United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Farmington Field Office
6251 College Blvd. - Suite A
Farmington, New Mexico 87402
www.blm.gov/nm

In Reply Refer To:
3162.3-1 (NMF01110)

February 24, 2017

OIL CONS. DIV DIST. 3
MAR 01 2017

SG Interests I LTD
286 Sawyer Drive Ste A
P.O. Box 2677
Durango, CO 81302

Dear Mr. Mankin:

The following Application for Permit to Drill (APD) for the following well:

Caballo 30-15-29 1H, located 1,165' FNL and 830' FEL, Section 29, T30N, R15W, NENE, San Juan County, New Mexico on Federal lease No. NMNM 013959.

30-045-35683

The APD is being returned per our conversation on February 24, 2017 regarding inadequate pipeline infrastructure in the vicinity of the project.

If there was no surface disturbance related to the project, please submit a sundry notice within 30 days stating there was no surface disturbance. Please remove any and all survey stakes associated with the project and make note that survey stakes have been removed in the aforementioned sundry notice.

If you wish to drill this well at some later date, please re-file your complete application.

Under 43 CFR 3165.3, you may request an Administrative Review of any instructions, orders, or decisions issued by the Authorized Officer. Such a request, including all supporting documents, must be filed in writing within 20 business days of receipt of this notice and must be filed with the State Director, Bureau of Land Management, P.O. Box 27115, Santa Fe, New Mexico 87502-0115. Such a request will not result in a suspension of the instructions, orders, or decisions unless the reviewing official so determines. Procedures governing appeals from the instructions, orders, or decisions are contained in 43 CFR 3165.4 and 43 CFR 4.400 et. Seq.

Sincerely,

Cynthia Marquez

Cynthia Marquez
Land Law Examiner
Petroleum Management Team

Distribution:
NMOCD -1
Well File-1
NMF01110: CMarquez: cm: 12/27/2016: X7741:

91

Form 3160-3
(March 2012)

OIL CONS. DIV DIST. 3

MAR 01 2017

RECEIVED

APR 08 2015

Farmington Field Office
Bureau of Land Management

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: [X] DRILL [ ] REENTER	5. Lease Serial No. SHL+PBE NMNM 86497 BH 13959NMNM
1b. Type of Well: [X] Oil Well [X] Gas Well [ ] Other [X] Single Zone [ ] Multiple Zone	6. If Indian, Allottee or Tribe Name
	7. If Unit or CA Agreement, Name and No. NMNM 134939
	8. Lease Name and Well No. **Caballo 30-15-29**
2. Name of Operator: ***SG INTERESTS I, LTD (Agent: Nika Energy Operating, LLC)***	9. API Well No. **#1H**
3a. Address **P.O Box 2677, Durango, Colorado 81302** / 3b. Phone No (include area code) **970-259-2701**	10. Field and Pool, or Exploratory **Basin Mancos**
4. Location of Well *(Report location clearly and in accordance with any State requirements*)* At surface **Unit Letter A, 1165' FNL, 830' FEL Section 29, T30N, R15W** At proposed prod. Zone **SAME** X	11.Sec., T. R. M. or Blk and Survey or Area **Section 29, T30N, R15W**
14. Distance in miles and direction from nearest town or post office * **2.2 miles North of Kirtland, NM**	12. County or Parish **San Juan** / 13. State **NM**
15. Distance from proposed * location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) **700'**	16. No of acres in lease ~~1,549.83~~ 1805.77 / 17. Spacing Unit dedicated to this well **320**
18. Distance from proposed location * to nearest well, drilling completed, applies for, on this lease, ft. **None**	19. Proposed Depth **TMD 10000' +/-** / 20. BLM/BIA Bond No. on file **NM1935**
21. Elevations (Show whether DF, KDB, RT, GL, etc) **5216'**	22. Approximate date work will start* **June 1, 2015** / 23. Estimated duration **30 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.)
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above.)
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature	Name *(Printed Typed)*	Date
Mike L. Mankin	**Mike L. Mankin (505.634.6393)**	**Wednesday, April 08, 2015**

Title
Authorized Agent for SG Interests I, LTD (505.634.6393)

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

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 an Title 43 U.S.C. Section 1212; make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

DRILLING OPERATIONS AUTHORIZED ARE SUBJECT TO COMPLIANCE WITH ATTACHED "GENERAL REQUIREMENTS"

NMOCD

*(Instructions on page 2)

APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

SG Interests I, LTD

Horizontal Basin Mancos Drilling Program

Caballo 30-15-29 #1H

APD Certification:

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 with 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 the 18 U.S.C. 1001 for the filing of false statements.

Executed this 8th day of April, 2015.

Name: Mike L. Mankin

Position/Title: Agent for SG Interests I, LTD

Address: P.O. Box 2677, Durango, Colorado 81302

Telephone: 505-634-6393

Field representative (if not above signatory):

E-mail: mgcattle@yahoo.com

Date: April 8, 2015

District I
1625 N. French Dr, Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
	97232	Basin Mancos

4 Property Code	5 Property Name	6 Well Number
317571	CABALLO 30-15-29	1H

7 OGRID No.	8 Operator Name	9 Elevation
20572	SG INTERESTS I, LTD.	5216

10 Surface Location

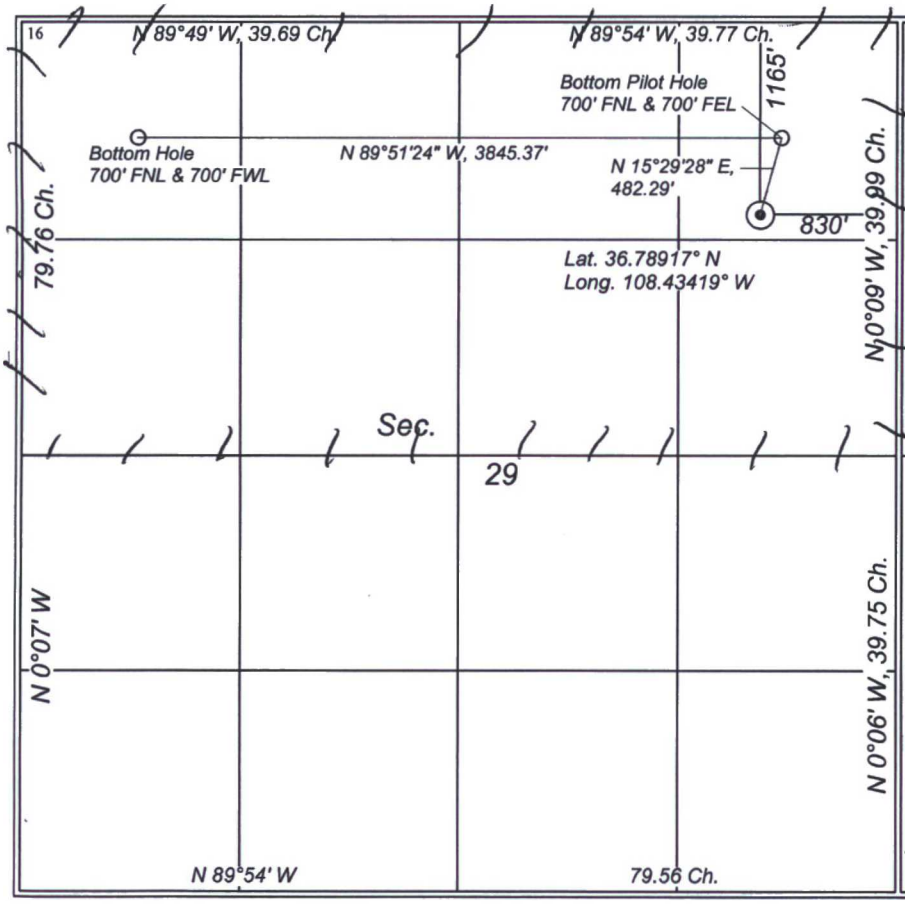
UL or Lot No.	Section	Township	Range	Lot Idn.	Feet from the	North/South Line	Feet from the	East/West Line	County
A	29	30 N	15 W		1165	North	830	East	San Juan

11 Bottom Hole Location If Different From Surface

UL or Lot No.	Section	Township	Range	Lot Idn.	Feet from the	North/South Line	Feet from the	East/West Line	County
D	29	30 N	15 W		700	North	700	West	San Juan

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
320.00 N/2			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature — Date: 7.8.18

Printed Name: Mike L Manka

mgcattle@yahoo.com

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Rev. 19 June 2013
04 Feb 2013

Date of Survey

Signature and Seal of Professional Surveyor:

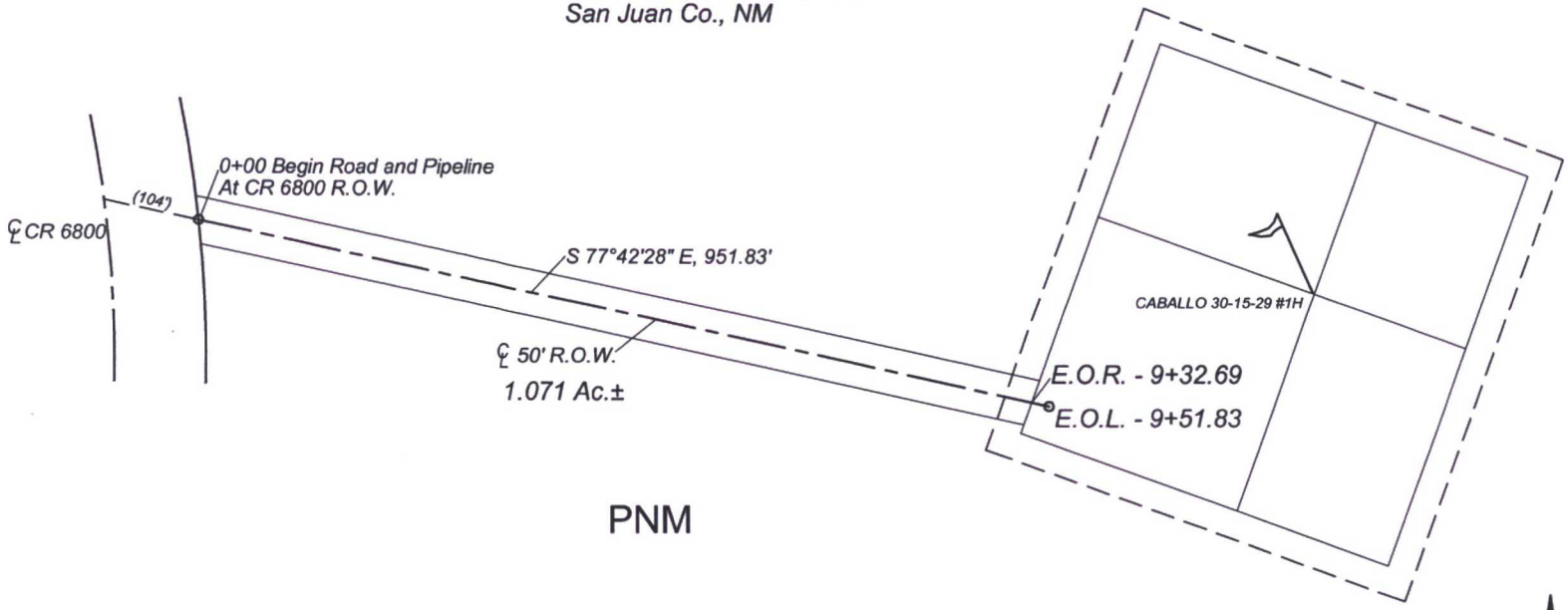
NEW MEXICO #8466 REGISTERED PROFESSIONAL SURVEYOR

William E. Mahnke II

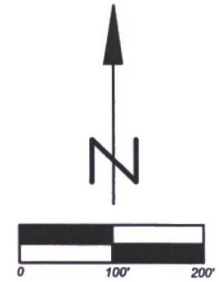
Certificate Number 8466

Bearings from GLO Plat

Proposed Access Road and Pipeline for
SG INTERESTS I, LTD.
CABALLO 30-15-29 #1H
1165' FNL & 830' FEL
Sec.29, T30N, R15W, NMPM
San Juan Co., NM



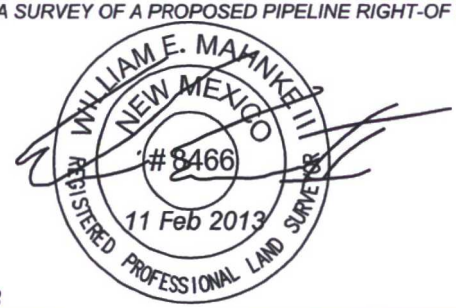
PNM



Scale : 1"=200'

SURVEYORS CERTIFICATE

I, WILLIAM E. MAHNKE II, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THE SURVEY SHOWN HEREON, AND THAT THE SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN THE STATE OF NEW MEXICO.
I FURTHER CERTIFY THAT THIS IS NOT A SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT AND THAT THIS IS A SURVEY OF A PROPOSED PIPELINE RIGHT-OF WAY AND PROPOSED ACCESS ROAD.

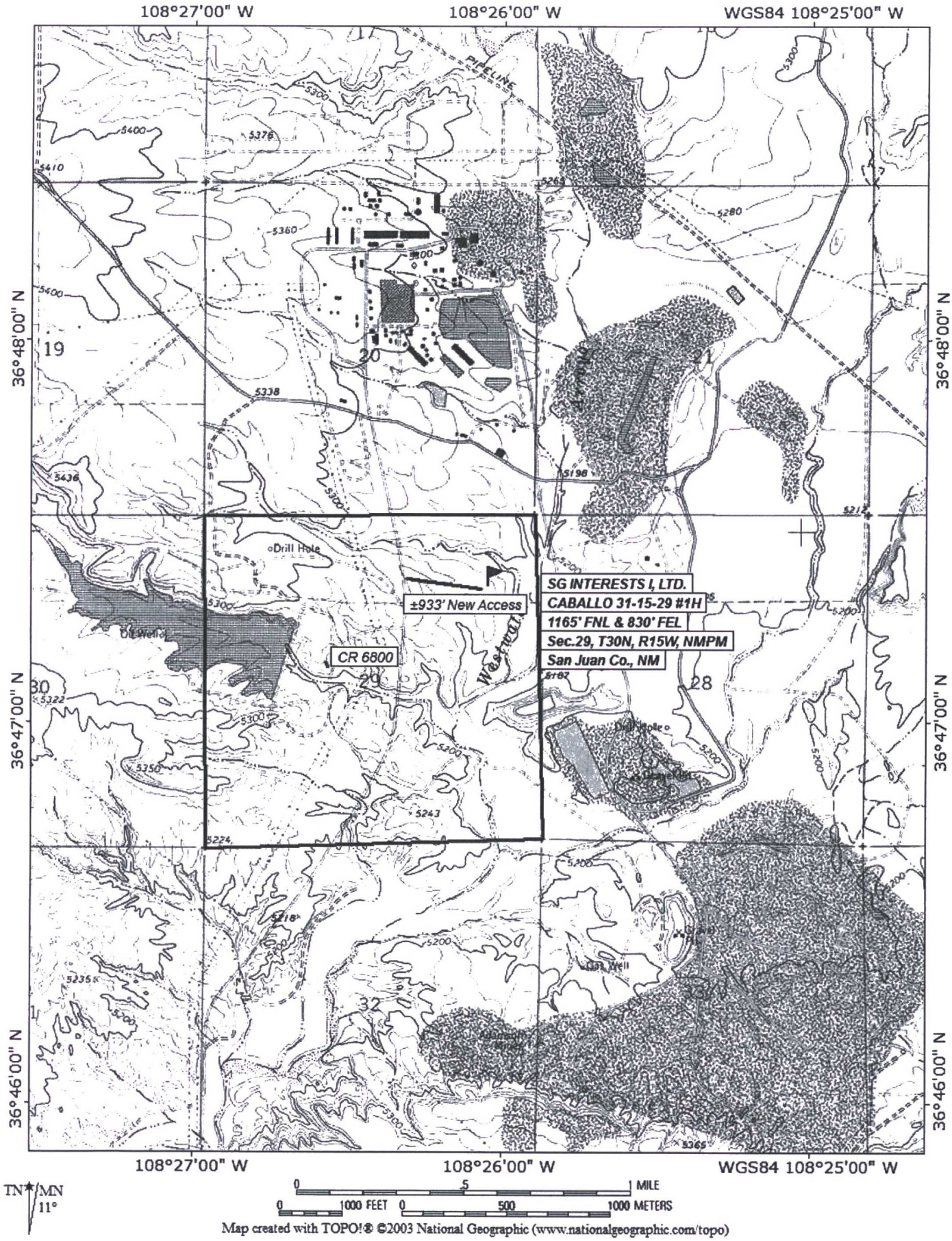


WILLIAM E. MAHNKE II
NEW MEXICO P.L.S. # 8466

Field Completion Date: 04 Feb 2013

ENERGY SURVEYORS, INC.
P.O. BOX 991
FARMINGTON, NM 87499
FAX: 801-659-4246
OFFICE: 505-325-4005
CELL: 505-360-8142

CABALLO 30-15-29 #1H



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

ENERGY SURVEYORS, INC.

