Susana Martinez Governor

David Martin Cabinet Secretary-Designate

Brett F. Woods, Ph.D. Deputy Cabinet Secretary Jami Bailey, Division Director Oil Conservation Division



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

Operator Signature Date: 4/24/14 Well information; _____, Well Name and Number HEROS 4 O 60103 Operator API# <u>30.045.35741</u>, Section <u>4</u>, Township <u>23</u> NS, Range <u>F</u> E/W

Conditions of Approval:

(See the below checked and handwritten conditions)

Notify Aztec OCD 24hrs prior to casing & cement.

• Hold C-104 for directional survey & "As Drilled" Plat

Hold C-104 for NSL, NSP, DHC

- Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- 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.

NMOCD Approved by Signature

1220 South St. Francis Drive • Santa Fe, New Mexico 87505 Phone (505) 476-3460 • Fax (505) 476-3462 • www.emnrd.state.nm.us/ocd

Proved product of the second and second product of the second								
UNDER STATES SPR 24 2014 DEPARTMENT OF THE INTERNOR BUREAU OF LAND MANAGEMENT APPL24 2014 APPLICATION FOR PERMIT TO DIRLL GENERAU FOR PERMIT			F	ECEI	VE	FORM	No. 1004-013	7
APPLICATION FOR PERMIT TO DRILL	DEPAR	TMENT OF THE	INTERIOR			5. Lease Serial No.	*****	014
Ia. Type of vork: DRLL REENTER Interestignment 7 if Units or CA Agreement, Name and No. Ib. Type of Welt: Other Isingle Zone: Multiple Zone: Isingle Zone:				REENTERFiel			e or Tribe N	lame
b. Type of Well: O Well: O Well: O San Well Other Single Zone Multiple Zone Horos 40 2. Name of Operator Logos Operating, LLC 9. API Well No. 9. API Well No. Son OOL of Exploratory 3a. Address 4001 N. Builer Ave, Bldg 7101 3b. Phone No. (Inclust area code) Basim Mancos 4. Location of Well (Agore Inclust) Son	la. Type of work: I DRILL	REENT			nagom	¹ / ₂ If Unit or CA Ag	reement, Nar	ne and No.
3a. Address 4001 N. Butler Ave, Bidg 7101 Farmington, NM 87401 3b. Phone No. (include area code) 505-330-9333 10. Field and Pol, or Exploratory Basin Mancos 4. Location of Well (Report Jocution clearly have and in accordance with any Suite requirements.') At surface 734' FSL & 1833' FEL (SW/SE) 11. Sec, T. R. M. or Bik and Survey or Area Sec 4, T23N, R08W, UL O 4. Increase of mole and threadon from nearest town or post office' 5 miles acutheast of Nageezi 12. Ocumest 12. Ocumest well difficult difficult on this well 40 acres SW4/SE4 01L CONS, DIV DIV MM 18. Distance from proposed' 7.34' from south edge of Sec 4 (Adso in nearest offic, unit line, if avy) 19. Proposed Depth 4. Distance from proposed' 7.34' from south edge of Sec 4 (Adso in nearest offic, unit line, if avy) 19. Proposed Depth 4. Approx. 6400' 20. BLMBIA Bond Na: on File BLM NMB000917 AUG 0 5 2014 10. Elevations (Show whether DF, KDB, RT, GL, etc.) 22. Approximate date work will start' SUPO must be file with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form: 4. Odgys 11. Elevations (Show whether DF, KDB, RT, GL, etc.) 22. Approximate date work will start' SUPO must be file with the appropriate Forest Service Office) 4. Bond to cover the operations maless covered by an existing bond on file (sec BLM 12. Signature Moder for the location is on Maional Forest System Lands, the SUPO must be file with the appropriate Forest Service Office) 4. Bond to cover the operations males covered by an existing bond on file (sec BLM 23. Signature Moder file office			Sin,	gle Zone 🔲 Multi	ple Zone	Heros 40	Well No.	
