved solids (TDS) are 10,000+.

Flowback water from completion activities will be recycled and returned to an Enduring water recycling facility for reuse. Flowback water may contain solids, oil, and produced water when immediately returned from the wellbore. Before the water leaves the completion location, it will pass through the permanent facilities on location if built and commissioned or pass through a temporary treatment facility on location. Treatment will remove oil and solids before leaving the location. Flowback water may additionally pass through the permanent water treatment facility at the containment location before entering the containment if necessary. Flowback water within containment after treatment and filtration may contain a mixture of produced water and supply water from the Entrada Formation used for the stimulation process.

Enduring will fill and store water in all their water recycling containments and Above-Ground Storage Tanks (ASTs) for anticipated use during drilling and completion activities. Filling containments and ASTs via Entrada supply wells will begin no later than four to five working weeks before drilling and completion activities commence unless supplementary sources are used in addition thereto. Enduring provides all stimulation fluid properties and additives through the Frac Focus site established for reporting to State and Federal Agencies. See Frac Focus for stimulation fluid components.

## 7. LOCATIONS AND TYPES OF WATER SUPPLY

Fresh water would be obtained from the following location(s):

#### 5.3. Smelser (POD No. RG06855)

The Smelser Well is located in the northeast ¼ of the northeast ¼ of Section 9, Township 21, North Range 2 West, NMPM. The well is located at Latitude 36.069826° North and Longitude -107.04718° West. This source is located on private lands. Transportation from source will be via truck.

#### 5.4. Blanco Trading Post (POD No. SJ02105)

The Blanco Trading Post Well is located in the southwest <sup>1</sup>/<sub>4</sub> of the northeast <sup>1</sup>/<sub>4</sub> of Section 32, Township 25 North, Range 9 West, NMPM. The well is located at Latitude 36.359802° North and Longitude - 107.810310° West. This source is located on State of New Mexico lands managed by the New Mexico State Lands Office (NMSLO). Transportation from source will be via truck.

Non-Potable water would be obtained from the following location(s):

#### Enduring Resources NEU 2207-16B Water Recycling Facility

The NEU 2207-16B Water Recycling Facility is located in the Northwest ¼ of the Northeast ¼ of Section 16, Township 22 North, Range 9 West, NMPM. The supply well is located at Latitude 36.143567° North and Longitude -107.576013° West. This water recycling Facility is located on State of New Mexico lands managed by the NMSLO. Transportation from the source would be via truck unless alternate methods are otherwise permitted.

#### Enduring Resources WLU 2309-24N Water Recycling Facility

The WLU 2309-24N Water Recycling Facility is located in the Southeast ¼ of the Southwest ¼ and Southwest ¼ of the Southeast ¼ of Section 24, Township 23 North, Range 9 West, NMPM. The supply well is located at Latitude 36.205932° North and Longitude -107.741568° West. This water recycling Facility is located on public lands managed by the BLM-FFO. Transportation from the source would be via truck unless alternate methods are otherwise permitted.

#### Enduring Resources KWU 2309-19K Water Recycling Facility

The KWU 2309-19K Water Recycling Facility is located in the Northeast ¼ of the Southwest ¼ of Section 19, Township 23 North, Range 9 West, NMPM. The supply well is located at Latitude 36.210181° North and Longitude -107.831776° West. This water recycling Facility is located on public lands managed by the BLM-FFO. Transportation from the source would be via truck unless alternate methods are otherwise permitted.

#### Enduring Resources SEU 2206-200 Water Recycling Facility

The SEU 2206-200 Water Recycling Facility is located in the Southwest ¼ of the Southeast ¼ of Section 20, Township 22 North, Range 6 West, NMPM. The supply well is located at Latitude 36.117342° North and Longitude -107.488712° West. This water supply well is located on public lands managed by the BLM-FFO. Transportation from the source would be via truck unless alternate methods are otherwise permitted.

#### Enduring Resources NEL 2306-06P Water Recycling Facility

The NELC 2306-06P Water Recycling Facility is located in the South ½ of Section 14, Township 22 North, Range 8 West, NMPM. The supply well is located at Latitude 36.310147° North and Longitude -107.651626° West. This water supply well is located on public lands managed by the BLM-FFO. Transportation from the source would be via truck unless alternate methods are otherwise permitted.

## **8. CONSTRUCTION MATERIALS**

- A. Enduring will maximize the use of native material within the proposed project area to reduce or eliminate the need to haul in foreign material.
- B. All surface infrastructure would be constructed utilizing native borrow within the permitted area to create a balanced working surface. Surfacing material or fill material, such as sandstone, gravel, pit run, or road base would be used if needed and economically viable and obtained from an approved location.
- C. Material may be imported and used for any of the following reasons; low water crossings (pit run and road base), road surfacing (road base, gravel, or sandstone), erosion control (riprap cobblestone), barricades (boulders), under and surrounding equipment (gravel), and filling soft or muddy areas (sandstone, pit run, road base, or gravel).
- D. A map of borrow pit locations where Enduring may obtain material can be found in Appendix D. The borrow pits are labeled with the operating company name if applicable and the legal location of the quarter-quarter.
- E. Range ponds are not currently proposed to be constructed for the construction of the HCU 428H Project.

## 9. METHODS FOR HANDLING WASTE

#### A. Cuttings:

- Drilling operations will utilize a closed-loop system. Drilling of the horizontal laterals will be accomplished with water-based mud. Oil-based mud could be used contingent on the formation properties encountered.
- All cuttings will be placed in roll-off bins and hauled to a commercial disposal facility or land farm. Enduring will follow Onshore Oil and Gas Order No. 1 regarding the placement, operation, and removal of closed-loop systems. No blow pit will be used.
- Closed-loop tanks will be adequately sized for the containment of all fluids.
- B. Drilling Fluids:
  - Drilling fluids will be stored onsite in above-ground storage tanks. Upon termination of drilling operations, the drilling fluids will be recycled and transferred to other permitted closed-loop systems or disposed of at a designated facility.
- C. Spills:
  - Any spills of non-freshwater fluids will be immediately cleaned up and removed to an approved disposal site.
- D. Sewage
  - Portable toilets will be provided and maintained as needed during construction.
- E. Garbage and other waste material
  - All garbage and trash will be placed in enclosed metal trash containers. The trash and garbage will be hauled off-site and dumped in an approved landfill, as needed.
- F. Hazardous Waste
  - No chemicals subject to reporting under Superfund Amendments and Reauthorization Act Title III in an
    amount equal to or greater than 10,000 pounds will be used, produced, stored, transported, or disposed of
    annually in association with the drilling, testing, or completion of these wells.
  - No extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities will be used, produced, stored, transported, or disposed of annually in association with the drilling, testing, or completing of these wells.
  - All fluids (i.e., scrubber cleaners) used during the washing of production equipment will be properly disposed of to avoid ground contamination or hazards to livestock or wildlife.
- G. Flowback:
  - Flowback transported off location/through temporary flowback equipment will consist of approximately 1,000 bbls of produced water per day per well for approximately 14 days. After this flow-back period, production will be sent to the permanent facility for processing.
  - Flowback fluid will be gathered, recycled, and reused as described in Section 5. If there are no foreseeable drilling and completion operations, flow back will be disposed of at one of the disposal wells listed below.
- H. Produced water will be hauled by truck and/or if permitted, transported through below-grade or surface pipeline infrastructure to any of Enduring's water recycling facilities. Produced water may be gathered and used in future drilling and completion operations as an alternative disposal method.
- I. Enduring will dispose of produced water at the following facilities:
  - Disposal 001, API 30-045-26862, operated by Basin Disposal Inc., located in the Southeast ¼ of the Northwest ¼, Section 3, Township 29 North, Range 11 West.
  - Sunco Disposal 001, API 30-045-28653, operated by Agua Moss, LLC, located in the Southwest ¼ of the Northwest ¼, Section 2, Township 29 North, Range 12 West.

- Pretty Lady 30 11 34 001, API 30-045-30922, operated by Agua Moss, LLC, located in the Northwest ¼ of the Southeast ¼, Section 34, Township 30 North, Range 11 West.
- NE Lybrook SWD 001, API 30-039-31378, operated by Enduring Resources IV, LLC, located in the Northwest ¼ of the Southeast ¼ of Section 13, Township 23 North, Range 7 West.
- W Lybrook 2309 24N SWD 001, API 30-045-38292, operated by Enduring Resources IV, LLC, located in the Southeast <sup>1</sup>/<sub>4</sub> of the Southwest <sup>1</sup>/<sub>4</sub> of Section 24, Township 23 North, Range 9 West.

## **10.** PLANS FOR SURFACE RECLAMATION

A Surface Reclamation Plan for the HCU 428H Project has been provided as a separate document. The projectassociated Surface Reclamation Plan was prepared in accordance with Onshore Oil and Gas Order No. 1 and the BLM Bare Soil Reclamation Procedures.

The Surface Reclamation plan addresses:

- Configuration of the reshaped topography;
- Drainage systems;
- Segregation of spoil material;
- Surface disturbances;
- Backfill requirements;
- Redistribution of topsoil;
- Soil treatments;
- Seeding or other steps to reestablish vegetation;
- Weed control;
- and practices necessary to reclaim all disturbed areas.

## **11. SURFACE OWNERSHIP**

The project is located on public lands managed by the BLM-FFO

Bureau of Land Management Farmington Field Office 6251 College Boulevard, Suite A Farmington, New Mexico 87402 (505) 564-7600

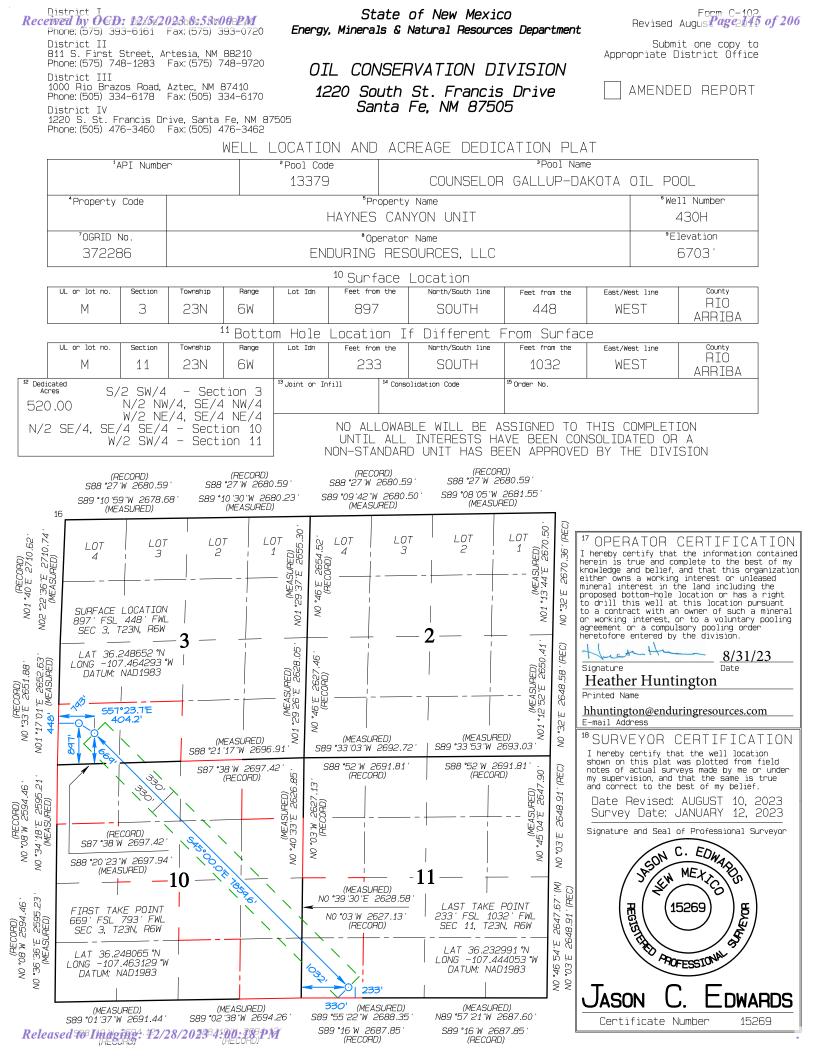
## **12.** OTHER INFORMATION

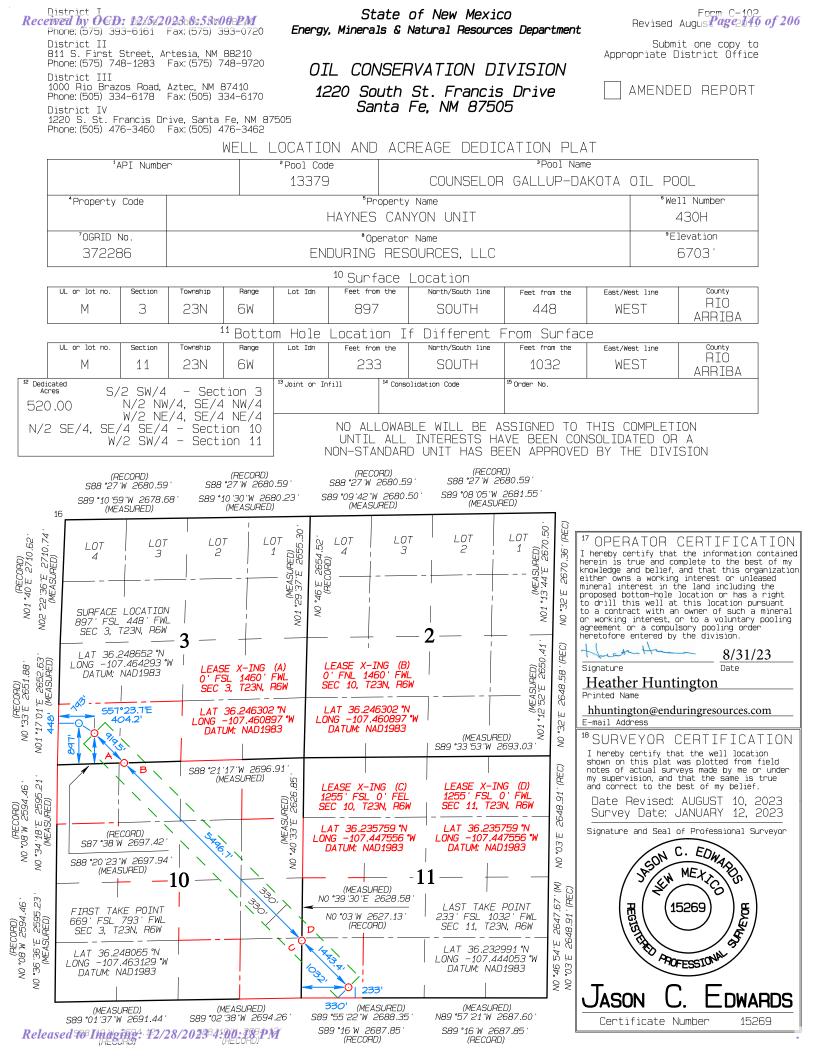
- A. Enduring's appointed construction contractors will call New Mexico One-Call (or equivalent) to identify the location of any marked or unmarked pipelines or cables located in proximity to the proposed HCU 428H Project or any other areas proposed to have ground disturbances at least two working days before ground disturbance.
- B. The construction phase of the project will commence upon receipt of an approved APD. The BLM-FFO will be notified via phone or email at least 48 hours before the start of construction activities associated with the project.
- C. All activities associated with the construction, use/operation, maintenance, and abandonment or termination of the HCU 428H Project will be limited to areas approved in the APDs.

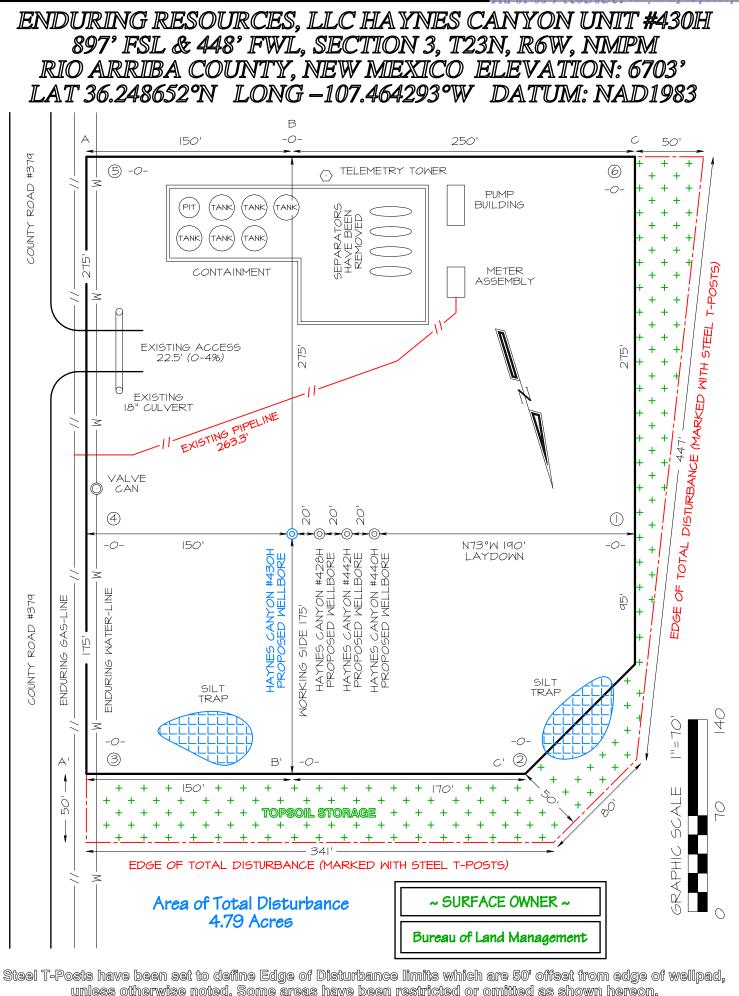
- D. The project area has been surveyed by the Division of Conservation Archeology (DCA). The cultural survey report has been submitted directly to the surface managing agencies. Cultural mitigation, monitoring, and implementation of site protection barriers will occur if stipulated in the COAs attached to the approved APDs.
- E. Per BLM at the June 27, 2023 onsite, a biological survey would not be required as no new surface is permitted or anticipated disturbance resultant of project approval and implementation. Any necessary protection of flora and fauna, Special Status Species (SSS), wildlife, migratory birds, water resources, and air resources will occur if stipulated in the COAs attached to the approved APDs or stipulations in the Right-of-Way (ROW) grants.
- F. Construction and maintenance activities will cease if soil or road surfaces become saturated to the extent that construction equipment is unable to stay within the project area and/or when activities cause irreparable harm to roads, soils, or streams.
- G. All BLM-FFO general COAs will apply to this proposed action.

# Appendix A. SURVEY PLATS

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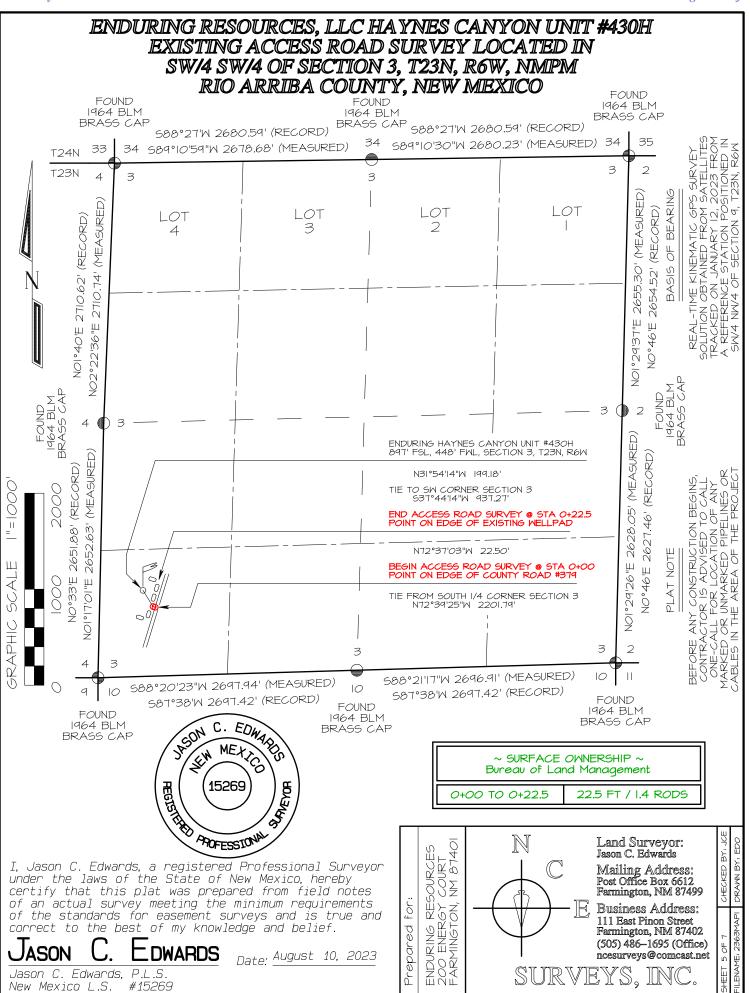
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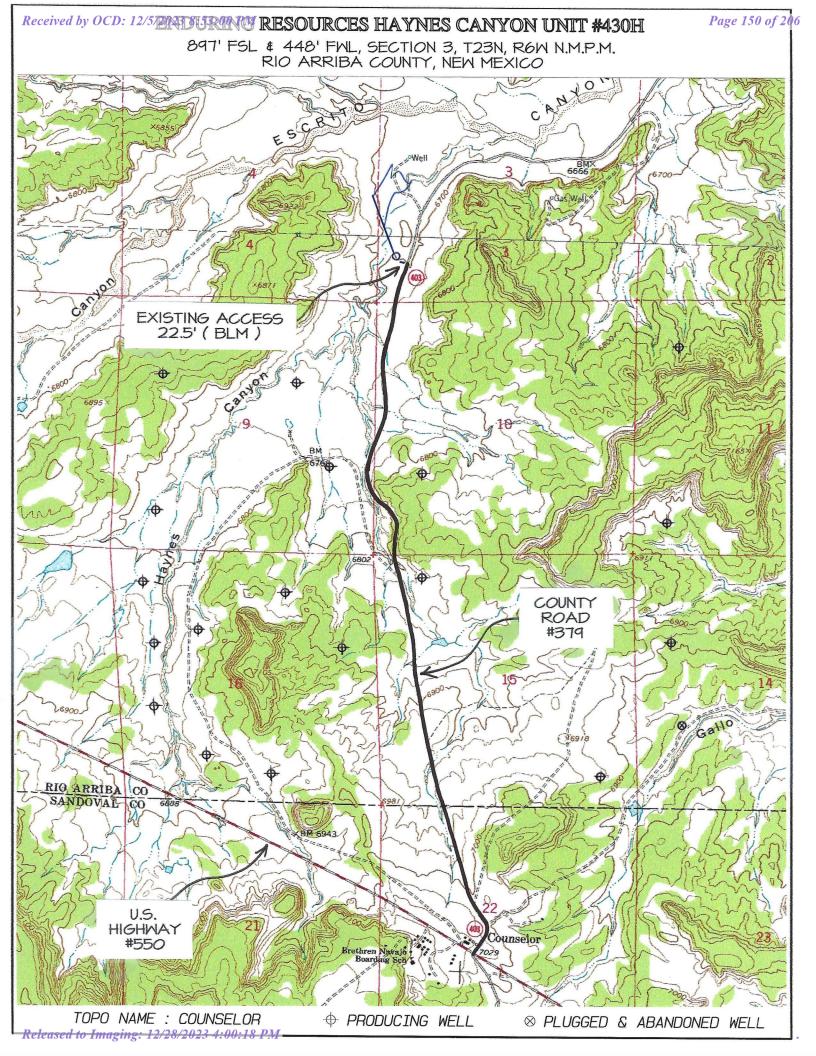
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#### Directions from the Intersection of US Hwy 550 & US Hwy 64

#### in Bloomfield, NM to Enduring Resources, LLC Haynes Canyon Unit #430H

#### 897' FSL & 448' FWL, Section 3, T23N, R6W, N.M.P.M., Rio Arriba County, NM

#### Latitude 36.248652°N Longitude -107.464293°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 53.8 miles to Mile Marker 97.6

Go Left (Northerly) on County Road #379 (aka State Highway #403) for 1.5 miles to fork in roadway;

Go Right (Northerly) which is straight remaining on County Road #379 (aka State Highway #403) for 1.4 miles to existing access road on left-hand side which continues for 22.5' to Enduring Haynes Canyon Unit #430H staked location.