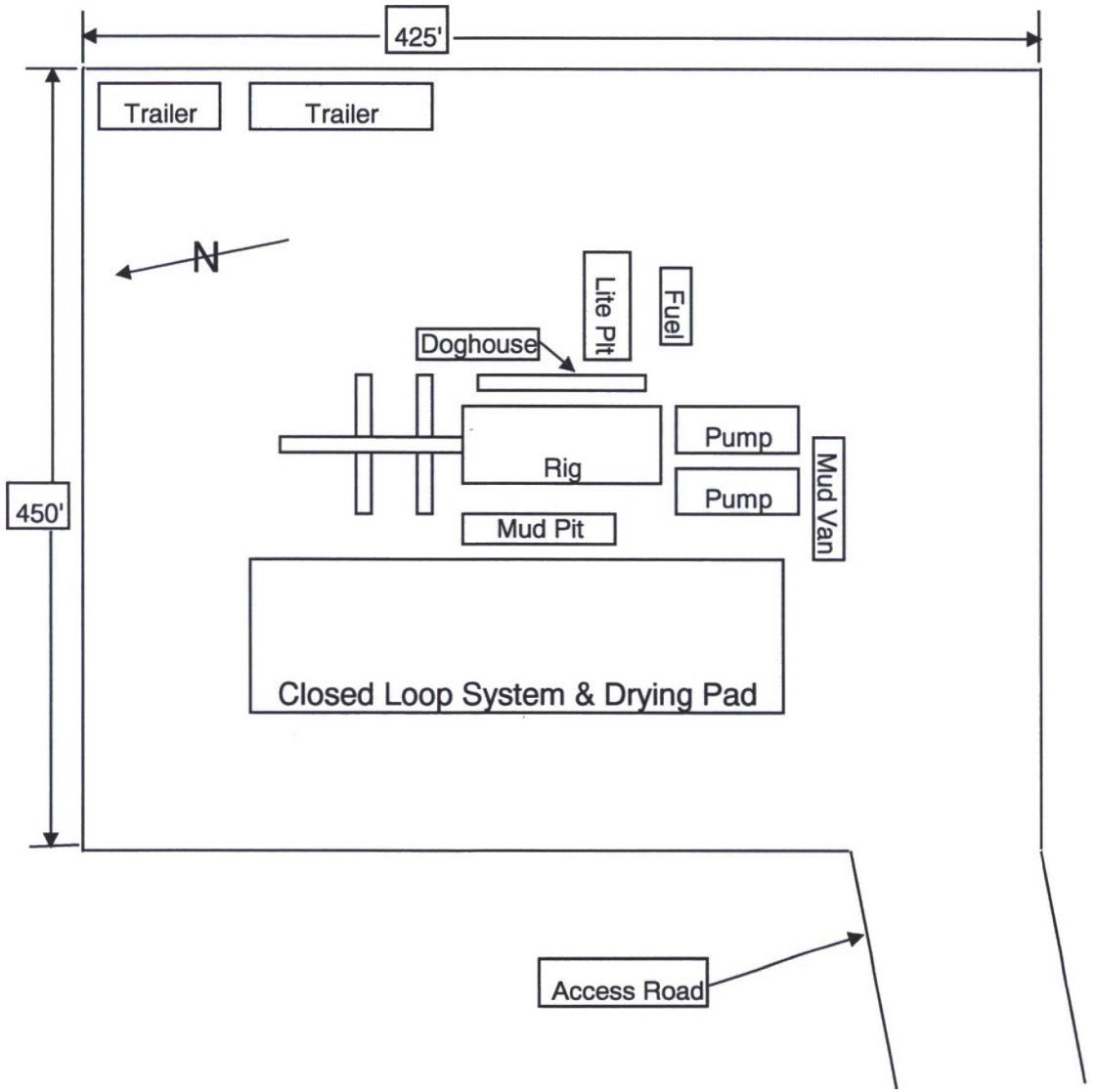
P.O. Box 991
Farmington, NM 87499

Phone: 505-325-4005 Cell: 505-360-8142

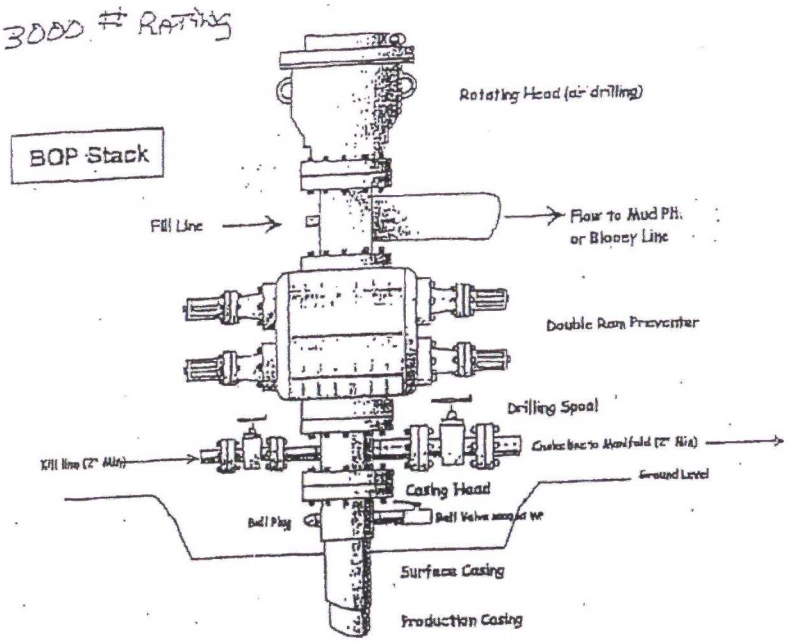
Access Description for Caballo 30-15-29 #1H

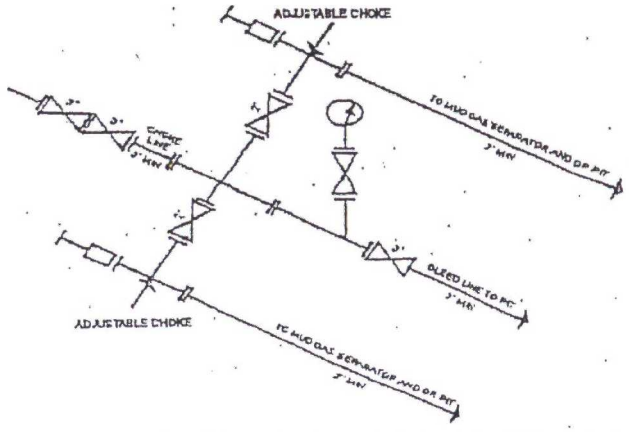
From the stop light at the intersection of US Hwy 64 and CR 6800 west of Kirtland, NM, turn north and follow CR 6800 ±2.2 miles. Turn right (east) off CR 6800 and follow flagged access road ±933 feet southeasterly to location.

Drilling Site Layout-Caballo 30-15-29 #1H



3000 # Rating





3M CHOKE MANIFOLD EQUIPMENT - CONFIGURATION OF CHOKES MAY VARY

[54 FR 39528, Sept. 27, 1989]

SG INTERESTS I, Ltd.

Horizontal Gallup Test Well

Drilling Procedure

March, 2013

Bob Sagle, P.E.

WELL NAME:	Caballo 30-15-29 #1H
FIELD NAME:	Basin Mancos
SURFACE LOCATION:	NENE ¼, Section 29, T30N, R15W 1165' FNL, 830' FEL UL-D Lat 36.78917° N, Long -108.43419° W San Juan County, New Mexico
GALLUP ENTRY POINT:	NENE ¼, Section 29, T30N, R15W 700' FNL, 700' FEL
BOTTOM HOLE LOCATION:	NWNW ¼, Section 29, T30N, R15 700" FNL, 700' FWL
ELEVATION:	5216' GL
PROPOSED TD:	4076' TVD, MD 8014'
DATE:	April, 2013

NOTE: Review APD Stipulations before moving on location. Review regulatory notification requirements and notify accordingly. Comply with all safety and environmental requirements.

NOTIFY: BLM Field Office Manager (Inspection and Enforcement Section) 24 hours before SPUD, CEMENTING OR PLUGGING OPERATIONS at (505) 599-8907.

DIRECTIONS: From the stop light of US HWY 64 and County Road 6800 west of Kirtland, NM, turn north and follow CR 6800 approx. 2.2 miles. Turn right (east) off CR 6800 and follow flagged access road approx. 1000' SE to location.

Caballo 30-15-29 #1H

DRILLING SKELETON:

Interval	Hole Size	Casing Size	Measured Depth, ft	TVD, ft
Surface	12 ¼"	9 5/8"	500	500
Intermediate	8 ¾"	7"	4598	4191
Production Liner	6 1/8"	4 ½"	8014	4076 (115' updip)

NOTE: the production liner will be tied back to surface and used for a fracture string. It will likely be removed following completion.

MUD PROGRAM:

Interval, MD	Mud Type	Mud Weight	Funnel Viscosity	Water Loss
0' – 500'	Native	8.4 - 8.8	38-45	1 - 10
500' – 4598'	Native/LSND	8.5 – 9.3	30 – 50	8 – 10
4598'- TD	Oil Based	7.5 - 9.3	40 – 45	8 - 10

CASING AND CEMENTING PROGRAM:

Interval	Size, Wt, Grade, Thread	Depth, MD	Cement
Surface	9 5/8", 36#, J55 STC	500'	275sx Class G + 1/8 #/sx poly-flake + 2% CACL
Intermediate	7", 26# , N80, LT&C	4598'	425 sx Premium Lite + 5#/sx LCM + 1/8#/sx poly-flake Followed by: 100 sx Class G + 1/8#/sx poly-flake
Production	4 ½", 11.6#, N-80, LT&C TD		50 sx Type V 230 sx Foamed 50/50 Poz + .2% Versaset 75 sx 50/50 Poz + .2% Versaset

Liner will be tied back to surface during fracture treatments, and then likely removed.

WELLHEAD:

3000# 9-5/8" 3M x 9 5/8" 8rd casing head
3000# 7 1/16" 3M x 7 1/16" 3M casing spool with flanged gate valves
3000# 7 1/16" 3M x 7-1/16" 3M tubing head with RTJ flanged gate valves",
3000# B2P, 7-1/16" 3M x 3-1/8" 3M Upper tree adapter with RTJ flanged gate valve.

NOTE: section must accommodate 4 ½" tie back frac string.

BLOWOUT PREVENTION EQUIPMENT REQUIREMENTS:

Description	Rating
11" Double Ram Type Preventer	3000 psi
11" Annular Preventer	3000 psi
Rotating Head	3000 psi

BOPE testing will be done by a third party tester in accordance with Onshore Order No. 2. The test must be performed and recorded using a test pump, calibrated test gauges and properly calibrated strip or chart recorder. The test gauges and recorders must be of the proper range and resolution commensurate with the authorized test pressure. The test must be recorded and will include a low pressure test requirement of 250 psig and a high pressure test requirement of 100% of rated working pressure for the ram type BOPE (3000 psi) and 50% of rated working pressure for the annular BOPE(1500 psi). Casing and manifold pressure tests must be held for 30 minutes with no more than 10 percent pressure drop during the test.

GEOLOGIC PROGNOSIS:

Elevations: GL ~ 5216', KB ~ 5231'

Formation Tops	Depth
Cliff House	1516'
Point Lookout	2516'
Mancos	2766'
Gallup	4016'
Horizontal Gallup	4191'

Note: A mud logger will be on location from drilling of the surface shoe to TD.

DIRECTIONAL DRILLING PROGRAM: (directional plans to be attached)

An 8 ¾" vertical hole will kick off at 550' at an azimuth of 31.94 degrees. Angle will be built at 1.5 degrees/100' using build/hold and drop with a maximum angle of 14.97 degrees. The curve kick off point is 3679' MD, 3618' TVD. The curve will be kicked off at 270 degrees azimuth with angle built at 10 degrees/100' to an inclination of 90 degrees to the 7" intermediate casing point in the Gallup Formation. A 6 1/8" hole will be drilled horizontally to TD. Lateral length is 3416'.

NOTE: the hard line for entering the Gallup @ TVD of 4016' is 700' FNL and 700' FEL. From that point will continue at 270 degrees azimuth reaching the intermediate csg point at 4191' TVD.

MUD PROGRAM:

A fresh water native mud (using lime, benex & gel additions) will be used to drill the surface hole. The 8-3/4" hole should be drilled with native mud and a LSND mud as necessary for hole stability from the surface shoe to the intermediate casing point. The horizontal lateral will be drilled with oil based mud.

The Fruitland Coal and Mesa Verde are expected to be under-pressured to normal-pressured and may encounter lost circulation. LCM should be stored on location and used as needed in the event of lost circulation. Barite should also be on location in the event an over-pressured zone is encountered and a kick is taken.

A closed loop mud system will be used on all phases of the well. Above ground tanks will be used to hold fluids and cuttings. Wastes will be disposed of properly at an EPA approved site. Fresh water/cuttings will be disposed of at an approved site such as Industrial Ecosystems or Basin Disposal.