Farmington, NM 87401 505-330-9333 Basin Mancos 4. Location of Well Repert location clearly and in acordance with any Sate requirement.? St. Set, T. R. M. or Bik and Survey of Area A surface 734 FSL & 1833 FEL (SW/SE) St. Set, T. R. M. or Bik and Survey of Area Set A, T23N, ROBW, UL O St. Set, T. R. M. or Bik and Survey of Area Set Distance in miles and direction from neuros town or post office* 12. County or Parish Similes Southeast of Nageezi 13. State 5 miles southeast of Nageezi 639.60 acres 10. Distance from proposed* 734 from south edge of Sec 4 16. No. of acres in lease 10. States 17. Spacing Unit dedicated to this well 40 acres SWA/SE4 OIL CONS. DIV Dir. 11. Exclose of non proposed* 734 from south edge of Sec 4 19. Proposed Depth 20. BLMBIA Bond No. on file 12. County or Parish 21. Estimated duration 40 acres 21. Estimated duration 13. Estate 6602 22. Approx. He400* 23. Estimated duration 40 acres 14. Distance from proposed and cance with the requirements of Onshore Oil and Gis Order No. 1, must be attached to this form: 1. Well Bat certified by a registred surveyor. 24. Attachments 15. Signature Asurface UP and (f the location is on National Forest Syst		LLC				30-045	-35	541
At surface 734 FSL & 1833 FEL (SW/SE) Sec 4, T23N, R08W, UL 0 At proposed prod. zone same 12. County or Parish 13. State 14. Distance in miles and direction from nearest town or post office 13. State San Juan NM 15. Distance from proposed 734' from south edge of Sec 4 16. No. of acres in lease 17. Spacing Unit dedicated to this well 16. Distance from proposed location* 630 fibo acres 012. County or Parish NM 17. Distance from proposed location* 630 fibo acres 012. County or Parish NM 18. Distance from proposed location* 680' from Logos 5 19. Proposed Depth 20. BLMBIA Bond Na. on file DIL CONS. DIV DIV 18. Distance from proposed location* 680' from Logos 5 19. Proposed Depth 20. BLMBIA Bond Na. on file DIL CONS. DIV DIV 21. Elevations (Show whether DF, KDB, RT, GL, ec.) 22. Approximate date work will star* 23. Estimated duration do days 24. Attachments 24. Attachments 40 days Date 10. days 25. Signature 24. Strimated fibre 9. Operator certification 5. Such others its specific information and/or plans as may be required by the BLM. 25. Signature Mame (Printed Typed) Tarra Sessions Tarra								
14. Distance in miles and direction from nearest town or post office* 12. County or Parish NM 13. State NM 15. Distance from proposed 734 from south edge of Sec 4 16. No. of acres in lease 17. Spacing Unit dedicated to this well 16. Distance from proposed location* 734 from south edge of Sec 4 16. No. of acres in lease 17. Spacing Unit dedicated to this well 17. Spacing Unit Inte, if any) 18. Distance from proposed location* 639.60 acres 40 acres SW4/SE4 OIL CONS. DIV DIV 18. Distance from proposed location* 800 from Logos 5 19. Proposed Depth 20. BLMBIA Bond No. on file DIV DIV 19. Levations (Show whether DF, KDB, RT, GL, ec.) 22. Approximate date work will start* 23. Estimated duration 40 days 24. Attachments 24. Attachments 16. Bond to cover the operations unless covered by an existing bond on file (see them 20 dovs). 5. Operator certification 6. Such other site specific information and/or plans as may be required by the BLM. 25. Signature Name (Printed Typed) Tranva Sessions Date 7/31/20014 26. Signature Name (Printed Typed) Tranva Sessions 7/31/20014 26. Signature Name (Printed Typed) Tranva Sessions 7/31/20014 27. Signature Na	At surface 734' FSL & 1833' FEL (At surface 734' FSL & 1833' FEL (SW/SE)						ey or Area
15. Distance from proposed* (Action to neares: (Also to near	14. Distance in miles and direction from neare	st town or post office*						