## Appendix B. EXISTING WELLS WITHIN 1 MILE

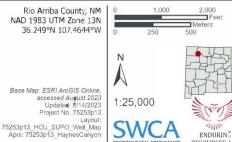
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#### HCU 428H Project | Wells Within 1 Mile Wellpad OSE Points of Diverson 1 Mile Buffer Oil and Gas Well Status Active Cancelled A Wells Within 1 Mile Within Map Extent 0 New **OSE Points of Diversion** 2 Active O&G 12 5 Plugged (site released) $\oplus$ Cancelled O&G 2 0 Released to Imaging: 12/28/2023 4:00:18 PM 2

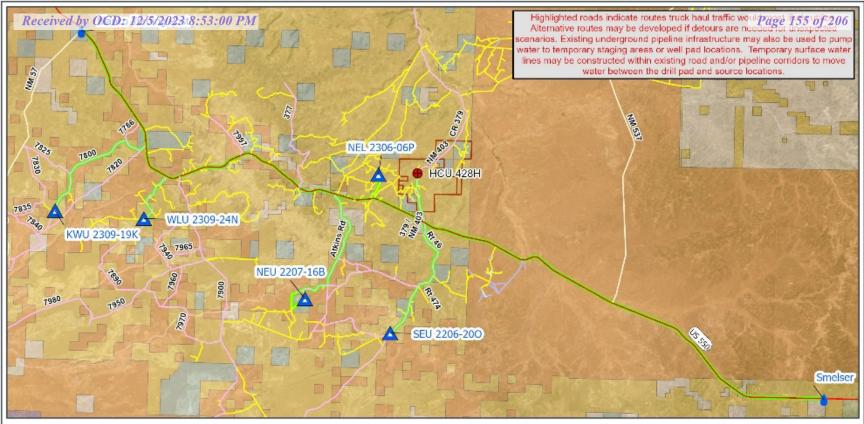
Plugged (site released) O&G



RESOURCES, LLC

### Appendix C. WATER TRANSPORTATION MAP

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#### HCU 428H Project | Water Transportation



Unit Boundary



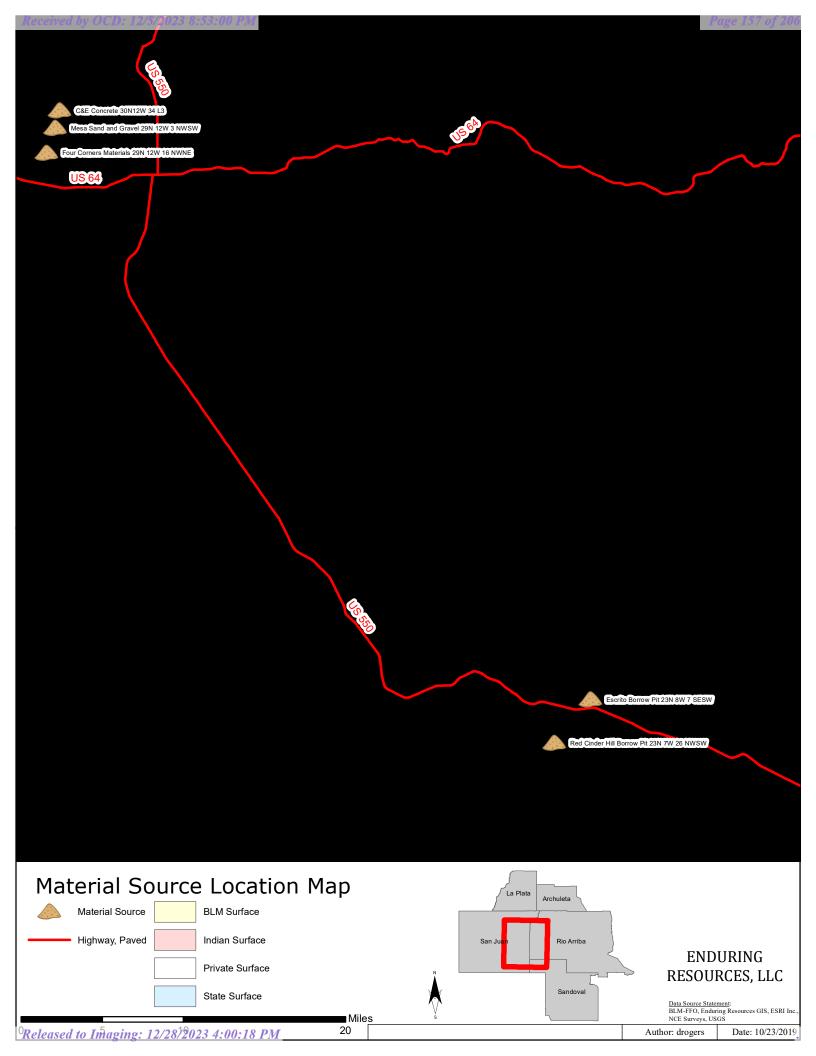
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PHYDRONIMENTAL CONFLETANTS

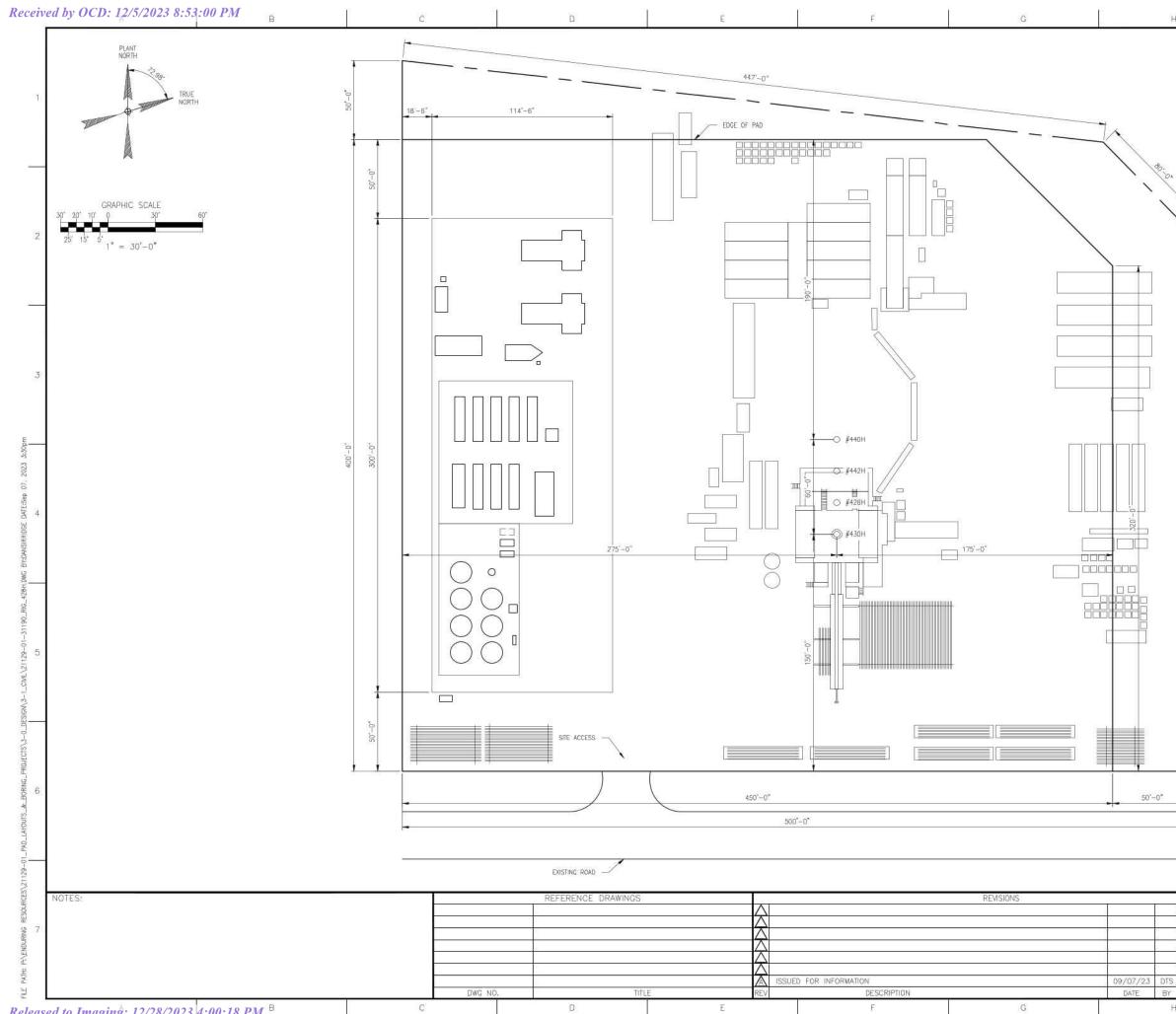
## Appendix D. CONSTRUCTION MATERIALS MAP

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### Appendix E. WELL PAD LAYOUT DIAGRAMS

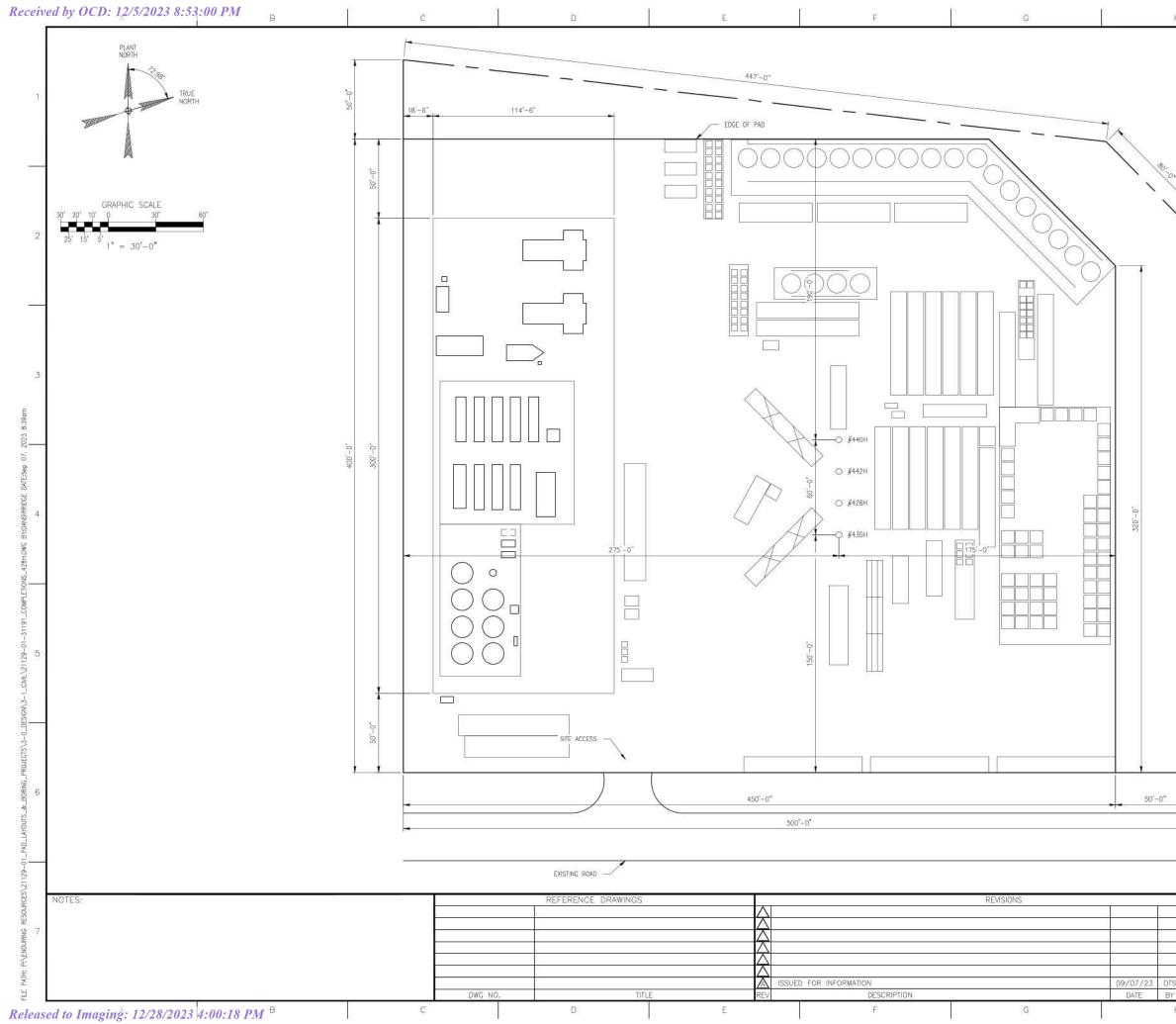
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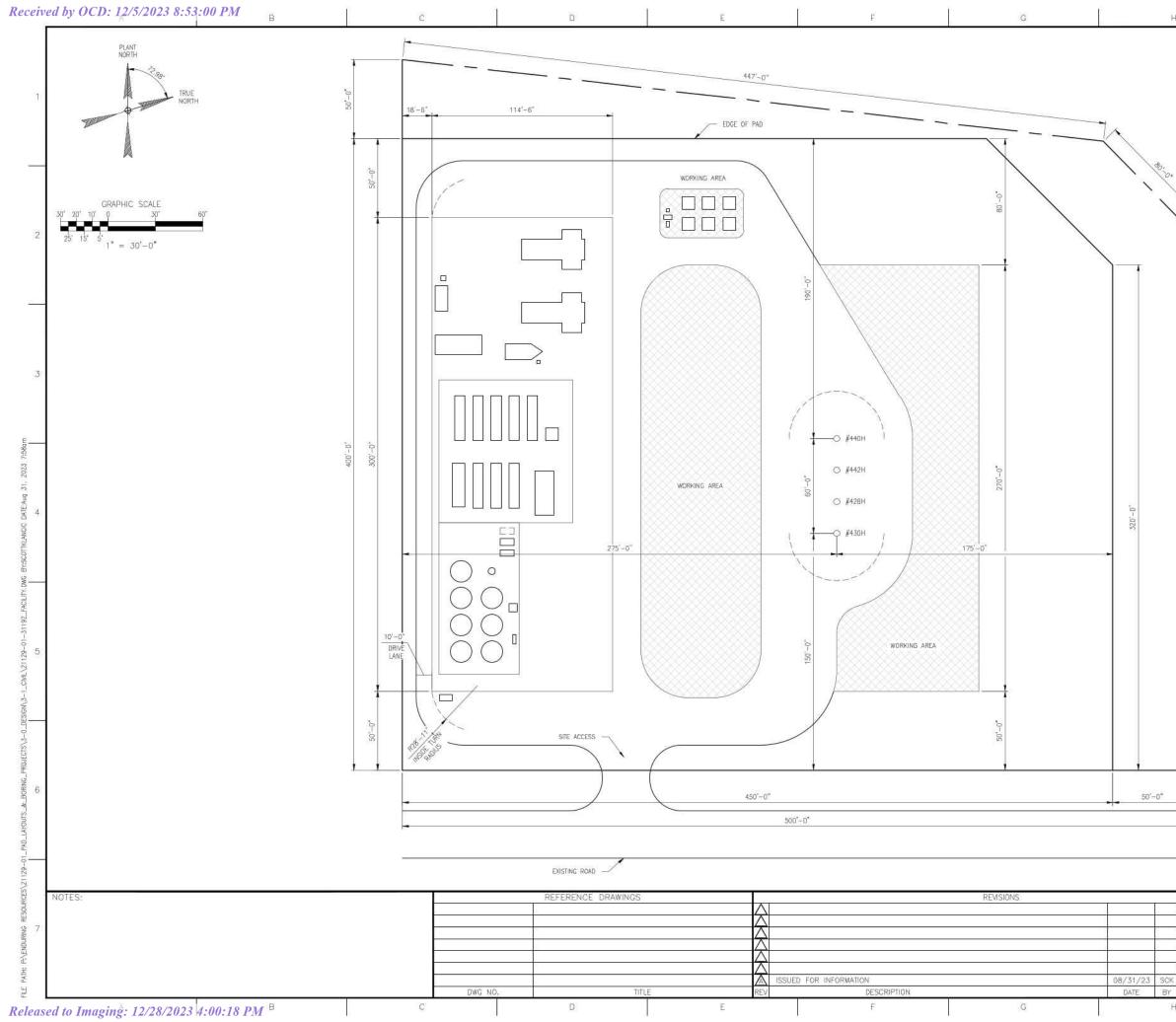
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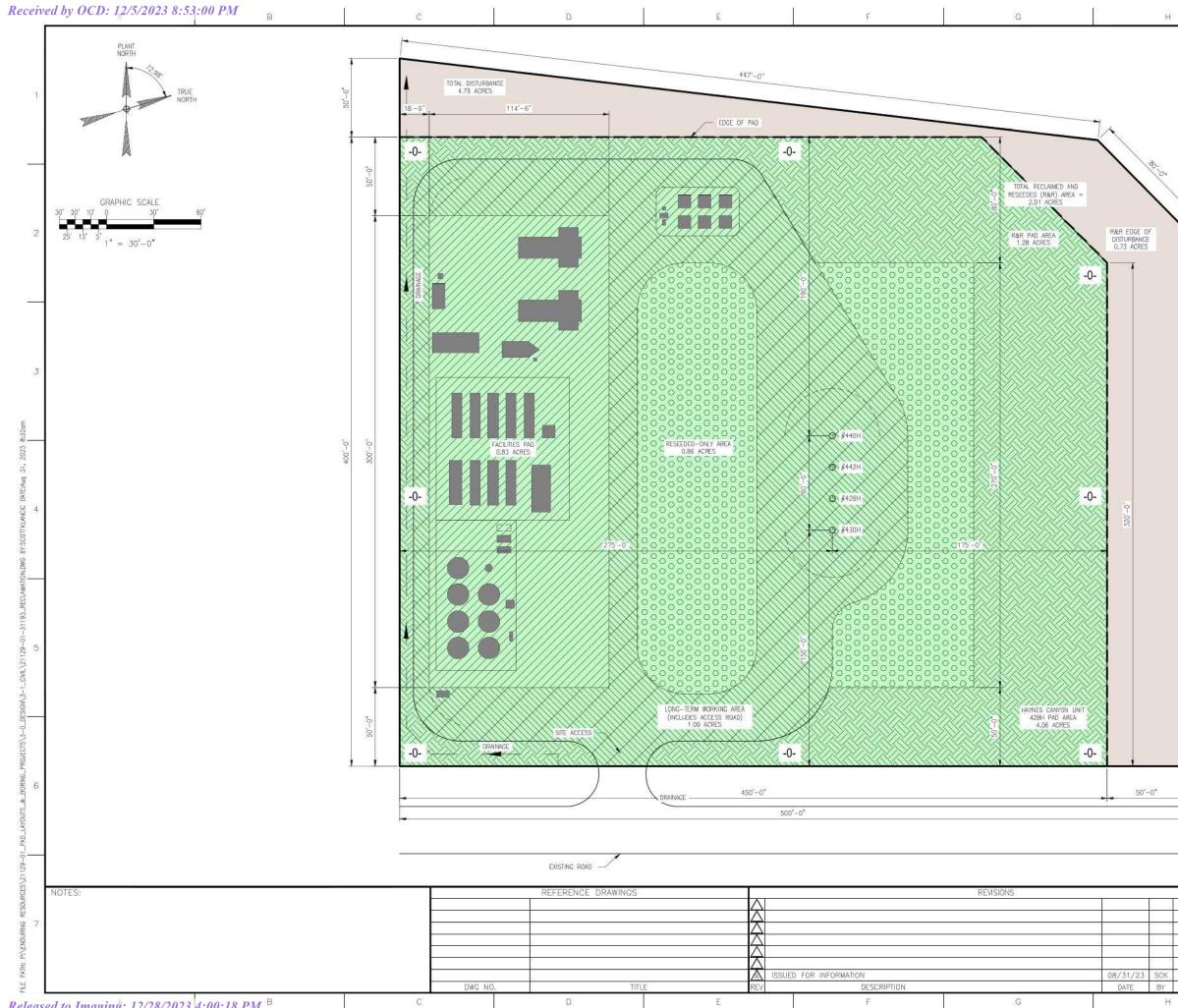
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**Section 1 - General** 

Would you like to address long-term produced water disposal? NO

#### Section 2 - Lined

Would you like to utilize Lined Pit PWD options? N Produced Water Disposal (PWD) Location: PWD surface owner: Lined pit PWD on or off channel: Lined pit PWD discharge volume (bbl/day): Lined pit Pit liner description: **Pit liner manufacturers** Precipitated solids disposal: Decribe precipitated solids disposal: Precipitated solids disposal Lined pit precipitated solids disposal schedule: Lined pit precipitated solids disposal schedule Lined pit reclamation description: Lined pit reclamation Leak detection system description: Leak detection system

**PWD** disturbance (acres):

#### **Operator Name: ENDURING RESOURCES LLC**

Well Name: HAYNES CANYON UNIT

Well Number: 430H

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Lined pit Monitor description:

Lined pit Monitor

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information

#### **Section 3 - Unlined**

Would you like to utilize Unlined Pit PWD options? N

Produced Water Disposal (PWD) Location:

PWD disturbance (acres):

PWD surface owner:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

**Unlined pit** 

Precipitated solids disposal:

Decribe precipitated solids disposal:

#### Precipitated solids disposal

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule

Unlined pit reclamation description:

**Unlined pit reclamation** 

Unlined pit Monitor description:

**Unlined pit Monitor** 

Do you propose to put the produced water to beneficial use?

Beneficial use user

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic

State

**Unlined Produced Water Pit Estimated** 

Unlined pit: do you have a reclamation bond for the pit?

#### **Operator Name: ENDURING RESOURCES LLC**

Well Name: HAYNES CANYON UNIT

Well Number: 430H

PWD disturbance (acres):

Injection well name:

Injection well API number:

#### Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information

#### Section 4 -

Would you like to utilize Injection PWD options? N

Produced Water Disposal (PWD) Location:

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

**PWD surface owner:** 

Injection well number:

Assigned injection well API number?

Injection well new surface disturbance (acres):

Minerals protection information:

**Mineral protection** 

**Underground Injection Control (UIC) Permit?** 

**UIC Permit** 

#### **Section 5 - Surface**

Would you like to utilize Surface Discharge PWD options? N

 Produced Water Disposal (PWD) Location:

 PWD surface owner:
 PWD disturbance (acres):

 Surface discharge PWD discharge volume (bbl/day):
 PWD disturbance (acres):

 Surface Discharge NPDES Permit?
 Surface Discharge NPDES Permit attachment:

 Surface Discharge site facilities information:
 Surface discharge site facilities map:

 Section 6 Section 6 

Would you like to utilize Other PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

Other PWD discharge volume (bbl/day):

PWD disturbance (acres):

#### Operator Name: ENDURING RESOURCES LLC

Well Name: HAYNES CANYON UNIT

Well Number: 430H

#### Other PWD type description:

Other PWD type

Have other regulatory requirements been met?

Other regulatory requirements

### **WAFMSS**

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

APD ID: 10400093965 Operator Name: ENDURING RESOURCES LLC Well Name: HAYNES CANYON UNIT Well Type: OIL WELL

#### Submission Date: 09/29/2023

ALL STREET, ST

Well Number: 430H Well Work Type: Drill Highlighted data reflects the most recent changes <u>Show Final Text</u>