CASING AND CEMENTING PROCEDURE:

Note: Notify BLM 24 hours prior to spud, testing of BOP's and cementing.
505-599-8907. NMOCD needs to be notified 24 hrs in advance of cementing.

Surface Casing:

1. Drill to a minimum of 500' to accommodate tallied 9 5/8" casing plus 3'. Casing tally to be taken on location.
2. Use a landing joint of 9 5/8" casing to set casing at ground level. Guide shoe on casing should be not more than 10 feet off bottom. Casing head flange to be set at ground level.
3. Roll casing off truck with thread protectors in place.
4. Visually inspect, rabbit, number, and tally casing on racks. Remove thread protectors and clean threads. Use quick release protectors while running casing. Do not move or roll casing without thread protectors in place.
5. Bakerlok 9 5/8" guide shoe to bottom of first joint of casing.
6. Bakerlok 9 5/8" differential float collar to top of first joint of casing. Bakerlok second joint of casing into top of float collar
7. Casing should be made up to proper torque using an API thread compound.
8. Casing should be run no faster than 2 feet per second (20 seconds per 40 foot joint). At the first indication of mud loss, the running time should be doubled to 40 seconds per joint (1 foot per second).
9. Break circulation at 250 feet and circulate a minimum of 15 minutes. Make sure that the hole is not flowing. Adjust mud properties as necessary. Circulate the last joint of casing **to TD. Rotate pipe before kicking in pumps. Kick pumps in slowly to minimize surge pressures.**
10. Centralizers should be run on each of the first 6 joints. A stop-ring should be used to hold the first centralizer in place. Place the remaining centralizers on collars.
11. After casing is landed at TD, circulate hole until mud properties measured at the flowline are within the ranges given in the "Mud Program" of this drilling prognosis.
12. Rig up rotational cementing head and return lines. Chixson should be long enough to allow 25'-30' reciprocation.
13. Pump 10 barrels of fresh water. Pump 20 barrel chemical wash. Pump cement slurry. Wash lines.
14. Drop top plug and displace with water. Do not over-displace. Pipe should be rotated at 10-20 RPM or reciprocated at least 20 feet every two to three minutes throughout displacement.
15. Bump plug with 500 psi over final displacement pressure. Hold pressure for 5 minutes. If plug does not bump, hold initial shut down pressure on casing for 5 minutes. Then check to see that float is holding (flow back into cement pump tank).
16. Wait on cement a minimum of 8 hours or until surface samples are hard, whichever is longer **before** nippling up the BOP. Test BOP's. Test surface casing to 1500#.

Caballo 30-15-29 #1H

Intermediate Casing:

1. Drill to intermediate csg pt.
2. Roll casing off truck with thread protectors in place.
3. Change out pipe rams to accommodate 7" casing.
4. Visually inspect, rabbit, number, and tally casing on racks. Remove thread protectors and clean threads. Use quick release protectors while running casing. Do not move or roll casing without thread protectors in place.
5. Bakerlok 7" float shoe to bottom of first joint of casing.
6. Bakerlok 7" differential float collar to top of first joint of casing. Bakerlok second joint of casing into top of float collar
7. Casing should be made up to proper torque using an API thread compound.
8. Casing should be run no faster than 2 feet per second (20 seconds per 40 foot joint). At the first indication of mud loss, the running time should be doubled to 40 seconds per joint (1 foot per second).
9. Break circulation at 2000 feet, and 3600 feet and circulate each a minimum of 30 minutes. Make sure that the hole is not flowing. Adjust mud properties as necessary. Circulate the last joint of casing to TD. Kick pumps in slowly to minimize surge pressures.
10. Centralizers should be run on each of the first 10 joints, and every 3rd joint to surface. A stop-ring should be used to hold the first centralizer in place. Place the remaining centralizers on collars.
11. After casing is landed just above TD, circulate hole until mud properties measured at the flowline are within the ranges given in the "Mud Program" of this drilling prognosis.
12. Rig up rotational cementing head and return lines. Chixson should be long enough to allow 25'-30' reciprocation.
13. Pump 10 barrels of fresh water. Pump 20 barrel chemical wash. Pump cement slurry. Wash lines.
14. Drop top plug and displace with water. Do not over-displace. If Possible, pipe should be rotated at 10-20 RPM or reciprocated at least 20 feet every two to three minutes throughout displacement. Bump plug with 500 psi over final displacement pressure. Hold pressure for 4 hours or until cement is set, to avoid the potential of collapsed casing. If plug does not bump, hold initial shut down pressure on casing for 4 hours or until cement is set.
15. Wait on cement a minimum of 12 hours or until surface samples are hard, whichever is longer **before** nippling down the BOP. NUBOP stack and test. Test intermediate csg to 1500#.

Caballo 30-15-29 #1H

Production Casing:

1. Drill to TD and verify depth. Pump hi vis sweep and TOOH. LD directional tools and MWD.
2. P/U BHA and reamer and ream lateral as needed. Circ and TOOH.
3. Bakerlok float shoe. Bakerlok float collar on top of 1st jt.
4. TIH w/ 4 ½" liner, and liner hanger packer on DP/HWDP. NOTE: liner hanger packer to have PBR and be set in vertical section of well.
5. Run one slider centralizer on every jt of casing from the shoe through the curve.
6. Circulate @ 7" csg shoe and note pressures. Circulate only if necessary until TD is reached. Circulate @ TD.
7. Cement liner to liner top, set liner hanger PKR. Reverse out cement. Test back side.
8. TOOH and LDDP/HWDP.
9. TIH w/ 4 ½" tie back frac string. Latch liner hanger PKR and space out. Circulate well clean with KCL water. Land in WH hanger. Test liner and back side.
10. NDBOP and NUWH.
11. Rig down.

NOTE: will need to determine best way to cement liner while leaving the option of being able to pump the first perforating gun down. ("wet shoe" for example)

Cement Slurry Designs and Notes

Slurry	Cement & Additives	Water gals/sx	Weight PPG	Yield cu ft/sx
Surface	Class G + 1/8 #/sx poly flake + 2% CACL	5.0	15.8	1.17
Intermediate				
Lead	Premium Lite + 1/8#/sx Poly flake + 5#/sx LCM	9.33	12.5	1.85
Tail	Class G + 1/8#/sx poly flake	5.0	15.8	1.15
Production Liner				
Lead	Type V	5.24	15.6	1.18
Foamed CMT	50/50 Poz + .2% Versaset	6.76	13.0	1.43
Tail	50/50 Poz + .2% Versaset	5.67	13.5	1.28

Cement Slurry Designs and Notes cont.

Figure slurry volume as follows:

Surface: Calculate slurry based on hole and casing size annular volumes plus 100% excess.

Intermediate: Calculate slurry based on hole and casing size annular volumes plus 30% excess

Production: Calculate slurry based on hole and casing size annular volumes + 30% excess.

NOTES:

1. Pump rates should be a minimum of 4 BPM throughout displacement.
   Slurry weights should be measured using a mud balance at least every 10 minutes during mixing.

2. At least two samples of all slurries should be caught and monitored at room temperature for thickening time.

3. Run temperature log on surface and intermediate casing strings if cement does not circulate.

NOTIFICATION SCHEDULE

Purpose or Reason

Regulatory	Phone Number	Comments
BLM	505-564-7750	Notify 24 hours before spud, testing BOP's, running casing, or cementing.
BLM	505-564-7600	Changes or questions regarding approved plans or drilling ops.
BLM		Emergency program changes after normal business hours.
	571-275-6474	William Tambkou
	505-608-1989	Troy Salyers
NMOCD	505-334-6178	Notify 24hrs before cementing. Monica Kuehling

Drilling Issues

Tripp Schwab tripp@nikaenergy.com	970-259-2701 970-769-3589 970-769-3589	Office Mobile Home
Bob Sagle	970-749-0473	Mobile

Caballo 30-15-29 #1H

VENDOR LIST

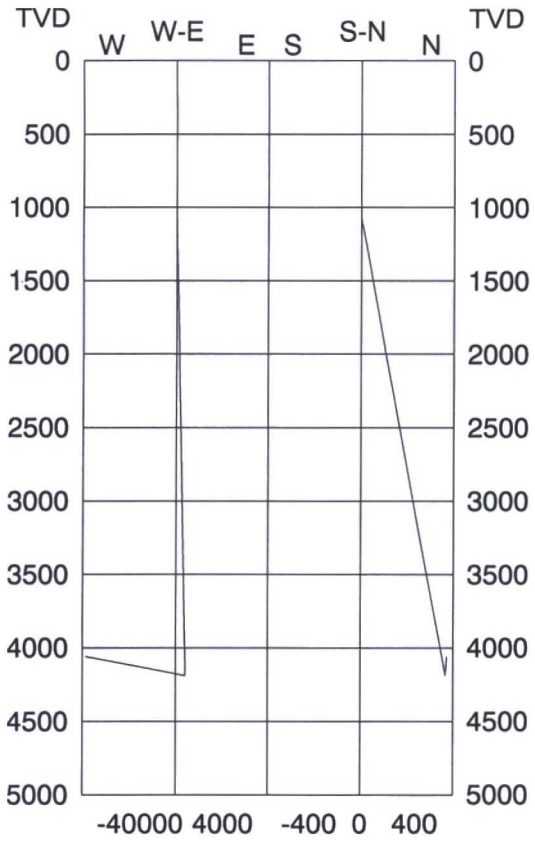
Service or Material	Company or Contact		Phone Number
Dirt Contractor	Aztec Excavation Wink Meador	Off	505-334-4020
Pit Liner	see Dirt Contractor		
Anchors	Mote	Off	505-325-9711
Drilling Contractor	TBD		
Surface & Long String	Cave Enterprises Jim Cave	Off	505-325-3401
Cementing & Hardware	TBD		
Wellhead Equipment	WSI Lynda Gammon	Off	505-326-0308
Casing Crew	San Juan Casing Ron Fellabaum	Off Cell	505-325-5835 505-320-1334
Open Hole Logging	JetWest Mike	Off	505-326-1415
Cement, Bond Log, Temp Log & Perforating	BlueJet Danny Seip	Off	505-325-5584
Water Hauling	B&B Vac	Home	505-289-4048
	Dustin Bridge	Cell	505-320-1211
Water Hauling	Overright Trucking Mike Overright	Cell	505-330-2324
Frac Tank & Heavy Hauling	Lindrith Backhoe Doyle Post Dillon Gibson	Cell	505-320-5460
Light Trucking / Hotshot	Lindrith Backhoe		
	Doyle Post	Cell	505-320-5460
	Dillon Gibson	Cell	505-330-4275

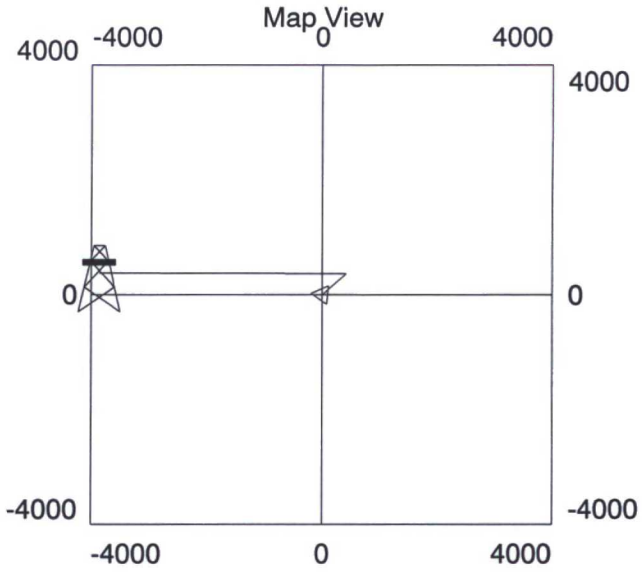
VENDOR LIST cont.

Service or Material	Company or Contact		Phone Number
Porta Johns	Cabannas	Off	505-325-5835
	Hal Stone	Cell	505-330-7566
Drilling Fluids	Basin/Swaco	Off	505-632-2595
	Tom Griffin	Cell	505-793-6238
	Lee Davis	Cell	970-560-9977
Mud Solids Management	Basin/Swaco	Off	505-327-4572
	Keith Hurt	Cell	970-309-7531
Closed Loop Waste Management	Enviroco	Cell	505-320-2896
	Rick Perez		
Roustabout & Trashbasket	Lindrith Backhoe		
	Doyle Post	Cell	505-320-5460
	Dillon Gibson		
BOP Rental	Knight Oil Tools	Off	505-632-6666
BOP Testing	Four Corners Testing	Cell	505-215-4600

Wsn:53481 WELL: 300450900 (Caballo 30-15 29 #1H) [DEV]

Directional Survey





PATHFINDER
A Schlumberger Company

SG Interests Caballo 30-15-29 #1H Rev0 JBE 07Mar13 Proposal Geodetic Report

(Non-Def Plan)

Report Date:	March 08, 2013 - 12:13 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	SG Interests I, Ltd.	**Vertical Section Azimuth:**	277.069 ° (True North)
Field:	NM San Juan County NAD83	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	SG Interests Caballo 30-15-29 #1H / Caballo 30-15-29 #1H	**TVD Reference Datum:**	RKB
Well:	Caballo 30-15-29 #1H	**TVD Reference Elevation:**	5231.000 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	5216.000 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	10.008 °
Survey Name:	SG Interests Caballo 30-15-29 #1H Rev0 JBE 07Mar13	**Total Gravity Field Strength:**	999.3831 mgn (9.8 based)
Survey Date:	March 07, 2013	**Total Magnetic Field Strength:**	50447.651 nT
Tort / AHD / DDI / ERD Ratio:	121.875 ° / 4553.294 ft / 6.026 / 1.086	**Magnetic Dip Angle:**	63.316 °
Coordinate Reference System:	NAD83 New Mexico State Plane, Western Zone, US Feet	**Declination Date:**	March 07, 2013
Location Lat / Long:	N 36° 47' 21.01200", W 108° 26' 3.08400"	**Magnetic Declination Model:**	BGGM 2012
Location Grid N/E Y/X:	N 2107130.100 ftUS, E 2547152.485 ftUS	**North Reference:**	True North
CRS Grid Convergence Angle:	-0.3598 °	**Grid Convergence Used:**	0.0000 °
Grid Scale Factor:	0.99995208	**Total Corr Mag North->True North:**	10.0085 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim True (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL Caballo 30-15-29 #1H	0.00	0.00	31.94	0.00	0.00	0.00	0.00	N/A	2107130.10	2547152.49	N 36 47 21.01	W 108 26 3.08
Nudge 1.5°/100'	550.00	0.00	31.94	550.00	0.00	0.00	0.00	0.00	2107130.10	2547152.49	N 36 47 21.01	W 108 26 3.08
Hold 15°	1548.28	14.97	31.94	1536.96	-54.55	110.07	68.62	1.50	2107239.73	2547221.79	N 36 47 22.10	W 108 26 2.24
Drop 1.5°/100'	2662.20	14.97	31.94	2613.04	-175.60	354.32	220.88	0.00	2107483.01	2547375.58	N 36 47 24.52	W 108 26 0.37
Vertical	3660.48	0.00	31.94	3600.00	-230.15	464.39	289.50	1.50	2107592.64	2547444.88	N 36 47 25.60	W 108 25 59.52
Curve KOP 10°/100'	3678.52	0.00	31.94	3618.04	-230.15	464.39	289.50	0.00	2107592.64	2547444.88	N 36 47 25.60	W 108 25 59.52
Gallup												
Caballo 30-15-29 #1H EP	*4118.41*	*43.98*	*270.14*	*4016.00*	*-70.64*	*464.77*	*128.81*	*10.00*	*2107594.03*	*2547284.21*	*N 36 47 25.61*	*W 108 26 1.50*
Landing Point	4597.92	91.93	270.14	4190.80	357.79	465.83	-302.76	10.00	2107597.79	2546852.67	N 36 47 25.62	W 108 26 6.81
Caballo 30-15-29 #1H PBHL	8013.64	91.93	270.14	4076.00	3746.67	474.39	-3716.54	0.00	2107627.80	2543439.18	N 36 47 25.70	W 108 26 48.77