18. Distance from proposed location* 880 from Logos 5 to nearest well, drilling, completed, SA T23N R8W 19. Proposed Depth Approx. 6400' 20. BLMMBA Bond No. on the BLM NMB000917 AUG 0 5 2014 21. Elevations (Show whether DF, KDB, RT, GL, etc.) 22. Approximate date work will start* 23. Estimated duration 40 days 24. Attachments 40 days 7. He following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form: 4. Bond to cover the operations unless covered by an existing bond on file (see them 20 above). 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest System Correct Provide Office). 4. Bond to cover the operations unless covered by an existing bond on file (see them 20 above). 25. Signature Name (Printed Typed) Date 7.3 Y-1.4 Y 7. Title Operator Stechnician Name (Printed Typed) Date 7.3 Y-1.4 Y 7. Title Operator Stechnician Name (Printed Typed) Date 7.3 Y-1.4 Y 7. Title Operator of must or certify that the appleant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conditions of approval. if any, are attached. Date 7.3 Y-1.4 Y 7. He betroffer to the attached state meets or epresentations as to any matter whithin it juringliciton. Diffect to papproval. does not wa	property or lease line, ft.	uth edge of Sec 4				-		ONS. DIV D
GL 6862 06/30/2014 40 days 24. Attachments The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form: 1. Well plat certified by a registered surveyor. 2. A Drilling Plan. 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). 25. Signature 4. Bond to cover the operations unless covered by an existing bond on file (see them 20 above). 25. Signature Name (Printed Typed) Title Det 1/2 June Operations Technician Name (Printed Typed) Title Date Petrolecuric Engineer Affect Application approval does not waren to certify that the applicant holds legal or equitable title to those rights in the subjectlease which would entitle the applicant to conduct operations thereon Conditions of approval, if any, are attached. Conditions of approval, if any, are attached. Title B USC. Section 1001 and Title 43 USC. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as ony matter within its jurisdiction, on page 2) Marce (The Tech Tech Tech Tech Tech Tech Tech T	to nearest well, drilling, completed,	from Logos 5 23N R8W	-	•				
The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form: 1. Well plat certified by a registered surveyor. 2. A Drilling Plan. 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). 25. Signature (A there it e specific information and/or plans as may be required by the BLM. 25. Signature Name (Printed Typed) Tamra Sessions 7 Title Operations Technician Approved by (Signature) Name (Printed Typed) Tamra Sessions 7 Title Operations Technician Approved by (Signature) Office Application approval does not waben to certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. Conditions of approval, if any, are attached. Conditions of approval, if any, are attached. Title B U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as on ay matter within its jurisdiction. Gettrinte-dispective/dependical does not waben to easy false, fictitious of appeoplation operations of approval to 43 CFR 3165.4 Mide ACT DA DES NOT RELIEVE THE L		, GL, etc.)			rt*		on	
1. Well plat certified by a registered surveyor. 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). 3. A surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). 9. Operator certification 3. Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). 9. Operator certification 25. Signature Name (Printed Typed) Tarma Sessions Date 4. Approved by (Signature) Name (Printed Typed) Tarma Sessions Date 7. Hoperations Technician Name (Printed Typed) Troy Salvess Date Application approval does not watch to certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations of approval, if any, are attached. Date Title B USC. Section 1010 and Title 43 USC. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any fails, fictivitous or fradulent statements or representations as to any matter within its jurisdiction. *(Instructions on page 2) Deparations of appeal Deparations Report Printed Tiped Tarma Sessions *(Instructions on page 2) Deparations of appeal Deparations at any appeal *(Instructions on page 2) Deparations of appeal Deparations at any appeal <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>								