Bond Info Data

### Bond

Federal/Indian APD: FED

**BLM Bond number:** 

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

**BLM** reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond

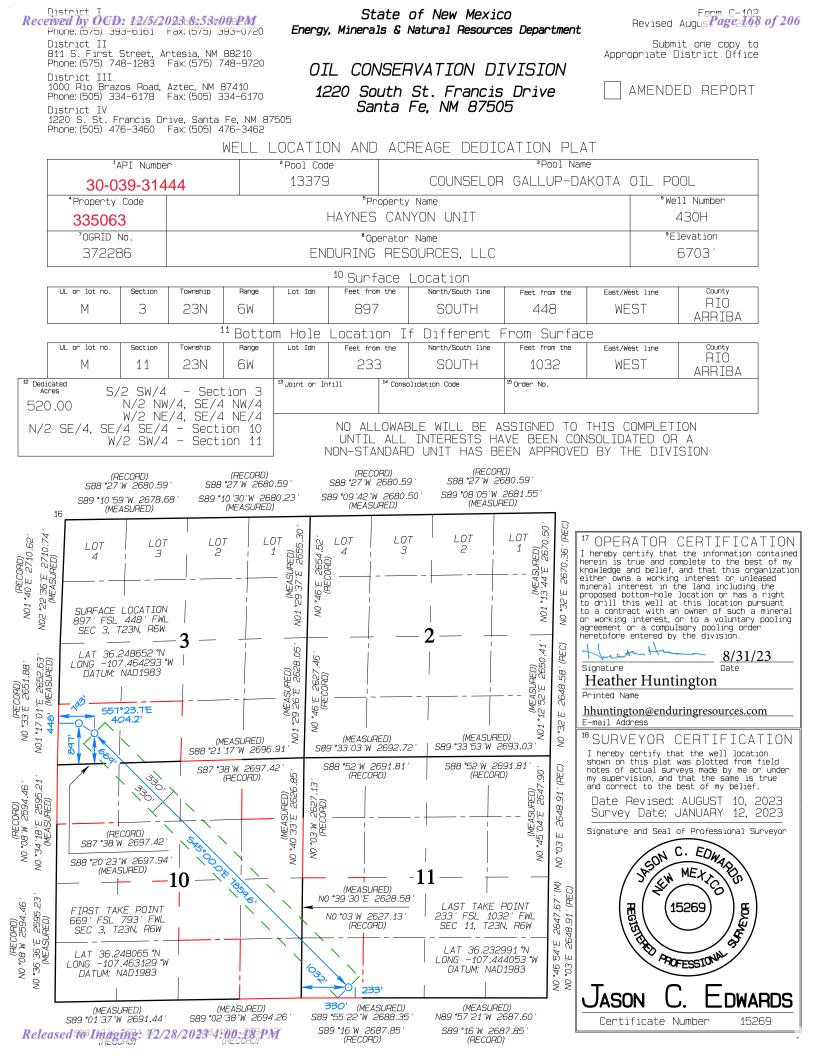
**Reclamation bond number:** 

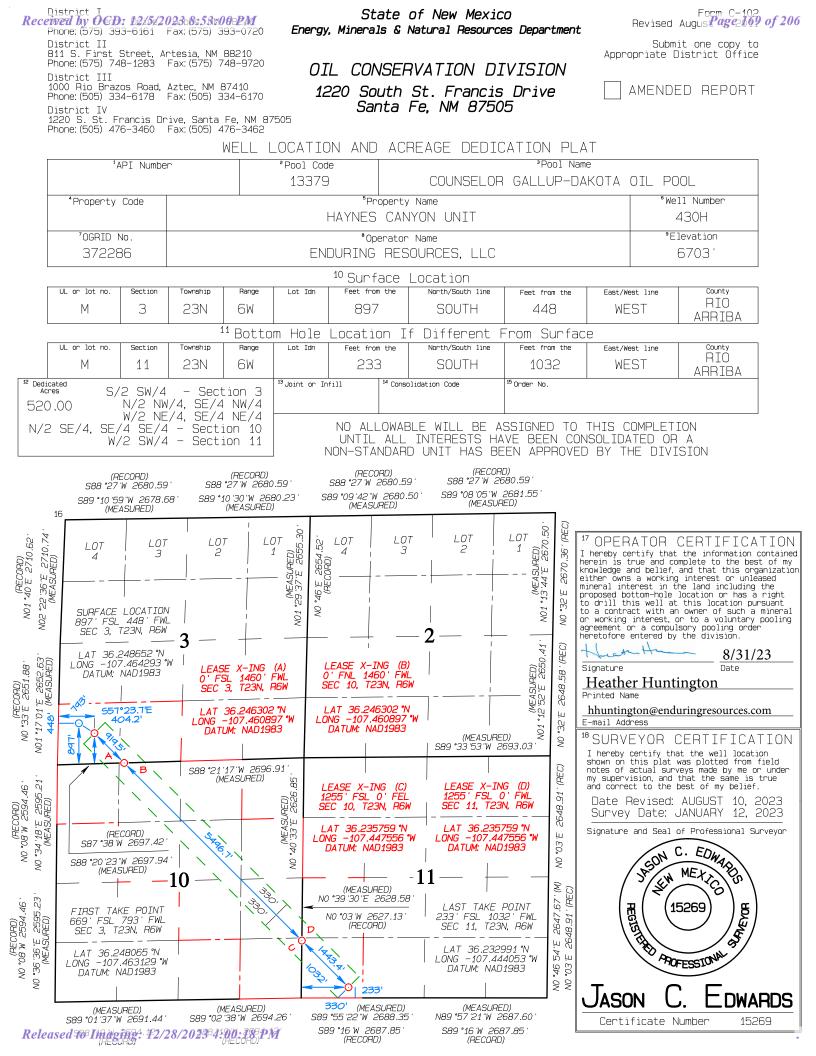
**Reclamation bond amount:** 

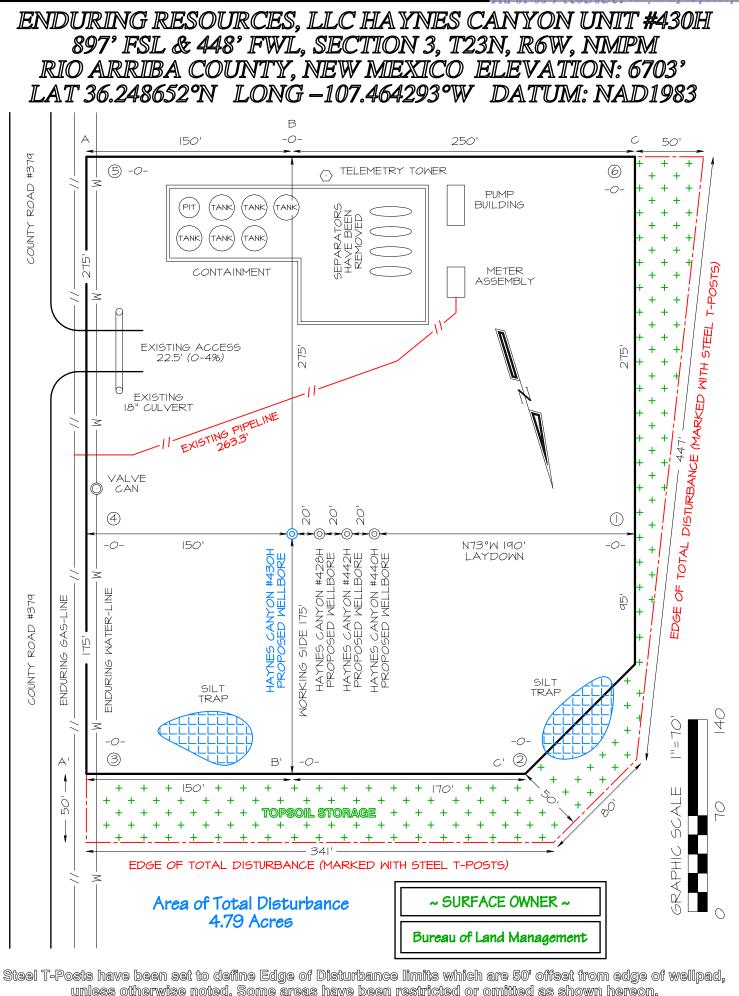
**Reclamation bond rider amount:** 

Additional reclamation bond information

12/05/2023







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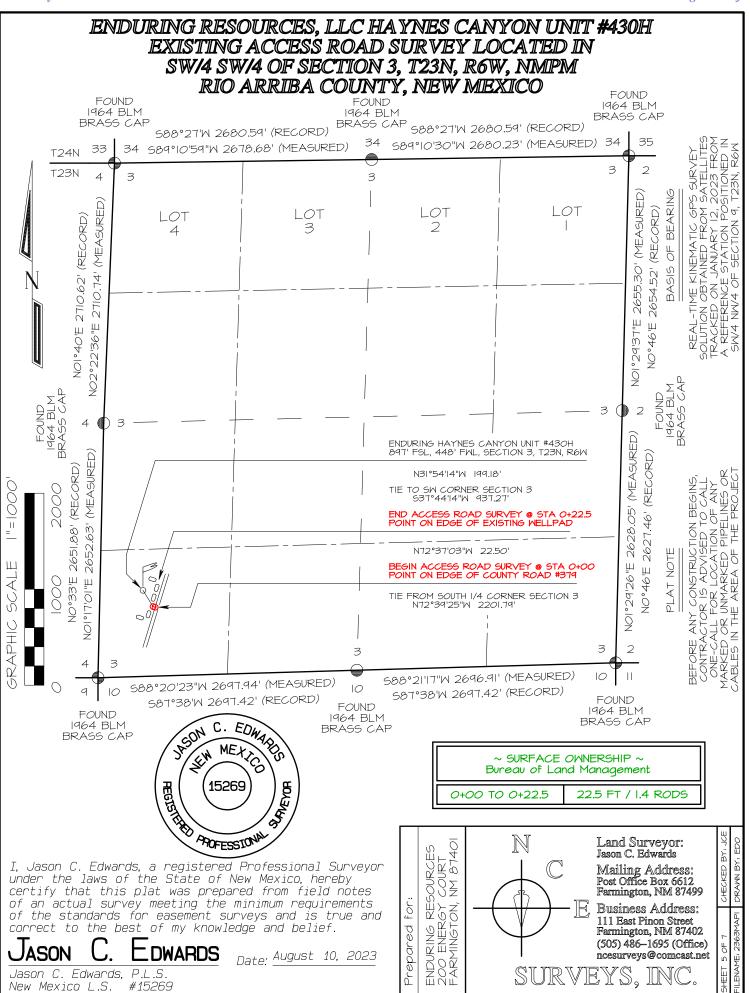
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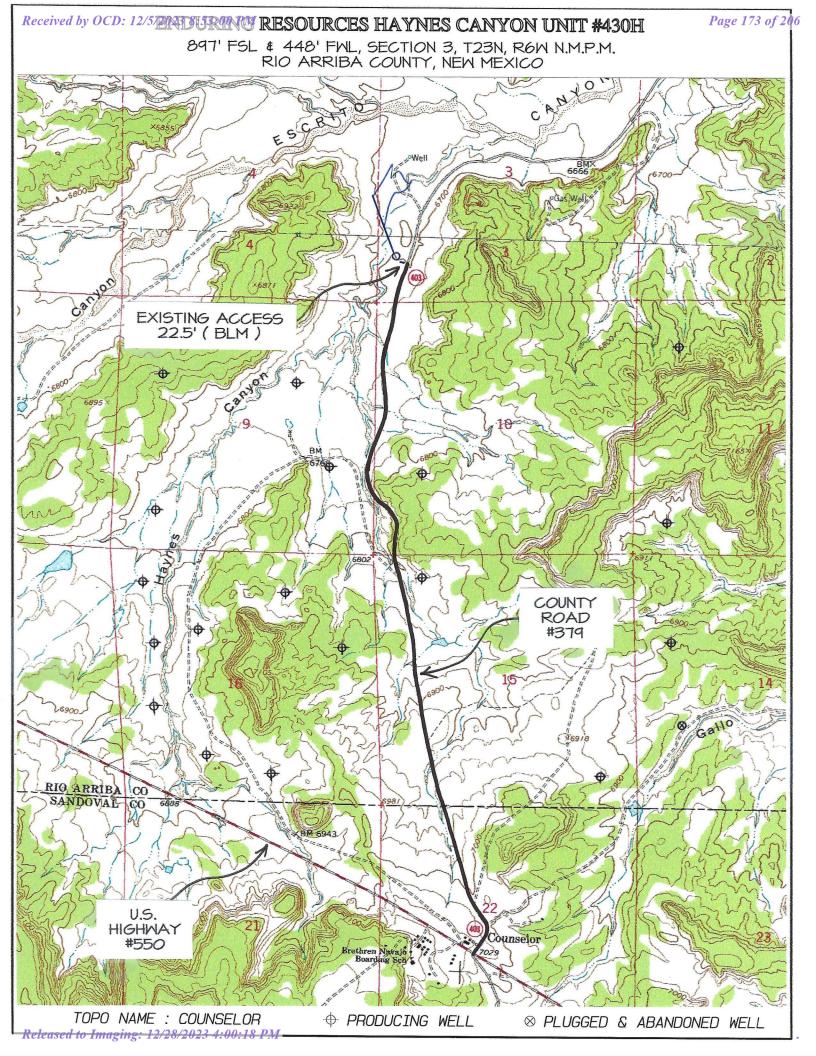
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#### Directions from the Intersection of US Hwy 550 & US Hwy 64

#### in Bloomfield, NM to Enduring Resources, LLC Haynes Canyon Unit #430H

#### 897' FSL & 448' FWL, Section 3, T23N, R6W, N.M.P.M., Rio Arriba County, NM

#### Latitude 36.248652°N Longitude -107.464293°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 53.8 miles to Mile Marker 97.6

Go Left (Northerly) on County Road #379 (aka State Highway #403) for 1.5 miles to fork in roadway;

Go Right (Northerly) which is straight remaining on County Road #379 (aka State Highway #403) for 1.4 miles to existing access road on left-hand side which continues for 22.5' to Enduring Haynes Canyon Unit #430H staked location.

State of New Mexico Energy, Minerals and Natural Resources Department

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

Submit Electronically Via E-permitting

**Date:** 12/5/2023

#### 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.

#### <u>Section 1 – Plan Description</u> <u>Effective May 25, 2021</u>

\_\_\_\_\_OGRID: \_372286\_

I. Operator: Enduring Resources IV, LLC\_

**II. Type:**  $\square$  Original  $\square$  Amendment due to  $\square$  19.15.27.9.D(6)(a) NMAC  $\square$  19.15.27.9.D(6)(b) NMAC  $\square$  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
Haynes Canyon Unit 428H	pending	Sec. 3, T23N, R6W	UL:M SHL: 903' FSL & 429' FWL	279	1304	373
Haynes Canyon Unit 430H	pending	Sec. 3, T23N, R6W	UL:M SHL: 897' FSL & 448' FWL	279	1304	373
Haynes Canyon Unit 440H	pending	Sec. 3, T23N, R6W	UL:M SHL: 916' FSL & 390' FWL	279	1304	373
Haynes Canyon Unit 442H	pending	Sec. 3, T23N, R6W	UL:M SHL: 910' FSL & 409' FWL	279	1304	373

IV. Central Delivery Point Name: <u>Haynes Canyon 428 CDP</u> [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
Haynes Canyon Unit 428H	pending	5/1/2024	5/20/2024	6/10/2024	7/8/2024	7/10/2024
Haynes Canyon Unit 430H	pending	5/13/2024	5/25/2024	6/10/2024	7/8/2024	7/10/2024
Haynes Canyon Unit 440H	pending	5/24/2024	6/4/2024	6/10/2024	7/9/2024	7/11/2024
Haynes Canyon Unit 442H	pending	6/1/2024	6/8/2024	6/10/2024	7/9/2024	7/11/2024

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

**VII. Operational Practices:**  $\boxtimes$  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.

 $\boxtimes$  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.**  $\Box$  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  $\boxtimes$  will  $\square$  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  $\boxtimes$  does  $\square$  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:**  $\Box$  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:

 $\boxtimes$  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

 $\Box$  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.**  $\Box$  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.**  $\Box$  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: Han
Printed Name: Heather Huntington
Title: Regulatory Agent
E-mail Address: hhuntington@enduringresources.com
Date: 12/5/2023
Phone: 505-636-9751
OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)
(Only applicable when submitted as a standalone form)
(Only applicable when submitted as a standalone form) Approved By:
(Only applicable when submitted as a standalone form)         Approved By:       Title:
(Only applicable when submitted as a standalone form)         Approved By:         Title:         Approval Date:
(Only applicable when submitted as a standalone form)         Approved By:         Title:         Approval Date:

### Attachments:

#### Separation Equipment: Below is a complete description of how Operator will size separation equipment to optimize gas capture.

#### Description of how separation equipment will be sized to optimize gas capture:

Well separation equipment is sized to have appropriate residence time and vapor space to remove gas particles on the micron scale per typical engineering calculations and/or operational experience. Furthermore, a sales scrubber downstream of the well separators is planned in order to capture any additional liquids if present. All gas is routed to end users or the sales pipeline under normal operating conditions.

# Operational & Best Management Practices: Below is a complete description of the actions the Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC. Additionally, below is a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

#### **Drilling Operations:**

Enduring Resources will minimize venting by:

- Gas will only be vented to the atmosphere to avoid risk of immediate or substantial adverse impact to employee safety, public health, and the environment.
- If utilized, flare stacks shall be located at a minimum of 100 feet from the nearest surface hole location

#### **Completion Operations:**

Enduring Resources will minimize venting by:

- Separator operation will commence as soon as technically feasible.
- Gas will route immediately to a collection system or applied to other beneficial use, such as a fuel source for onsite equipment.
- During initial flowback and if technically feasible, flaring shall occur rather than venting.
- If natural gas does not meet pipeline standards, gas will be vented or flared. A gas analysis will be performed twice weekly until standards are met (for up to 60 days). This is not anticipated to occur.
- If required, all venting and flaring of natural gas during flowback operations shall be performed in compliance with Subsections B, C and D of <u>19.15.27.8</u> NMAC.

#### **Production Operations:**

Enduring Resources will minimize venting by:

- Shutting in the wells if the pipeline is not available. No flaring of high pressure gas will occur.
- Utilizing gas for equipment fuel, heater fuel, and artificial lift when allowable.
- Capturing low pressure gas via a gas capture system when allowable.

#### In General:

- All venting and flaring from drilling, flowback and operation phases shall be reported in compliance with Subsection G of <u>19.15.27.8</u> NMAC.
- If utilized, flare stacks shall be located at a minimum of 100 feet from the nearest surface hole location and 100 ft from the permanent facility storage tanks.

#### 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 <u>Gas Transporter</u> system at that time. Based on current information, it is <u>Operator's</u> 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 nonpipeline 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
  - $\circ$  Only a portion of gas is consumed operating the generator, remainder of gas will 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
  - o Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines
- Power generation for grid;
- Liquids removal on lease;
- Reinjection for underground storage;
- Reinjection for temporary storage;
- Reinjection for enhanced oil recovery;
- Fuel cell production; and
- Other alternative beneficial uses approved by the division.



## ENDURING RESOURCES IV, LLC 6300 S SYRACUSE WAY, SUITE 525 CENTENNIAL, COLORADO 80211

## DRILLING PLAN:

Drill, complete, and equip single lateral in the Mancos-H formation

\A/E11	INFORMATION:	
VVELL	INFORMATION:	

Name:	Haynes Canyon Unit 430H		
API Number:	Not yet assigned		
AFE Number:	Not yet assigned		
ER Well Number:	Not yet assigned		
State:	New Mexico		
County:	Rio Arriba		
Surface Elevation:	6,703 ft ASL (GL)	6,728 ft ASL (KB)	
Surface Location:	3-23-6 Sec-Twn-Rng	897 ft FSL	448 ft FWL
	36.248652 °N latitude	107.464293 °W longitude	(NAD 83)
BH Location:	11-23-6 Sec-Twn-Rng	233 ft FSL	1,032 ft FWL
	36.232991 ° N latitude	107.444053 °W longitude	(NAD 83)
Driving Directions:	FROM THE INTERSECTION OF US	HWY 550 & US HWY 64 IN BLOOM	IFIELD, NM:
	South on US Hwy 550 for 53.8 n	niles to MM 97.6; Left (North) on C	R #379 (State Hwy 403) for 1.3 m

South on US Hwy 550 for 53.8 miles to MM97.6; Left (North) on CR #379 (State Hwy 403) for 1.3 miles to fork; Right (North) remaining on CR #379 for 1.5 miles to location access on left; Haynes Canyon Unit 428H Pad. From East to West 430H, 428H, 442H, 440H).

#### GEOLOGIC AND RESERVOIR INFORMATION:

Prognosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	0/G/W	Pressure
	Ojo Alamo	5,325	1,403	1,405	W	normal
	Kirtland	5,225	1,503	1,505	W	normal
	Fruitland	5,000	1,728	1,731	G, W	sub
	Pictured Cliffs	4,765	1,963	1,967	G, W	sub
	Lewis	4,615	2,113	2,118	G <i>,</i> W	normal
	Chacra	4,320	2,408	2,415	G, W	normal
	Cliff House	3,210	3,518	3,531	G, W	sub
	Menefee	3,205	3,523	3,536	G <i>,</i> W	normal
	Point Lookout	2,505	4,223	4,238	G <i>,</i> W	normal
	Mancos	2,210	4,518	4,533	0,G	sub (~0.38)
	Gallup (MNCS_A)	1,870	4,858	4,873	0,G	sub (~0.38)
	MNCS_B	1,780	4,948	4,963	0,G	sub (~0.38)
	MNCS_C	1,645	5,083	5,100	0,G	sub (~0.38)
	MNCS_Cms	1,580	5,148	5,169	0,G	sub (~0.38)
	MNCS_D	1,505	5,223	5,253	0,G	sub (~0.38)
	MNCS_E	1,420	5,308	5,359	0,G	sub (~0.38)
	MNCS_F	1,375	5,353	5,424	0,G	sub (~0.38)
	MNCS_G	1,290	5,438	5,574	0,G	sub (~0.38)
	MNCS_H	1,245	5,483	5,672	0,G	sub (~0.38)
	MNCS_I	0	0	0	0,G	sub (~0.38)
	FTP TARGET	1,245	5,483	5,694	0,G	sub (~0.38)
	PROJECTED LTP	1,267	5,461	13,759	0,G	sub (~0.38)

Surface: Nacimiento

**Oil & Gas Zones:** Several gas bearing zones will be encountered; target formation is the Gallup

Pressure:	Normal (0.43 psi/ft) or sub-normal pressure gradients anticipated in all formations									
	Max. pressure gradient: 0.43 psi/ft Evacuated hole gradient:									
	Maximum anticipated BH pre	ssure, assumi	ng maximum	pressure gradient:	2,360	psi				
	Maximum anticipated surface	1,160	psi							
Temperature:	Maximum anticipated BHT is 1									

#### H<sub>2</sub>S INFORMATION:

H<sub>2</sub> S Zones: Encountering hydrogen-sulfide bearing zones is NOT anticipated.

Safety: Sensors and alarms will be placed in the substructure, on the rig floor, above the pits, and at the shakers.

### LOGGING, CORING, AND TESTING:

Mud Logs:	
-	None planned; remote geo-steering from drill out of 9-5/8" casing to TD; gas detection from drillout of 13-3/8" casing to TD.
MWD/LWD:	Gamma Ray from drillout of 13-3/8" casing to TD
Open Hole Logs:	None planned
Testing:	None planned
Coring:	None planned
Cased Hole Logs:	CBL on 5-1/2" casing from deepest free-fall depth to surface

## DRILLING RIG INFORMATION:

 Contractor:
 Aztec

 Rig No.:
 1000

 Draw Works:
 E80 AC 1,500 hp

Mast: Hyduke Triple (136 ft, 600,000 lbs, 10 lines)

Top Drive: NOVIDS-350PE (350 ton)

Prime Movers: 4 - GE Jenbacher Natural Gas Generator Pumps: 2 - RS F-1600 (7.500 psi)

BOPE 1: Cameron single & double gate rams (13-5/8", 3,000 psi)

BOPE 2: Cameron annular (13-5/8", 5,000 psi)

Choke Cameron (4", 10,000 psi)

KB-GL (ft): 25

Note: Actual drilling rig may vary depending on availability at time the well is scheduled to be drilled.

STATE AND FEDERAL	NOTIFICATIONS	BLM	State
Construction and	BLM is to be notified minimum of 48 hours prior to start of construction or reclamation.		
Reclamation:	Grazing permittee is to be notified 10 days in advance.	(505) 564-7600	
Spud	BLM and state are to be notified minimum of 24 hours prior to spud.	(505) 564-7750	(505) 334-6178
BOP	BLM is to be notified minimum of 24 hours prior to BOPE testing.	(505) 564-7750	seenote
Casing / cementing	BLM and state are to be notified minimum of 24 hours prior to running casing and		
	cementing.	(505) 564-7750	(505) 334-6178
Plugging	BLM and state are to be notified minimum of 24 hours prior to plugging ops.	(505) 564-7750	see note
	All notifications are to be recorded in the WellView report with time, date, name or		
	number that notifications were made to.		

Note: Monica Keuhling with the OCD requests state notifications 24 hrs in advance for spud, BOP tests, casing & cementing and any plugging be given to her in both phone message and email: (505) 320-0243, monica.keuhling@emnrd.nm.gov

#### **BOPE REQUIREMENTS:**

- See attached diagram for details regarding BOPE specifications and configuration.
- 1) Rig will be equipped with upper and lower kelly cocks with handles available.
- 2)

Inside BOP and TIW valves will be available to use on all sizes and threads of drill pipe used while drilling the well.
BOP accumulator will have enough capacity to open the HCR valve, close all rams and annular preventer, and retain minimum of 200 psi above precharge on the closing manifold without the use of closing pumps. The fluid reservoir capacity shall be at least double the usable fluid volume of the accumulator system capacity, and the fluid level shall be maintained at manufacturer's recommendation. There will be two additional sources of power for the closing pumps (electric and air). Sufficient nitrogen bottles will be available and will be recharged when pressure falls below manufacturer's recommended minimum.

3)

BOP testing shall be conducted (a) when initially installed, (b) whenever any seal is broken or repaired, (c) if the time since the previous test exceeds 30 days. Tests will be conducted using a test plug. BOP ram preventers will be tested to 3,000 psig for 10 minutes, and the annular preventer will be tested to 1,500 psi for 10 minutes. Ram and annular preventers will be tested to 250 psi for 5 minutes. Additionally, BOP and casing strings will be tested to .22 psi/ft or 1,500 psi, whichever is greater but not exceeding 70% of yield strength of the casing, for 30 minutes, prior to drilling out 13-3/8" and 9-5/8" casing. Rams and hydraulically operated remote choke line valve will be function tested daily at a minimum.

- 4) Remote valve for BOP rams, HCR, and choke shall be placed in a location that is readily available to the driller. The remote BOP valve shall be capable of closing and opening the rams.
- 5) Manual locking devices (hand wheels) shall be intalled on rams. A valve will be installed on the annular preventer's closing line as close as possible to the preventer to act as a locking device. The valve will be maintained in the open position and shall only be closed when the there is no power to the accumulator.

#### FLUIDS AND SOLIDS CONTROL PROGRAM:

#### Fluid Measurement:

Pumps shall be equipped with stroke counters with displays in the dog-house. Slow pump speed shall be recorded daily and<br/>after mudding up, at a minimum, on the drilling report. A Pit Volume Totalizer will be installed and the readout will be<br/>displayed in the dog-house. Gas-detecting equipment will be installed at the shakers, and readouts will be available in the<br/>dog-house and the in the geologist's work-station (if geologist or mud-logger is on-site).Closed-Loop System:A fully, closed-loop system will be utilized. The system will consist of above-ground piping and above-ground storage tanks<br/>and bins. The system will not entail any earthen pits, below-grade storage, or drying pads. All equipment will be<br/>disassembled and removed from the site when drilling operations cease. The system will be capable of storing all fluids and<br/>generated cuttings and of preventing uncontrolled releases of the same. The system will be operated in an efficient manner<br/>to allow the recycling and reuse of as much fluid as possible and to minimimize the amount of fluids and solids that require<br/>disposal.Fluid Disposal :Fluid ta cannot be reused, recycled, or returned to the supplier will be hauled to and disposed of at an approved disposal<br/>site (Industrial Ecosystem, Inc. or Envirotech, Inc.).Solids Disposal :Drilling solids will be stored (until haul-off) on-site in separate containers with no other waste, debris, or garbage products.

Waste solids will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.).
 Fluid Program: See "Detailed Drilling Plan" section for additional details. Sufficient barite will be on location to weight up mud system to balance maximum anticipated pressure gradient.

#### DETAILED DRILLING PLAN:

0 ft (MD)	to	350 ft (MD)	Hole Section Length:	350 ft
0 ft (TVD)	to	350 ft (TVD)	Casing Required:	350 ft
 			1 6.1 1.1111 I	

Note: Surface hole may be drilled, cased, and cemented with a smaller rig in advance of the drilling rig.