Survey Type: Non-Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	15.000	1/100.000	30.000	30.000	SLB_MWD-STD-Depth Only	Original Borehole / SG Interests Caballo 30-15-29 #1H Rev0 JBE
	15.000	8013.640	1/100.000	30.000	30.000	SLB_MWD-STD	Original Borehole / SG Interests Caballo 30-15-29 #1H Rev0 JBE

PATHFINDER
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SG Interests Caballo 30-15-29 #1H Rev0 JBE 07Mar13 Proposal Geodetic Report

(Non-Def Plan)

Report Date:	March 08, 2013 - 12:13 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	SG Interests I, Ltd.	**Vertical Section Azimuth:**	277.069 ° (True North)
Field:	NM San Juan County NAD83	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	SG Interests Caballo 30-15-29 #1H / Caballo 30-15-29 #1H	**TVD Reference Datum:**	RKB
Well:	Caballo 30-15-29 #1H	**TVD Reference Elevation:**	5231.000 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	5216.000 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	10.008 °
Survey Name:	SG Interests Caballo 30-15-29 #1H Rev0 JBE 07Mar13	**Total Gravity Field Strength:**	999.3831 mgn (9.8 based)
Survey Date:	March 07, 2013	**Total Magnetic Field Strength:**	50447.651 nT
Tort / AHD / DDI / ERD Ratio:	121.875 ° / 4553.294 ft / 6.026 / 1.086	**Magnetic Dip Angle:**	63.316 °
Coordinate Reference System:	NAD83 New Mexico State Plane, Western Zone, US Feet	**Declination Date:**	March 07, 2013
Location Lat / Long:	N 36° 47' 21.01200", W 108° 26' 3.08400"	**Magnetic Declination Model:**	BGGM 2012
Location Grid N/E Y/X:	N 2107130.100 ftUS, E 2547152.485 ftUS	**North Reference:**	True North
CRS Grid Convergence Angle:	-0.3598 °	**Grid Convergence Used:**	0.0000 °
Grid Scale Factor:	0.99995208	**Total Corr Mag North->True North:**	10.0085 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim True (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL Caballo 30-15-29 #1H	0.00	0.00	31.94	0.00	0.00	0.00	0.00	N/A	2107130.10	2547152.49	N 36 47 21.01	W 108 26 3.08
Nudge 1.5°/100'	550.00	0.00	31.94	550.00	0.00	0.00	0.00	0.00	2107130.10	2547152.49	N 36 47 21.01	W 108 26 3.08
	600.00	0.75	31.94	600.00	-0.14	0.28	0.17	1.50	2107130.38	2547152.66	N 36 47 21.01	W 108 26 3.08
	700.00	2.25	31.94	699.96	-1.24	2.50	1.56	1.50	2107132.59	2547154.06	N 36 47 21.04	W 108 26 3.06
	800.00	3.75	31.94	799.82	-3.44	6.94	4.33	1.50	2107137.01	2547156.85	N 36 47 21.08	W 108 26 3.03
	900.00	5.25	31.94	899.51	-6.74	13.60	8.48	1.50	2107143.64	2547161.05	N 36 47 21.15	W 108 26 2.98
	1000.00	6.75	31.94	998.96	-11.14	22.47	14.01	1.50	2107152.48	2547166.63	N 36 47 21.23	W 108 26 2.91
	1100.00	8.25	31.94	1098.10	-16.62	33.54	20.91	1.50	2107163.51	2547173.61	N 36 47 21.34	W 108 26 2.83
	1200.00	9.75	31.94	1196.87	-23.20	46.82	29.19	1.50	2107176.73	2547181.96	N 36 47 21.47	W 108 26 2.73
	1300.00	11.25	31.94	1295.19	-30.87	62.28	38.83	1.50	2107192.13	2547191.70	N 36 47 21.63	W 108 26 2.61
	1400.00	12.75	31.94	1393.00	-39.61	79.93	49.83	1.50	2107209.71	2547202.81	N 36 47 21.80	W 108 26 2.47
	1500.00	14.25	31.94	1490.24	-49.43	99.74	62.18	1.50	2107229.44	2547215.28	N 36 47 22.00	W 108 26 2.32
Hold 15°	1548.28	14.97	31.94	1536.96	-54.55	110.07	68.62	1.50	2107239.73	2547221.79	N 36 47 22.10	W 108 26 2.24
Drop 1.5°/100'	2662.20	14.97	31.94	2613.04	-175.60	354.32	220.88	0.00	2107483.01	2547375.58	N 36 47 24.52	W 108 26 0.37
	2700.00	14.41	31.94	2649.61	-179.63	362.45	225.95	1.50	2107491.11	2547380.70	N 36 47 24.60	W 108 26 0.31
	2800.00	12.91	31.94	2746.78	-189.56	382.49	238.44	1.50	2107511.06	2547393.31	N 36 47 24.79	W 108 26 0.15
	2900.00	11.41	31.94	2844.54	-198.42	400.36	249.58	1.50	2107528.86	2547404.57	N 36 47 24.97	W 108 26 0.02
	3000.00	9.91	31.94	2942.81	-206.20	416.05	259.37	1.50	2107544.49	2547414.45	N 36 47 25.13	W 108 25 59.90
	3100.00	8.41	31.94	3041.53	-212.89	429.56	267.79	1.50	2107557.95	2547422.95	N 36 47 25.26	W 108 25 59.79
	3200.00	6.91	31.94	3140.64	-218.49	440.86	274.83	1.50	2107569.21	2547430.07	N 36 47 25.37	W 108 25 59.71
	3300.00	5.41	31.94	3240.06	-223.00	449.97	280.51	1.50	2107578.27	2547435.80	N 36 47 25.46	W 108 25 59.64
	3400.00	3.91	31.94	3339.72	-226.42	456.86	284.80	1.50	2107585.14	2547440.14	N 36 47 25.53	W 108 25 59.58
	3500.00	2.41	31.94	3439.57	-228.74	461.53	287.72	1.50	2107589.79	2547443.08	N 36 47 25.58	W 108 25 59.55

Comments	MD (ft)	Incl (°)	Azim True (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	3600.00	0.91	31.94	3539.53	-229.95	463.98	289.25	1.50	2107592.23	2547444.63	N 36 47 25.60	W 108 25 59.53
Vertical	3660.48	0.00	31.94	3600.00	-230.15	464.39	289.50	1.50	2107592.64	2547444.88	N 36 47 25.60	W 108 25 59.52
Curve KOP 10°/100'	3678.52	0.00	31.94	3618.04	-230.15	464.39	289.50	0.00	2107592.64	2547444.88	N 36 47 25.60	W 108 25 59.52
	3700.00	2.15	270.14	3639.52	-229.75	464.39	289.10	10.00	2107592.64	2547444.48	N 36 47 25.60	W 108 25 59.53
	3800.00	12.14	270.14	3738.62	-217.42	464.42	276.67	10.00	2107592.75	2547432.06	N 36 47 25.60	W 108 25 59.68
	3900.00	22.14	270.14	3834.05	-188.20	464.49	247.24	10.00	2107593.00	2547402.62	N 36 47 25.60	W 108 26 0.04
	4000.00	32.14	270.14	3922.93	-142.97	464.60	201.68	10.00	2107593.40	2547357.07	N 36 47 25.61	W 108 26 0.60
	4100.00	42.13	270.14	4002.55	-83.12	464.74	141.38	10.00	2107593.92	2547296.78	N 36 47 25.61	W 108 26 1.35
Gallup Caballo 30-15-29 #1H EP	*4118.41*	*43.98*	*270.14*	*4016.00*	*-70.64*	*464.77*	*128.81*	*10.00*	*2107594.03*	*2547284.21*	*N 36 47 25.61*	*W 108 26 1.50*
	4200.00	52.13	270.14	4070.49	-10.45	464.91	68.18	10.00	2107594.55	2547223.58	N 36 47 25.61	W 108 26 2.25
	4300.00	62.13	270.14	4124.69	72.82	465.12	-15.71	10.00	2107595.28	2547139.70	N 36 47 25.61	W 108 26 3.28
	4400.00	72.13	270.14	4163.50	164.18	465.34	-107.73	10.00	2107596.08	2547047.68	N 36 47 25.61	W 108 26 4.41
	4500.00	82.13	270.14	4185.73	260.83	465.58	-205.10	10.00	2107596.94	2546950.33	N 36 47 25.62	W 108 26 5.61
Landing Point	4597.92	91.93	270.14	4190.80	357.79	465.83	-302.76	10.00	2107597.79	2546852.67	N 36 47 25.62	W 108 26 6.81
Caballo 30-15-29 #1H PBHL	8013.64	91.93	270.14	4076.00	3746.67	474.39	-3716.54	0.00	2107627.80	2543439.18	N 36 47 25.70	W 108 26 48.77

Survey Type: Non-Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)		Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	15.000		1/100.000	30.000	30.000	SLB_MWD-STD-Depth Only	Original Borehole / SG Interests Caballo 30-15-29 #1H Rev0 JBE
	15.000	8013.640		1/100.000	30.000	30.000	SLB_MWD-STD	Original Borehole / SG Interests Caballo 30-15-29 #1H Rev0 JBE

PATHFINDER
A Schlumberger Company

SG Interests Caballo 30-15-29 #1H Rev0 JBE 07Mar13 Proposal Geodetic Report

(Non-Def Plan)

Report Date:	March 08, 2013 - 12:13 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	SG Interests I, Ltd.	**Vertical Section Azimuth:**	277.069 ° (True North)
Field:	NM San Juan County NAD83	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	SG Interests Caballo 30-15-29 #1H / Caballo 30-15-29 #1H	**TVD Reference Datum:**	RKB
Well:	Caballo 30-15-29 #1H	**TVD Reference Elevation:**	5231.000 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	5216.000 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	10.008 °
Survey Name:	SG Interests Caballo 30-15-29 #1H Rev0 JBE 07Mar13	**Total Gravity Field Strength:**	999.3831 mgn (9.8 based)
Survey Date:	March 07, 2013	**Total Magnetic Field Strength:**	50447.651 nT
Tort / AHD / DDI / ERD Ratio:	121.875 ° / 4553.294 ft / 6.026 / 1.086	**Magnetic Dip Angle:**	63.316 °
Coordinate Reference System:	NAD83 New Mexico State Plane, Western Zone, US Feet	**Declination Date:**	March 07, 2013
Location Lat / Long:	N 36° 47' 21.01200", W 108° 26' 3.08400"	**Magnetic Declination Model:**	BGGM 2012
Location Grid N/E Y/X:	N 2107130.100 ftUS, E 2547152.485 ftUS	**North Reference:**	True North
CRS Grid Convergence Angle:	-0.3598 °	**Grid Convergence Used:**	0.0000 °
Grid Scale Factor:	0.99995208	**Total Corr Mag North->True North:**	10.0085 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim True (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL Caballo 30-15-29 #1H	0.00	0.00	31.94	0.00	0.00	0.00	0.00	N/A	2107130.10	2547152.49	N 36 47 21.01	W 108 26 3.08
Nudge 1.5°/100'	550.00	0.00	31.94	550.00	0.00	0.00	0.00	0.00	2107130.10	2547152.49	N 36 47 21.01	W 108 26 3.08
Hold 15°	1548.28	14.97	31.94	1536.96	-54.55	110.07	68.62	1.50	2107239.73	2547221.79	N 36 47 22.10	W 108 26 2.24
Drop 1.5°/100'	2662.20	14.97	31.94	2613.04	-175.60	354.32	220.88	0.00	2107483.01	2547375.58	N 36 47 24.52	W 108 26 0.37
Vertical	3660.48	0.00	31.94	3600.00	-230.15	464.39	289.50	1.50	2107592.64	2547444.88	N 36 47 25.60	W 108 25 59.52
Curve KOP 10°/100'	3678.52	0.00	31.94	3618.04	-230.15	464.39	289.50	0.00	2107592.64	2547444.88	N 36 47 25.60	W 108 25 59.52
Gallup Caballo 30-15-29 #1H EP	*4118.41*	*43.98*	*270.14*	*4016.00*	*-70.64*	*464.77*	*128.81*	*10.00*	*2107594.03*	*2547284.21*	*N 36 47 25.61*	*W 108 26 1.50*
Landing Point	4597.92	91.93	270.14	4190.80	357.79	465.83	-302.76	10.00	2107597.79	2546852.67	N 36 47 25.62	W 108 26 6.81
Caballo 30-15-29 #1H PBHL	8013.64	91.93	270.14	4076.00	3746.67	474.39	-3716.54	0.00	2107627.80	2543439.18	N 36 47 25.70	W 108 26 48.77

Survey Type: Non-Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	15.000	1/100.000	30.000	30.000	SLB_MWD-STD-Depth Only	Original Borehole / SG Interests Caballo 30-15-29 #1H Rev0 JBE
	15.000	8013.640	1/100.000	30.000	30.000	SLB_MWD-STD	Original Borehole / SG Interests Caballo 30-15-29 #1H Rev0 JBE

SG Interests I, Ltd.