25. Signature Name (Printed Typed) Tamra Sessions Date Mart Mart Mart Mart Mart Mart Mart Mart	 Well plat certified by a registered surveyor. A Drilling Plan. A Surface Use Plan (if the location is on 	National Forest System		 Bond to cover the ltem 20 above). Operator certification Such other site states 	ne operation ation	ns unless covered by ar	U	
Operations Technician Approved by (Signature) Mame (Printed Typed) Date Topy Date Title Petholeum Engineer Action AFM Office FFD Application approval does not waren or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. Date Title Petholeum Engineer Action AFM FFD Date Title 2014 Application approval does not waren or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. Conditions of approval, if any, are attached. Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. *(Instructions on page 2) Difference DLM'S APPROVAL OR ACCEPTANCE OF THIS *(Instructions on page 2) CPR ATOR FROM OBTAINING ANY OTHER AUTHORIZED ARE SUBJECT TO OPERATIONS ON FEDERAL AND INDIAN LANDS *(Instructions on page 2) Difference Difference *(Instructions on page 2) Compliance With Attached OPERATIONS ON FEDERAL AND INDIAN LANDS Compliance With Attached OPERATIONS OF Compliance With Attached OPERATIONS	25. Signature Tamfem	ì		Printed Typed)		<u>.</u>	Date 4	24-14
Title Troy Salyess 7/31/2014 Application approval does not waren to certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. Conduct operations thereon. Conditions of approval, if any, are attached. FFD FFD Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. *(Instructions on page 2) Diff Section 1901 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. *(Instructions on page 2) Diff Section 1905 Appendent to a pocedural review pursuant to a procedural review pursuant to a SCFR 3165.3 and appeal ursuant to 43 CFR 3165.4 ACTION DOES NOT RELIEVE THE LESSEE AND OPERATION REQUIRED FOR OPERATIONS AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS *(Instructions on page 2) DRILLING OPERATIONS ON FEDERAL AND INDIAN LANDS Compliance with a trached of the compliance withe compliance withe compliance with a trache		N.						
Pettoleum Engineer (Acting AFM) FFØ Application approval does not wardent or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. Conditions of approval, if any, are attached. Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. Dif Contring edugaccharge of nical of procedural review pursuant to appeal ursuant to 43 CFR 3165.4 ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS *(Instructions on page 2) Dif Contring edugaccharge of the difference of th	Jy Sale	jus	T		35		Date 73	31/2014
States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. BLM'S APPROVAL OR ACCEPTANCE OF THIS BLM'S APPROVAL OR ACCEPTANCE OF THIS BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS AUTHORIZED ARE SUBJECT TO ON FEDERAL AND INDIAN LANDS ON FEDERAL AND INDIAN LANDS ON FEDERAL AND INDIAN LANDS ON FEDERAL REQUIREMENTS"	Application approval does not ward nt or certi conduct operations thereon.		N F		s in the subj	ect lease which would e	entitle the app	olicant to
ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS AUTHORIZATION REQUIRED FOR OPERATIONS AUTHORIZED ARE SUBJECT TO COMPLIANCE WITH ATTACHED "GENERAL REQUIREMENTS"	Title 18 U.S.C. Section 1001 and Title 43 U.S.C. States any false, fictitious or fraudulent statement	ents or representations as	to any matter wit	hin its jurisdiction	-		or agency of	the United
	nd procedural review pursuant to	ACTION DC OPERATOR AUTHORIZ	ES NOT RE FROM OB	LIEVE THE L FAINING ANY UIRED FOR C	ESSEE A OTHE R	AND *(Inst ONS DRILL AUTHORIZ COMPLIA	ING OPEI ZED ARE NCE WITH	RATIONS SUBJECT TO HATTACHED
Britis Britis British				MOODA				