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Fluid:	Туре	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	рН	Comr	ments
	Fresh Water	8.4	N/C	2 - 8	2 - 12	9.0	Spuc	l mud
Hole Size: Bit / Motor: MWD / Survey:	Mill Tooth or P							
Logging:								
Procedure:			open to 17-1/2"					
			hole and fluid fo g cement job and			-		as detailed
Casing Specs:		Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
Specs	13.375	54.5	J-55	BTC	1,130	2,730	853,000	909,000
Loading					153	791	116,634	116,634
Min. S.F.					7.39	3.45	7.31	7.79
AU Torque (ft lbs): Casing Summary:	Minumum: Make-up as pei	Burst: maximu hole and 8.4 p Tension: buoye N/A r API Buttress Co	evacuated casir im anticipated s pg equivalent ex ed weight in 8.4 Optimum: onnection runni	surface pressure kternal pressure ppg fluid with 2 N/A ng procedure.	with 9.5 ppg flu gradient	uid inside casing		intermediate
					m 2 its 1 contra	lizor por 2 its to	surface	
Centruitzers:	2 centralizers p	ici ji stop-ballue	ed 10' from each		Hole Cap.	אוזצפו אפו ג זוא ונ	Planned TOC	
Cement:	Туре	Weight (nng)	Yield (cuft/sk)	Water (gal/sk)	Hole Cap. (cuft/ft)	% Excess	(ft MD)	Total Cmt (sx
cement.	TYPE III	14.6	1.39	6.686	0.6946	100%	0	364
Annular Capacity	0.6946	cuft/ft		x 17-1/2" hole		Csg capacity	0.8680	ft3/ft
			nent volumes as					Cu Ft Slurry
Druke L	inergy ber meesi	curcurated cen		sume gaage no				505.3
<u>INTERMEDIATE:</u>	350	ft (MD)	to	3,685	ft (MD)		ection Length:	3,335 f
						<b>.</b>	and a second second	2
	350	ft (TVD)	to	3,673	ft (TVD)	Ca	asing Required:	3,685 f
	350	ft (TVD)		3,673		Ca	asing Required:	3,685 f
Eluide			FL (mL/30		YP (lb/100			
Fluid:	Туре	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	рН	Comr	ments
	Type LSND (5% KCl)		FL (mL/30		YP (lb/100		Comr	
Hole Size:	<b>Type</b> LSND (5% KCI) 12-1/4"	<b>MW (ppg)</b> 8.8 - 9.5	FL (mL/30 min) 20	PV (cp)	YP (lb/100 sqft)	рН	Comr	ments
Hole Size: Bit / Motor:	<b>Type</b> LSND (5% KCl) 12-1/4" 12-1/4" PDC bi	MW (ppg) 8.8 - 9.5 t w/mud motor	FL (mL/30 min) 20	<b>PV (cp)</b> 8 - 14	YP (lb/100 sqft) 8-14	<b>рН</b> 9.0 - 9.5	Comr	ments
Hole Size: Bit / Motor:	<b>Type</b> LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4.	FL (mL/30 min) 20 0, stage, 0.16 re	<b>PV (cp)</b> 8 - 14 v/gal, 1.83 DEG	YP (lb/100 sqft) 8 - 14	<b>рН</b> 9.0 - 9.5 DIFF PSIG	Comr No (	ments
Hole Size: Bit / Motor: Bit / Motor:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8,4. DC w/16 mm or	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters,	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0.	<b>pH</b> 9.0 - 9.5 DIFF PSIG 90 max), <b>jet w</b> it	Comr No (	ments
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8,4. DC w/16 mm or	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters,	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0.	<b>pH</b> 9.0 - 9.5 DIFF PSIG 90 max), <b>jet w</b> it	Comr No (	ments
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination	FL (mL/30 min) 20	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a	YP (lb/100 sqft) 8 - 14 .900 GPM, 950 (range 0.65 - 0. at a minimum), 0	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional	Comr No ( th 6 - 12s	nents OBM
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 9 g to	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500	Comr No ( th 6 - 12s	nents OBM
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo owing direction	FL (mL/30 min) 20	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin tole past casing	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o g to setting depth).	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed	Comr No ( th 6 - 12s psi for 30 minu to keep well on	nents OBM Ites. plan. Keep DLS
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo owing direction ad keep slide len	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin possible. Take su	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 to (range 0.65 - 0. at a minimum), y g to setting depth). urveys every star	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r	nents OBM Ites. plan. Keep DLS ates of 750
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo owing direction d keep slide len able to control	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur cove); pressure te al plan (20' rat-h gth < 10', when return rates). Mi	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin pole past casing possible. Take su nimum desired	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), y g to setting depth). urveys every star flow-rate is 650	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an	nents OBM Ites. plan. Keep DL: ates of 750 d fluid for
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey W None NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo wing direction d keep slide len able to control u . TOOH. Run cas	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin pole past casing possible. Take su nimum desired and washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), g to setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W	nents OBM Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey W None NU BOPE and tt Drill to TD follo < 3 deg/100' an GPM (higher if casing running	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo ywing direction d keep slide len able to control u . TOOH. Run cas off-line cement j	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin pole past casing possible. Take su nimum desired and washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), g to setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W	nents OBM Ites. plan. Keep DLS ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo ywing direction d keep slide len able to control u . TOOH. Run cas off-line cement j	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin pole past casing possible. Take su nimum desired and washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), g to setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W	nents OBM Ites. plan. Keep DL: ates of 750 d fluid for alk rig to next
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo ywing direction d keep slide len able to control u . TOOH. Run cas off-line cement j	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin pole past casing possible. Take su nimum desired and washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), g to setting depth). urveys every star flow-rate is 650 rculating as requ	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed Id, at a minimu GPM. At TD, co Jired. Land casin	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ment job and n	nents OBM Ites. plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo owing direction d keep slide len able to control u . TOOH. Run cas off-line cement j ace.	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemen	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100': st 13-3/8" casin <b>tole past casing</b> possible. Take su nimum desired and washing / ci nt as detailed be	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), 4 g to setting depth). urveys every star flow-rate is 650 reculating as requ alow. Monitor re	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casin aturns during ce	Comm No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ment job and n	nents OBM Ites. plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs:	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and tt Drill to TD follo < 3 deg/100 are GPM (higher if casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo wing direction d keep slide len able to control u. . TOOH. Run cas off-line cement j ace. Wt (lb/ft)	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemen	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin pole past casing possible. Take su nimum desired and washing / ci	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), 4 g to setting depth). rrveys every star flow-rate is 650 rcculating as requ dow. Monitor ref Collapse (psi)	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin sturns during ce Burst (psi)	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs)	nents OBM Ites. plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs)
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if casing running well. Perform c	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo owing direction d keep slide len able to control u . TOOH. Run cas off-line cement j ace.	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemen	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be Conn.	YP (lb/100 sqft) 8 - 14 . 900 GPM, 950 (range 0.65 - 0. at a minimum), 4 g to setting depth). rrveys every star flow-rate is 650 rculating as requ low. Monitor ref Collapse (psi) 2,020	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin turns during ce Burst (psi) 3,520	Comm No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ment job and n	nents DBM Utes. plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and tt Drill to TD follo < 3 deg/100 are GPM (higher if casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted abo wing direction d keep slide len able to control u. . TOOH. Run cas off-line cement j ace. Wt (lb/ft)	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemen	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be Conn.	YP (lb/100 sqft) 8 - 14 , 900 GPM, 950 t (range 0.65 - 0. at a minimum), 4 g to setting depth). rrveys every star flow-rate is 650 rcculating as requ dow. Monitor ref Collapse (psi)	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin sturns during ce Burst (psi)	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ment job and n Tens. Body (lbs) 564,000 215,309	nents OBM Ites. plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8,4. DC w/16 mm or ith inclination a est (as noted abo owing directions d keep slide len able to control u . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0	FL       (mL/30 min)         20          0, stage, 0.16 re          19 mm cutters, and azimuth sur          ove); pressure te al plan (20' rat-h gth < 10', when preturn rates). Mi ing using a CRT a ob. Pump cemer	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin pole past casing possible. Take st nimum desired and washing / ci nt as detailed be Conn. LTC	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o g to setting depth). urveys every star flow-rate is 650 rcculating as requ clow. Monitor re Collapse (psi) 2,020 1,604 1.26	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co uired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62	nents OBM Ites. plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination a est (as noted abo owing direction d keep slide len able to control i . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully	FL (mL/30 min) 20 0, stage, 0.16 re 19 mm cutters, and azimuth sur ove); pressure te al plan (20' rat-h gth < 10', when p return rates). Mi ing using a CRT a ob. Pump cemen	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be <u>Conn.</u> LTC	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), o g to setting depth). urveys every star flow-rate is 650 rculating as required elow. Monitor res Collapse (psi) 2,020 1,604 1.26 equivalent exte	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed nd, at a minimu GPM. At TD, co uired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gu	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient	nents OBM Jan. Keep DL3 ates of 750 d fluid for alk rig to next ote cement Tens. Conn (Ibs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination : est (as noted abo owing directions id keep slide len able to control i . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'; st 13-3/8" casin nole past casing possible. Take su nimum desired and washing / ci nt as detailed be Conn. LTC ag with 8.4 ppg surface pressure	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), of g to setting depth). urveys every star flow-rate is 650 rculating as required elow. Monitor res 2,020 1,604 1.26 equivalent exter with 9.5 ppg flot	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed nd, at a minimu GPM. At TD, co uired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gu	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient	nents DBM JESS plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination : est (as noted abo by ing directions id keep slide len able to control u . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pl	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be Conn. LTC ag with 8.4 ppg surface pressure strenal pressure	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), v g to setting depth). Inveys every star flow-rate is 650 reulating as required elow. Monitor re Collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co Jired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casing	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient	nents DBM JESS plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination : est (as noted abo by ing directions id keep slide len able to control u . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pl	FL       (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when	PV (cp) 8 - 14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be Conn. LTC ag with 8.4 ppg surface pressure strenal pressure	YP (lb/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), v g to setting depth). Inveys every star flow-rate is 650 reulating as required elow. Monitor re Collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co Jired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casing	Comr No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient	nents DBM JESS plan. Keep DL ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD folic <3 deg/100' an GPM (higher if casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum:	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or rith inclination est (as noted aboving direction able to control u TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 p Tension: buoye 3,400	FL (mL/30 min)         20         0, stage, 0.16 retains         19 mm cutters, and azimuth surrowers, and azimuth surro	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin nole past casing possible. Take st nimum desired and washing / ci nt as detailed be Conn. LTC and with 8.4 ppg surface pressure strenal pressure pg fluid with 2 4,530	YP (lb/100 sqft) 8 - 14 . 900 GPM, 950 (frange 0.65 - 0. at a minimum), 4 g to setting depth). urveys every star flow-rate is 650 reculating as required flow-rate is	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin teturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gui id inside casing 5,660	Comm No of th 6 - 12s psi for 30 minu to keep well on m. Target flowr ndition hole an ng. ND BOPE. W ment job and n Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents DBM JESS plan. Keep DL ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test: Procedure: Casing Specs: Specs Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo <3 deg/100' an GPM (higher if casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8,4. DC w/16 mm or ith inclination is est (as noted abo wing direction; d keep slide len able to control u; TOOH. Run cass off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pr Tension: buoye 3,400 casing, float col	FL (mL/30 min)         20         0, stage, 0.16 retains         19 mm cutters, and azimuth surrowers, and azimuth surro	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin pole past casing possible. Take ss nimum desired and washing / ci nt as detailed be Conn. LTC g with 8.4 ppg surface pressure sternal pressure ternal pressure 4,530 rface (FLOAT EQ	YP (lb/100 sqft) 8 - 14 . 900 GPM, 950 (frange 0.65 - 0. at a minimum), 4 g to setting depth). urveys every star flow-rate is 650 reculating as required flow-rate is	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin teturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gui id inside casing 5,660	Comm No of th 6 - 12s psi for 30 minu to keep well on m. Target flowr ndition hole an ng. ND BOPE. W ment job and n Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents DBM JESS plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10
Hole Size: Bit / Motor: Bit / Motor: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and te Drill to TD folic <3 deg/100' an GPM (higher if) casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in n	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination is est (as noted aboving directions) d keep slide len able to control i . TOOH. Run cass off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pl Tension: buoye 3,400 casing, float col on-vertical hole	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when p	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100's st 13-3/8" casin possible. Take ss nimum desired and washing / ci nt as detailed be Conn. LTC sg with 8.4 ppg surface pressure sternal pressure sternal pressure pg fluid with 1 4,530 rface (FLOAT EQ n vertical hole	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), 4 g to setting depth). urveys every star flow-rate is 650 rculating as required as required as required as required flow. Monitor ref 2,020 1,604 1.26 equivalent exter with 9.5 ppg flow gradient 200,000 Ibs over Maximum: UIPMENT FROM	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, coo jired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casin 5,660 WEATHERFORD	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents DBM DBM ites. plan. Keep DL ates of 750 d fluid for alk rig to next ote cement <b>Tens. Conn</b> ( <b>ibs</b> ) 453,000 215,309 <b>2.10</b> production
Hole Size: Bit / Motor: Bit / Motor: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and te Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8,4. DC w/16 mm or ith inclination a est (as noted abo owing direction d keep slide len able to control i . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj Tension: buoye 3,400 casing, float col on-vertical hole t stop-banded 1	FL (mL/30 min)         20         0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when p	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take st nimum desired and washing / ci nt as detailed be Conn. LTC Ag with 8.4 ppg surface pressure ckernal pressure start as detailed be pg fluid with 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), of gto setting depth). urveys every star flow-rate is 650 rculating as required elow. Monitor re collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizer	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co uired. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr uid inside casing r-pull 5,660 WEATHERFORD	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents OBM observed to the second seco
Hole Size: Bit / Motor: Bit / Motor: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	Type LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if, casing running well. Perform of volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KO	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8,4. DC w/16 mm or ith inclination a est (as noted abo owing direction d keep slide len able to control i . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 pj Tension: buoye 3,400 casing, float col on-vertical hole t stop-banded 1	FL (mL/30 min)         20            0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take st nimum desired and washing / ci nt as detailed be Conn. LTC Ag with 8.4 ppg surface pressure ckernal pressure start as detailed be pg fluid with 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), of gto setting depth). urveys every star flow-rate is 650 rcculating as required elow. Monitor re collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizer	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co uired. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr uid inside casing r-pull 5,660 WEATHERFORD	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents OBM Jession States plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production
Hole Size: Bit / Motor: Bit / Motor: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	Type LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if, casing running well. Perform of volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KO	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8, 4. DC w/16 mm or ith inclination a est (as noted abo owing directions d keep slide len able to control i . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 p, Tension: buoye 3,400 casing, float col on-vertical hole t stop-banded 1 DP ; 1 centralizer	FL (mL/30 min)         20            0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take st nimum desired and washing / ci nt as detailed be Conn. LTC Ag with 8.4 ppg surface pressure ckernal pressure start as detailed be pg fluid with 4,530 rface (FLOAT EQ n vertical hole be on bottom 1 j	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), of gto setting depth). urveys every star flow-rate is 650 rcculating as required elow. Monitor re collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizer	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casing r-pull 5,660 WEATHERFORD rfloating on bot Scepter Supply	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents DBM ites. plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production ntralizer per jt 9-5/8" x
Hole Size: Bit / Motor: Bit / Motor: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	Type LSND (5% KCl) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and te Drill to TD folic < 3 deg/100' an GPM (higher if. casing running well. Perform c volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KC 11.75" SOLID E	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8,4. DC w/16 mm or ith inclination a est (as noted abo owing directions d keep slide len able to control i . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 p Tension: buoye 3,400 casing, float col on-vertical hole t stop-banded 1 DP; 1 centralizer 30DY POLYMER	FL (mL/30 min)         20            0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when j	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be Conn. LTC bg with 8.4 ppg surface pressure cxternal pressure ppg fluid with surface ppg fluid with a fluid trace (FLOAT EQ n vertical hole be on bottom 1 j ng) to surface (Co	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), of g to setting depth). urveys every star flow-rate is 650 rculating as reque elow. Monitor re Collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo g radient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizers from	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimur GPM. At TD, co jired. Land casing eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure gr id inside casing r-pull 5,660 WEATHERFORD c floating on bot Scepter Supply Planned TOC	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents DBM DBM ites. plan. Keep DL: ates of 750 d fluid for alk rig to next ote cement Tens. Conn (lbs) 453,000 215,309 2.10 production ntralizer per jt 9-5/8" x Total Cmt (cu
Hole Size: Bit / Motor: Bit / Motor: Logging: Pressure Test: Procedure: Casing Specs: Loading Min. S.F.	Type LSND (5% KCI) 12-1/4" 12-1/4" PDC bi MOTOR: NOV 0 BIT: 6-BLADE PI MWD Survey w None NU BOPE and to Drill to TD follo < 3 deg/100' an GPM (higher if, casing running well. Perform of volume to surfa 9.625 Assumptions: Minumum: Float shoe, 1 jt 1 per joint in m 1 centralizers jt (floating) to KO	MW (ppg) 8.8 - 9.5 t w/mud motor 87840 - 7/8,4. DC w/16 mm or ith inclination a est (as noted abo owing directions d keep slide len able to control i . TOOH. Run cas off-line cement j ace. Wt (lb/ft) 36.0 Collapse: fully Burst: maximu hole and 8.4 p Tension: buoye 3,400 casing, float col on-vertical hole t stop-banded 1 DP; 1 centralizer 30DY POLYMER	FL (mL/30 min)         20            0, stage, 0.16 re         19 mm cutters,         and azimuth sur         ove); pressure te         al plan (20' rat-h         gth < 10', when	PV (cp) 8-14 v/gal, 1.83 DEG TFA = 0.67 sq-ir vey (every 100'a st 13-3/8" casin possible. Take su nimum desired and washing / ci nt as detailed be Conn. LTC bg with 8.4 ppg surface pressure cxternal pressure ppg fluid with surface ppg fluid with a fluid trace (FLOAT EQ n vertical hole be on bottom 1 j ng) to surface (Co	YP (Ib/100 sqft) 8 - 14 900 GPM, 950 (range 0.65 - 0. at a minimum), of gto setting depth). urveys every star flow-rate is 650 rcculating as required elow. Monitor re collapse (psi) 2,020 1,604 1.26 equivalent exter with 9.5 ppg flo gradient 200,000 lbs over Maximum: UIPMENT FROM t & 1 centralizer	pH 9.0 - 9.5 DIFF PSIG 90 max), jet wit GR optional 1,500 Steer as needed id, at a minimu GPM. At TD, co jired. Land casin eturns during ce Burst (psi) 3,520 1,370 2.57 rnal pressure guid inside casing r-pull 5,660 WEATHERFORD rfloating on bot Scepter Supply	Comm No ( No ( th 6 - 12s psi for 30 minu to keep well on m. Target flow-r ndition hole an ng. ND BOPE. W ement job and n Tens. Body (lbs) 564,000 215,309 2.62 radient g while drilling	nents OBM observed to the second seco

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	0.3132	cuft/ft		: 12-1/4" hole ai		9-5/8"36#ID	8.921	
	0.4341	cuft/ft	9-5/8" casing v		est shoe jt ft	44		
	Calculated cen	nent volumes as	sume gauge ho	le and the exces	ss (open hole on	ly) noted in tab	le	
Spacer	D-Mud Breaker	SAPP						
			D-MPA-1 .4% BWOC					
Load	ASTM Type III 90/10 Poz	D-CSE 1 5.0% BWOC	Fluid Loss & Gas Migration Control		D-CD 2 .4% BWOC Dispersant	Cello Flace LCM .25 lb/sx		D-R1.5% Retarder
Leuu	90/10 P02	Strength Enhancer	-	Na Metasilitate	Dispersant	ID/ SX	Deloamer	D-R1.5% Retaiter
			D-MPA-1 .4% BWOC Fluid Loss & Gas		D-CD 2 .5% BWOC	Cello Flace LCM .25		
Tail	ASTM Type III Blend	diato Comontin	Migration Control		Dispersant	lb/sx		D-R1 .2% Retarder
	Druke internie	diate Cementing	y Program					
	Cement must a	achieve 500 psi	compressive st	rength before d	rilling out.			
		& BLM if ceme	nt is not circula	ted to surface.	Cement must ad	hieve 500 psi c	ompressive stre	ngth before
	drilling out.							
PRODUCTION:	Drill to TD follo	wing direction	al plan, run cas	ing, cement cas	ing to surface.			
		ft (MD)	to	-	ft (MD)	Hole S	ection Length:	10,074 ft
	3,673	ft (TVD)	to	5,461	ft (TVD)	Ca	sing Required:	13,759 ft
		F	stimated KOP:	4 950	ft (MD)	4 937	ft (TVD)	
	E	stimated Landi			ft (MD)		ft (TVD)	
		Estimated L	ateral Length:	8,065	ft (MD)			
					VD (1) (4.00			1
					YP (lb/100			
Eluid	Type	M/M (ppg)	W/DS nnm	цтцр		FS	OWP	Comment
Fluid:	Туре	MW (ppg)	WPS ppm	НТНР	sqft)	ES	OWR	Comment WBM as
Fluid:	Type OBM	<b>MW (ppg)</b> 8.0 - 9.0	WPS ppm 120,000 CaCl	HTHP NC		<b>ES</b> +300	<b>OWR</b> 80:20	Comment WBM as contingency
Fluid: Fluids / Solids Notes:	OBM OptiDrill OBM	8.0 - 9.0 system will be b	120,000 CaCl uilt from previo	NC	sqft) ±6 that drying shak	+300 ers are rigged u	80:20 p after the rig (2)	WBM as contingency nd set) of
	OBM OptiDrill OBM shakers. Solids	8.0 - 9.0 system will be b control will bur	120,000 CaCl uilt from previo n retorts on cut	NC us well. Ensure tings samples o	sqft) ±6 that drying shał ne per tour to c	+300 ers are rigged u heck % ROC. Add	80:20 p after the rig (2) d diesel and prod	WBM as contingency nd set) of
	OBM OptiDrill OBM shakers. Solids	8.0 - 9.0 system will be b	120,000 CaCl uilt from previo n retorts on cut	NC us well. Ensure tings samples o	sqft) ±6 that drying shał ne per tour to c	+300 ers are rigged u heck % ROC. Add	80:20 p after the rig (2) d diesel and prod	WBM as contingency nd set) of
	OBM OptiDrill OBM shakers. Solids required to ma	8.0 - 9.0 system will be b control will bur	120,000 CaCl uilt from previo n retorts on cut	NC us well. Ensure tings samples o	sqft) ±6 that drying shak ne per tour to c	+300 ers are rigged u heck % ROC. Add	80:20 p after the rig (2) d diesel and prod	WBM as contingency nd set) of
Fluids / Solids Notes: Hole Size:	OBM OptiDrill OBM shakers. Solids required to ma	8.0 - 9.0 system will be b control will bur intain mud in p	120,000 CaCl uilt from previo n retorts on cut	NC us well. Ensure tings samples o	sqft) ±6 that drying shak ne per tour to c	+300 ers are rigged u heck % ROC. Add	80:20 p after the rig (2) d diesel and prod	WBM as contingency nd set) of
Fluids / Solids Notes: Hole Size: Bit / Motor:	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o	sqft) ±6 that drying shak ne per tour to c ırk's mud progra	+300 ers are rigged u neck % ROC. Add m for additiona ,580 DIFF PSIG	80:20 o after the rig (2) d diesel and prod l details.	WBM as contingency nd set) of ducts as
Fluids / Solids Notes: Hole Size: Bit / Motor:	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breaking	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/- ng device(s) as re	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3,	sqft) ±6 that drying shak ne per tour to c ırk's mud progra deg, 750 GPM, 1 ,000' behind the	+300 ers are rigged u neck % ROC. Add m for additiona ,580 DIFF PSIG a bit.	80:20 o after the rig (2) d diesel and prod l details.	WBM as contingency nd set) of ducts as
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor:	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tarp	sqft) ±6 that drying shak ne per tour to c irk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1.	+300 ers are rigged u neck % ROC. Add m for additiona ,580 DIFF PSIG e bit. 5 sq-in	80:20 o after the rig (2) d diesel and prod l details. (or similar); on o	WBM as contingency nd set) of ducts as
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor:	OBM Opti Drill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR,	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1	120,000 CaCl uilt from previc n retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tarp	sqft) ±6 that drying shak ne per tour to c irk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1.	+300 ers are rigged u neck % ROC. Add m for additiona ,580 DIFF PSIG e bit. 5 sq-in	80:20 o after the rig (2) d diesel and prod l details. (or similar); on o	WBM as contingency nd set) of ducts as
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 77857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tarp ey every joint fro tings sampling,	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs	+300 ers are rigged up heck % ROC. Add m for additiona ,580 DIFF PSIG e bit. 5 sq-in ng Point and su	80:20 p after the rig (2) d diesel and prod l details. (or similar); on c rvey every 100'	WBM as contingency nd set) of ducts as
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P htire section, no est (as noted abo	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r 4 azimuth (surve oint) mud-log or cut bove); pressure te	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tarp ey every joint fro tings sampling, st 9-5/8" casing	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to	+300 ers are rigged up neck % ROC. Add m for additiona ,580 DIFF PSIG e bit. 5 sq-in ng Point and su 1,500	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu	WBM as contingency nd set) of ducts as demand minimum tes.
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM Opti Drill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GP MWD with GR GR MWD for er NU BOPE and to Drill to KOP fol	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and a fater Landing P titre section, no est (as noted abo lowing directio	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut pove); pressure te nal plan. Target	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tarp ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650	sqft) ±6 that drying shall ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to -700 GPM. Tar,	+300 ers are rigged up neck % ROC. Add m for additiona ,580 DIFF PSIG e bit. 5 sq-in ng Point and su 1,500 get differential i	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700	WBM as contingency nd set) of ducts as demand minimum tes. - 1,000 psig.
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GP mWD with GP off AWD for er NU BOPE and tu Drill to KOP fol Target ROP 50C	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P htire section, no est (as noted abo	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut pove); pressure te nal plan. Target er as needed to	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla	sqft) ±6 that drying shall ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to - 700 GPM. Tar, n. Keep DLS < 3	+300 ers are rigged up neck % ROC. Add m for additiona ,580 DIFF PSIG e bit. 5 sq-in ng Point and su 1,500 get differential i deg/100' and ke	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100'n psi for 30 minu s pressure is 700 ep slide length <	WBM as contingency nd set) of ducts as demand demand tes. - 1,000 psig. : 10' until KOP,
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and tr Drill to KOP fol Target ROP 500 when feasible. Geology and Er	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing directio ) - 600 ft/hr. Ste Take surveys even ngineering. Drill	120,000 CaCl uilt from previc ro retorts on cui rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to l ery stand, at a m curve following	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tarp ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confiri directional pla	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to i - 700 GPM. Tar, in. Keep DLS < 3 m landing targe n and updated l	+300 ers are rigged up neck % ROC. Add m for additiona ,580 DIFF PSIG bit. 5 sq-in ng Point and su 1,500 get differential i deg/100' and ke t, planned BUR f anding target. T	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length < or curve, and KO ake survey every	WBM as contingency nd set) of ducts as demand demand tes. - 1,000 psig. - 10' until KOP, DP with - joint during
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and tu Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cur	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/, ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abc lowing directio 0 - 600 ft/hr. Ste Take surveys even ngineering. Drill rve. Continue dr	120,000 CaCl uilt from previc ro retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to l rry stand, at a m curve following iilling in lateral s	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 flow-rate is 650 directional pla section, steering	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to - 700 GPM. Tar, in. Keep DLS < 3 m landing target n and updated l g as needed to ke	+300 eers are rigged up neck % ROC. Add m for additiona ,580 DIFF PSIG bit. 5 sq-in ng Point and su 1,500 get differential i deg/100' and ke ;, planned BUR f anding target. T eep well on plan	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100'n psi for 30 minu s pressure is 700 ep slide length or curve, and KC ake surve, every and in the targe	WBM as contingency nd set) of ducts as demand minimum tes. 10' until KOP, P with joint during et window.
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and ti Drill to KOP foo when feasible. Geology and Er curve. Land cur Keep DLS < 2 de	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abo lowing direction 0 - 600 ft/nr. Ste Take surveys ever gineering. Drill rve. Continue dr eg/100' and keep	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut pry stand, at a m curve following rilling in lateral s o slide length < 2	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tarp ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 6500 (keep well on pla inimum. Confiring directional pla section, steering to, when feasibl	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to -700 GPM. Tar, m. Keep DLS < 3 m landing targe n and updated l g as needed to ke le. Take surveys	+300 ers are rigged up neck % ROC. Add m for additiona ,580 DIFF PSIG a bit. 5 sq-in ng Point and su <b>1,500</b> get differential i deg/100' and ke ;, planned BUR f anding target. T eep well on plan every stand, at a	80:20 pafter the rig (2) d diesel and prod l details. (or similar); on o rvey every 100'n psi for 30 minu s pressure is 700 ep slide length - or curve, and K0 ake survey every and in the targe minimum. <b>Targ</b>	WBM as contingency ad set) of ducts as demand demand ininimum tes. - 1,000 psig. : 10' until KOP, DP with joint during et window. ret rotating
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cu Keep DLS < 2 de parameters / p	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 077857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abo lowing directio 0- 600 ft/hr. Stee Take surveys ever agineering. Drill rve. Continue dr eg/100' and keep	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve toint) mud-log or cut poe); pressure te nal plan. Target er as needed to lary stand, at a m curve following filling in lateral : o slide length < 2 pw-rate is 650 -	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, tar ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 6500 keep well on pla inimum. Confiru directional pla section, steering to', when feasibl 700 GPM, differ	sqft) ±6 that drying shall ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to -700 GPM. Tar. n. Keep DLS < 3 m landing targee n and updated l gas needed to k le. Take surveys rential is pressu	+300 ers are rigged up heck % ROC. Add m for additional ,580 DIFF PSIG e bit. 5 sq-in ng Point and su 1,500 get differential i deg/100' and ke ;, planned BUR f anding target. T sep well on plan every stand, at a re is 700 - 1,000	80:20 p after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100'f psi for 30 minu s pressure is 700'f ep slide length cor curve, and Ko ake survey every and in the targe minimum. Targ D psig, ROP 500	WBM as contingency ad set) of ducts as demand demand tes. - 1,000 psig. c10' until KOP, DP with joint during i twindow. tet rotating - 600 ft/hr,
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOVO friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 When feasible. Geology and Er. Geology and Er. Geology and Er. Geology and Er.	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abo lowing direction 0 - 600 ft/nr. Ste Take surveys ever gineering. Drill rve. Continue dr eg/100' and keep	120,000 CaCl uilt from previc rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve toint) mud-log or cut ove); pressure te nal plan. Target er as needed to 1 ery stand, at a m curve following illing in lateral : o slide length < 2 ow-rate is 650 - pe MUT). After	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, target ey every joint from tings sampling, st 9-5/8" casing flow-rate is 650 (eep well on plating) inimum. Config inimum. Config flow-rate is 650 (eep well on plating) asection, steering 0', when feasibli 700 GPM, differ reaching TD, per	sqft) ±6 that drying shall ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to -700 GPM. Tar. in. Keep DLS < 3 m landing targe n and updated l gas needed to ki le. Take surveys. rential is pressu form no more t	+300 ers are rigged up heck % ROC. Add m for additional ,580 DIFF PSIG e bit. 5 sq-in ng Point and su <b>1,500</b> get differential i deg/100' and ke t; planned BUR t, planned BUR teg well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u	80:20 pafter the rig (2) didesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep slide length < or curve, and KC ake survey every and in the targe minimum. <b>Targ</b> <b>D psig, ROP 500</b> p cycle to condi	WBM as contingency ad set) of ducts as demand demand tes. - 1,000 psig. 10' until KOP, DP with joint during et window. tet rotating - 600 ft/hr, tion hole for
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma * 8-1/2" 8-1/2" PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cur Keep DLS < 2 de parameters / p torque 38K ft-1 casing running required with 0	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P ntire section, no est (as noted abc lowing directio ) - 600 ft/hr. Ste Take surveys even gineering. Drill rve. Continue dr eg/100' and keep eeformance: fto bs (MAX drill pi unless shakers i DBM system). W	120,000 CaCl uilt from previo retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surva 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to rry stand, at a m curve following illing in lateral : o slide length < 2 ow-rate is 650 - pe MUT). After ndicate addition	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, targo ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 eep well on pla inimum. Confiri girectional pla section, steering c0', when feasibl 700 GPM, differ reaching TD, per nal cleaning nee- ple cleaning sec	sqft) ±6 that drying shall ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to -700 GPM. Tarj n. Keep DLS < 3 m landing targer n and updated 1 g as needed to ke le. Take surveys rential is pressu form no more t ded. TOOH & LE zeps, fine LCM p	+300 ers are rigged up heck % ROC. Add m for additional ,580 DIFF PSIG e bit. 5 sq-in ng Point and su 1,500 get differential i deg/100' and ke ;, planned BUR f anding target. T eep well on plan every stand, at a re is 700 - 1,00 han one clean-u o drill pipe (ROC roduct is to be u	80:20 a after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100' psi for 30 minu s pressure is 700 ep Slide length or curve, and KO ake survey every and in the target minimum. Targ D psig, ROP 500 p cycle to condi H, if required; sl sed -Do not use	WBM as contingency and set) of ducts as demand demand demand tes. 1 - 1,000 psig. 10' until KOP, P with joint during et window. tet rotating - 600 ft/hr, tion hole for hould NOT be barite for
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2"PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and tu Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cu Keep DLS < 2 de parameters / p torque 38K ft-I casing running required with 0 sweeps. Run c	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/. ng device(s) as re DC w/16 mm - 1 inclination, an d after Landing P titre section, no est (as noted abc lowing directio ) - 600 ft/hr. Ste Take surveys eve gineering. Drill rve. Continue d reg/100' and keep eeformance: flo bs (MAX drill pi unless shakers i DBM system). W asing as describe	120,000 CaCl uilt from previo retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve oint) mud-log or cut ove); pressure te nal plan. Target er as needed to ry stand, at a m curve following tilling in lateral : o slide length < 2 ow-rate is 650 - pe MUT). After ndicate addition hen pumping he	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, targe ey every joint from tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confiri gdirectional pla section, steering c0', when feasibl 700 GPM, differ reaching TD, per nal cleaning need ple cleaning swe RT for casing run	sqft) ±6 that drying shall ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to - 700 GPM. Tarj in. Keep DLS < 3 m landing targer n and updated 1 gas needed to ke le. Take surveys rential is pressu form no more to ded. TOOH & LE paning only if needed to the top only if needed to the to	+300 ers are rigged up heck % ROC. Add m for additional ,580 DIFF PSIG e bit. 5 sq-in ng Point and su 1,500 get differential i deg/100' and ke ;, planned BUR f anding target. T eep well on plan every stand, at a re is 700 - 1,000 han one clean-u o drill pipe (ROO roduct is to be u essary (should N	80:20 o after the rig (2) d diesel and prod l details. (or similar); on o rvey every 100'n psi for 30 minu s pressure is 700 ep slide length or curve, and KC ake survey every and in the targe minimum. Targ D psig, ROP 500 p cycle to condi H, if required; sl sed -Do not use IOT be required	WBM as contingency and set) of ducts as demand demand tes. 1 - 1,000 psig. 10' until KOP, P with joint during et window. ret rotating - 600 ft/hr, tion hole for barite for with OBM).
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2"PDC bit MOTOR: NOV O friction breakin BIT: 5-BLADE PI MWD with G GR MWD for er NU BOPE and tu Drill to KOP fol Target ROP 500 when feasible. Geology and Er curve. Land cu Keep DLS < 2 de parameters / p torque 38K ft-l casing running required with ( sweeps. Run c Verify make up	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing directio ) - 600 ft/hr. Ste Take surveys even ingineering. Drill rve. Continue dr cg/100' and keep to ft/ and keep to	120,000 CaCl uilt from previo ra retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te nal plan. Target er as needed to ery stand, at a m curve following filling in lateral o slide length < 2 ow-rate is 650 - pe MUT). After ndicate addition hen pumping h ed below. Use C inning casing. Sp	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, targ ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 keep well on pla inimum. Confiri directional pla section, steering 20', when feasible <b>700 GPM, differ</b> <b>700 GPM</b> <b>700 GPM</b>	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to -700 GPM. Tar, in. Keep DLS < 3 m landing targe n and updated I gas needed to ke le. Take surveys- rential is pressu form no more t ded. TOOH & LD puning only if neo getting the toos	+300 ers are rigged up neck % ROC. Add m for additional ,580 DIFF PSIG e bit. 5 sq-in ng Point and su 1,500 get differential i deg/100' and ke ;, planned BUR f anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u o drill pipe (ROO roduct is to be u essary (should N leeve as close to	80:20 a after the rig (2) d diesel and prod l details. (or similar); on of rvey every 100'n psi for 30 minu s pressure is 700 ep slide length for curve, and KO ake survey every and in the targe minimum. Targ D psig, ROP 500 	WBM as contingency add set) of ducts as demand demand demand tes. 10' until KOP, DP with joint during et rotating 600 ft/hr, tion hole for hould NOT be barite for with OBM). Land casing
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and ti Drill to KOP fol When feasible. Geology and Er curve. Land cur Keep DLS < 2 de parameters / p torque 38K ft-1 casing running required with 0 Sweeps. Run c Verify make up and test pack-co	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/- ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing direction 0 - 600 ft/hr. Ste Take surveys ever agineering. Drill rve. Continue dr eg/100' and keep terformance: fto bs (MAX drill pi unless shakers i DBM system). W asing as describut	120,000 CaCl uilt from previc ro retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te ras needed to ry stand, at a m curve following rilling in lateral so slide length < 2 ow-rate is 650 - pe MUT). After ndicate addition hen pumping h ed below. Use C inning casing. Sp ion sub, fill casin	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, target ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 ceep well on pla inimum. Confiring directional pla section, steering to', when feasible 700 GPM, differ reaching TD, per hal cleaning need ble cleaning sweet RT for casing run bace out casing gun	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to - 700 GPM. Tar, in. Keep DLS < 3 m landing target n and updated l gas needed to ke le. Take surveys rential is pressu form no more t ded. TOOH & LC seps, fine LCM p ning only if nec getting the toes a s required. Put	+300 eers are rigged up heck % ROC. Add m for additiona ,580 DIFF PSIG a bit. 5 sq-in ng Point and su <b>1,500</b> get differential i deg/100' and ke ; planned BUR f anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u o drill pipe (ROO roduct is to be u essary (should N leeve as close to mp cement as d	80:20 a after the rig (2) d diesel and prod l details. (or similar); on of rvey every 100'n psi for 30 minu s pressure is 700 ep slide length for curve, and KO ake survey every and in the targe minimum. Targ D psig, ROP 500 	WBM as contingency add set) of ducts as demand demand demand tes. 10' until KOP, DP with joint during et rotating 600 ft/hr, tion hole for hould NOT be barite for with OBM). Land casing
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and ti Drill to KOP fol When feasible. Geology and Er curve. Land cur Keep DLS < 2 de parameters / p torque 38K ft-1 casing running required with 0 Sweeps. Run c Verify make up and test pack-co	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/ ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing directio ) - 600 ft/hr. Ste Take surveys even ingineering. Drill rve. Continue dr cg/100' and keep to ft/ and keep to	120,000 CaCl uilt from previc ro retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te ras needed to ry stand, at a m curve following rilling in lateral so slide length < 2 ow-rate is 650 - pe MUT). After ndicate addition hen pumping h ed below. Use C inning casing. Sp ion sub, fill casin	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, target ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 ceep well on pla inimum. Confiring directional pla section, steering to', when feasible 700 GPM, differ reaching TD, per hal cleaning need ble cleaning sweet RT for casing run bace out casing gun	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to - 700 GPM. Tar, in. Keep DLS < 3 m landing target n and updated l gas needed to ke le. Take surveys rential is pressu form no more t ded. TOOH & LC seps, fine LCM p ning only if nec getting the toes a s required. Put	+300 eers are rigged up heck % ROC. Add m for additiona ,580 DIFF PSIG a bit. 5 sq-in ng Point and su <b>1,500</b> get differential i deg/100' and ke ; planned BUR f anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u o drill pipe (ROO roduct is to be u essary (should N leeve as close to mp cement as d	80:20 a after the rig (2) d diesel and prod l details. (or similar); on of rvey every 100'n psi for 30 minu s pressure is 700 ep slide length for curve, and KO ake survey every and in the targe minimum. Targ D psig, ROP 500 	WBM as contingency ad set) of ducts as demand demand demand tes. 1,000 psig. 10' until KOP, DP with joint during et voidow. det rotating - 600 ft/hr, tion hole for hould NOT be barite for with OBM). Land casing
Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOV 0 friction breakin BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and ti Drill to KOP fol When feasible. Geology and Er curve. Land cur Keep DLS < 2 de parameters / p torque 38K ft-1 casing running required with 0 Sweeps. Run c Verify make up and test pack-co	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/- ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing direction 0 - 600 ft/hr. Ste Take surveys ever agineering. Drill rve. Continue dr eg/100' and keep terformance: fto bs (MAX drill pi unless shakers i DBM system). W asing as describut	120,000 CaCl uilt from previc ro retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te ras needed to ry stand, at a m curve following rilling in lateral so slide length < 2 ow-rate is 650 - pe MUT). After ndicate addition hen pumping h ed below. Use C inning casing. Sp ion sub, fill casin	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, target ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 ceep well on pla inimum. Confiring directional pla section, steering to', when feasible 700 GPM, differ reaching TD, per hal cleaning need ble cleaning sweet RT for casing run bace out casing gun	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to - 700 GPM. Tar, in. Keep DLS < 3 m landing target n and updated l gas needed to ke le. Take surveys rential is pressu form no more t ded. TOOH & LC seps, fine LCM p ning only if nec getting the toes a s required. Put	+300 eers are rigged up heck % ROC. Add m for additiona ,580 DIFF PSIG a bit. 5 sq-in ng Point and su <b>1,500</b> get differential i deg/100' and ke ; planned BUR f anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u o drill pipe (ROO roduct is to be u essary (should N leeve as close to mp cement as d	80:20 a after the rig (2) d diesel and prod l details. (or similar); on of rvey every 100'n psi for 30 minu s pressure is 700 ep slide length for curve, and KO ake survey every and in the targe minimum. Targ D psig, ROP 500 	WBM as contingency ad set) of ducts as demand demand demand tes. 1,000 psig. 10' until KOP, DP with joint during et voidow. det rotating - 600 ft/hr, tion hole for hould NOT be barite for with OBM). Land casing
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Fluids / Solids Notes: Hole Size: Bit / Motor: Bit / Motor: MWD / Survey: Logging: Pressure Test:	OBM OptiDrill OBM shakers. Solids required to ma 8-1/2" 8-1/2" PDC bit MOTOR: NOVC friction breakin BIT: 5-BLADE PI BIT: 5-BLADE PI MWD with GR, before KOP and GR MWD for er NU BOPE and to Drill to KOP fol Target ROP 500 When feasible. Geology and Er Curve. Land cu Keep DLS < 2 de parameters / p torque 38K ft-I casing running required with ( sweeps. Run c Verify make up and test pack-o volume circula	8.0 - 9.0 system will be b control will bur intain mud in p w/mud motor 177857 - 6.5" 7/- ng device(s) as re DC w/16 mm - 1 inclination, and d after Landing P titre section, no est (as noted abo lowing direction 0 - 600 ft/hr. Ste Take surveys ever agineering. Drill rve. Continue dr eg/100' and keep terformance: fto bs (MAX drill pi unless shakers i DBM system). W asing as describut	120,000 CaCl uilt from previc ro retorts on cut rogram specs. R 8, 5.0 stage, 0.2 equired, bottom 9 mm cutters, r d azimuth (surve 'oint) mud-log or cut ove); pressure te ras needed to ry stand, at a m curve following rilling in lateral so slide length < 2 ow-rate is 650 - pe MUT). After ndicate addition hen pumping h ed below. Use C inning casing. Sp ion sub, fill casin	NC us well. Ensure tings samples o eference Newpa 3 rev/gal, 1.83 o tool spaced ~3, natrix body, target ey every joint fro tings sampling, st 9-5/8" casing flow-rate is 650 ceep well on pla inimum. Confiring directional pla section, steering to', when feasible 700 GPM, differ reaching TD, per hal cleaning need ble cleaning sweet RT for casing run bace out casing gun	sqft) ±6 that drying shak ne per tour to c rk's mud progra deg, 750 GPM, 1 ,000' behind the get TFA = 1.0 - 1. om KOP to Land no OH WL logs to - 700 GPM. Tar, in. Keep DLS < 3 m landing target n and updated l gas needed to ke le. Take surveys rential is pressu form no more t ded. TOOH & LC seps, fine LCM p ning only if nec getting the toes a s required. Put	+300 eers are rigged up heck % ROC. Add m for additiona ,580 DIFF PSIG a bit. 5 sq-in ng Point and su <b>1,500</b> get differential i deg/100' and ke ; planned BUR f anding target. T eep well on plan every stand, at a <b>re is 700 - 1,00</b> han one clean-u o drill pipe (ROO roduct is to be u essary (should N leeve as close to mp cement as d	80:20 a after the rig (2) d diesel and prod l details. (or similar); on of rvey every 100'n psi for 30 minu s pressure is 700 ep slide length for curve, and KO ake survey every and in the targe minimum. Targ D psig, ROP 500 	WBM as contingency add set) of ducts as demand demand demand tes. 10' until KOP, DP with joint during et rotating 600 ft/hr, tion hole for hould NOT be barite for with OBM). Land casing