KB: 15'

Rev0

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WELL	FIELD	STRUCTURE
Caballo 30-15-29 #1H	NM San Juan County NAD83	SG Interests Caballo 30-15-29 #1H

Magnetic Parameters: Model: BGGM 2012 | Dip: 63.316° | Mag Dec: 10.008° | Date: March 07, 2013 | Ftb: 50447.7nT

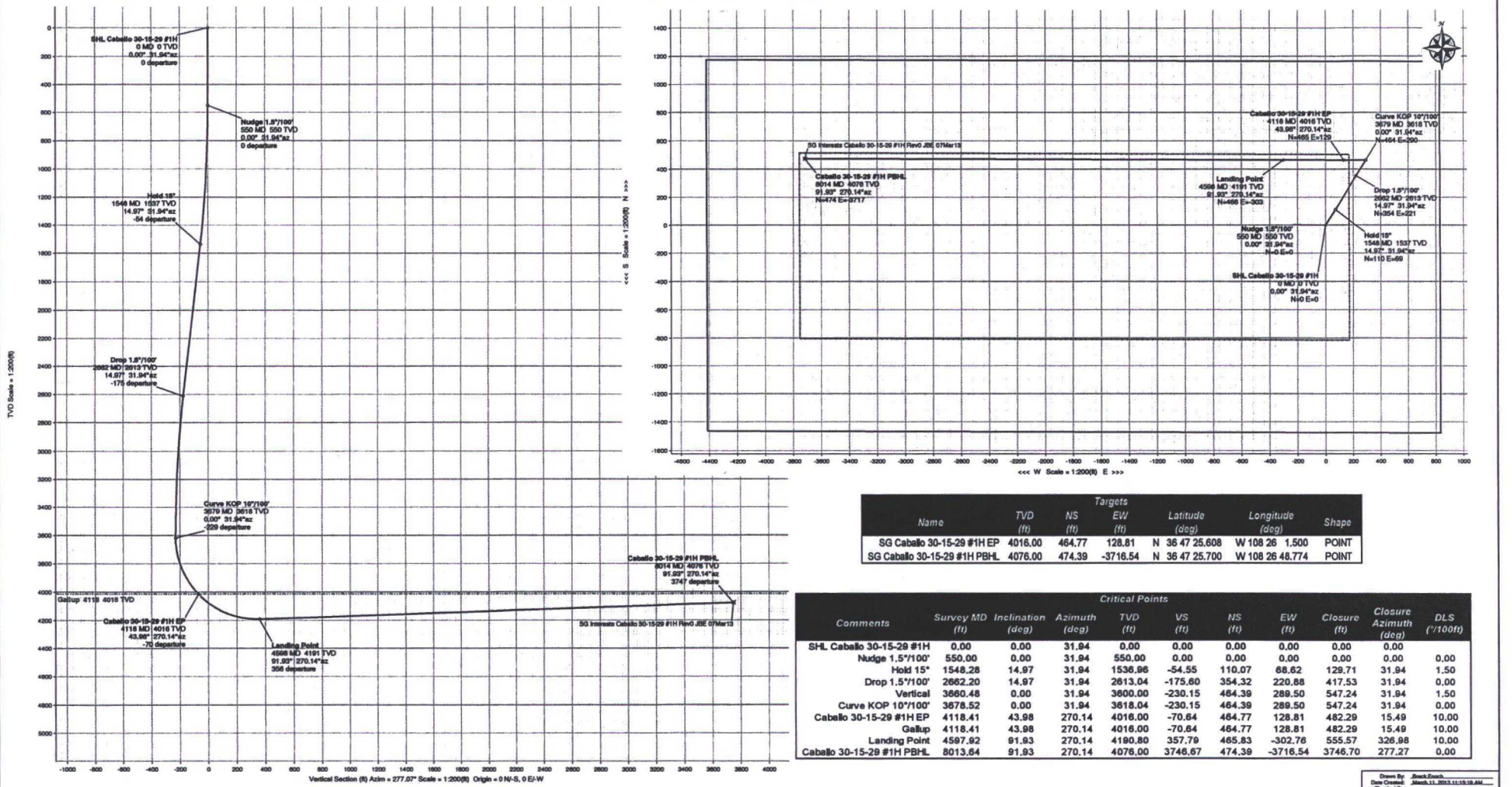
Surface Location: NAD83 New Mexico State Plane, Western Zone, US Feet | Lat: N 36 47 21.012 | Long: W 108 26 3.084 | Northing: 2107130.10 ftUS | Easting: 2547152.49 ftUS | Grid Conv: -0.360° | Scale Fact: 0.99995208

Miscellaneous: Slot: Caballo 30-15-29 #1H | Plan: SG Interests Caballo 30-15-29 #1H Rev0 JBE 07Mar13 | TVD Ref: RKB(5231ft above MSL)

Legend

- Sec 29 T30N R15W - N 1/4 - 660' HL
- SG Interests Caballo 30-15-29 #1H EP
- Sec 29 T30N R15W - N 1/4
- SG Caballo 30-15-29 #1H PBHL
- SG Interests Caballo 30-15-29 #1H Rev0 JBE 07Mar13

True North
Tot Corr (M->T 10.0085°)
Mag Dec (10.008°)
Grid Conv (-0.360°)



Targets

Name	TVD (ft)	NS (ft)	EW (ft)	Latitude (deg)	Longitude (deg)	Shape
SG Caballo 30-15-29 #1H EP	4016.00	464.77	128.81	N 36 47 25.608	W 108 26 1.500	POINT
SG Caballo 30-15-29 #1H PBHL	4076.00	474.39	-3716.54	N 36 47 25.700	W 108 26 48.774	POINT

Critical Points

Comments	Survey MD (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	VS (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (deg)	DLS (°/100ft)
SHL Caballo 30-15-29 #1H	0.00	0.00	31.94	0.00	0.00	0.00	0.00	0.00	0.00	
Nudge 1.5°/100'	550.00	0.00	31.94	550.00	0.00	0.00	0.00	0.00	0.00	0.00
Hold 15°	1548.28	14.97	31.94	1536.96	-54.55	110.07	68.62	129.71	31.94	1.50
Drop 1.5°/100'	2662.20	14.97	31.94	2613.04	-175.60	354.32	220.88	417.53	31.94	0.00
Vertical	3660.48	0.00	31.94	3600.00	-230.15	464.39	289.50	547.24	31.94	1.50
Curve KOP 10°/100'	3678.52	0.00	31.94	3618.04	-230.15	464.39	289.50	547.24	31.94	0.00
Caballo 30-15-29 #1H EP	4118.41	43.98	270.14	4016.00	-70.64	464.77	128.81	482.29	15.49	10.00
Gallup	4118.41	43.98	270.14	4016.00	-70.64	464.77	128.81	482.29	15.49	10.00
Landing Point	4597.92	91.93	270.14	4190.80	357.79	465.83	-302.76	555.57	326.98	10.00
Caballo 30-15-29 #1H PBHL	8013.64	91.93	270.14	4076.00	3746.67	474.39	-3716.54	3746.70	277.27	0.00

Drawn By: Brock Enoch
Date Created: March 11, 2013 11:15:10 AM
Checked By:
Checked Date:
Approved By:
Approved Date:

Project: SJB COLORADO & NEW MEXICO
Date: Wednesday, February 13, 2013 at 11:39 AM

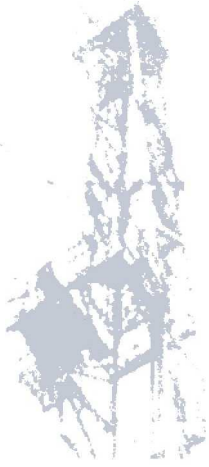
Directional Survey Data - Wsn:53481 WELL: 300450900 (Caballo 30-15 29 #1H) [DEV]

Depth Units = Feet
X,Y Units = Feet

MD	TVD	EW	NS
0.00	0.00	0.00	0.00
1075.00	1075.00	0.00	0.00
4238.96	4189.08	422.58	366.81
8525.83	4059.21	-3862.32	373.67

End of Report

DRILLING FLUIDS PROPOSAL

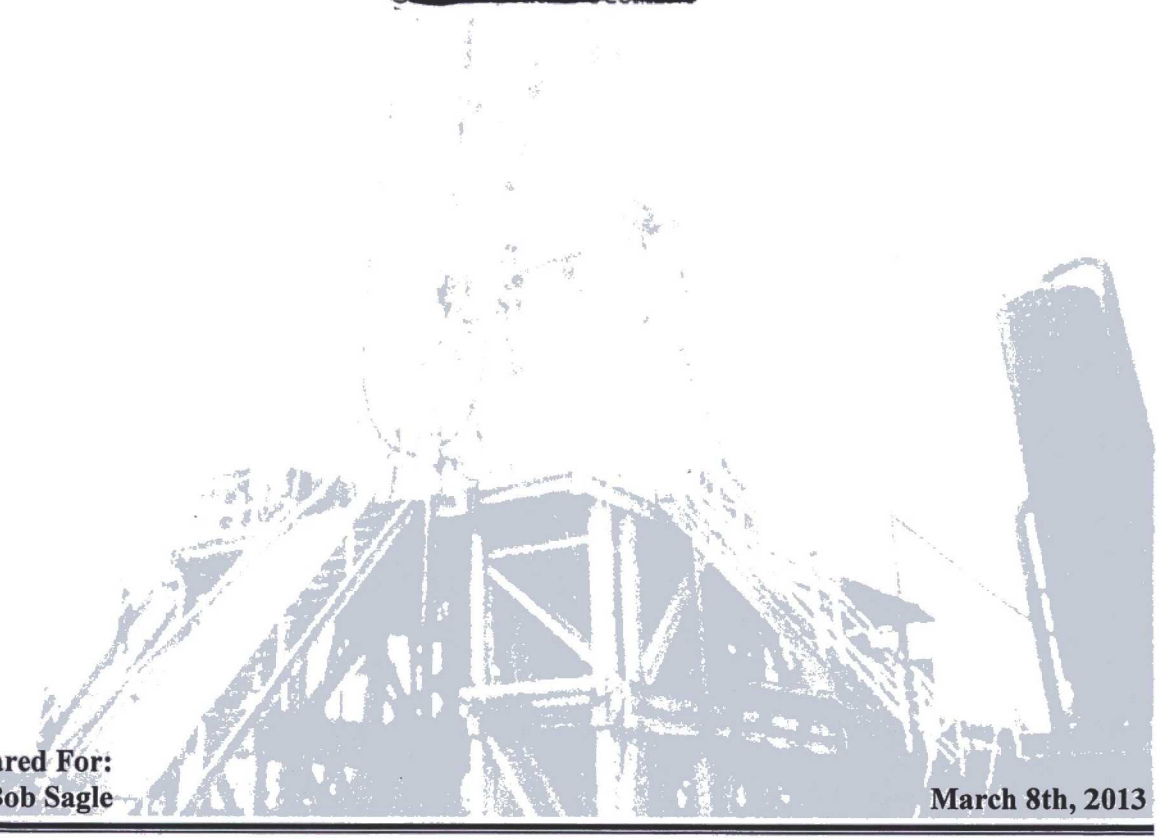


SG Interests I, Ltd.

Caballo 30-15-29#1H

Sec. 29, T30N, R15W

San Juan County, New Mexico



Prepared For:
Mr. Bob Sagle

March 8th, 2013

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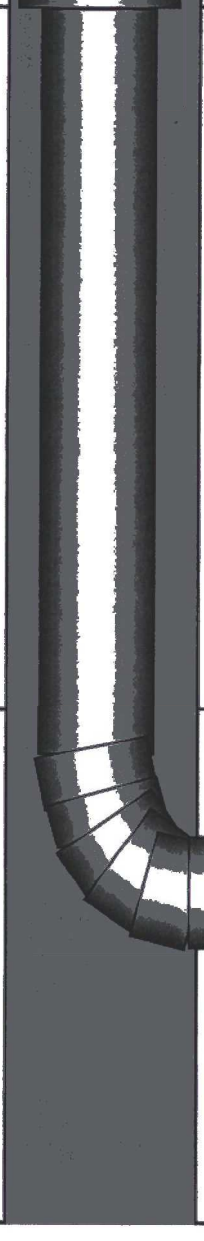
WELL SCHEMATIC

Casing Size (in)	Hole Size (in)	Casing Program	Depth (ft)		Mud System	Mud Weight (ppg)	Sum Days	Cumulative Mud Cost ($1,000)
9-5/8"	12-1/4"		500'	Casing Pt	**Freshwater/ Sweeps**	8.4-8.8	1	[redacted]
7"	8-3/4"		4,550'	Cliff House Point Lookout Mancos Gallup Casing Pt.	**LSND System** Vis 38-45 YP 8-12 API FL <10 LGS <10% Add Asphasol Supreme LCM sweeps of 15% or more may be needed if losses occur	8.5- 9.3	8	[redacted]
4-1/2"	6-1/8"		8,430'	Horizontal Gallup TD	**Switch to Megadril** Lateral to 8,430' MD **Vis 40-45 YP 8-12 Pom 2.5-3.0 HTHP Fl 8-10 LGS 4-6% ES 400-500 OWR 75:25-80:20**	7.5-9.3	15	[redacted]

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DRILLING SOLUTIONS INTERVAL 1

12-1/4" - (0' - 500' MD) - 9-5/8" Casing	
Drilling Fluid System	Water & High Viscosity Sweeps
Key Fluids Products	M-I Gel, Poly Plus, DrilZone L, SAPP, Sodium Bicarbonate, Rapid Sweep drill sticks
Focus Of Interval	Spud and successfully drill surface with water and M-I Gel/ Poly Plus high viscosity sweeps
Recommended SCE	Rig shakers, centrifuge, dewatering unit
Recommended Shaker Screens	While circulating across shakers screen up as tight as possible 210-230 mesh
Recommended PCE	None Required
Potential Problems	Hole cleaning, seepage losses, possible lost circulation
Engineering Service Type	[redacted]

Interval Drilling Fluid Properties						
Mud Weight (ppg)	Funnel Viscosity (cp)	Yield Point (lb/100ft²)	Gels (10 sec/ 10 min)	Total Hardness (Mg/l)	API Fluid Loss (ml/30min)	Total Solids (%)
8.4 - 8.8	26 - 30	As Needed	As Needed	< 200	Not Required	1 - 2

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INTERVAL 1 DISCUSSION

- Spud in the well circulating with fresh water.
- If dewatering unit is available, use Calcium Nitrate or gypsum to maintain hardness in 800-1200 mg/L or as dewatering personnel require to ensure efficient removal of solids.
- Drilzone L and Rapid Sweep PHPA sticks should be alternated down the drill pipe on connections in the amount of 1-2 vis cups/ sticks each to prevent bit ball, clay accretion, and improve ROP.
- High viscosity sweeps consisting of M-I Gel and Poly Plus should be pumped every 100'-150' or as needed to keep the hole clean. Mix M-I Gel as needed for 65+ sec/qt vis and then add 1/2 can Poly Plus in 50 bbls water.
- If losses are occurring Polyswell can be added to the high viscosity sweeps to help cure losses. *Polyswell should only be added to the sweep while pumping the sweep. Do not allow Polyswell to sit in the pits.
- Should hole cleaning become a problem increase the frequency and viscosity of the sweeps. Also consider adding Super Sweep (synthetic monofilament fiber) to increase mechanical carrying capacity without increasing the viscosity. As a last resort, mud up a light spud mud .
- Prior to tripping for surface casing be sure to pump two high viscosity sweeps to ensure the hole is clean. If the hole does not appear to be cleaned out, mud up the system and do not trip or run casing until the hole is clean.
- Lost circulation may exist in this area. The Fruitland Coal is expected to be under-pressured and lost circulation may occur. Keep a good supply of fibrous lost circulation materials (G-Seal Plus, WALNUT NUT PLUG, M-I-X II, SAFECARB, CEDAR FIBER, AND SAWDUST) on location for any mud losses. (See attached Lost Circulation Pages)