ı

DISTRICT I 1625 M. French Dr., 1 Phones (575) 533-611 DISTRICT II 611 S. First St., Artes Phones (576) 748-122 DISTRICT III 1000 Ho Brance Ed., Phones (555) 534-617	11 Paz: (676) 4a, N.M. 8821 3 Paz: (675) Asteo, N.M. 8) 893-0720 0 748-0720 77410	E	nergy, Mine OIL (Resources Departs ON DIVISION Francis Dr. M 87505	APR 24	2014		Form C- August 1, 1 to appropr District Of
DISTRICT IV 1220 S. SL. Francis D Phone: (505) 476-344	r., Santa Fe, 10 Fax: (505)	NM 87505 478-3468	WELL I	JOCATIO	N AND AC	REAGE DED	armington F	ield Off <u>in</u> Manage LAT	le ^{ywe} l Weur	NDED REPO
	Number	CF 111	Pool Code 972-32				Pool Name BASIN MANCOS			
30-0 *Property 0		2241	_	//	Property	Name			é 1	ell Number
3314	ר				HEROS					0040
TOGRED No	».				*Operator	Name			1	Elevation
28940	3			L	LOGOS OPERA	TING, LLC				6862'
					¹⁰ Surface	Location				
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/Wes		County
	4	23-N	11 Dott	 	734	SOUTH	1833	EAS		SAN JUAI
UL or lot no.	Section	Township	BOLL	om Hole	LOCALION Feet from the	If Different Fr	om Surface	East/Ver	t line	County
200 mg 11 A B A			¹⁹ Joint or	Infill	¹⁴ Consolidation	Code	¹⁰ Order No.			-
40.00 ACRE		E	- some or							
40.00 ACRE	S SW/SA Able W	ILL BE A	SSIGNEI	D TO THI		ON UNTIL ALL EEN APPROVED 	BY THE DI 17 OP 1 hereby a 4 frue and	VISION ERATOR artigy that the 5 complete to	CERT information	IFICATION on contained here f my knowledge a
40.00 ACRE NO ALLOW ¹⁸	S SW/SA Able W	ILL BE A	SSIGNEI NON-STA	D TO THI	UNIT HAS B		BY THE DI I hereby a fe true an belief, and s working land incha has a righ to a control	VISION ERATOR artify that the d complete to that this org destruct or w Mag the prope t to drift this	CERT the best q miscation inleased mi seed bottom well at th well at the	IFICATION on contained here f my knowledge a
40.00 ACRE NO ALLOW ¹⁶ <u>T-24-1</u> T-23-N	S SW/SI ABLE W J J J J J J J J J J J J J J J J J J J	THE SOUTH T THE SOUTH T THE SOUTH T THE SOUTH T THE SOUTH T THE SOUTH	EAST CORN	D TO THI NDARD I LOT	EAST EST,	EEN APPROVED 	BY THE DI 17 OP 1 hereby a is true and belief, and a working hard such has a right to a control division. Tom Signatur Tap Printed + Sess i E-mail a	VISION ERATOR srtigy that the d complete to that this ory interest or us the prope t to drill this sate with or to interest, on to interest, or to interest, o	CERT s beformation the best q andicated me sad bottom well at H order herr a volumb order herr Da Da 0.2.5.7.1	IFICATION on contained here f my knowledge a stilter owns meral enterest in it hale location or is location purved is a mineral or

Logos Operating, LLC Operations Plan Heros 40

Note: This procedure will be adjusted on site based on actual conditions.

I. Location: 734' FSL & 1833' FEL Sec 4, T23N R08W San Juan County, NM

Date: April 23, 2014

Field: Mancos Surface: Federal Minerals: Federal

Elev: GL 6,862'

II. Geology: Surface formation: Nacimiento

Formation Tops	Depths
Ojo Alamo	867'
Kirtland	1083'
Fruitland	1501'
Pictured Cliffs	
Lewis	
Chacra	
Cliff House	
Menefee	
Point Lookout	3971'
Mancos	4098'
Niobrara Member	
Sanostee Member-Mancos	5702'
Greenhorn Member-Mancos	5943'
Ganeros Member-Mancos	6014'
Total Depth	6400'

a. (Note: tops estimated from Warner-Caldwell 1A)

Estimated depths of anticipated water, oil, gas, and other mineral bearing formations, which are expected to be encountered:

Water and gas- 1504' and 3971' Water, gas, and oil- 4098' and 5702'

- b. Logging Program: Induction/GR and density/neutron logs from TD to the surface casing point. Mud logs will be run from below the surface casing to TD. No DST's or cores are planned for this well. Cased hole GR/CCI and CBL logs will be run from PBTD to surface.
- c. No over pressured zones are expected in this well. No H₂S zones will be penetrated in this well. Max BHP = 2850 psig. Lost circulation zones may be encountered in the Mesa Verde group and Niobrara sections.

III. Drilling

.