							Tens. Body	Tens. Conn
Casing Specs:	Size (in)	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	(lbs)	(lbs)
Specs	5.500	17.0	P-110	LTC	7,460	10,640	546,000	445,000
Loading					2,698	9,011	301,837	301,837
Min. S.F.					2.77	1.18	1.81	1.47

Assumptions: Collapse: fully evacuated casing with 9.5 ppg fluid in the annulus (floating casing during running) Burst: 8,500 psi maximum surface treating pressure with 10.2 ppg equivalent mud weight sand laden fluid with 8.4 ppg equivalent external pressure gradient

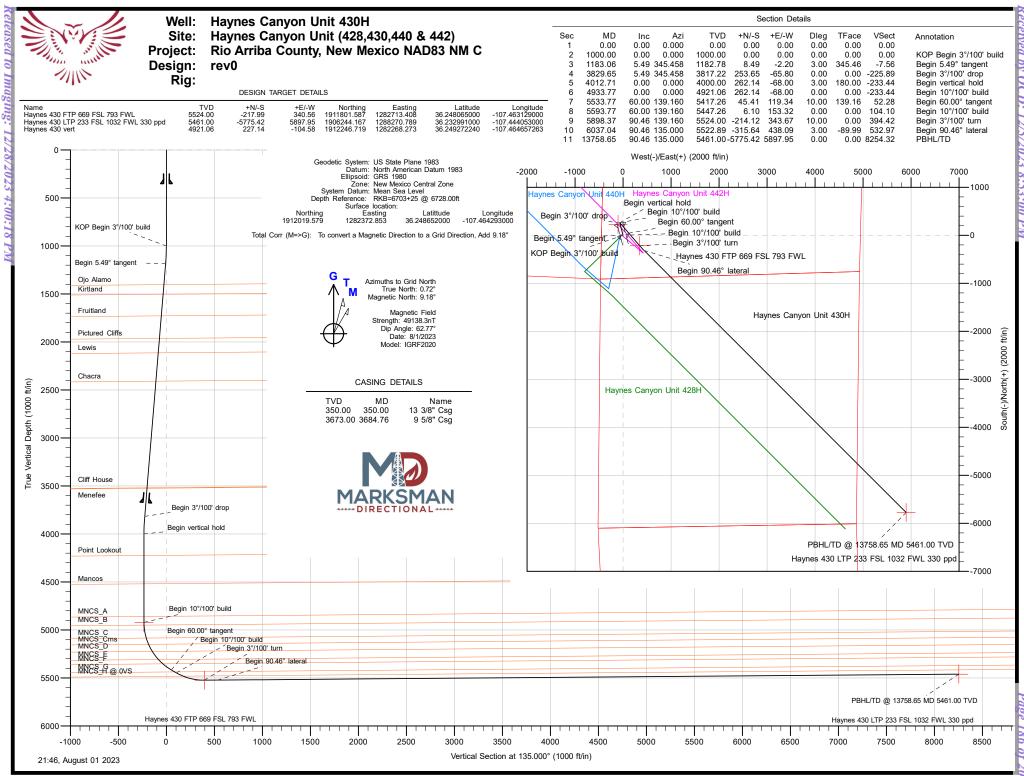
Tension: buoyed weight in 9.0 ppg fluid with 100,000 lbs over-pull

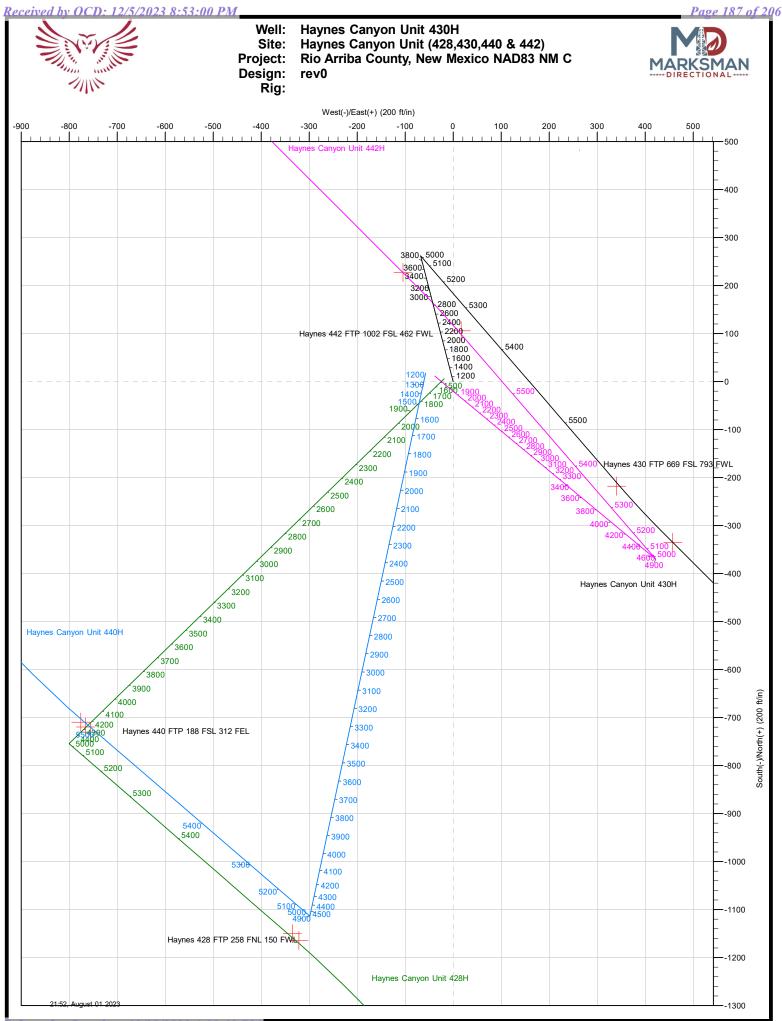
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MU Torque (ft lbs): Casing Summary:	Minumum: 3,470 Optimum: 4,620 Maximum: 5,780 Float shoe, float collar, 1 jt casing, float collar, 20' marker joint, toe-intitiation sleeve, casing to KOP with 20' marker joints spaced evenly in lateral every 2,000', floatation sub at KOP, casing to surface. The toe-initiation sleeve (last-take-point) cannot be placed closer than 330' to the unit boundary when measured perpendicular to the well path.								
Casing Summary:	Float shoe, float collar w/debris catcher, 1 jt casing, float collar (Weatherford (WFT) float equipment), 20' marker joint, toe- nititation sleeve (WFT RD 8,500 psi), casing to KOP with 20' marker joints spaced evenly in lateral every ~2,000', floatation sub (NCS Air-Lock 2,500 psi from WFT), casing to surface. The toe-initiation sleeve shall be placed no closer to the unit boundary than 300' measured perpendicular to the East or West lease lines for a East-West azimuth drilled wellbore. Wellbore path must be no closer than 600' from the parallel lease lines. Note: the LTP is the maximum depth of the toe sleeve and is noted on the Well Plan. Drill past the LTP as required for necessary rat-hole and shoe-track length to place the toe sleeve as close to (but not past) the planned LTP as possible.								
Centralizers:	Lateral: 1 centre Top of curve to	ralizer per 3 joir 9-5/8" shoe: 1	ent may be adju hts (purchase cer centralizer per 5 ralizer per 5 join	ntralizers from e 5 joints					
						Planned TOC		Total Cmt (cu	
Cement:	Туре	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	(ft MD)	Total Cmt (sx)	ft)	
Spacer	IntegraGuard Star	11		31.6		0	60 bbls		
Lead	ASTM type I/II	12.4	2.370	13.40	50%	0	541	1,283	
Tail	G:POZ blend	13.3	1.570	7.70	10%	4,533	1,481	2,325	
Displacement		est bbls							
Annular Capacity	0.2691	cuft/ft		9-5/8" casing a					
	0.2291	cuft/ft	, 5	8-1/2" hole an	nulus				
	0.1245	cuft/ft	5-1/2" casing v		est shoe jt ft	100			
			ssume gauge ho		ss noted in table	•			
	American Cem	enting Liner & F	Production Blen	d IntegraGuard Star					
Spacer	S-8 Silica Flour 163.7 lbs/bbl	Avis 616 viscosifier 11.6 lb/bbl	FP24 Defoamer .5 Ib/bbl	Plus 3K LCM 15 lb/bbl	SS201 Surfactant 1 gal/bbl				
Lead	ASTM Type I/II	BA90 Bonding Agent 5.0 lb/sx	Bentonite Viscosifier 8% BWOB	FL24 Fluid Loss .5% BWOB	IntegraGuard GW86 Viscosifier .1% BWOB	R7C Retarder .2% BWOB	FP24 Defoamer 0.3% BWOB, Anti- Static .01 lb/sx		
Tail	Туре G 50%	Pozzolan Fly Ash Extender 50%	BA90 Bonding Agent 3.0 lb/sx	Bentonite Viscosifier 4% BWOB	FL24 Fluid Loss .4% BWOB	IntegraGuard GW86 Viscosifier .1% BWOB	R3 Retarder .5% BWOB	FP24 Defoamer .3% BWOB, IntegraSeal 0.25 lb/sx	
	Notify NMOCD	& BLM if ceme	ssume gauge ho nt is not circula	ted to surface.					
Note:			d an unorthodo						
			16.15.C.1.b, no						
		-	f the well or 330						
			by NMAC 19.15						
			5.16.7.J, respect						
			take point will b <b>the unit bound</b> a						
		to the azimuth			easured along ti		e well of 550 1	lieasureu	
	perpendiculai	to the azimuth	or the wen.						
FINISH WELL:									
Procedure:	After off-line ce	ement Job, cap a	and cover well. C	ontinue ariiin	g operations on :	subsequent wei	is on pad.		
		A. N.I.							
COMPLETION AND PR									
Est Lateral Length:	7,965		120.000			40.200.000			
Est Frac Inform:		Frac Stages		bbls slick wate	r	10,360,000	lbs proppant		
		0 1	n tubing as press cubing via gas-lif		nt production ar	nd storage facilit	ties		
ESTIMATED START DA	ATEC.								
Drilling: Completion:	11/1/23								
Completion:	12/31/23								
Production:	2/14/24								

Drilling:	11/1/23	
Completion:	12/31/23	
Production:	2/14/24	

Prepared by:	Alec Bridge	12/20/21
Updated:	Greg Olson	2/20/23
	Greg Olson	3/27/23
	G Olson	8/8/23







Database: Company: Project: Site: Nell: Nellbore: Design:	Rio Arriba C Haynes Can	esources LLC ounty, New Me iyon Unit (428, iyon Unit 430H	exico NAD83 NM C 430,440 & 442)	TVD Reference MD Reference North Referen	:	Well Haynes Ca RKB=6703+25 ( RKB=6703+25 ( Grid Minimum Curvat	⊉ 6728.00ft ⊉ 6728.00ft
Project	Rio Arriba Co	ounty, New Me	kico NAD83 NM C				
Map System: Geo Datum: Map Zone:	US State Plane North Americar New Mexico Co	n Datum 1983		System Datum		Mean Sea Level	
Site	Haynes Cany	on Unit (428,4	30,440 & 442)				
Site Position: From: Position Uncertainty:	Lat/Long	0.00 ft	Northing: Easting: Slot Radius:	1,912,025.2 1,282,353.7 13-3/	55 usft Longit		36.248667000 -107.464358000
Well	Haynes Cany	on Unit 430H,	Surf loc: 897 FSL 44	48 FWL Section 03-T2	3N-R06W		
Well Position	+N/-S +E/-W	0.00 ft 0.00 ft	Northing: Easting:		2,019.579 usft 2,372.853 usft	Latitude: Longitude:	36.248652000 -107.464293000
Position Uncertainty Grid Convergence:		0.00 ft -0.72 °	Wellhead Ele	evation:	ft	Ground Level:	6,703.00 ft
Wellbore	Original Hole	•					
Magnetics	Model Na	ame	Sample Date	Declination (°)		Dip Angle (°)	Field Strength (nT)
	IG	RF2020	8/1/2023		8.46	62.77	49,138.30656079
Design	rev0						
Audit Notes:							0.00
Version: Vertical Section:		Denth	Phase: From (TVD)	PLAN +N/-S	Tie On De +E/-W		0.00
		Dopti	(ft)	(ft)	(ft)		(°)
			0.00	0.00	0.00	13	5.000
	ogram	<b>Date</b> 8/1/2	2023				
Plan Survey Tool Pro Depth From	Depth To						
-	(ft)	Survey (Well rev0 (Origina		Tool Name	Rem	arks	

.



Database:	DB Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.000	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,183.06	5.49	345.458	1,182.78	8.49	-2.20	3.00	3.00	0.00	345.46	
3,829.65	5.49	345.458	3,817.22	253.65	-65.80	0.00	0.00	0.00	0.00	
4,012.71	0.00	0.000	4,000.00	262.14	-68.00	3.00	-3.00	0.00	180.00	
4,933.77	0.00	0.000	4,921.06	262.14	-68.00	0.00	0.00	0.00	0.00	
5,533.77	60.00	139.160	5,417.26	45.41	119.34	10.00	10.00	0.00	139.16	
5,593.77	60.00	139.160	5,447.26	6.10	153.32	0.00	0.00	0.00	0.00	
5,898.37	90.46	139.160	5,524.00	-214.12	343.67	10.00	10.00	0.00	0.00	
6,037.04	90.46	135.000	5,522.89	-315.64	438.09	3.00	0.00	-3.00	-89.99	
13,758.65	90.46	135.000	5,461.00	-5,775.42	5,897.95	0.00	0.00	0.00	0.00	Haynes 430 LTP 23



Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.000	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.000	300.00	0.00	0.00	0.00	0.00	0.00	0.00
350.00	0.00	0.000	350.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8" Csg									
400.00	0.00	0.000	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.000	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.000	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.000	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.000	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.000	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.000	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Begin 3			.,						
1,100.00	3.00	345.458	1,099.95	2.53	-0.66	-2.26	3.00	3.00	0.00
1,183.06	5.49	345.458	1,182.78	8.49	-2.20	-7.56	3.00	3.00	0.00
Begin 5.49° t									
1,200.00	5.49	345.458	1,199.64	10.05	-2.61	-8.95	0.00	0.00	0.00
1,300.00	5.49	345.458	1.299.18	19.32	-5.01	-17.20	0.00	0.00	0.00
1,400.00	5.49	345.458	1,398.72	28.58	-7.41	-25.45	0.00	0.00	0.00
1,404.50	5.49	345.458	1,403.21	29.00	-7.52	-25.82	0.00	0.00	0.00
Ojo Alamo	0110	0.01100	.,	20100	1102	20.02	0.00	0100	0100
1,500.00	5.49	345.458	1,498.27	37.85	-9.82	-33.70	0.00	0.00	0.00
1,505.03	5.49	345.458	1,503.27	38.31	-9.94	-34.12	0.00	0.00	0.00
Kirtland			.,						
	5.40	0.45.450	4 507 04	17.11	10.00	44.05	0.00	0.00	0.00
1,600.00	5.49	345.458	1,597.81	47.11	-12.22	-41.95	0.00	0.00	0.00
1,700.00	5.49	345.458	1,697.35	56.37	-14.62	-50.20	0.00	0.00	0.00
1,731.22	5.49	345.458	1,728.42	59.26	-15.37	-52.78	0.00	0.00	0.00
Fruitland 1,800.00	5.40	245 459	1,796.89	65.64	-17.03	E9 / E	0.00	0.00	0.00
1,900.00	5.49 5.49	345.458 345.458	1,796.69	65.64 74.90	-17.03	-58.45 -66.70	0.00 0.00	0.00	0.00
1,967.46	5.49	345.458	1,963.58	81.15	-21.05	-72.27	0.00	0.00	0.00
Pictured Clif									
2,000.00	5.49	345.458	1,995.97	84.16	-21.83	-74.95	0.00	0.00	0.00
2,100.00	5.49	345.458	2,095.51	93.43	-24.24	-83.20	0.00	0.00	0.00
2,118.25	5.49	345.458	2,113.68	95.12	-24.67	-84.71	0.00	0.00	0.00
Lewis	F 10	0.45.450	0.405.05	400.00	60 G (	<u> </u>	0.00	0.00	0.00
2,200.00	5.49	345.458	2,195.05	102.69	-26.64	-91.45	0.00	0.00	0.00
2,300.00	5.49	345.458	2,294.59	111.95	-29.04	-99.70	0.00	0.00	0.00
2,400.00	5.49	345.458	2,394.13	121.22	-31.44	-107.95	0.00	0.00	0.00
2,414.81	5.49	345.458	2,408.88	122.59	-31.80	-109.17	0.00	0.00	0.00
Chacra		0.45.455	0.465.55	102.12					
2,500.00	5.49	345.458	2,493.68	130.48	-33.85	-116.20	0.00	0.00	0.00
2,600.00	5.49	345.458	2,593.22	139.74	-36.25	-124.45	0.00	0.00	0.00
2,700.00	5.49	345.458	2,692.76	149.01	-38.65	-132.70	0.00	0.00	0.00
2,800.00	5.49	345.458	2,792.30	158.27	-41.06	-140.95	0.00	0.00	0.00
2,900.00	5.49	345.458	2,891.84	167.54	-43.46	-149.20	0.00	0.00	0.00
3,000.00	5.49	345.458	2,991.38	176.80	-45.86	-157.45	0.00	0.00	0.00
3,100.00	5.49	345.458	3,090.92	186.06	-48.27	-165.70	0.00	0.00	0.00
3,200.00	5.49	345.458	3,190.46	195.33	-50.67	-173.94	0.00	0.00	0.00
3,300.00	5.49	345.458	3,290.00	204.59	-53.07	-182.19	0.00	0.00	0.00
3,400.00	5.49	345.458	3,389.54	213.85	-55.47	-190.44	0.00	0.00	0.00
3,500.00	5.49	345.458	3,489.09	223.12	-57.88	-198.69	0.00	0.00	0.00



Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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)
3,530.67	5.49	345.458	3,519.62	225.96	-58.61	-201.22	0.00	0.00	0.00
Cliff House									
3,535.70	5.49	345.458	3,524.62	226.42	-58.74	-201.64	0.00	0.00	0.00
Menefee									
3,600.00	5.49	345.458	3,588.63	232.38	-60.28	-206.94	0.00	0.00	0.00
3,684.76	5.49	345.458	3,673.00	240.23	-62.32	-213.94	0.00	0.00	0.00
9 5/8" Csg 3.700.00	E 40	245 459	2 699 17	241.64	60.69	215 10	0.00	0.00	0.00
3,800.00	5.49 5.49	345.458 345.458	3,688.17 3,787.71	241.64 250.91	-62.68 -65.09	-215.19 -223.44	0.00 0.00	0.00 0.00	0.00 0.00
3,829.65	5.49	345.458	3,817.22	253.65	-65.80	-225.89	0.00	0.00	0.00
Begin 3°/100		545.450	5,017.22	233.03	-05.00	-225.09	0.00	0.00	0.00
3,900.00	3.38	345.458	3,887.36	258.92	-67.17	-230.58	3.00	-3.00	0.00
4,000.00	0.38	345.458	3,987.29	262.10	-67.99	-233.41	3.00	-3.00	0.00
4,012.71	0.00	0.000	4,000.00	262.14	-68.00	-233.44	3.00	-3.00	0.00
Begin vertica		0.000	4 007 00	000 44	~~~~	000 11	0.00	2.22	0.00
4,100.00	0.00	0.000	4,087.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,200.00	0.00	0.000	4,187.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,237.58	0.00	0.000	4,224.87	262.14	-68.00	-233.44	0.00	0.00	0.00
<b>Point Looko</b> 4,300.00	ut 0.00	0.000	4.287.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,400.00	0.00	0.000	4,387.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,500.00	0.00	0.000	4,487.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,532.58	0.00	0.000	4,519.87	262.14	-68.00	-233.44	0.00	0.00	0.00
Mancos									
4,600.00	0.00	0.000	4,587.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,700.00	0.00 0.00	0.000 0.000	4,687.29 4,787.29	262.14 262.14	-68.00 -68.00	-233.44 -233.44	0.00 0.00	0.00 0.00	0.00 0.00
4,800.00 4,872.58	0.00	0.000	4,859.87	262.14	-68.00	-233.44	0.00	0.00	0.00
MNCS_A			.,						
4,900.00	0.00	0.000	4,887.29	262.14	-68.00	-233.44	0.00	0.00	0.00
4,933.77	0.00	0.000	4,921.06	262.14	-68.00	-233.44	0.00	0.00	0.00
Begin 10°/10	0' build								
4,950.00	1.62	139.160	4,937.29	261.97	-67.85	-233.21	10.00	10.00	0.00
4,962.59	2.88	139.160	4,949.87	261.59	-67.53	-232.72	10.00	10.00	0.00
MNCS_B 5,000.00	6.62	139.160	4,987.14	259.25	-65.50	-229.63	10.00	10.00	0.00
5,050.00 5,099.70	11.62 16.59	139.160 139.160	5,036.50 5,084.68	253.25 244.09	-60.32 -52.40	-221.73 -209.65	10.00 10.00	10.00 10.00	0.00 0.00
MNCS C	10.00	100.100	0,004.00	L 17.00	02.70	200.00	10.00	10.00	0.00
5,100.00	16.62	139.160	5,084.97	244.02	-52.34	-209.56	10.00	10.00	0.00
5,150.00	21.62	139.160	5,132.20	231.64	-41.63	-193.23	10.00	10.00	0.00
5,168.73	23.50	139.160	5,149.49	226.20	-36.93	-186.06	10.00	10.00	0.00
MNCS_Cms									
5,200.00	26.62	139.160	5,177.81	216.18	-28.27	-172.86	10.00	10.00	0.00
5,250.00	31.62	139.160	5,221.48	197.78	-12.36	-148.59	10.00	10.00	0.00
5,253.18 MNCS_D	31.94	139.160	5,224.18	196.51	-11.27	-146.92	10.00	10.00	0.00
5,300.00	36.62	139.160	5,262.86	176.56	5.97	-120.63	10.00	10.00	0.00
5,350.00	41.62	139.160	5,301.64	152.70	26.60	-89.17	10.00	10.00	0.00
5,359.47	42.57	139.160	5,308.67	147.90	30.75	-82.84	10.00	10.00	0.00
MNCS_E			,						
5,400.00	46.62	139.160	5,337.52	126.38	49.35	-54.46	10.00	10.00	0.00

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Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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)
5,423.50	48.97	139.160	5,353.30	113.21	60.74	-37.10	10.00	10.00	0.00
MNCS_F									
5,450.00		139.160	5,370.23	97.78	74.07	-16.77	10.00	10.00	0.00
5,500.00	56.62	139.160	5,399.52	67.14	100.55	23.63	10.00	10.00	0.00
5,533.77	60.00	139.160	5,417.26	45.41	119.34	52.28	10.00	10.00	0.00
Begin 60.0	0° tangent								
5,573.86	•	139.160	5,437.30	19.14	142.05	86.91	0.00	0.00	0.00
MNCS_G									
5,593.77	60.00	139.160	5,447.26	6.10	153.32	104.10	0.00	0.00	0.00
Begin 10°/	100' build								
5,600.00	60.62	139.160	5,450.34	2.00	156.86	109.50	10.00	10.00	0.00
5,650.00	65.62	139.160	5,472.94	-31.73	186.02	153.97	10.00	10.00	0.00
5,671.92	67.82	139.160	5,481.60	-46.96	199.19	174.05	10.00	10.00	0.00
MNCS_H		1001100	0,101100	10100	100110	11 1100	10100	10.00	0100
5,700.00	-	139.160	5,491.56	-66.82	216.35	200.23	10.00	10.00	0.00
5,750.00		139.160	5,506.08	-103.01	247.63	247.94	10.00	10.00	0.00
5,800.00		139.160	5,516.36	-140.01	279.62	296.72	10.00	10.00	0.00
5,850.00	85.62	139.160	5,522.35	-177.56	312.07	346.22	10.00	10.00	0.00
5,898.37	90.46	139.160	5,524.00	-214.12	343.67	394.42	10.00	10.00	0.00
Begin 3°/1		1001100	0,0200		0.0101	001112	10100	10.00	0.00
5,900.00		139.111	5,523.99	-215.35	344.74	396.04	3.00	0.00	-3.00
6,000.00		136.111	5,523.18	-289.20	412.15	495.93	3.00	0.00	-3.00
6,037.04		135.000	5,522.89	-315.64	438.09	532.97	3.00	0.00	-3.00
Begin 90.4	6° lateral								
6,100.00		135.000	5,522.38	-360.16	482.60	595.92	0.00	0.00	0.00
6,200.00	90.46	135.000	5,521.58	-430.87	553.31	695.92	0.00	0.00	0.00
6,300.00		135.000	5,520.78	-501.57	624.02	795.91	0.00	0.00	0.00
6,400.00		135.000	5,519.98	-572.28	694.73	895.91	0.00	0.00	0.00
6,500.00	90.46	135.000	5,519.18	-642.99	765.44	995.91	0.00	0.00	0.00
6,600.00	90.46	135.000	5,518.37	-713.70	836.15	1,095.90	0.00	0.00	0.00
6,700.00	90.46	135.000	5,517.57	-784.41	906.85	1,195.90	0.00	0.00	0.00
6,800.00		135.000	5,516.77	-855.11	977.56	1,295.90	0.00	0.00	0.00
6,900.00		135.000	5,515.97	-925.82	1,048.27	1,395.89	0.00	0.00	0.00
7,000.00		135.000	5,515.17	-996.53	1,118.98	1,495.89	0.00	0.00	0.00
7,100.00	90.46	135.000	5,514.37	-1,067.24	1,189.69	1,595.89	0.00	0.00	0.00
7,200.00	90.46	135.000	5,513.57	-1,137.94	1,260.40	1,695.88	0.00	0.00	0.00
7,300.00		135.000	5,512.76	-1,208.65	1,331.11	1,795.88	0.00	0.00	0.00
7,400.00		135.000	5,511.96	-1,279.36	1,401.82	1,895.88	0.00	0.00	0.00
7,500.00		135.000	5,511.16	-1,350.07	1,472.53	1,995.88	0.00	0.00	0.00
7,600.00	90.46	135.000	5,510.36	-1,420.78	1,543.23	2,095.87	0.00	0.00	0.00
7,700.00	90.46	135.000	5,509.56	-1,491.48	1,613.94	2,195.87	0.00	0.00	0.00
7,800.00	90.46	135.000	5,508.76	-1,562.19	1,684.65	2,295.87	0.00	0.00	0.00
7,900.00		135.000	5,507.96	-1,632.90	1,755.36	2,395.86	0.00	0.00	0.00
8,000.00		135.000	5,507.15	-1,703.61	1,826.07	2,495.86	0.00	0.00	0.00
8,100.00	90.46	135.000	5,506.35	-1,774.32	1,896.78	2,595.86	0.00	0.00	0.00
8,200.00		135.000	5,505.55	-1,845.02	1,967.49	2,695.85	0.00	0.00	0.00
8,300.00		135.000	5,504.75	-1,915.73	2,038.20	2,795.85	0.00	0.00	0.00
8,400.00		135.000	5,503.95	-1,986.44	2,108.91	2,895.85	0.00	0.00	0.00
8,500.00		135.000	5,503.15	-2,057.15	2,179.62	2,995.84	0.00	0.00	0.00
8,600.00	90.46	135.000	5,502.35	-2,127.85	2,250.32	3,095.84	0.00	0.00	0.00
8,700.00		135.000	5,501.54	-2,198.56	2,321.03	3,195.84	0.00	0.00	0.00
8,800.00		135.000	5,500.74	-2,269.27	2,391.74	3,295.83	0.00	0.00	0.00
8,900.00	90.46	135.000	5,499.94	-2,339.98	2,462.45	3,395.83	0.00	0.00	0.00

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Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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)
9,000.00	90.46	135.000	5,499.14	-2,410.69	2,533.16	3,495.83	0.00	0.00	0.00
9,100.00	90.46	135.000	5,498.34	-2,481.39	2,603.87	3,595.82	0.00	0.00	0.00
9,200.00	90.46	135.000	5,497.54	-2,552.10	2,674.58	3,695.82	0.00	0.00	0.00
9,300.00	90.46	135.000	5,496.73	-2,622.81	2,745.29	3,795.82	0.00	0.00	0.00
9,400.00	90.46	135.000	5,495.93	-2,693.52	2,816.00	3,895.81	0.00	0.00	0.00
9,500.00	90.46	135.000	5,495.13	-2,764.23	2,886.70	3,995.81	0.00	0.00	0.00
9,600.00	90.46	135.000	5,494.33	-2,834.93	2,957.41	4,095.81	0.00	0.00	0.00
9,700.00	90.46	135.000	5,493.53	-2,905.64	3,028.12	4,195.80	0.00	0.00	0.00
9,800.00	90.46	135.000	5,492.73	-2,976.35	3,098.83	4,295.80	0.00	0.00	0.00
9,900.00	90.46	135.000	5,491.93	-3.047.06	3,169.54	4,395.80	0.00	0.00	0.00
10,000.00	90.46	135.000	5,491.12	-3,117.77	3,240.25	4,495.79	0.00	0.00	0.00
10,100.00	90.46	135.000	5,490.32	-3,188.47	3,310.96	4,595.79	0.00	0.00	0.00
10,200.00	90.46	135.000	5,489.52	-3,259.18	3,381.67	4,695.79	0.00	0.00	0.00
10,300.00	90.46	135.000	5,488.72	-3,329.89	3,452.38	4,795.79	0.00	0.00	0.00
10,400.00	90.46	135.000	5,487.92	-3,400.60	3,523.08	4,895.78	0.00	0.00	0.00
10,500.00	90.46	135.000	5,487.12	-3,471.30	3,593.79	4,995.78	0.00	0.00	0.00
10,600.00	90.46	135.000	5,486.32	-3,542.01	3,664.50	5,095.78	0.00	0.00	0.00
10,700.00	90.46	135.000	5,485.51	-3,612.72	3,735.21	5,195.77	0.00	0.00	0.00
10,800.00	90.46	135.000	5,484.71	-3,683.43	3,805.92	5,295.77	0.00	0.00	0.00
10,900.00	90.46	135.000	5,483.91	-3,754.14	3,876.63	5,395.77	0.00	0.00	0.00
11,000.00	90.46	135.000	5,483.11	-3,824.84	3,947.34	5,495.76	0.00	0.00	0.00
11,100.00	90.46	135.000	5,482.31	-3,895.55	4,018.05	5,595.76	0.00	0.00	0.00
11,200.00	90.46	135.000	5,481.51	-3,966.26	4,088.76	5,695.76	0.00	0.00	0.00
11,300.00	90.46	135.000	5,480.71	-4,036.97	4,159.47	5,795.75	0.00	0.00	0.00
11,400.00	90.46	135.000	5.479.90	-4,107.68	4,230.17	5,895.75	0.00	0.00	0.00
11,500.00	90.46	135.000	5,479.10	-4,178.38	4,300.88	5,995.75	0.00	0.00	0.00
11,600.00	90.46	135.000	5,478.30	-4,249.09	4,371.59	6,095.74	0.00	0.00	0.00
11,700.00	90.46	135.000	5,477.50	-4,319.80	4,442.30	6,195.74	0.00	0.00	0.00
11,800.00	90.46	135.000	5,476.70	-4,390.51	4,513.01	6,295.74	0.00	0.00	0.00
11,900.00	90.46	135.000	5,475.90	-4,461.21	4,583.72	6,395.73	0.00	0.00	0.00
12,000.00	90.46	135.000	5,475.10	-4,531.92	4,654.43	6,495.73	0.00	0.00	0.00
12,100.00	90.46	135.000	5,474.29	-4,602.63	4,725.14	6,595.73	0.00	0.00	0.00
12,200.00	90.46	135.000	5,473.49	-4,673.34	4,795.85	6,695.72	0.00	0.00	0.00
12,200.00	90.46	135.000	5,472.69	-4,744.05	4,866.55	6,795.72	0.00	0.00	0.00
12,300.00	90.46	135.000	5,471.89	-4,814.75	4,800.33	6,895.72	0.00	0.00	0.00
12,400.00	90.46	135.000	5,471.09	-4,885.46	4,937.20 5,007.97	6,995.72	0.00	0.00	0.00
12,500.00	90.46 90.46	135.000	5,471.09 5,470.29	-4,005.40 -4,956.17	5,007.97 5,078.68	7,095.71	0.00	0.00	0.00
12,700.00	90.46	135.000	5,469.48	-5,026.88	5,149.39	7,195.71	0.00	0.00	0.00
12,800.00	90.46	135.000	5,468.68	-5,097.59	5,220.10	7,295.71	0.00	0.00	0.00
12,900.00	90.46	135.000	5,467.88	-5,168.29	5,290.81	7,395.70	0.00	0.00	0.00
13,000.00	90.46	135.000	5,467.08	-5,239.00	5,361.52	7,495.70	0.00	0.00	0.00
13,100.00	90.46	135.000	5,466.28	-5,309.71	5,432.23	7,595.70	0.00	0.00	0.00
13,200.00	90.46	135.000	5,465.48	-5,380.42	5,502.94	7,695.69	0.00	0.00	0.00
13,300.00	90.46	135.000	5,464.68	-5,451.13	5,573.64	7,795.69	0.00	0.00	0.00
13,400.00	90.46	135.000	5,463.87	-5,521.83	5,644.35	7,895.69	0.00	0.00	0.00
13,500.00	90.46	135.000	5,463.07	-5,592.54	5,715.06	7,995.68	0.00	0.00	0.00
13,600.00	90.46	135.000	5,462.27	-5,663.25	5,785.77	8,095.68	0.00	0.00	0.00
13,700.00	90.46	135.000	5,461.47	-5,733.96	5,856.48	8,195.68	0.00	0.00	0.00
13,758.65	90.46	135.000	5,461.00	-5,775.42	5,897.95	8,254.32	0.00	0.00	0.00
		61.00 TVD							



Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

## 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
Haynes 430 vert - plan misses target c - Point	0.00 enter by 50.6	0.000 3ft at 4933.8	4,921.06 80ft MD (492	227.14 1.10 TVD, 26	-104.58 2.14 N, -68.00	1,912,246.719 D E)	1,282,268.273	36.249272240	-107.464657263
Haynes 430 LTP 233 FS - plan hits target cente - Point	0.00 er	0.000	5,461.00	-5,775.42	5,897.95	1,906,244.167	1,288,270.789	36.232991000	-107.444053000
Haynes 430 FTP 669 FS - plan misses target c - Point	0.00 enter by 4.89	0.000 9ft at 5899.26	5,524.00 6ft MD (5523	-217.99 6.99 TVD, -214	340.56 1.79 N, 344.26	1,911,801.587 6 E)	1,282,713.408	36.248065000	-107.463129000

## Casing Points

Measured	Vertical	Name	Casing	Hole
Depth	Depth		Diameter	Diameter
(ft)	(ft)		(")	(")
350.00		13 3/8" Csg	13-3/8	17-1/2
3,684.76		9 5/8" Csg	9-5/8	12-1/4

## Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,404.50	1,403.21	Ojo Alamo		-0.46	135.000
1,505.03	1,503.27	Kirtland		-0.46	135.000
1,731.22	1,728.42	Fruitland		-0.46	135.000
1,967.46	1,963.58	Pictured Cliffs		-0.46	135.000
2,118.25	2,113.68	Lewis		-0.46	135.000
2,414.81	2,408.88	Chacra		-0.46	135.000
3,530.67	3,519.62	Cliff House		-0.46	135.000
3,535.70	3,524.62	Menefee		-0.46	135.000
4,237.58	4,224.87	Point Lookout		-0.46	135.000
4,532.58	4,519.87	Mancos		-0.46	135.000
4,872.58	4,859.87	MNCS_A		-0.46	135.000
4,962.59	4,949.87	MNCS_B		-0.46	135.000
5,099.70	5,084.68	MNCS_C		-0.46	135.000
5,168.73	5,149.49	MNCS_Cms		-0.46	135.000
5,253.18	5,224.18	MNCS_D		-0.46	135.000
5,359.47	5,308.67	MNCS_E		-0.46	135.000
5,423.50	5,353.30	MNCS_F		-0.46	135.000
5,573.86	5,437.30	MNCS_G		-0.46	135.000
5,671.92	5,481.60	MNCS H @ 0VS		-0.46	135.000



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Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Plan Annotations

Measured	Vertical	Local Coor	dinates	
Depth (ft)	Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,000.00	1,000.00	0.00	0.00	KOP Begin 3°/100' build
1,183.06	1,182.78	8.49	-2.20	Begin 5.49° tangent
3,829.65	3,817.22	253.65	-65.80	Begin 3°/100' drop
4,012.71	4,000.00	262.14	-68.00	Begin vertical hold
4,933.77	4,921.06	262.14	-68.00	Begin 10°/100' build
5,533.77	5,417.26	45.41	119.34	Begin 60.00° tangent
5,593.77	5,447.26	6.10	153.32	Begin 10°/100' build
5,898.37	5,524.00	-214.12	343.67	Begin 3°/100' turn
6,037.04	5,522.89	-315.64	438.09	Begin 90.46° lateral
13,758.65	5,461.00	-5,775.42	5,897.95	PBHL/TD @ 13758.65 MD 5461.00 TVD



Database: Company: Project: Site: Well: Wellbore: Design:	DB_Decv0422v16 Enduring Resources LLC Rio Arriba County, New Mexico NAD83 NM C Haynes Canyon Unit (428,430,440 & 442) Haynes Canyon Unit 430H Original Hole rev0			Local Co-ordin TVD Reference: MD Reference: North Reference Survey Calcula	e:	Well Haynes Ca RKB=6703+25 RKB=6703+25 Grid Minimum Curva	@ 6728.00ft	
Project	Rio Arriba Co	unty, New Me	kico NAD83 NM C					
Oco Datain.	US State Plane North Americar New Mexico Ce	n Datum 1983		System Datum:		Mean Sea Level		
Site	Haynes Cany	on Unit (428,4	30,440 & 442)					
Site Position: From: Position Uncertainty:	Lat/Long	0.00 ft	Northing: Easting: Slot Radius:	1,912,025.28 1,282,353.75 13-3/1	5 usft Longit			36.248667000 107.464358000
Well	Haynes Canyo	on Unit 430H,	Surf loc: 897 FSL 44	18 FWL Section 03-T23	N-R06W			
Well Position	+N/-S +E/-W	0.00 ft 0.00 ft	Northing: Easting:		,019.579 usft ,372.853 usft	Latitude: Longitude:	-	36.248652000 107.464293000
Position Uncertainty Grid Convergence:		0.00 ft -0.72 °	Wellhead Ele	vation:	ft	Ground Level:		6,703.00 ft
Wellbore	Original Hole	•						
Magnetics	Model Na	ame	Sample Date	Declination (°)		Dip Angle (°)	Field Strengt (nT)	h
	IG	RF2020	8/1/2023		8.46	62.77	49,138.306	56079
Design	rev0							
Audit Notes:								
Version:			Phase:	PLAN	Tie On Dep		0.00	
Vertical Section:		Depth	From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Dir	ection (°)	
			0.00	0.00	0.00	13	5.000	
Plan Survey Tool Pro	gram	Date 8/1/2	2023					
Depth From (ft)	Depth To (ft)	Survey (Well	bore)	Tool Name	Rema	arks		
1 0.00	13,758.64	rev0 (Origina	Hole)	MWD OWSG MWD - Sta	ndard			

Released to Imaging: 12/28/2023 4:00:18 PM



# Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.000	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,183.06	5.49	345.458	1,182.78	8.49	-2.20	3.00	3.00	0.00	345.46	
3,829.65	5.49	345.458	3,817.22	253.65	-65.80	0.00	0.00	0.00	0.00	
4,012.71	0.00	0.000	4,000.00	262.14	-68.00	3.00	-3.00	0.00	180.00	
4,933.77	0.00	0.000	4,921.06	262.14	-68.00	0.00	0.00	0.00	0.00	
5,533.77	60.00	139.160	5,417.26	45.41	119.34	10.00	10.00	0.00	139.16	
5,593.77	60.00	139.160	5,447.26	6.10	153.32	0.00	0.00	0.00	0.00	
5,898.37	90.46	139.160	5,524.00	-214.12	343.67	10.00	10.00	0.00	0.00	
6,037.04	90.46	135.000	5,522.89	-315.64	438.09	3.00	0.00	-3.00	-89.99	
13,758.65	90.46	135.000	5,461.00	-5,775.42	5,897.95	0.00	0.00	0.00	0.00	Haynes 430 LTP 2



## Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.000	0.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
100.00	0.00	0.000	100.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
200.00	0.00	0.000	200.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
300.00	0.00	0.000	300.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
350.00	0.00	0.000	350.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
13 3/8" 0	Csg								
400.00	0.00	0.000	400.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
500.00	0.00	0.000	500.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
600.00	0.00	0.000	600.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
700.00	0.00	0.000	700.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
800.00	0.00	0.000	800.00	0.00	0.00	1,912,019.579	1,282,372.853	36.248652000	-107.464293000
900.00 1,000.00	0.00 0.00	0.000 0.000	900.00 1,000.00	0.00 0.00	0.00 0.00	1,912,019.579 1,912,019.579	1,282,372.853 1,282,372.853	36.248652000 36.248652000	-107.464293000 -107.464293000
			1,000.00	0.00	0.00	1,912,019.579	1,202,372.033	30.240032000	-107.404293000
1,100.00	gin <b>3°/100' bui</b> 3.00	345.458	1,099.95	2.53	-0.66	1,912,022.113	1,282,372.196	36.248658936	-107.464295336
1,183.06	5.49	345.458	1,182.78	8.49	-2.20	1,912,028.064	1,282,370.652	36.248675229	-107.464300824
	49° tangent	010.100	1,102.10	0.10	2.20	1,012,020.001	1,202,010.002	00.2 10010220	101.101000021
1,200.00	5.49	345.458	1,199.64	10.05	-2.61	1,912,029.634	1,282,370.245	36.248679526	-107.464302272
1,300.00	5.49	345.458	1,299.18	19.32	-5.01	1,912,038.898	1,282,367.842	36.248704886	-107.464310813
1,400.00	5.49	345.458	1,398.72	28.58	-7.41	1,912,048.161	1,282,365.439	36.248730245	-107.464319355
1,404.50	5.49	345.458	1,403.21	29.00	-7.52	1,912,048.578	1,282,365.331	36.248731388	-107.464319740
Ojo Alan	no								
1,500.00	5.49	345.458	1,498.27	37.85	-9.82	1,912,057.425	1,282,363.036	36.248755605	-107.464327897
1,505.03	5.49	345.458	1,503.27	38.31	-9.94	1,912,057.891	1,282,362.915	36.248756881	-107.464328327
Kirtland									
1,600.00	5.49	345.458	1,597.81	47.11	-12.22	1,912,066.688	1,282,360.633	36.248780965	-107.464336439
1,700.00	5.49	345.458	1,697.35	56.37	-14.62	1,912,075.952	1,282,358.230	36.248806325	-107.464344980
1,731.22		345.458	1,728.42	59.26	-15.37	1,912,078.844	1,282,357.480	36.248814242	-107.464347647
Fruitland 1,800.00	d 5.49	345.458	1,796.89	65.64	-17.03	1,912,085.215	1,282,355.827	36.248831684	-107.464353522
1,900.00	5.49	345.458	1,896.43	74.90	-17.03	1,912,085.215	1,282,353.424	36.248857044	-107.464362064
1,967.46	5.49	345.458	1,963.58	81.15	-21.05	1,912,100.728	1,282,351.803	36.248874152	-107.464367826
Pictured		010.100	1,000.00	01.10	21.00	1,012,100.120	1,202,001.000	00.210011102	101.101001020
2,000.00	5.49	345.458	1,995.97	84.16	-21.83	1,912,103.743	1,282,351.021	36.248882404	-107.464370606
2,100.00	5.49	345.458	2,095.51	93.43	-24.24	1,912,113.006	1,282,348.618	36.248907764	-107.464379147
2,118.25	5.49	345.458	2,113.68	95.12	-24.67	1,912,114.697	1,282,348.179	36.248912392	-107.464380706
Lewis									
2,200.00	5.49	345.458	2,195.05	102.69	-26.64	1,912,122.270	1,282,346.215	36.248933123	-107.464387689
2,300.00	5.49	345.458	2,294.59	111.95	-29.04	1,912,131.533	1,282,343.812	36.248958483	-107.464396231
2,400.00	5.49	345.458	2,394.13	121.22	-31.44	1,912,140.797	1,282,341.409	36.248983843	-107.464404773
2,414.81	5.49	345.458	2,408.88	122.59	-31.80	1,912,142.169	1,282,341.053	36.248987599	-107.464406038
Chacra									
2,500.00	5.49	345.458	2,493.68	130.48	-33.85	1,912,150.060	1,282,339.006	36.249009202	-107.464413315
2,600.00	5.49	345.458	2,593.22	139.74	-36.25	1,912,159.324	1,282,336.603	36.249034562	-107.464421856
2,700.00	5.49	345.458 345.458	2,692.76	149.01 158.27	-38.65	1,912,168.587	1,282,334.200	36.249059922	-107.464430398
2,800.00 2,900.00	5.49 5.49	345.458 345.458	2,792.30 2,891.84	158.27 167.54	-41.06 -43.46	1,912,177.851 1,912,187.115	1,282,331.797 1,282,329.394	36.249085282 36.249110641	-107.464438940 -107.464447482
3,000.00	5.49 5.49	345.458	2,891.84	176.80	-43.40	1,912,196.378	1,282,326.991	36.249136001	-107.464456024
3,100.00	5.49	345.458	3,090.92	186.06	-48.27	1,912,205.642	1,282,324.588	36.249161361	-107.464464565
3,200.00	5.49	345.458	3,190.46	195.33	-50.67	1,912,214.905	1,282,322.185	36.249186720	-107.464473107
3,300.00	5.49	345.458	3,290.00	204.59	-53.07	1,912,224.169	1,282,319.782	36.249212080	-107.464481649
3,400.00	5.49	345.458	3,389.54	213.85	-55.47	1,912,233.432	1,282,317.379	36.249237440	-107.464490191
3,500.00	5.49	345.458	3,489.09	223.12	-57.88	1,912,242.696	1,282,314.976	36.249262800	-107.464498733



## Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,530.67	7 5.49	345.458	3,519.62	225.96	-58.61	1,912,245.537	1,282,314.239	36.249270578	-107.464501353
Cliff Ho	use								
3,535.70	5.49	345.458	3,524.62	226.42	-58.74	1,912,246.003	1,282,314.118	36.249271852	-107.464501782
Menefe									
3,600.00		345.458	3,588.63	232.38	-60.28	1,912,251.959	1,282,312.573	36.249288159	-107.464507275
3,684.76		345.458	3,673.00	240.23	-62.32	1,912,259.812	1,282,310.536	36.249309655	-107.464514515
<b>9 5/8" 0</b> 3,700.00	-	345.458	3,688.17	241.64	-62.68	1,912,261.223	1,282,310.170	36.249313519	-107.464515817
3,800.00		345.458	3,787.71	250.91	-65.09	1,912,270.487	1,282,307.767	36.249338879	-107.464524358
3,829.65		345.458	3,817.22	253.65	-65.80	1,912,273.233	1,282,307.055	36.249346398	-107.464526891
Begin 3	°/100' drop								
3,900.00	3.38	345.458	3,887.36	258.92	-67.17	1,912,278.500	1,282,305.688	36.249360817	-107.464531748
4,000.00		345.458	3,987.29	262.10	-67.99	1,912,281.678	1,282,304.864	36.249369515	-107.464534678
4,012.7		0.000	4,000.00	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
-	vertical hold	0.000	4 007 00	000.44		4 0 4 0 0 0 4 7 4 0	4 000 004 050	00.04000007	
4,100.00		0.000 0.000	4,087.29 4,187.29	262.14 262.14	-68.00	1,912,281.719 1,912,281.719	1,282,304.853	36.249369627	-107.464534715 -107.464534715
4,200.00 4,237.58		0.000	4,187.29	262.14 262.14	-68.00 -68.00	1,912,281.719	1,282,304.853 1,282,304.853	36.249369627 36.249369627	-107.464534715
Point L		0.000	4,224.07	202.14	-00.00	1,012,201.710	1,202,004.000	00.240000027	107.404004710
4,300.00		0.000	4,287.29	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
4,400.00		0.000	4,387.29	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
4,500.00	0.00	0.000	4,487.29	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
4,532.58	3 0.00	0.000	4,519.87	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
Mancos									
4,600.00		0.000	4,587.29	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
4,700.00 4,800.00		0.000 0.000	4,687.29 4,787.29	262.14 262.14	-68.00 -68.00	1,912,281.719 1,912,281.719	1,282,304.853 1,282,304.853	36.249369627 36.249369627	-107.464534715 -107.464534715
4,872.58		0.000	4,859.87	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
MNCS			.,			.,	.,,		
4,900.00		0.000	4,887.29	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
4,933.77	7 0.00	0.000	4,921.06	262.14	-68.00	1,912,281.719	1,282,304.853	36.249369627	-107.464534715
-	0°/100' build								
4,950.00		139.160	4,937.29	261.97	-67.85	1,912,281.545	1,282,305.004	36.249369155	-107.464534198
4,962.59		139.160	4,949.87	261.59	-67.53	1,912,281.170	1,282,305.327	36.249368138	-107.464533085
5,000.00		139.160	4,987.14	259.25	-65.50	1,912,278.826	1,282,307.354	36.249361768	-107.464526113
5,050.00		139.160	4,987.14 5,036.50	259.25	-60.32	1,912,278.820	1,282,312.537	36.249345479	-107.464508285
5,099.70		139.160	5,084.68	244.09	-52.40	1,912,263.667	1,282,320.457	36.249320587	-107.464481040
MNCS	с								
5,100.00	) 16.62	139.160	5,084.97	244.02	-52.34	1,912,263.603	1,282,320.513	36.249320411	-107.464480848
5,150.00		139.160	5,132.20	231.64	-41.63	1,912,251.215	1,282,331.221	36.249286756	-107.464444012
5,168.73		139.160	5,149.49	226.20	-36.93	1,912,245.778	1,282,335.920	36.249271985	-107.464427845
MNCS_		400 400	5 477 04	040.40	00.07	4 040 005 700	4 000 044 500	00.040044700	407 404000050
5,200.00 5,250.00		139.160 139.160	5,177.81 5,221.48	216.18 197.78	-28.27 -12.36	1,912,235.760 1,912,217.356	1,282,344.580 1,282,360.489	36.249244768 36.249194769	-107.464398056 -107.464343332
5,253.18		139.160	5,224.18	196.51	-11.27	1,912,216.090	1,282,361.583	36.249191330	-107.464339568
MNCS_			3,221.10			.,	.,_0_,001.000	00.2.10101000	
5,300.00		139.160	5,262.86	176.56	5.97	1,912,196.143	1,282,378.825	36.249137138	-107.464280255
5,350.00		139.160	5,301.64	152.70	26.60	1,912,172.282	1,282,399.450	36.249072314	-107.464209305
5,359.47	42.57	139.160	5,308.67	147.90	30.75	1,912,167.477	1,282,403.604	36.249059260	-107.464195017
MNCS_									
5,400.00	46.62	139.160	5,337.52	126.38	49.35	1,912,145.955	1,282,422.207	36.249000791	-107.464131023



## Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

## Planned Survey

V/V         (1) <th(1)< th=""> <th(1)< th=""> <th(1)< th=""></th(1)<></th(1)<></th(1)<>	Measured Depth (ft)		Azimuth	Vertical Depth (ft)	+N/-S	+E/-W	Map Northing (usft)	Map Easting (usft)	l stitude	Laurituda
Mescs_F		(°)	(°)		(ft)	(ft)	. ,		Latitude	Longitude
5.450.00         516.2         139.160         5.570.23         97.78         74.07         1.912,117.362         1.282,444.922         36.24487022         1.017,446146005           5.550.00         5.650.00         139.160         5.471.22         45.41         119.34         1.912,064.927         1.282,442.196         36.244870820         1.077.43896296           Beigin 60.07 tangent         -         <			139.160	5,353.30	113.21	60.74	1,912,132.788	1,282,433.588	36.248965020	-107.464091872
Begin 60.0° tangent	5,450.00 5,500.00	51.62 56.62	139.160	5,399.52	67.14	100.55	1,912,086.722	1,282,473.408	36.248839869	-107.463954894
5.73 //a 6         6.00         139 / 100         5.437 //a 0         19.14         14.20         1.912 / 0.28 / 19         3.82 / 487 / 0.456         -107 / 433812160           MNCS, C         -			100.100	0,111.20	10.11	110.01	1,012,001.001	1,202,102.100	00.210100020	101.100000200
5.93.77         60.00         139.160         5.447.26         6.10         153.22         1,912.025.876         1.282.582.176         38.246674022         -107.46377337           5.600.00         65.62         139.160         5.47.20         -31.86         5.17.152         67.82         139.160         5.47.192         -31.86.02         1.282.557.16         36.246671237         -107.463365003           5.671.92         67.82         139.160         5.481.60         -46.96         199.19         1,911.972.617         1.282.557.040         36.248571857         -107.463365660           5.700.00         70.62         139.160         5.491.56         -66.82         216.35         1,211.952.75         1.282.692.05         36.248477071         -107.463365660           5.700.00         70.62         139.160         5.520.40         -211.31.679.567         1.282.693.026         36.248072402         -107.463318390           5.800.00         80.62         139.160         5.523.90         -217.55         34.74         1.911.804.204         1.282.717.594         36.248072402         -107.46311891           5.900.00         90.46         136.111         5.523.99         -215.35         34.74         1.911.804.203         1.282.775.540         36.248072402         -107.462841256	5,573.86	60.00	139.160	5,437.30	19.14	142.05	1,912,038.719	1,282,514.901	36.248709456	-107.463812160
5,600.00         60.62         139.160         5,450.24         -107.433761198         1282.2858.87         -32.44662894         -107.433761198           5,671.02         67.82         139.160         5,471.92         67.82         139.160         5,471.92         67.82         139.160         5,481.60         -46.96         199.19         1,911.972.617         1.282.572.00         36.2485727         -107.436356589           5,700.00         70.62         139.160         5,516.36         -100.01         27.463         1,911.972.617         1.282.582.82         36.248475021         -107.435356589           5,800.00         86.52         139.160         5,516.35         -100.01         27.463         1,911.945.758         1.282.692.4452         36.248177612         -107.46344893           5,800.00         80.62         139.160         5,522.35         -177.56         312.07         1,911.842.024         1.282.717.544         32.24817601         -107.4632471659           5,900.00         90.46         135.010         5,522.38         -215.55         344.74         1,911.703.382         1.282.110.933         32.247807402         -107.462843294           6.000.0         90.46         135.000         5,522.38         -30.01         42.20         1.282.86.43         32	_		139.160	5,447.26	6.10	153.32	1,912,025.676	1,282,526.176	36.248674022	-107.463773377
5.680.00         66.52         139.160         5.472.94         -31.73         189.02         1.911.997.860         1.282.582.92         32.24857227         -107.46366000           5.671.02         67.82         139.160         5.481.60         -46.96         199.19         1.911.997.617         1.282.582.04         36.24857221         -107.46356660           5.700.00         76.62         139.160         5.506.08         -103.01         247.63         1.911.952.763         1.282.582.04         35.248377076         -107.463356560           5.800.00         86.52         139.160         5.522.35         -177.56         1.207.765         1.282.584.72         32.24807755         -107.4633183910           5.800.00         90.46         139.160         5.522.39         -177.56         12.07         1.118.05.44         1.282.716.526         32.24807755         -107.463148190           6.000.00         90.46         139.110         5.52.38         -215.35         344.74         1.911.804.230         1.282.716.50         32.247878178         -107.462314219           6.000.00         90.46         135.000         5.522.88         -316.64         438.09         1.911.916.80         2.282.785.453         36.247679427         -107.462314219           6.000.00 <t< td=""><td>Begin 1</td><td>0°/100' build</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Begin 1	0°/100' build								
5671 92         67.82         139.160         5.481.60         -46.96         199.19         1,911.972.617         1.282,572.040         36.24852987.3         -107.463615608           MNCS H @ OVS         70.62         139.160         5.500.08         -103.01         247.63         1,911.952.758         1.282,589.205         36.248475921         -107.463356560           5.800.00         80.62         139.160         5.522.35         -177.56         312.07         1,911.976.07         1.282.652.445         36.248377016         -107.4633148963           5.800.00         80.62         139.160         5.522.40         -211.2         343.67         1,911.842.024         1.282.715.26         36.248072402         -107.4631489163           5.800.00         90.46         133.111         5.523.89         -215.35         344.74         1.911.804.201         1.282.717.544         36.248702402         -107.463143916           6.000.00         90.46         135.000         5.522.89         -316.64         4136.00         1.911.659.422         1.282.755.43         36.247679427         -107.462348271           6.200.00         90.46         135.000         5.521.88         -30.757         1.911.894.221         236.247679427         -107.46254517           6.400.00         90.46<									36.248662894	
MNCS H @ 0vs           5,700.00         70.62         139.160         5,491.56         -66.82         216.35         1.911.952.758         1.282.589.205         36.244375921         -107.453358930           5,800.00         86.62         139.160         5,516.36         -140.01         276.62         1.911.979.677         1.282.662.472         36.244277076         -107.453358930           5,800.00         86.62         139.160         5,522.35         -177.756         312.07         1.911.842.024         1.282.663.472         36.244277076         -107.463327295           5,898.37         90.46         139.160         5,522.30         -215.35         344.74         1.911.805.444         1.282.716.504         36.244072402         -107.4633718691           6,000.00         90.46         135.000         5,522.18         -248.02         412.15         1.911.703.397         1.282.716.504         36.247671467         -107.46284328571           6,000.00         90.46         135.000         5,522.18         -360.16         482.60         1.911.659.422         1.282.861.62         36.247679427         -107.462843286           6,000.00         90.46         135.000         5,521.88         -490.87         5,518.107         1.282.881.76         38.247679427         -107.462										
5,700.00         70.62         139.160         5,441.56         -66.82         213.35         1,111,1952.758         1,282,620.465         36,244776221         -107.463566660           5,750.00         86.62         139.160         5,550.08         -103.10         247.83         1,111,1956.757         1,282,662.472         36,24877024         -107.463338939           5,850.00         86.62         139.160         5,552.35         -177.56         312.07         1,191.842.024         1,282,761.52         36,248075755         -107.4631727295           5,868.37         90.46         139.111         5,523.18         -280.20         1,111,730.322         1,282,715.594         36,248075402         -107.462388227           6,007.00         90.46         135.000         5,522.38         -360.16         422.0         1,281,1659.422         1,282,810.938         36,247679427         -107.4628483227           6,007.00         90.46         135.000         5,522.38         -360.16         1,911,863.007         1,282,855.453         36,247679427         -107.462841326           6,200.00         90.46         135.000         5,520.78         -90.17         1,911,882.007         1,282,855.453         36,24476768         -107.462398571           6,400.00         90.46         135			139.160	5,481.60	-46.96	199.19	1,911,972.617	1,282,572.040	36.248529873	-107.463615609
5,750.00         756.20         139.160         5,500.08         -103.01         247.63         1,911.916.572         1282.650.485         36.248377612         -107.46334893           5,850.00         85.62         139.160         5,513.68         -140.01         277.62         1,911.875.657         1.282.650.422         36.248277076         -107.46333893           5,850.00         85.62         139.160         5,524.00         -214.12         343.67         1,911.805.404         1,282.716.528         36.248072402         -107.463148919           6,000.00         90.46         136.111         5,522.89         -280.20         412.15         1,911.703.392         1,282.717.594         36.2476719427         -107.46214963           6,000.00         90.46         135.000         5,522.88         -360.16         482.60         1,911.659.422         1,282.856.453         36.2476719427         -107.462241326           6,000.00         90.46         135.000         5,522.88         -360.16         482.60         1,911.858.714         1,282.856.453         36.247679427         -107.462241326           6,000.00         90.46         135.000         5,521.88         -360.16         482.60         1,911.818.07         1,828.966.757         36.2471691418         -107.461913065	_	-	100,100	5 404 50		040.05	4 0 44 0 50 750	4 000 500 005	00.040475004	407 400550500
5,800.00         80.62         139.160         5,512.35         -177.56         312.07         1,911,822.024         1,282,682.472         36.24827706         -107.46338830           5,850.00         85.62         139.160         5,522.35         -177.56         312.07         1,911,820.24         1,282,684.924         36.24807755         -107.46331830           5,889.37         90.46         139.111         5,523.99         -215.35         344.74         1,911,804.230         1,282,717.594         36.248072402         -107.463114919           6,000.00         90.46         138.111         5,523.99         -215.35         344.74         1,911,703.382         1,822,717.594         36.248072402         -107.46281326           6,000.00         90.46         135.000         5,522.89         -315.64         432.60         1,911,703.397         1,282,856.453         36.247670427         -107.46284326           6,100.00         90.46         135.000         5,521.58         40.30         757         62.402         1,811,850.422         1,822,856.453         36.247670427         -107.462841326           6,000.00         90.46         135.000         5,521.58         40.30         755         1,911,569         1,222,966.870         36.247295888         -107.461710313										
5,850.00         85.62         139.160         5,524.00         -214.12         343.67         1,911,805.464         1,282,716.526         36.248075755         -107.463227290           5,989.37         90.46         139.110         5,524.00         -214.12         343.67         1,911,805.464         1,282,716.526         36.248072402         -107.463114591           6,000.00         90.46         135.111         5,523.89         -215.35         344.74         1,911,703.382         1,282,717.594         36.248072402         -107.46283227           6,037.04         90.46         135.000         5,522.89         -315.64         438.09         1,911,703.382         1,282,718.580         36.24780195         -107.462841326           6,100.00         90.46         135.000         5,522.78         -360.16         482.60         1,911,659.422         1,282,958.162         36.24780198         -107.462841326           6,200.00         90.46         135.000         5,527.78         -501.57         654.41         1,911,589.71         1283,967.579         36.24796198         -107.46193065           6,400.00         90.46         135.000         5,517.57         778.41         906.85         1,911,365.91         1,283,475.97         36.246912347         -107.4614670813										
5,896.37         90.46         139.160         5,524.00         -214.12         343.67         1,911,805.464         1,282,716.526         36.248075755         -107.463118591           Bogin 3'/100' turn         - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>, ,</td> <td></td> <td></td> <td></td>							, ,			
Begin 3'/100' turn           5,900.00         90.46         139,111         5,523.99         -215.35         344.74         1,911,804.230         1,282,715.594         36,248072402         -107.463114919           6,000.00         90.46         135.000         5,522.89         -315.64         438.09         1,911,730.382         1,282,785.000         36,247871897         -107.462883227           6,010.00         90.46         135.000         5,522.38         -360.16         422.60         1,911,599.422         1,282,810.938         36,2476019427         -107.462641326           6,100.00         90.46         135.000         5,522.78         -501.57         624.02         1,911,518.007         1,282,968.170         36,2476679427         -107.462641326           6,300.00         90.46         135.000         5,519.18         -642.29         694.73         1,911,305.894         1,283,0298.870         36,2467104118         -107.461913065           6,500.00         90.46         135.000         5,517.7         -784.41         906.85         1,283,208.997         36,24672076         -107.461427663           6,700.00         90.46         135.000         5,515.97         -925.82         1,911,935.76         1,283,325.74         36,24615259         -107.461427663				,						
5.900.00         90.46         138.111         5.523.89         -215.35         344.74         1.911,730.382         1.282,717.594         36.247871897         -107.463114919           6.007.04         90.46         135.000         5.522.89         -315.64         482.09         1.911,730.387         1.282,716.000         36.247871897         -107.462784152           Begin 90.46*         135.000         5.522.88         -360.16         482.60         1.911,659.422         1.282,785.000         36.247787018         -107.46274156           6,100.00         90.46         135.000         5.522.18         -300.17         624.02         1.911,659.422         1.282,986.870         36.247769427         -107.462641326           6,400.00         90.46         135.000         5.519.38         -572.28         694.73         1.911,472.99         1.283,108.286         36.24769427         -107.461673033           6,600.00         90.46         135.000         5.518.37         -713.70         836.15         1.911,365.841         1.283,208.97         36.247691427         -107.461427653           6,600.00         90.46         135.000         5.518.77         -784.41         906.85         1.911,365.844         1.283,208.97         36.244592364         -107.461427633           6,6			100.100	0,021.00	211.12	010.07	1,011,000.101	1,202,110.020	00.210010100	101.100110001
6.000.00         90.46         136.111         5.523.18         -289.20         412.15         1,911,730.382         1,282,785.000         38.247871897         -107.462283227           6.037.04         90.46         135.000         5,522.38         -360.16         482.60         1,911,593.422         1,282,855.453         36.247679427         -107.462641326           6,100.00         90.46         135.000         5,521.58         -430.87         553.31         1,911,584.41         1,282,926.162         36.24779427         -107.462641326           6,300.00         90.46         135.000         5,521.78         -501.57         624.02         1,911,578.414         1,282,926.162         36.247497658         -107.462155817           6,400.00         90.46         135.000         5,519.98         -672.28         694.73         1,911,376.591         1,283,138.288         36.246912347         -107.461427563           6,500.00         90.46         135.000         5,517.57         -784.41         906.85         1,911,365.884         1,283,208.997         36.246720576         -107.461427563           6,700.00         90.46         135.000         5,515.97         -925.82         1,941,973.40         1,283,281.433         36.24562804         -107.460049318           7,000.0	-		139.111	5.523.99	-215.35	344.74	1.911.804.230	1.282.717.594	36.248072402	-107.463114919
Begin 90.46° lateral           6,100.00         90.46         135.000         5,522.38         -360.16         482.60         1,911,659.422         1,282,855.453         36.247679427         -107.46241326           6,200.00         90.46         135.000         5,521.78         -501.57         624.02         1,911,588.714         1,282,958.670         36.247679427         -107.4624158617           6,400.00         90.46         135.000         5,519.98         -572.28         694.73         1,911,376.591         1.283,077.579         36.247679488         -107.46170313           6,600.00         90.46         135.000         5,518.37         -7713.70         836.15         1,911,376.591         1.283,138.288         36.246720576         -107.4614727663           6,700.00         90.46         135.000         5,515.97         -928.82         1,044.27         1,911,93.706         1.283,421.123         36.24652890         -107.461472763           6,800.00         90.46         135.000         5,515.97         -928.82         1,044.27         1,183.84         1.283,421.123         36.245569434         -107.460456573           7,00.00         90.46         135.000         5,515.77         -986.51         1,911,93.706         1.283,471.637         36.245569938         -				,				, ,		
6,100.00         90.46         135.000         5,522.38         -360.16         482.60         1,911,588.714         1,282,925,453         36,247679427         -107.46241326           6,200.00         90.46         135.000         5,521.58         430.87         563.31         1,911,588.714         1,282,926,162         36,247487658         -107.46215817           6,400.00         90.46         135.000         5,519.98         -572.28         694.73         1,911,472.99         1,283,067.579         36,247104118         -107.46147563           6,600.00         90.46         135.000         5,519.18         -642.99         765.44         1,911,376.591         1,283,067.579         36,246712057         -107.46147563           6,700.00         90.46         135.000         5,515.77         -784.41         906.85         1,911,325.776         1,283,3279.706         36,24672057         -107.46042065           6,900.00         90.46         135.000         5,515.77         -925.82         1,048.27         1,911,903.760         1,283,491.832         36,24678074         -107.460699318           7,000.00         90.46         135.000         5,515.77         -925.82         1,048.27         1,283,491.832         36,245761712         -107.46042055           7,000.00	6,037.04	90.46	135.000	5,522.89	-315.64	438.09	1,911,703.937	1,282,810.938	36.247800156	-107.462794155
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Begin 9	0.46° lateral								
6,300.00       90.46       135.000       5,520.76       -501.57       624.02       1,911,518.007       1,282,996.870       36.247295888       -107.46215817         6,400.00       90.46       135.000       5,519.98       -572.28       694.73       1,911,472.99       1,283,067.579       36.247104118       -107.46170313         6,600.00       90.46       135.000       5,518.37       -713.70       836.15       1,911,305.864       1,283,208.997       36.246720576       -107.461427563         6,700.00       90.46       135.000       5,516.77       -784.41       906.85       1,911,123.176       1,283,279.706       36.246720576       -107.461427563         6,900.00       90.46       135.000       5,516.77       -925.82       1,048.27       1,911,1023.053       1,283,421.123       36.246145259       -107.460969318         7,000.00       90.46       135.000       5,514.37       -1,067.24       1,189.96       1,910,932.54       1,283,562.541       36.2455761712       -107.460213282         7,200.00       90.46       135.000       5,511.97       -1,286.65       1,331.11       1,910,810.627       1,283,773.66       36.24558938       -107.45972833         7,400.00       90.46       135.000       5,511.96       -1,279.36	6,100.00	90.46	135.000	5,522.38	-360.16	482.60	1,911,659.422	1,282,855.453	36.247679427	-107.462641326
6,400.00         90.46         135.000         5,519.98         -572.28         694.73         1,911,447.299         1,283,067.579         36.247104118         -107.461913065           6,500.00         90.46         135.000         5,519.18         -642.99         765.44         1,911,376.591         1,283,138.288         36.246912347         -107.461470313           6,600.00         90.46         135.000         5,517.57         -784.41         906.85         1,911,235.176         1,283,279.706         36.246528804         -107.461184813           6,800.00         90.46         135.000         5,515.77         -855.11         977.56         1,911,937.60         1,283,491.832         36.2465259         -107.460942065           6,900.00         90.46         135.000         5,515.77         -96.53         1,118.98         1,911,023.053         1,283,491.832         36.245593486         -107.460456573           7,100.00         90.46         135.000         5,513.57         -1,087.24         1,189.69         1,910,982.345         1,283,491.832         36.245593486         -107.4509728343           7,200.00         90.46         135.000         5,511.46         -1,279.36         1,401.82         1,910,982.345         1,283,703.988         36.245578163         -107.4597284482	6,200.00	90.46	135.000	5,521.58	-430.87	553.31	1,911,588.714	1,282,926.162	36.247487658	-107.462398571
6,500.0090.46135.0005,519.18-642.99765.441,911,376.5911,283,138.28836.246912347-107.4616703136,600.0090.46135.0005,518.37-713.70836.151,911,305.8841,283,209.99736.246720576-107.46114275636,700.0090.46135.0005,516.77-855.11977.561,911,164.4681,283,320.41436.246337032-107.46109420556,900.0090.46135.0005,515.77-925.821,048.271,911,093.7601,283,421.12336.245953486-107.4609420557,000.0090.46135.0005,513.57-1,137.941,280.491,911,093.7601,283,421.12336.245953486-107.4609420557,200.0090.46135.0005,513.57-1,137.941,260.401,910,952.3451,283,625.4136.245963486-107.4602138287,200.0090.46135.0005,511.76-1,208.651,331.111,910,810.371,283,703.95836.245578163-107.4592728347,400.0090.46135.0005,511.76-1,208.651,331.111,910,810.9291,283,774.66736.2449186327-107.4592728347,600.0090.46135.0005,511.36-1,427.781,401.821,910,588.061,283,916.08536.244302855-107.459778667,600.0090.46135.0005,501.56-1,491.481,613.941,910,582.0981,283,946.37636.24490452-107.4587573867,600.0090.46135.0005,507.66-1,491.481,61									36.247295888	-107.462155817
6,600.0090.46135.0005,518.37-713.70836.151,911,305.8841,283,208.99736.246720576-107.4614275636,700.0090.46135.0005,517.57-784.41906.851,911,235.1761,283,3279.70636.246327032-107.461184136,800.0090.46135.0005,515.77-855.11977.561,911,033.7601,283,3421.12336.246145259-107.4609420656,900.0090.46135.0005,515.77-995.531,118.981,911,023.0531,283,491.83236.2455693846-107.4604565737,100.0090.46135.0005,513.57-1,137.941,260.401,910.952.3451,283,632.5036.245569938-107.450218287,200.0090.46135.0005,511.67-1,208.651,331.111,910,811.6371,283,633.25036.245569938-107.459710857,500.0090.46135.0005,511.66-1,279.361,401.821,910,740.2221,283,774.66736.245186387-107.4592488627,600.0090.46135.0005,510.36-1,420.781,543.231,910,582.0981,283,916.08536.244802835-107.4592428627,600.0090.46135.0005,510.36-1,420.781,543.231,910,582.0981,283,916.08536.24410284-107.4582428627,600.0090.46135.0005,507.96-1,632.901,755.361,910,366.6831,284,916.2936.24419284-107.4587437867,900.0090.46135.0005,507.96-1,632.901,755.										
6,700.0090.46135.0005,517.57-784.41906.851,911,235.1761,283,279.70636.246528804-107.4611848136,800.0090.46135.0005,516.77-855.11977.561,911,164.4681,283,350.41436.246337032-107.4609420656,900.0090.46135.0005,515.17-996.531,118.981,911,023.0531,283,421.12336.246145259-107.4606993187,000.0090.46135.0005,514.37-1,067.241,189.691,910,952.3451,283,633.25036.245569938-107.4602138287,200.0090.46135.0005,511.76-1,208.651,331.111,910,816.371,283,633.25036.245569938-107.4597283437,400.0090.46135.0005,511.96-1,279.361,401.821,910,740.2221,283,703.95836.24508163-107.4597284527,500.0090.46135.0005,511.36-1,279.361,401.821,910,740.2221,283,714.66736.244994612-107.4592428627,500.0090.46135.0005,501.36-1,420.781,543.231,910,598.061,283,945.37636.244994612-107.4592428627,600.0090.46135.0005,508.76-1,562.191,684.651,910,315.97536.244994612-107.459274867,900.0090.46135.0005,507.96-1,632.901,755.361,910,315.9751,284,057.50236.24440285-107.4587248627,900.0090.46135.0005,507.15-1,703.611,860.771,910,31										
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6,900.0090.46135.0005,515.97-925.821,048.271,911,093.7601,283,421.12336.246145259-107.4606993187,000.0090.46135.0005,515.17-996.531,118.981,911,023.0531,283,491.82236.245953486-107.4604565737,100.0090.46135.0005,514.37-1,067.241,189.691,910,952.3451,283,632.5036.24556938-107.4604565737,200.0090.46135.0005,512.76-1,279.361,401.821,910,981.6371,283,703.95836.24556938-107.459710857,400.0090.46135.0005,511.16-1,279.361,401.821,910,740.2221,283,774.66736.245186387-107.4594286027,500.0090.46135.0005,511.6-1,420.781,543.231,910,695.141,283,946.5336.244802835-107.459001247,600.0090.46135.0005,509.56-1,491.481,613.941,910,528.0981,283,986.79436.244611058-107.4587573867,800.0090.46135.0005,507.56-1,622.191,684.651,910,457.3911,284,057.50236.244402573-107.4582719158,000.0090.46135.0005,507.56-1,774.321,896.781,910,245.2681,284,418.29236.24435724-107.4582719158,000.0090.46135.0005,506.35-1,774.321,896.781,910,315.9751,284,408.522-107.458278168,000.0090.46135.0005,506.35-1,774.321,867.491,910,										
7,000.0090.46135.0005,515.17-996.531,118.981,911,023.0531,283,491.83236.245953486-107.4604565737,100.0090.46135.0005,514.37-1,067.241,189.691,910,952.3451,283,633.25036.24556938-107.4502138287,200.0090.46135.0005,513.57-1,137.941,260.401,910,810.9291,283,703.95836.245578163-107.4599710857,300.0090.46135.0005,511.6-1,208.651,331.111,910,740.2221,283,703.95836.245378163-107.4594856027,500.0090.46135.0005,511.16-1,350.071,472.531,910,669.5141,283,916.08536.244904612-107.4592428627,600.0090.46135.0005,510.36-1,420.781,543.231,910,598.8061,283,916.08536.2446102835-107.4589748667,700.0090.46135.0005,507.66-1,62.191,684.651,910,457.3911,284,957.50236.24419281-107.4585738667,900.0090.46135.0005,507.15-1,703.611,826.071,910,315.9751,284,128.21136.2443023724-107.4582719158,000.0090.46135.0005,505.55-1,845.021,990,8761,910,315.9751,284,410.33736.243652166-107.4577864498,200.0090.46135.0005,503.55-1,986.741,910,315.9751,284,410.33736.2436605-107.457373178,300.0090.46135.0005,503.55-1,986.442,108.91 <td></td>										
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7,200.0090.46135.0005,513.57-1,137.941,260.401,910,881.6371,283,633.25036.245569938-107.4599710857,300.0090.46135.0005,512.76-1,208.651,331.111,910,810.9291,283,703.95836.245378163-107.4597283437,400.0090.46135.0005,511.16-1,279.361,401.821,910,740.2221,283,774.66736.245186387-107.4594268027,500.0090.46135.0005,511.16-1,350.071,472.531,910,669.5141,283,845.37636.244994612-107.4592428627,600.0090.46135.0005,509.56-1,491.481,613.941,910,528.0981,283,946.08536.244611058-107.4587573867,800.0090.46135.0005,507.66-1,632.901,755.361,910,345.97536.244011058-107.4587573867,900.0090.46135.0005,507.15-1,703.611,826.071,910,315.9751,284,198.92036.2440135724-107.4582719158,000.0090.46135.0005,505.55-1,845.021,967.491,910,174.5601,284,340.33736.24363945-107.4578024988,200.0090.46135.0005,503.95-1,915.732,038.201,910,174.5601,284,340.33736.2436036-107.4577864498,200.0090.46135.0005,503.95-1,986.442,108.911,910,733.1441,284,481.75536.2436036-107.4573009878,400.0090.46135.0005,503.95-1,986.442,108.91<										
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7,700.0090.46135.0005,509.56-1,491.481,613.941,910,528.0981,283,986.79436.244611058-107.4587573867,800.0090.46135.0005,508.76-1,562.191,684.651,910,457.3911,284,057.50236.244419281-107.4585146507,900.0090.46135.0005,507.96-1,632.901,755.361,910,386.6831,284,128.21136.244227503-107.4582719158,000.0090.46135.0005,507.15-1,703.611,826.071,910,315.9751,284,198.92036.244035724-107.4580291818,100.0090.46135.0005,506.35-1,774.321,896.781,910,245.2681,284,269.62936.243843945-107.4577864498,200.0090.46135.0005,505.55-1,845.021,967.491,910,174.5601,284,340.33736.243652166-107.4575437178,300.0090.46135.0005,504.75-1,915.732,038.201,910,103.8521,284,411.04636.243460386-107.4570582588,500.0090.46135.0005,503.15-2,057.152,179.621,909,962.4371,284,552.46436.243076824-107.4568155308,600.0090.46135.0005,501.54-2,198.562,321.031,909,821.0211,284,693.88136.242693260-107.4563300788,700.0090.46135.0005,501.74-2,269.272,391.741,909,750.3131,284,764.59036.242309694-107.456830788,800.0090.46135.0005,500.74-2,269.	7,500.00	90.46	135.000	5,511.16	-1,350.07	1,472.53	1,910,669.514	1,283,845.376	36.244994612	-107.459242862
7,800.0090.46135.0005,508.76-1,562.191,684.651,910,457.3911,284,057.50236.244419281-107.4585146507,900.0090.46135.0005,507.96-1,632.901,755.361,910,386.6831,284,128.21136.244227503-107.4582719158,000.0090.46135.0005,507.15-1,703.611,826.071,910,315.9751,284,198.92036.244035724-107.4580291818,100.0090.46135.0005,506.35-1,774.321,896.781,910,245.2681,284,269.62936.243843945-107.4577864498,200.0090.46135.0005,505.55-1,845.021,967.491,910,174.5601,284,340.33736.243652166-107.4575437178,300.0090.46135.0005,504.75-1,915.732,038.201,910,103.8521,284,411.04636.243460386-107.4570582588,500.0090.46135.0005,503.15-2,057.152,179.621,909,962.4371,284,552.46436.243076824-107.4568155308,600.0090.46135.0005,501.54-2,178.52,250.321,909,891.7291,284,623.17336.24285042-107.4565728038,700.0090.46135.0005,501.54-2,198.562,321.031,909,821.0211,284,693.88136.242693260-107.4563300788,800.0090.46135.0005,500.74-2,269.272,391.741,909,750.3131,284,764.59036.242309694-107.4568446338,900.0090.46135.0005,499.94-2,339.9	7,600.00	90.46	135.000	5,510.36	-1,420.78	1,543.23	1,910,598.806	1,283,916.085	36.244802835	-107.459000124
7,900.0090.46135.0005,507.96-1,632.901,755.361,910,386.6831,284,128.21136.244227503-107.4582719158,000.0090.46135.0005,507.15-1,703.611,826.071,910,315.9751,284,198.92036.244035724-107.4580291818,100.0090.46135.0005,506.35-1,774.321,896.781,910,245.2681,284,269.62936.243843945-107.4577864498,200.0090.46135.0005,505.55-1,845.021,967.491,910,174.5601,284,340.33736.243652166-107.4575437178,300.0090.46135.0005,504.75-1,915.732,038.201,910,103.8521,284,411.04636.243460386-107.4573009878,400.0090.46135.0005,503.95-1,986.442,108.911,910,033.1441,284,481.75536.243268605-107.4570582588,500.0090.46135.0005,503.15-2,057.152,179.621,909,962.4371,284,552.46436.243076824-107.4568155308,600.0090.46135.0005,501.54-2,127.852,250.321,909,891.7291,284,623.17336.242885042-107.4565728038,700.0090.46135.0005,501.54-2,198.562,321.031,909,821.0211,284,693.88136.242693260-107.4563300788,800.0090.46135.0005,500.74-2,269.272,391.741,909,750.3131,284,764.59036.242309694-107.4568446338,900.0090.46135.0005,499.94-2,339	7,700.00	90.46	135.000	5,509.56		1,613.94	1,910,528.098		36.244611058	
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8,800.00         90.46         135.000         5,500.74         -2,269.27         2,391.74         1,909,750.313         1,284,764.590         36.242501477         -107.456087353           8,900.00         90.46         135.000         5,499.94         -2,339.98         2,462.45         1,909,679.606         1,284,835.299         36.242309694         -107.455844630										
8,900.00 90.46 135.000 5,499.94 -2,339.98 2,462.45 1,909,679.606 1,284,835.299 36.242309694 -107.455844630	,						, ,			
9,000.00 90.46 135.000 5,499.14 -2,410.69 2,533.16 1,909,608.898 1,284,906.008 36.242117910 -107.455601908										
	9,000.00	90.46	135.000	5,499.14	-2,410.69	2,533.16	1,909,608.898	1,284,906.008	36.242117910	-107.455601908



## Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey

Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Map Northing	Map Easting		
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)	Latitude	Longitude
9,100.00	90.46	135.000	5,498.34	-2,481.39	2,603.87	1,909,538.190	1,284,976.717	36.241926126	-107.455359188
9,200.00	90.46	135.000	5,497.54	-2,552.10	2,674.58	1,909,467.482	1,285,047.425	36.241734341	-107.455116468
9,300.00	90.46	135.000	5,496.73	-2,622.81	2,745.29	1,909,396.775	1,285,118.134	36.241542556	-107.454873750
9,400.00	90.46	135.000	5,495.93	-2,693.52	2,816.00	1,909,326.067	1,285,188.843	36.241350770	-107.454631032
9,500.00	90.46	135.000	5,495.13	-2,764.23	2,886.70	1,909,255.359	1,285,259.552	36.241158984	-107.454388316
9,600.00	90.46	135.000	5,494.33	-2,834.93	2,957.41	1,909,184.652	1,285,330.261	36.240967197	-107.454145602
9,700.00	90.46	135.000	5,493.53	-2,905.64	3,028.12	1,909,113.944	1,285,400.969	36.240775410	-107.453902888
9,800.00	90.46	135.000	5,492.73	-2,976.35	3,098.83	1,909,043.236	1,285,471.678	36.240583622	-107.453660175
9,900.00	90.46	135.000	5,491.93	-3,047.06	3,169.54	1,908,972.528	1,285,542.387	36.240391834	-107.453417464
10,000.00	90.46	135.000	5,491.12	-3,117.77	3,240.25	1,908,901.821	1,285,613.096	36.240200045	-107.453174754
10,100.00	90.46	135.000	5,490.32	-3,188.47	3,310.96	1,908,831.113	1,285,683.805	36.240008255	-107.452932045
10,200.00	90.46	135.000	5,489.52	-3,259.18	3,381.67	1,908,760.405	1,285,754.513	36.239816465	-107.452689337
10,300.00	90.46	135.000	5,488.72	-3,329.89	3,452.38	1,908,689.697	1,285,825.222	36.239624675	-107.452446631
10,400.00	90.46	135.000	5,487.92	-3,400.60	3,523.08	1,908,618.990	1,285,895.931	36.239432884	-107.452203926
10,500.00	90.46	135.000	5,487.12	-3,471.30	3,593.79	1,908,548.282	1,285,966.640	36.239241092	-107.451961221
10,600.00	90.46	135.000	5,486.32	-3,542.01	3,664.50	1,908,477.574	1,286,037.348	36.239049300	-107.451718518
10,700.00	90.46	135.000	5,485.51	-3,612.72	3,735.21	1,908,406.866	1,286,108.057	36.238857508	-107.451475817
10,800.00	90.46	135.000	5,484.71	-3,683.43	3,805.92	1,908,336.159	1,286,178.766	36.238665714	-107.451233116
10,900.00	90.46	135.000	5,483.91	-3,754.14	3,876.63	1,908,265.451	1,286,249.475	36.238473921	-107.450990417
11,000.00	90.46	135.000	5,483.11	-3,824.84	3,947.34	1,908,194.743	1,286,320.184	36.238282127	-107.450747718
11,100.00	90.46	135.000	5,482.31	-3,895.55	4,018.05	1,908,124.036	1,286,390.892	36.238090332	-107.450505021
11,200.00	90.46	135.000	5,481.51	-3,966.26	4,088.76	1,908,053.328	1,286,461.601	36.237898537	-107.450262325
11,300.00	90.46	135.000	5,480.71	-4,036.97	4,159.47	1,907,982.620	1,286,532.310	36.237706741	-107.450019631
11,400.00	90.46	135.000	5,479.90	-4,107.68	4,230.17	1,907,911.912	1,286,603.019	36.237514945	-107.449776937
11,500.00	90.46	135.000	5,479.10	-4,178.38	4,300.88	1,907,841.205	1,286,673.728	36.237323148	-107.449534245
11,600.00	90.46	135.000	5,478.30	-4,249.09	4,371.59	1,907,770.497	1,286,744.436	36.237131351	-107.449291554
11,700.00	90.46	135.000	5,477.50	-4,319.80	4,442.30	1,907,699.789	1,286,815.145	36.236939553	-107.449048864
11,800.00	90.46	135.000	5,476.70	-4,390.51	4,513.01	1,907,629.081	1,286,885.854	36.236747755	-107.448806175
11,900.00	90.46	135.000	5,475.90	-4,461.21	4,583.72	1,907,558.374	1,286,956.563	36.236555956	-107.448563487
12,000.00	90.46	135.000	5,475.10	-4,531.92	4,654.43	1,907,487.666	1,287,027.272	36.236364157	-107.448320801
12,100.00	90.46	135.000	5,474.29	-4,602.63	4,725.14	1,907,416.958	1,287,097.980	36.236172357	-107.448078116
12,200.00	90.46	135.000	5,473.49	-4,673.34	4,795.85	1,907,346.250	1,287,168.689	36.235980556	-107.447835432
12,300.00	90.46	135.000	5,472.69	-4,744.05	4,866.55	1,907,275.543	1,287,239.398	36.235788756	-107.447592749
12,400.00	90.46	135.000	5,471.89	-4,814.75	4,937.26	1,907,204.835	1,287,310.107	36.235596954	-107.447350067
12,500.00	90.46	135.000	5,471.09	-4,885.46	5,007.97	1,907,134.127	1,287,380.816	36.235405152	-107.447107387
12,600.00	90.46	135.000	5,470.29	-4,956.17	5,078.68	1,907,063.420	1,287,451.524	36.235213350	-107.446864708
12,700.00	90.46	135.000	5,469.48	-5,026.88	5,149.39	1,906,992.712	1,287,522.233	36.235021547	-107.446622029
12,800.00	90.46	135.000	5,468.68	-5,097.59	5,220.10	1,906,922.004	1,287,592.942	36.234829743	-107.446379353
12,900.00	90.46	135.000	5,467.88	-5,168.29	5,290.81	1,906,851.296	1,287,663.651	36.234637939	-107.446136677
13,000.00	90.46	135.000	5,467.08	-5,239.00	5,361.52	1,906,780.589	1,287,734.359	36.234446135	-107.445894002
13,100.00	90.46	135.000	5,466.28	-5,309.71	5,432.23	1,906,709.881	1,287,805.068	36.234254330	-107.445651329
13,200.00	90.46	135.000	5,465.48	-5,380.42	5,502.94	1,906,639.173	1,287,875.777	36.234062524	-107.445408657
13,300.00	90.46	135.000	5,464.68	-5,451.13	5,573.64	1,906,568.465	1,287,946.486	36.233870718	-107.445165986
13,400.00	90.46	135.000	5,463.87	-5,521.83	5,644.35	1,906,497.758	1,288,017.195	36.233678911	-107.444923316
13,500.00	90.46	135.000	5,463.07	-5,592.54	5,715.06	1,906,427.050	1,288,087.903	36.233487104	-107.444680647
13,600.00	90.46	135.000	5,462.27	-5,663.25	5,785.77	1,906,356.342	1,288,158.612	36.233295296	-107.444437980
13,700.00	90.46	135.000	5,461.47	-5,733.96	5,856.48	1,906,285.634	1,288,229.321	36.233103488	-107.444195314
13,758.65	90.46	135.000	5,461.00	-5,775.42	5,897.95	1,906,244.167	1,288,270.789	36.232991000	-107.444053000
PBHL/TC	0@13758.65	MD 5461.00 T	VD						



# Planning Report - Geographic

Database:	DB_Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		
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
Haynes 430 vert - plan misses target c - Point	0.00 enter by 50.6	0.000 53ft at 4933.8	4,921.06 80ft MD (492	227.14 21.10 TVD, 26	-104.58 2.14 N, -68.00	1,912,246.719 D E)	1,282,268.273	36.249272240	-107.464657263
Haynes 430 LTP 233 FS - plan hits target cente - Point	0.00 er	0.000	5,461.00	-5,775.42	5,897.95	1,906,244.167	1,288,270.789	36.232991000	-107.444053000
Haynes 430 FTP 669 FS - plan misses target c - Point	0.00 enter by 4.89	0.000 9ft at 5899.20	5,524.00 6ft MD (5523	-217.99 9.99 TVD, -214	340.56 1.79 N, 344.26	1,911,801.587 6 E)	1,282,713.408	36.248065000	-107.463129000

Casing Points							
	Measured Depth	Vertical Depth			Casing Diameter	Hole Diameter	
	(ft)	(ft)		Name	(")	(")	
	()	()		Name	( )	( )	
	350.00	350.00	13 3/8" Csg		13-3/8	17-1/2	
	3,684.76	3,673.00	9 5/8" Csg		9-5/8	12-1/4	

Formations

De	isured epth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1	,404.50	1,403.21	Ojo Alamo		-0.46	135.000
1	,505.03	1,503.27	Kirtland		-0.46	135.000
1	,731.22	1,728.42	Fruitland		-0.46	135.000
1	,967.46	1,963.58	Pictured Cliffs		-0.46	135.000
2	2,118.25	2,113.68	Lewis		-0.46	135.000
2	2,414.81	2,408.88	Chacra		-0.46	135.000
3	3,530.67	3,519.62	Cliff House		-0.46	135.000
3	3,535.70	3,524.62	Menefee		-0.46	135.000
4	,237.58	4,224.87	Point Lookout		-0.46	135.000
4	,532.58	4,519.87	Mancos		-0.46	135.000
4	,872.58	4,859.87	MNCS_A		-0.46	135.000
4	,962.59	4,949.87	MNCS_B		-0.46	135.000
5	5,099.70	5,084.68	MNCS_C		-0.46	135.000
5	5,168.73	5,149.49	MNCS_Cms		-0.46	135.000
5	5,253.18	5,224.18	MNCS_D		-0.46	135.000
5	5,359.47	5,308.67	MNCS_E		-0.46	135.000
5	5,423.50	5,353.30	MNCS_F		-0.46	135.000
5	5,573.86	5,437.30	MNCS_G		-0.46	135.000
5	5,671.92	5,481.60	MNCS_H @ 0VS		-0.46	135.000



## Planning Report - Geographic

Database:	DB Decv0422v16	Local Co-ordinate Reference:	Well Haynes Canyon Unit 430H
Company:	Enduring Resources LLC	TVD Reference:	RKB=6703+25 @ 6728.00ft
Project:	Rio Arriba County, New Mexico NAD83 NM C	MD Reference:	RKB=6703+25 @ 6728.00ft
Site:	Haynes Canyon Unit (428,430,440 & 442)	North Reference:	Grid
Well:	Haynes Canyon Unit 430H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole	-	
Design:	rev0		

## **Plan Annotations**

Measured	Vertical	Local Coor	dinates	
Depth (ft)	Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,000.00	1,000.00	0.00	0.00	KOP Begin 3°/100' build
1,183.06	1,182.78	8.49	-2.20	Begin 5.49° tangent
3,829.65	3,817.22	253.65	-65.80	Begin 3°/100' drop
4,012.71	4,000.00	262.14	-68.00	Begin vertical hold
4,933.77	4,921.06	262.14	-68.00	Begin 10°/100' build
5,533.77	5,417.26	45.41	119.34	Begin 60.00° tangent
5,593.77	5,447.26	6.10	153.32	Begin 10°/100' build
5,898.37	5,524.00	-214.12	343.67	Begin 3°/100' turn
6,037.04	5,522.89	-315.64	438.09	Begin 90.46° lateral
13,758.65	5,461.00	-5,775.42	5,897.95	PBHL/TD @ 13758.65 MD 5461.00 TVD

#### VELL NAME: Haynes Canyon Unit 430H

OBJECTIVE:	Drill, compl	ete, and equip si	ngle latera	l in the Mancos	H formation		QUIC
API Number:	Not yet assign	ned					Sur TD (MD)
AFE Number:	Not yet assign	ned					Int TD (MD)
/ell Number:	Not yet assign	ned					KOP (MD)
State:	New Mexico						KOP (TVD)
County:	Rio Arriba						Target (TVD)
Surface Elev.:	6,703	ft ASL (GL)	6,728	ft ASL (KB)			Curve BUR
rface Location:	3-23-6	Sec-Twn- Rng	897	ft FSL	448	ft FWL	POE (MD)
BH Location:	11-23-6	Sec-Twn- Rng	233	ft FSL	1032	ft FWL	TD (MD)
Directions:	FROM THE IN	ITERSECTION OF U	S HWY 550	& US HWY 64 IN I	BLOOMFIELD,	NM:	Lat Len (ft)

> South on US Hwy 550 for 53.8 miles to MM 97.6; Left (North) on CR #379 (State Hwy 403) for 1.3 miles to fork; Right (North) remaining on CR #379 for 1.5 miles to location access on left; Haynes Canyon Unit 428H Pad. From East to West 430H, 428H, 442H, 440H).

QUICK REFERENCE

350 ft

3,685 ft

4,950 ft

4,937 ft

5,483 ft

5,694 ft

13,759 ft

8,065 ft

10 °/100 ft

#### CONSTRUCTION SUMMARY:

	Hole (in)	TD MD (ft)	Csg (in)	Csg (lb/ft)	Csg (grade)	Csg (conn)	Csg Top (ft)	Csg Bot (ft)
Surface	17.500	350	13.375	54.5	J-55	BTC	0	350
ntermediate	12.250	3,685	9.625	36.0	J-55	LTC	0	3,685
Production	8.500	13,759	5.500	17.0	P-110	LTC	0	13,759

#### **NT PROPERTIES SUMMARY:**

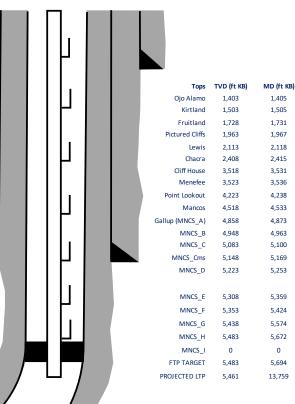
						TOC (ft		
	Туре	Wt (ppg)	Yd (cuft/sk)	Wtr (gal/sk)	% Excess	MD)	Total (sx)	Cu Ft Slurry
Surface	TYPE III	14.6	1.39	6.686	100%	0	364	505
Inter. (Lead)	0:10 Type III:P	12.5	2.14	12.05	70%	0	765	1,636
Inter. (Tail)	Type III	14.6	1.38	6.64	20%	3185	150	207
Prod. (Lead)	ASTM type I/II	12.4	2.370	13.4	50%	0	541	1,283
Prod. (Tail)	G:POZ blend	13.3	1.570	7.7	10%	4533	1481	2,325

#### LETION / PRODUCTION SUMMARY:

Frac: 7965

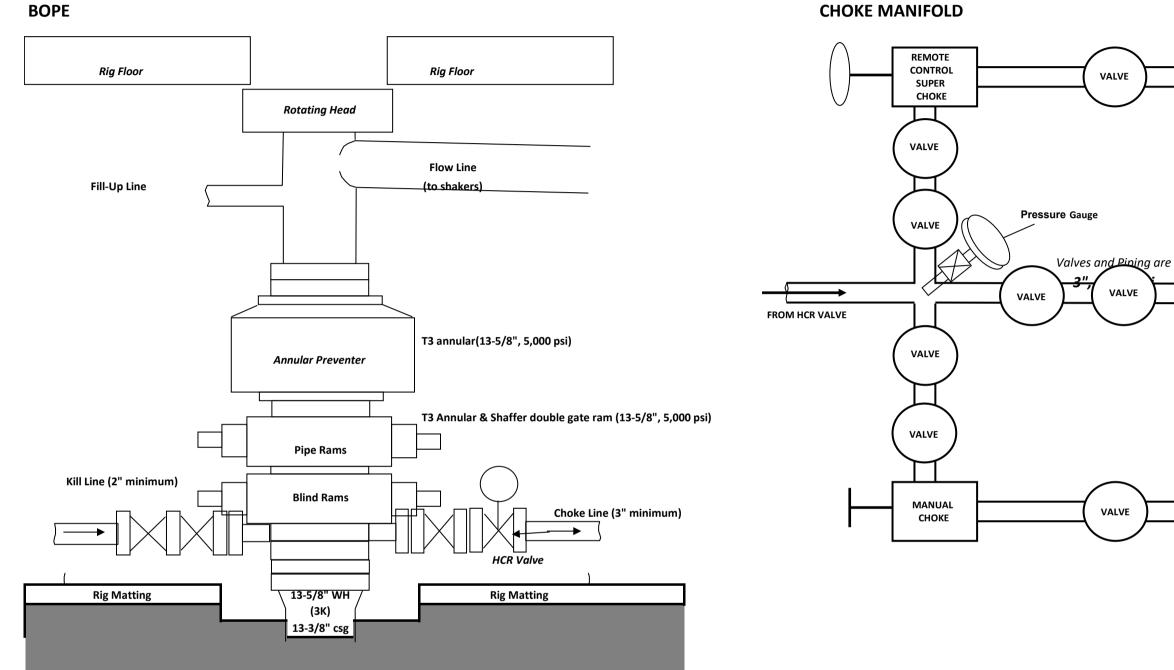
Flowback: Flow back through production tubing as pressures allow

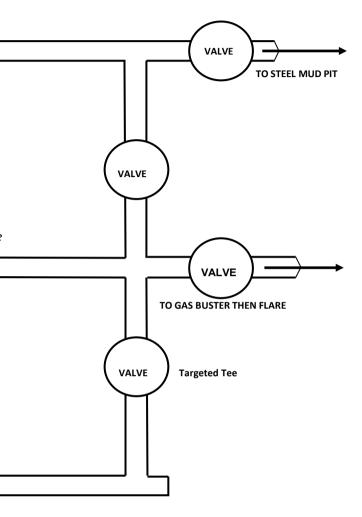
Production: Produce through production tubing via gas-lift into permanent production and storage facilities



# **BOPE & CHOKE MANIFOLD DIAGRAMS**

NOTE: EXACT BOPE AND CHOKE CONFIRGURATION AND COMPONENTS MAY DIFFER FROM WHAT IS DEPICTED IN THE DIGRAMS BELOW DEPENDING ON THE RIG AND ITS ASSOCIATED EQUIPMENT. RAM PREVENTERS, ANNULAR PREVENTERS, AND CHOKE MANIFOLD AND COMPONENTS WILL BE RATED TO 3,000 PSI MINIMUM.





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

CONDITIONS

Operator:	OGRID:
ENDURING RESOURCES, LLC	372286
6300 S Syracuse Way, Suite 525	Action Number:
Centennial, CO 80111	291548
	Action Type:
	[C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Condition	Condition Date
Notify OCD 24 hours prior to casing & cement	12/28/2023
Will require a File As Drilled C-102 and a Directional Survey with the C-104	12/28/2023
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	12/28/2023
Cement is required to circulate on both surface and intermediate1 strings of casing	12/28/2023
If cement does not circulate on any string, a CBL is required for that string of casing	12/28/2023
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	12/28/2023
	Notify OCD 24 hours prior to casing & cement         Will require a File As Drilled C-102 and a Directional Survey with the C-104         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         Cement is required to circulate on both surface and intermediate1 strings of casing         If cement does not circulate on any string, a CBL is required for that string of casing         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.

CONDITIONS

Action 291548