INTERVAL 1 INITIAL FLUIDS BLEND

Fluids Building For Spud Mud								
Interval Drilling Fluid Properties 0' to 500'								
Mud Weight (ppg)	Funnel Viscosity (cp)	Yield Point ($lb/100ft^2$)	Gels (10 sec/ 10 min)	Total Hardness (Mg/l)	API Fluid Loss (ml/30min)	pH	LGS Solids (%)	MBT ppb
8.4-8.8	40-60	10-25	4-15	< 200	< 20	9.5-10.5	< 10	< 15

Products Mixed Through Mud Hopper (for Spud Mud)		
Mix Order	Product	Concentration
# 1	M-I Gel	10-12 ppb
# 2	Poly Plus	.5-.75 ppb
# 3	Caustic Soda/ Lime	9.5-10.0 pH
# 4	PolyPac R/PolyPac UL/Unitrol (if needed)	.5-1.0 ppb
# 5	M-I WATE (as needed)	
# 6	Soda Ash (as needed for < 200 mg/l total hardness)	

Sweeps		
Mix Order	Product	Concentration
# 1	M-I Gel	12-15 ppb
# 2	Poly Plus	.5 ppb
#3	Lime	.5 ppb

DRILLING SOLUTIONS INTERVAL 2

8-3/4" - (500' - 4,550'MD) - 7" Casing	
Drilling Fluid System	LSND system
Key Fluids Products	M-I Gel, PolyPac R, Unitrol, Tannathin, Poly-Plus, Caustic, Lime, Asphasol Supreme, Safe-Carb 40 & 250
Focus Of Interval	Drill to 4,550' without hole issues and set 7" casing.
Recommended SCE	M-I SWACO Mongoose shaker or rig shaker, desander, desilter, dewatering unit and centrifuge
Recommended Shaker Screens	As fine as possible, preferably 200—230 mesh.
Recommended PCE	Gas buster, dual chokes, dual choke panel
Potential Problems	Hole cleaning, seepage losses, possible lost circulation, reactive shales and clays, bentonite stringers, anhydrite
Engineering Service Type	[redacted]

Interval Drilling Fluid Properties						
Mud Weight (ppg)	Funnel Viscosity (S/Qt)	Yield Point (lb/100ft²)	Gels (10 sec/ 10 min)	Total Hardness (Mg/l)	API Fluid Loss (ml/30min)	Total Solids (%)
8.5-9.3	50-60	15-20	10-15	<200	<10	<10%

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INTERVAL 2 DISCUSSION

- For mud up: mix Caustic Soda for a pH of 9.5—10.5, mix M-I Gel at 10– 12 ppb, mix Poly Plus at .75—1.0 ppb, and mix 0.5-1 ppb of Poly Pac R for fluid loss <10 cc/30 min API,
- To prevent bit balling and aid in ROP add Drilzone L to the mud system as needed.
- Should a bacteria issue occur, mix Myacide into the system at 1 can per 250 bbls of drilling fluid.
- Maintain pH at 9.5—10.0 with Caustic Soda and/or Lime to prevent contamination associated with CO2.
- If hole sloughing occurs, mix Asphasol Supreme at 2-4 ppb.
- Maintain yield point in 8-12 range to ensure good hole cleaning.
- Maintain API Fluid Loss <10cc utilizing Poly Pac R/PolyPac UL/Unitrol. This will prevent excessive filtrate invasion from affecting the water-sensitive shales
- **At approximately 100' prior to the Gallup formation, begin additions of Safe-Carb 40, 250 and Mica at 0.5 ppb each to prevent losses to the formation. Once drilled through the Gallup formation, reduce the LCM additions to 3-4 sacks per tour.**
- **The Frutiland Coal and Mesaverde formations could have abnormal or subnormal pressures with lost circulation, so allow hole conditions to dictate required density and be prepared to treat with LCM.**
- Maintain adequate supply of LCM on location in the event that losses occur. LCM should be good mix of fibrous and sized granular particles to provide best options for curing lost circulation. Offset wells have indicated that lost circulation can occur in the intermediate section.
- The expected mud weight for this interval is 8.5-9.3 ppg. However higher densities could possibly be required to control the well. Use mud weight as last resort as a last resort to control the wellbore.
- Run all solids control equipment while drilling this interval to minimize drill solids and facilitate maximum ROP.
- Pump high viscosity sweeps if additional hole cleaning is needed.
- Maintain adequate supply of LCM on location in the event that losses occur. LCM should be good mix of fibrous and sized granular particles to provide best options for curing lost circulation. Offset wells have indicated that lost circulation can occur in the intermediate section.
- All solids control equipment should be run while drilling and a proper dilution schedule implemented to maintain a low solids content and mud weight throughout the interval.

INTERVAL 2 FLUIDS BLEND

Fluids Building For LSND

Interval Drilling Fluid Properties

Mud Weight (ppg)	Funnel Viscosity (S/Qt)	Yield Point (lb/100ft²)	Gels (10 sec/ 10 min)	Total Hardness (Mg/l)	API Fluid Loss (ml/30min)	Total Solids (%)
8.5-9.3	50-60	15-20	10-15	<200	<10	<10%

Products Mixed Through Mud Hopper

Mix Order	Product	Concentration
# 1	M-I Gel	10– 12 ppb
# 2	Polypac R/ PolyPac UL/Unitrol	1-2ppb
# 3	Poly Plus	.5—.75 ppb
# 4	Myacide (as needed for bacteria)	
# 5	Defoam X (as needed for foaming)	
# 6	Soda Ash (as needed to treat hardness)	
# 7	Sodium Bicarbonate (as needed to treat cement contamination)	
# 8	M-I WATE (as needed)	
# 9	Asphasol Supreme	2 ppb

Products Mixed Through Chemical Barrel

Mix Order	Product	Concentration
# 1	Caustic Soda	9.5—10.5 pH
# 2	Lime	9.5—10.5 pH

After Mudded Up Maintain Chemical Concentrations By Keeping Up With Volume Accounting and All Dilution Volumes.

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DRILLING SOLUTIONS INTERVAL 3

6-1/8" - (4,550' - 8,430' MD) - Lateral 4-1/2" Liner	
Drilling Fluid System	Megadril oil based mud
Key Fluids Products	Megamul, Actimul RD, VG Plus, Versatrol M, HRP, Versathin, Lime, Calcium Chloride
Focus Of Interval	Drill 6 1/8" horizontal to 8,430' and run 4 1/2" liner to bottom with no issues.
Recommended SCE	Rig shakers, desander, desilter, centrifuge
Recommended Shaker Screens	Run tight mesh screens (200-230 Mesh) at all times when shaker is in use.
Recommended PCE	Dual Chokes and Panel, Gas Buster, Flare Lines
Potential Problems	Hole cleaning, seepage losses, possible lost circulation, stuck pipe, reactive clays, and sloughing shales
Engineering Service Type	[redacted]

Interval Drilling Fluid Properties						
Mud Weight (ppg)	OWR	ES	HTHP Fluid Loss (ml/30min)	YP ($lb/100ft^2$)	Excess Lime #/bbl	LGS %
7.5-9.3	70:30 - 75:25	400-500	<12 cc's	10-15	3.0-4.0	4-6

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INTERVAL 3 DISCUSSION

- After running 7" casing, displace to Megadril OBM. Surface tanks must be cleaned of WBM and replaced with **OBM built on location.** Mud Engineer will supervise building of the mud including formulation, isolation of surface pits and rolling time.
- To begin drilling, run in the hole to the casing shoe and then displace the hole to Megadril. Returns of the surface system in the hole should be taken to the reserve pit or catch tanks until Megadril is back to surface; at which time returns should be taken over the shakers. Another option is to displace the cement with Megadril from the storage tanks and effectively complete a cased hole displacement.
- While volume is being transferred it is important to have adequate personnel in place to spot leaks, monitor volumes, etc... All valves, hose connections, etc... should be checked by at least two different people prior to starting any transfers.
- Once drilling begins with the Megadril system; volume accounting will become a very important part of the process. All volume received or leaving location will be recorded daily in the One-Trax reporting system. All daily additions of diesel, water, brine, crude, etc...will be monitored and recorded daily. All losses to oil on cuttings, formation, etc...will be calculated and recorded daily.
- Many rig hands have not worked around oil based muds and do not understand the value of the mud. M-I SWACO asks that rig site management help the mud engineer stress the importance of minimizing losses of mud on the surface due to spills, etc. and through teaching good drilling practices to limit down hole losses as well.
- Some losses are to be expected from day to day, primarily due to oil on cuttings coming off the shakers. Anticipate a 30-40 bbl/ day average loss of Megadril to the cuttings, but losses could be even higher as ROP increases. Losses varying from 1.5 to 4.5 bbls/hr can be expected from most centrifuges when being used.
- Losses on the surface can be minimized by using a drip pan under the floor, having a mud bucket with a hose ran to the cellar or pits for wet connections, using pipe wipers, kelly mud saver sub, and a mud vacuum.
- It is highly recommended that shaker screens be pressure washed off on every connection during fast drilling (100+ ft/hr) and every other connection when ROP slows. This will prevent screens from plugging off and causing mud to run off the ends. It will also extend the life to the screen and ensure someone is visually looking at the screens on a regular schedule. A diesel pressure washer is most effective, but a water pressure washer is suitable as well.
- Water is a major contaminate of Megadril OBM when added in large enough quantities. Water hoses, etc... should be taken off the rig pits while drilling with OBM to minimize the chance of accidental additions.
- When using a closed loop system, drying shakers and three sided catch tanks should be utilized.
- **Any haul off should be manifested and documented per SG Interest I's Standard Operating Procedures for disposal.**

INTERVAL 3 MEGADRIL DISCUSSION

- Megamul/Actimul RD should be added to the system and maintained at 2.5-3.0 ppb while drilling. This will ensure a strong emulsion and low HTHP fluid loss as well as providing adequate wetting of any barite added to the system.
- Additions of lime should be made in a concentration of 1.5-2.0 ppb to provide an excess lime content of 3.0-3.5. This lime content should be constantly maintained to provide a sufficient "calcium soap" in the mud system.
- VG-Plus organophilic clay should be added at a concentration of 0.5-1.0 ppb to provide the desired viscosity and yield point for good carrying capacity. Additions will also improve the HTHP FL and promote a thin; tight filter cake.
- Versatrol M/ GSX 509-08 at 0.75 ppb can be mixed if necessary to further reduce the HTHP Fluid Loss to 8-10 cc's/30min or less if needed.
- Daily additions of diesel and water should be made based on ROP. These daily additions will help replace volume being lost to oil on cuttings over the shakers, evaporation, and also maintain the desired oil to water ratio. When these additions are calculated properly and excessive losses are not experienced, the well should be TD with approximately the same volume of fluid as started with.
- After displacing to OBM, the initial shaker screen selection should be a slightly coarser screen. This is necessary due to the temperature to the mud as well as the ambient temperature. M-I SWACO recommends 80-120 API mesh screens for the first 3-4 circulations. Once the mud has warmed up and sheared through the bit a few times, M-I SWACO recommends changing the screens to the finest mesh feasible; such as 200-230+ API mesh.
- Solids should be controlled through use of the shale shakers, centrifuge, and dilution. At no time should the shale shakers be by-passed until extreme lost circulation is occurring and a high concentration of LCM is trying to be maintained. Shaker screens with holes or tattered surfaces should be changed immediately.
- Additions of M-I WATE (barite) should be made as needed to maintain the system at the desired mud weight. Anytime barite is added to the system it is recommended that diesel be ran at 1 gpm during the additions.
- Calculated additions of water, salts or brine fluids (calcium chloride) are a normal and necessary treatment in oil based fluids, however large quantities of water such as from a water flow are a major contaminate of oil based fluids. If a water flow should occur, immediately increase the mud weight and begin adding additional Megamul to increase the electrical stability of the mud.
- If hole cleaning appears to be a problem, first try improving all mechanical means such as pump rates and rotary speed. Once those limits are reached sweeps can be ran in addition to raising the yield point and low end rheologies.
- Lost circulation may be problematic in this area. Keep a good supply of fibrous lost circulation materials (G-Seal Plus, Vinseal, SAFECARB, SAWDUST, CEDAR FIBER, AND MICA) on location for any mud losses. (See attached Lost Circulation Pages)

INTERVAL 3 INITIAL FLUIDS BLEND

Fluids Building For Megadril

Mud Weight (ppg)	OWR	ES	HTHP Fluid Loss (ml/30min)	PV/YP (lb/100ft²)	Excess Lime #/bbl	LGS %
7.5-9.3	70:30—75:25	400-500	<12 cc	10-15	3.0-4.0	4-6

Mix Order	Product	Concentration
# 1	Megamul/Actimul RD	2-4 ppb
# 2	VG Plus/ VG-Supreme	3-5 ppb
# 3	Versatrol (as needed for HTHP filtrate control)	2 ppb
#4	Lime	4 ppb
#5	M-I WATE (as needed for required density)	
#6	Calcium Chloride added to freshwater	2 –3 sx/bbl

- After Mudded Up Maintain Chemical Concentrations By Keeping Up With Volume Accounting and All Dilution Volumes

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MEGADRIL FLUIDS PROPERTIES

Production Interval Recommended Fluids Properties	
Fluid Density	7.5-9.3
Funnel Viscosity	45-50 Sec/Qt
Plastic Viscosity	14-18 cP
Yield Point	10-15 lb/100ft²
10 Sec. Gel	8-10
10 Min Gel	10-15
30 Min Gel	12-20
HTHP	8-10 cc
Water / In Filtrate	0.0 - 0.5 cc
Solids	10-12%
OWR	70:30 — 75:25
Pom	2.5-4.0
Chlorides	25,000—40,000 mg/l or 20 - 28%
Electrical Stability	400—500
LGS	5 - 6%

- Another value that should be monitored is the 6 rpm reading on the rheometer. The 6 rpm reading should be between 0.8-1 times the hole size for good hole cleaning.

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DISPLACEMENT PROCEDURE FOR MEGADRIL

Open hole displacement

- A pre-displacement meeting should be held with the company man, tool pusher, driller, derrick hand, and mud engineer prior to the displacement.
- Mud pits on the rig should be filled to near capacity prior to tripping in the hole to drill out the cement.
- A line needs to be rigged up from the flowline to either the reserve pit or a catch tank for catching returns while displacing.
- Once everything is in place for the displacement, run drill pipe in the hole and begin filling the pipe.
- Once the drill pipe catches pressure and circulation is established take returns of the fluid in the hole to the reserve pit or catch tank.
- Mud engineer and derrick hand should be on pits at the flowline to monitor returns. Once the calculated time for returns of Megadril draws near the mud engineer should be checking the fluid at the flowline visually and with an Electrical Stability meter to determine when usable Megadril with an ES meter reading of >100 volts is back to the surface.
- Once it is established that the hole has been displaced to Megadril returns should be taken over the shakers.