- a. Contractor:
- b. Mud Program:

The surface hole will be drilled with a fresh water mud.

The production hole will be drilled with a fresh water mud and will use bentonite to increase the viscosity. The weighting material will be drill solids or if conditions dictate, barite. The maximum mud weight expected in 9.2 ppg. The water loss will be controlled to a 6-8 cc/30 min. and loss circulation will be controlled with cedar fiber, paper, etc.

The Mancos and Gallup formations will all be considered for completion in this well. A completion procedure will be developed after evaluating the wireline and mud logs.

c. Minimum Blowout Control Specifications:

Double ram type 2000 psi working pressure BOP with a rotating head. See the attached Exhibit #1 for details on the BOP equipment. All ram type preventers and related equipment will be hydraulically tested at nipple-up to 250 psi (Low) for 5 minutes and 1,500 psi (High) for 10 minutes. All tests and inspections will be recorded in the daily drilling tour book.

The blind rams will be hydraulically activated and checked for operational readiness each time pipe is pulled out of the hole. All checks of the BOP stack and equipment will be noted on the daily drilling report. The BOP equipment will include a kelly cock, floor safety valve, and choke manifold all rated to 2000 psi.

IV. Materials

a. Lasing Prog	ram		
Hole Size	Depth	Casing Size	Wt. & Grade
12-1/4"	330'	9-5/8"	36# J-55
7-7/8"	6400'	5-1/2"	17# P-110

b. Float Equipment:

- i. Surface Casing: Notched collar, aluminum insert float in the first collar, and 3 centralizers on the bottom 3 joints.
- ii. Production Casing: 5-1/2" cement float shoe and self-fill insert float collar. Place float one joint above shoe. Place DV tool at 4248'. Place ten centralizers spaced every other joint above the shoe, two turbolizers on the collars below the DV tool and two turbolizers above the DV tool. Place five turbolizers every third joint from the top of the well.

V. Cementing:

3

Note: Cement volumes will be adjusted based on actual conditions. Surface casing: 9-5/8" – use 225 sx (266) cu. ft.) of Type V with 2% CaCl₂ and ¼ #/sk celloflake (Yield = 1.18 cu. ft./sk; slurry weight = 15.6 PPG). 100% excess to circulate cement to surface. WOC 12 hours. Pressure test surface casing to 1500 psi.

Production casing: 5-1/2" – Before cementing circulate hole with at least 1-1/2 hole volumes of mud. Precede cement with 30 bbls of fresh water. **1**st **stage: Lead** with 260 sx (458 cu. ft.) of Cl "B" 65/35 poz with 6% gel, 1% CaCl₂, 4% phenoseal, and ¼ #/sx celloflake (Yield = 1.6 cu. ft./sk; slurry weight – 12.8 PPG)> **Tail** with 100 sx (146 cu. ft.) of Cl "B" 50/50 poz with 0.15% dispersant, 1% CaCl₂ and ¼#/sk. Celloflake. (Yield 1.46 cu.ft./sk; slurry weight = 13.0 PPG). **2**nd **stage:** Precede cement with 20 bbls of water. **Lead** with 600 sx (1056 cu. ft.) Cl "B" 65/35 poz with 6% gel, 1% CaCl₂, and ¼#/sx celloflake (Yield = 1.76 cu. ft./sk; slurry weight = 12.8 PPG). **Tail** with 100 sx (146 cu. ft.) of Cl "B" 50/50 poz with 0.15% dispersand, 1% CaCl₂, and ¼#/sk. Celloflake. (Yield = 1.46 cu. ft./sk; slurry weight = 13.0 PPG). Total cement volume is 1806 cu. ft. (50% excess to hole volume to circulate cement to surface).

Date

Tamra Sessions Operations Technician

Logos Operating, LLC - Heros #40 Vertical Oil Well

additional fill or surfacing material is required, it will be obtained from existing permitted or private sources and will be hauled in by trucks over existing access roads to the area.