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MEGADRIL PRODUCTS

- **Megamul/Actimul RD** — Primary Emulsifier/Secondary Emulsifier
  - Initial System Concentration 2-4 ppb
  - Daily Treatment of .05-3 ppb
  - PPE required: protective rubber gloves and goggles/face shield in addition to minimum required PPE as listed on MSDS.
  - Tools required: Drum tilt stand or drum swivel attachment for forklift.
- **Versatrol/ GSX 509-08** — Fluid Loss Control Additive
  - Typical Treatment of 2-8 ppb
  - PPE required: Face mask in addition to minimum required PPE as listed on MSDS.
- **VG 69/ VG Plus/ VG Supreme** — Organophilic Clay/ Primary Viscosifier
  - Typical Treatment of 2-10 ppb depending on required rheology
  - PPE required: Face mask in addition to minimum required PPE as listed on MSDS.
- **Lime** — Calcium Source/ Alkalinity Agent
  - Initial System Concentration of 2-5 ppb
  - Daily Treatment of 1-3 ppb
  - PPE required: Face mask in addition to minimum required PPE as listed on MSDS.
- **Clean-UP** — Rig/ Equipment Cleaning Product
  - Typical concentration 1-3% of the volume of 100 bbls water.
  - Used to scrub rig, pits, flush lines
  - PPE Required: Face shield and chemical gloves in addition to minimum required PPE as listed on MSDS.

ADDITIONAL EQUIPMENT REQUIRED FOR MEGADRIL

- Sufficient storage tanks to hold all OBM needed.
- 400 bbl tank for diesel
- 400 bbl tank for brine water or sack calcium chloride.
- Valve manifold system, hoses, transfer pumps for Megadril and diesel.
- Pit liner and berm around tank farm
- Three sided cuttings catch tank and optional second cuttings tank for mixing cuttings with fly ash or other drying material (closed loop system)
- Fly ash or other drying/ absorbency material to mix with cuttings (closed loop system)
- Lined earthen pit for putting dried cuttings in or an option in place for removing the cuttings to an off site disposal area.
- Oil absorbent pads and oil dry material (floor dry)
- Centrifuge
- Mud vacuum (strategically placed on rig to reach floor, pump houses, cellar, etc..) for clean up of OBM.
- Mud bucket, preferably with a hose attached to it to divert OBM to the cellar or back to the pits. That type of mud bucket tends to be heavier and harder to handle, so the other option is a smaller plastic mud bucket.
- Some people's skin is more sensitive than others and it is recommended that appropriate rubber gloves be made available to floor hands for connections. Nitrile rubber gloves should be made available to the derrickhands for checking mud. Barrier creams should be made available for all personnel if needed.
- Super Vac trucks for cleaning pits at TD.

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General Lost Circulation Recommendations

Key LCM Points

1. Maintain a good supply of lost circulation material on location for regular routine treatments when drilling to TD.
2. M-I SWACO recommends for wells in areas where losses are known to be severe having a 100 bbl (15-20 lbs/bbl) LCM pill ready in a separate pit to sweep or spot at the first signs of lost circulation while drilling or circulating. If you feel lost circulation is a major factor in your project do not premix the sweep but have the products ready for use.
3. The size and shape of the bridging material should be matched to the severity of the loss.
4. It is important to increase the size and amount of the bridging agents if conventionally sized materials are not effective.
5. Once losses are encountered start treatments immediately in the suction pit, because hesitation in treating will cost the customer money. Scale your treatment to the severity of losses.

Recommended Treatments

1. **Seepage mud losses <10 bbl/hr**, sweep the hole with 50 - 100 bbl LCM pill formulated with 15 – 20 lbs/bbl of a combination of G-Seal Plus, Safe Carb (20/40), and Vinseal.
2. **Partial losses 10-100 bbl/hr.** Start sweeps 100 bbls of a 25 – 30 lbs/bbl LCM pill formulated with G-Seal Plus, Fed Seal, Vinseal (M), and Safe Carb (C - M), in open hole across the lost zone, it is recommended to allow the pill to soak 4 - 6 hours to heal the formation prior to circulating and drilling ahead. This scenario is best done before a trip if losses are greater that 10 bbl/hr then spot the LCM pill on bottom just before tripping out of the hole; if you cannot make a trip, you might have to control it with sweeps until a trip is apparent. If losses can not be controlled spot the pill and wait to see if the hole will heal up. **(If pills or sweeps are not helping losses, start carrying 5-9% LCM in the fluid system (G-Seal Plus, Fed Seal, Safe-Carb M-C and Vinseal (M).)**
3. **Total losses**, Maintain 10 to 15% LCM in the system and spot or sweep 100 bbls of a 50 lbs/bbl LCM pill formulated with a combination of Sawdust, Fed Seal, Vinseal (M – C), and Safe Carb 250 in the open hole across the lost zone and allow the pill 4 – 6 hours to heal the formation prior to circulating and drilling ahead.
4. If total returns cannot be regained or partial losses cannot be slowed, it is recommended to pull up and locate the point in the hole where the losses are occurring and spot Form-A-Blok. If the Form-A-Blok is not successful then a cement squeeze is always an option. Form-A-Blok is a new squeeze product M-I SWACO is offering to improve upon the previous Form-A-Squeeze product.

Do NOT EXCEED 30% LCM in any Sweep, Slug or Pill. Always consider BHA Configurations when designing LCM Slurries.

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1675 Broadway, Suite 700
Denver, Colorado 80202
Phone: 303.352.1400

LOST CIRCULATION RECOMMENDATIONS

Causes

Mechanical:

Improper hydraulics, excessive pump rates and velocities causing high ECD's.
Drilling Practices:

1. Increasing pump rates too rapidly after connections and trips.
2. Raising and lowering the pipe too fast (surge/Swab).

Excessive ROP's which will result in high cuttings concentration in the annular fluid causing high ECD's.
Hole conditions:

1. Sloughing shale or increased cuttings loading in the annulus and high ECD's.
2. Cuttings beds or barite sag on the low side of a directional hole.
3. Bridges.
4. Kicks and well control procedures.

Preventive Measures

1. Minimize down hole pressures.
2. Pipe movement should not exceed critical speeds when tripping.
3. Maintain mud weight to the minimum required to control known formation pressure.
4. Rotate the drill string when starting to circulate helps break the gels and minimize pump pressure surges.
5. Start circulation slowly after connections or periods of non-circulation. Plan to break circulation 2 to 3 times while tripping in the hole.

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FORM-A-BLOK

FORM-A-BLOK high-performance, high-strength additive is a single-sack proprietary blend designed for wellbore strengthening applications and a wide variety of lost circulation scenarios, including, but not limited to, fractures and matrix permeability. This product is applied in the form of a pill which, depending on the application, de-waters or de-oils rapidly to form a high strength plug.*

Typical Physical Properties

Physical appearance ..... Gray powder
Specific gravity 1.98
Odor ..... Odorless or non-characteristic odor

Applications

FORM-A-BLOK additive can be used in water-base or non-aqueous drilling fluids (NAF) for wellbore strengthening applications and to cure losses at temperatures up to 350°F (~ 177°C).
FORM-A-BLOK product is designed to be used for:

Wellbore strengthening applications

Curing partial or severe losses

Open hole remedial and/or preventive lost circulation squeeze

Improving casing shoe integrity

Cased-hole squeeze for sealing perforations and casing leaks

The recommended concentration of FORM-A-BLOK additive is 40 lb/bbl (114 kg/m3), for all fluid densities in freshwater, seawater or base oil/synthetic systems. The only exception is NAF slurries at or above 15.0 lb/gal (1.79 sg) which require 20 lb/bbl (57 kg/m3). While FORM-A-BLOK additive can be mixed with oil or synthetic base fluids, mixing a water-base pill will provide the maximum strength. The slurry can be weighted with barite, calcium carbonate or heavy brine. It is recommended to continuously agitate the pill until pumped and to pull pump screens prior to pumping.

Density, lb/gal (sg)	Fresh-water, bbl	FORM-A-BLOK, lb/bbl	M-I BAR*, lb/bbl	Thinner, lb/bbl
9 (1.0)	0.94	40	11	-
10(1.2)	0.90	40	66	-
12 (1.4)	0.82	40	176	-
14 (1.6)	0.75	40	286	-
16 (1.9)	0.67	40	396	As needed
18 (2.1)	0.59	40	506	

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FORM-A-BLOK Continued

Advantages

Quick-acting plug for wellbore strengthening and lost circulation applications

Single-sack system, though higher densities may require the addition of a thinner

Compatible with freshwater, seawater and NAF

Temperature stable up to 350°F (~177°C)

High-performance, high-strength pill

Can be mixed as a pill in densities of up to 18.0 lb/gal (2.16 sg)

Easy to mix with standard rig equipment

Does not require an activator or retarder

Does not depend on temperature to form a rigid plug

Can be pre-mixed well in advance of pumping provided pill is agitated continuously

Limitations

Approximately 35% acid soluble

Toxicity and Handling

Bioassay information is available upon request.
Handle as an industrial chemical, wearing protective equipment and observing the precautions described in the Material Safety Data Sheet (MSDS).

Packaging and Storage

FORM-A-BLOK product is packaged in 20-lb (9-kg), multi-wall, paper sacks.
Store in a dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

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KEY ISSUES RELATED TO WATER BASED MUDS

Solids Control

- Implement a planned dilution schedule. Constant evaluation of all solids control equipment should be exercised. Maintain the LGS's in the 4-6% range. Monitor closely.
- Monitor screen selection/ appropriate solids control equipment at all times.
- M-I SWACO Mongoose Dual Motion Shakers and 518 centrifuge or CD 500 centrifuge are recommended to maintain the drill solids in the 4-6% range.

Sloughing and Stuck Pipe

- If sloughing or instability of the wellbore occurs while using the LSND system, consider adding 2-3 ppb Asphasol Supreme and 2-3 ppb Sack Black to regain hole stability. Asphasol Supreme seals off and plaster micro-fractures within the shale body and reduces torque and drag.
- Use additions of 0.75-1.0 ppb Poly Pac R /UL or Unitrol to maintain the API fluid loss <10 cc/30min after the mud up.
- Mud weight can also be used to control shale and help with hole stability. This is a very effective means of controlling well bore conditions, but it is also a very dangerous way to do so as well. Caution and supervision should always be used; not only when raising the mud weight for well bore stability but under normal weight ups as well. The mud weight should never be raised faster than 0.3 ppg per circulation. Raising the mud weight any faster could cause damage to the formation and increase mud losses.
- Differentially stuck pipe may occur in shallow normal pressure zones when the mud weight is increased due to abnormal down hole pressure.
- The regular treatments of nut plug and sized calcium carbonate will eliminate or minimize differentially stuck pipe by minimizing seepage and re-enforcing the filter cake.
- A good drilling practice is to keep the drill string moving at all times while drilling or tripping.
- If the pipe becomes stuck, spot Pipelax mixed with diesel to free differentially stuck pipe.

Possible Other Contaminants

- **CO_2-Contamination:** will cause an increase in rheological properties and a decrease in pH, mud alkalinity, and soluble calcium. The treatment will require Lime/Caustic additions to increase the pH and calcium. Conqor 404 will also be required to control corrosion.
- **Oxygen-Contamination:** will require additions of Conqor 404, which is a passive type of inhibitor forming a protective film on metal surfaces to guard against corrosion attack. The recommended treatment is 4-6 gallons per 100 barrels of fluid. One can per 250 bbls mud Safe Scav HSW can help prevent and minimize corrosion if added.

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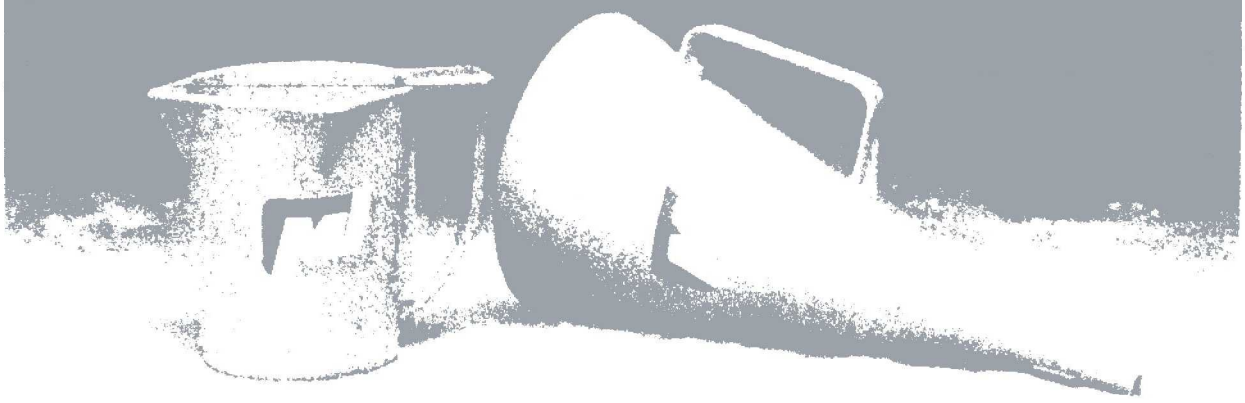
Possible Other Contaminants

- **H_2S Contamination:** is the most serious and corrosive contaminant and is usually detected by a decrease in pH, an increase in viscosity and fluid loss, and the discoloration of the mud to a dark color. The treatment will require increasing the pH to 11-.0-11.5 with caustic soda and/or lime and adding zinc oxide at 1-2 ppb. A 1 ppb concentration of zinc oxide will treat out 1100 mg/l of sulfides. It is recommended to treat with 2 ppb of zinc oxide. Conqor 404 will also be required to control corrosion.
- **Anhydrite Contamination:** will cause increased viscosity and gel strengths, increased fluid loss, and soluble calcium. A possible decrease in filtrate alkalinity and pH may be experienced as well. A treatment of soda ash will be required to precipitate the soluble calcium and dispersants, caustic soda, water dilution, and polymers are required to control and maintain good rheological and fluid loss control properties.
- **Bacteria Contamination:** a bactericide (myacide) will be required to control bacteria in water associated with drilling fluids. A fermented mud will cause a decrease in pHand an increase in viscosity and gel strengths. The recommended treatment on one gallon per 200 barrels of fluid is required, but severely contaminated fluids will require five gallons (1 can) per 250 barrels until bacteria are minimized.

STOCK POINTS & CONTACTS

Project Product & Equipment Stock Points			
Location	Service	Contact	Location Phone #
Denver, CO	Engineering / Support	Eric Dowdy	303-352-1403
Farmington, NM	Sack / Drum Product	M&R Trucking	505-334-5541
Big Piney, WY	Liquid Mud	Marvin Sorensen	307-276-3051
Casper, WY	Equipment Rental / Screens	Mike Kirby	307-472-7257



Project Service Contacts			
Name	Title	Office #	Cell #
Tim Sorensen	District Manager	303-352-1402	307-760-3139
Carlos Rivas	Regional Sales Manager	214 691 1396	
Eric Dowdy	Engineering Manager	303-352-1403	303-378-3317
Ammon Foster	Sr. Safety Engineer	307-857-9155	307-262-8687
Mike Pittsinger	Account Rep	303-352-1409	970-250-9400
Kevin Nate	District Mgr WP		307-878-3891
Dirk Millhouse	Regional Technical Services Mgr	303-352-1408	720-234-2079

- M-I SWACO Engineering Manager and District Manager will coordinate between the customer's office, rig, warehouse, and the M-I SWACO Tech Service Center.
- Well progress will be monitored to look for any changes, which will improve the efficiency of the operation or avert trouble.
- This well will be serviced from Farmington, NM.