- c. The proposed well pad is situated at the confluence of an unnamed, intermittent/ephemeral watercourse and Kimbeto Wash. The proposed project would be designed to avoid discharge into watercourses that are potentially USACE jurisdictional.
- d. Construction of the well pad will take approximately 1 week.
- 3. Well-tie Pipeline

. **.** ·

- a. Logos would construct, operate, maintain, and terminate an up to 3-inch outside diameter, buried, steel well connect pipeline to transport produced natural gas to existing pipeline infrastructure at the Logos #5 well site. The pipeline would be constructed on Lease #NM 109398 in Section 4, T23N, R8W, NMPM. The proposed pipeline is 798.39 feet in length. The pipeline would be constructed parallel to the proposed Heros #40 resource road for approximately 653 feet and would overlap existing Logos #5 well pad disturbance for approximately 146 feet.
- b. Within the proposed pipeline corridor, all vegetation would be cleared, the top 6 inches of topsoil would be salvaged and stockpiled, and the pipeline trench would be excavated.
- c. Trenching activity would be conducted using a trencher or backhoe. Where a pipeline trench would be required, it would be 4 to 5 feet in depth. The trench would be 16 inches in width if a trencher is used or 24 inches in width if a backhoe is used.
- d. After trenching and pipe placement in the trench, the soils excavated from the trench would be returned and compacted to prevent subsidence. The trench would be compacted after approximately 2 feet of fill is placed within the trench and after the ground surface has been leveled.
- e. Construction of the pipeline will take approximately 3-5 days.

G. Methods for Handling Waste Disposal:

- 1. Cuttings
 - a. The drill cuttings and drilling fluids will be placed in a reserve pit. The reserve pit will be lined with a 20 mil string re-enforced material and constructed to meet the NMOCD pit guidelines. The reserve pit will be fenced prior to drilling. After drilling, any free liquids in the pit will be disposed of at the appropriate waste disposal facilities. The solids in the

Logos Operating, LLC - Heros #40 Vertical Oil Well

reserve pit will be allowed to dry, tested, and buried according to NMOCD pit rules.

2. Flowback Water

. . .

- a. The water-based solution that flows back to the surface during and after completion operations will be placed in storage tanks on location.
- b. Flowback water will be confined to a storage tank for a period not to exceed 90 days after initial production and will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities, or recycled.
- 3. Spills any spills of non-freshwater fluids will be immediately cleaned up and removed to an approved disposal site.
- 4. Sewage self-contained, chemical toilets will be provided for human waste disposal. The toilet holding tanks will be pumped, as needed, and the contents thereof disposed of in an approved sewage disposal facility. The toilets will be onsite during all operations.
- 5. Garbage and other waste material garbage, trash, and other waste materials will be collected in a portable, self-contained and fully-enclosed trash container during drilling and completion operations. The accumulated trash will be removed, as needed, and will be disposed of at an authorized sanitary landfill. No trash will be buried or burned on location.
- 6. Immediately after removal of the drilling rig, all debris and other waste materials not contained in the trash container will be cleaned up and removed from the well location.
- 7. No chemicals subject to reporting under SARA Title III in an amount equal to or greater than 10,000 pounds will be used, produced, stored, transported, or disposed of in association with the drilling, testing, or completion of this well.
- 8. No extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, will be used, produced, stored, transported, or disposed of in association with the drilling, testing, or completion of this well.

H. Ancillary Facilities:

 Standard drilling operation equipment that will be on location includes: drilling rig with associated equipment, temporary office trailers equipped with sleeping quarters for essential company personnel, toilet facilities, and trash containers. Directions from the Intersection of Highway 550 and Highway 64 in Bloomfield, NM to LOGOS OPERATING, LLC HEROS #0040 734' FSL 1833' FEL, Section 4, T23N, R8W, N.M.P.M., San Juan County, New Mexico Latitude: 36° 15' 03.600" N Longitude: 107° 41' 02.887" W Nad 1983

, •.

From the Intersection of Highway 550 & Highway 64 Go South on Hwy 550 for 40.7 miles, turn left (north-northwesterly) for 400 feet to the west side of the existing location LOGOS #5, From which the new access begins and continues (northwesterly) for 628.74' to the new location.