ROLES & RESPONSIBILITIES

Project Engineer

It is the responsibility of the Project Engineer to direct personnel on the location with regard to the drilling and drilling fluids programs and provide the necessary technical support for the success of the project. The Project Engineer will analyze the daily mud report and make all necessary recommendations to enhance the project and all future projects. He will also work closely with the Drilling Engineer in the planning of all future projects, analyzing present operations, and actively participate in all areas related to the well. He will address any and all issues with the respective personnel.

- Review and approve a well specific Drilling Fluids Program for each project.
- Provide technical assistance to the drilling team and the drilling fluids engineer on location through local, regional, and global support groups.
- Analyze the daily mud report and make recommendations that will enhance the drilling operation.
- Communicate daily with the mud engineer on location and the Drilling Engineer coordinating the project.
- Available 24 hours a day and 7 days a week.
- Provide a cost effective solution to solve any drilling fluids problems.
- Attend and participate in the daily rig call, if possible.
- Provide a complete end of well Mud Recap.
- Capture and share Lessons Learned with the drilling team and plan for continuous improvement.
- Attend well planning Spud /Tech Limits meeting if possible.

Tech Service Support / Houston Based

The Technical Service Engineering Department and Field Service Laboratory are located in the Houston office complex. They can assistance through the local, regional, and global support groups. The Technical Service Engineering group consists of a pool of drilling fluids engineers specialized in drilling fluids problems and are available as required.

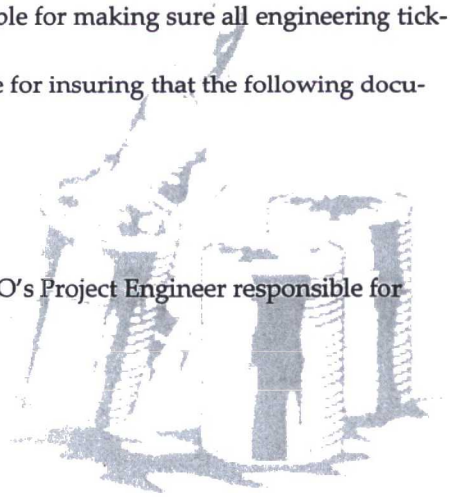
- The Technical Services Engineering department will provide technical assistance and support on any technical related issues.
- The Field Service Laboratory will provide complete analysis and testing on all mud samples sent in to the Houston lab.
- A report detailing all the test results will be provided to Project Engineer and Region Tech Service Engineer.
- The Field Service Laboratory report will include recommendations for fluid treatments as necessary.

ROLES & RESPONSIBILITIES

Drilling Fluids Engineers

The drilling fluids engineer is responsible for all testing and product recommendations to insure that the drilling fluid meets the specifications outlined in the drilling fluids program. He will also perform any additional testing of the fluid to improve treatments and minimize fluid problems. A brief but detailed summary of the past 24 hours will be included on each daily mud report. An accurate product inventory will be kept on location to meet all the requirements of the project. The drillings fluid engineer has the responsibility of educating the entire rig personnel on the proper protective equipment for handling and mixing the various products used in the drilling fluid and the hazards associated with them.

- Test and manage mud properties to follow the guidelines set forth in the mud program, keep an accurate count of all mud products on location, and calibrate the mud balance daily.
- Maintain a library of MSDS for all products on location and conduct training sessions with all pertinent personnel in the handling of the chemicals.
- Perform API mud checks daily and record on the daily mud report.
- Communicate daily with the MI SWACO Project Engineer assigned to your well and discuss any issues or concerns associated with the well and/or mud properties.
- Discuss daily treatments to the mud system with rig personnel at the pre-tour safety meetings.
- Product concentrations will be calculated daily using M-I SWACO's ONE-TRAX program to monitor mud treatments.
- Keep an accurate account of all onsite mud volumes and mud losses daily. These volumes will be reported in the Volume Accounting section of the daily mud report.
- Any products that are damaged at the location should be reported to the Well site Leader and Rig Manager immediately, then restacked so damaged material can used in the mud system if possible.
- Participate as required in the reporting and clean up of accidents and spills.
- Comply with all HSE policies and participate in the safety program.
- Attend well planning Spud /Tech Limits meeting if possible.
- Keep in contact with the delivering warehouse on product availability for each drilling interval and any specialty chemicals required for the well.
- Notify the delivering warehouse that mud products or liquid mud may be required at short notice due to unscheduled well events.
- At the end of each hitch the Drilling Fluids Engineer is responsible for making sure all engineering tickets are signed and mailed in to the Riverton office.
- At the end of the well the Drilling Fluids Engineer is responsible for insuring that the following documents are turned in to the Denver and Riverton offices.
    1. Complete OneTrax File
    2. Lessons Learned
    3. Customer Satisfaction Report
    4. End of Well Inventory. (To the delivering warehouse)
- The following reports will be faxed/emailed daily to M-I SWACO's Project Engineer responsible for your well in the Denver office:
    1. Daily Mud Report
    2. Well Site Inventory
    3. Daily Mud Volume Accounting
    4. Daily Product Concentrations



QHSE POLICY STATEMENT

"Our employees are the Company's most important asset."

Preventing occupational injuries, illnesses, and protection of the environment are of such consequence that management will provide all the facilities and support reasonably required to ensure success.

We are committed to a health, safety, and environment management system that conforms to the best practices of our industry. Health, safety, and environment considerations are a top priority in planning and development of products, services, and processes. We acknowledge the principle that all accidents can be prevented and actively promote the highest standards of safety awareness and performance. We acknowledge that the environment can be protected through design of environmentally acceptable products and responsible use of those products. Your Company is committed to continuous improvement of its global health, safety, and environmental processes while supplying high quality, environmentally responsible products, and services to our customers. Our objective is the lowest possible number of accidents, injuries, illnesses, and environmental problems. We recognize the importance of working closely with our customers and contractors. Only through the cooperative effort of all can the best possible health, safety, and environmental record be achieved. This policy requires internal cooperation in all health, safety, and environmental matters, not only between supervisor and employee, but also between each employee and his fellow workers.

Your Company recognizes that the responsibilities for health, safety, and environment are shared:

1. Management accepts the responsibility for leadership of the health, safety and environmental program, for its effectiveness and improvement, and for providing for the safeguards required to ensure safe, environmentally responsible conditions;

2. Supervisors are responsible for developing the proper attitudes towards health, safety, and environment in them as well as directing those whom they supervise toward this goal. Supervisors are responsible locally for ensuring that all operations are performed with the utmost regard for the health and safety of personnel and protection of the environment.

3. All employees are responsible for wholehearted, genuine cooperation with every aspect of the health, safety, and environmental program. This includes compliance with all rules and regulations and continuous, safe, environmentally

PERFORMANCE ENGINEERING

Regional and District Headquarters; 1675 Broadway, Suite 700 Denver, Colorado 80202

This suggested program is advisory only and may be rejected in the sole discretion of any and all parties receiving it. In addition all parties receiving this program recognize, agree, and acknowledge that M-I Drilling Fluids L.L.C. (M-I) / M-I SWACO has no care, custody or control of the well, the drilling equipment at the well, nor the premises about the well. Also, there are obviously many conditions within and associated with a well of which M-I can have no knowledge and over which it does not and cannot have control. Therefore, M-I shall not be liable for the failure of any equipment to perform in a particular way or the failure to obtain any particular results from carrying out this program by any party receiving it. Furthermore, the owner and operator of the well and the drilling contractor in consideration of the recommendations contained in this suggested program agree to indemnify and save M-I harmless from all claims and costs for loss, damage or injury to persons or property including, without limitations: subsurface damage, subsurface trespass or injury to the well or reservoir allegedly caused by M-I's operations or reliance by anyone upon this program unless such personal injuries or damage shall be caused by the willful misconduct or gross negligence of M-I.

M-I SWACO PRODUCT

ASPHASOL SUPREME

ASPHASOL SUPREME shale inhibitor is a partially water-soluble, water-dispersible sulfonated asphalt. It is used to aid in stabilizing shale sections, controlling solids dispersion and improving wall-cake characteristics. It is also used as a supplemental high-temperature fluid-loss additive for water-base drilling fluid systems.*

Typical Physical Properties

Physical appearance	Fine black/gray powder
Odor	Mild sulfur
Specific gravity	0.90 – 0.96 @ 77°F
pH (1% solution)	9.12
Solubility in water	71% soluble in water @ 72°F

Applications

ASPHASOL SUPREME additive is a sulfonated asphalt that can be used in most water-base muds. It is a free-flowing powder and can be added directly to the mud system through the mixing hopper. It is not necessary to premix ASPHASOL SUPREME inhibitor with oil. It contains no surfactants.

Normal concentrations of ASPHASOL SUPREME additive range from 3 to 6 lb/bbl (8.6 to 17.1 kg/m3) for shale stabilizing control and 6 lb/bbl (17.1 kg/m3) for high-temperature fluid-loss control.

In water-base drilling fluid systems, ASPHASOL SUPREME inhibitor exhibits the following characteristics:

Stabilizes shales
Lowers torque and drag
Reduces high-temperature fluid-loss
Produces thin-walled filter cakes
Improves borehole stability

Advantages

Easy to handle and mix
Plugs micro-fractures and seals shales
Inhibits swelling and water-wetting of shales
Reduces high-temperature, high-pressure (HTHP) fluid-loss
Reduces torque and drag
Improves filter-cake quality
Increases drilling-fluid lubricity

Limitations

Not recommended for use in non-aqueous fluids

Toxicity and Handling

Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions described in the Material Safety Data Sheet (MSDS).

Packaging and Storage

ASPHASOL SUPREME inhibitor is available in 50-lb (22.7-kg), multi-wall sacks; 50 sacks per shrink-wrapped pallet.

Store in a dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

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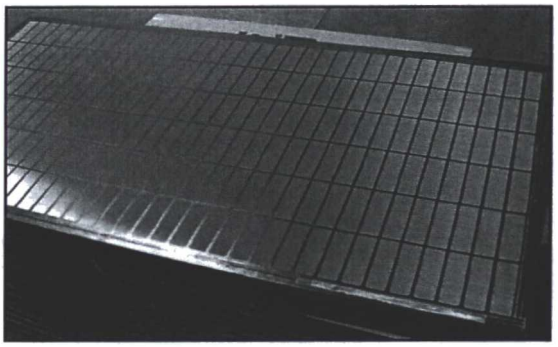
M-I SWACO DuraFlo Composite OEM Screens

For MONGOOSE PT / PRO shakers



Composite Screens Provide Longer Life

M-I SWACO* high-capacity composite shaker screens are the most rugged, long-lasting and efficient screens available.

The new composite screens, unique in the industry, provide resistance to corrosive drilling fluids.

The screens also offer significant fluid capacity, excellent resistance to blinding, drier solids discharge and a large net usable screen area.

Composite construction creates an ultra-tight seal between the screen and the screen bed and eliminates solids buildup and costly solids bypass.

XR MESH For Unmatched Screen Life and Exceptional Capacity

Larger-diameter wire gives XR Mesh screens the longest life in the industry today. Combining XR Mesh screens with the DuraFlo composite frame technology allows for exceptionally high fluid-handling capacity.

The XR Mesh is utilized in a unique three-layer arrangement that creates exceptional shale shaker screens. The XR design features innovative oblong openings with a greater length-to-width ratio than other rectangular meshes.

It also incorporates wire diameters that are 50% larger than comparable meshes. The large-diameter wire is calendared to lock mesh openings securely in place. All three layers are made of finely woven stainless steel. The middle layer increases screen life by acting as a buffer between the fine top mesh and coarse backup layer, as well as serving as a mechanical deblinding agent for the top mesh.

FEATURES

- Patented, composite frame design
- More Non-Blanked area which improves fluid handling capacity
- Lighter in weight than competitor metal frame screens
- Patented, Calendered XR Mesh

BENEFITS

- Corrosion resistant due to composite frame
- Increased operational life
- Lower screen-replacement costs
- Quick and easy to repair
- Less downtime
- Does not rust or delaminate
- Improved QHSE considerations

***Also offering Non-OEM replacement screens offering up to 11% more Non-Blanked Area in some cases over OEM Screens.**
***Ask about our Maintenance & Extended Warranty Program(s) w/ "FREE" Vibratory Systems Analysis and Test for your shakers.**

**** All inquiries can be sent to screeninfo@slb.com for immediate responses to questions about M-I SWACO Screens and Programs**

MI SWACO
A Schlumberger Company

Surface Use Plan of Operations

WC Basin Mancos Field

Caballo 30-15-29 #1H

Sec. 29, T30N. R15W; NMPM
San Juan County, NM

Lat: 36.78917
Long: -108.43419

Datum:NAD83

Prepared for:
SG Interests I, LTD
Houston, TX

Prepared by:

Adkins Consulting, Inc.
Environmental Permitting Services
Durango, Colorado

April 06, 2015

Contents

Plates

Appendices

Introduction

The following surface use plan of operations (SUPO) will be followed and carried out once the APD is approved by the BLM Farmington Field Office. No other disturbance will be created other than what was submitted in this surface use plan. If any other surface disturbance is needed after the APD is approved, a BLM approved sundry notice or right of way application will be acquired prior to any new surface disturbance.

Before any surface disturbance is created, stakes or flagging will be installed to mark boundaries of permitted areas of disturbance, including soil storage areas. As necessary, slope, grade, and other construction control stakes will be placed to ensure construction in accordance with the surface use plan. All boundary markers will be maintained in place until final construction cleanup is completed. If disturbance boundary markers are disturbed or knocked down, they will be replaced before construction proceeds.

A. Existing Roads

1. The proposed location is on disturbed ground that has naturally revegetated. Access to the location will be along a newly constructed access road as proposed in Section B, below. The proposed access road will intersect with Country Road 6800. The Road Maintenance Plan is located in Appendix A.
2. Location Access: from Kirtland, NM follow US Highway 64 approximately 5-miles west. At the intersection of US Highway 64 and Country Road 6800 head north for approximately 2.2 miles. Access to the location will be on the east side of Country Road 6800 (Plate 1).
3. The operator will improve or maintain any existing private access roads in a condition the same as or better than before as per landowner standards before operations begin. The operator will repair pot holes, diversion trenches, and road crowns. All existing structures on the entire access route such as cattle guards, other range improvement projects, culverts, etc. will be properly repaired or replaced if they are damaged or have deteriorated beyond practical use.
4. The operator will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or wind events. Landowner written approval will be acquired before application of surfactants, binding agents, or other dust suppression chemicals on roadways. Water application will used for default dust control.

B. New or Reconstructed Roads

A new access road is proposed to access the location. All constructed roads shall meet landowner requirements. The proposed access road is discussed below. Plate 2 shows the location of proposed access roads relative to the well pad.

1. The maximum driving width of reconstructed roads will be 20 feet. The maximum width of surface disturbance when reconstructing the existing roads will not exceed 50 feet. All areas outside of the driving surface will be revegetated.
2. The proposed access road is 933 feet in length.
3. New surface disturbance of the proposed access road is 0.43 acres. The ROW will create an additional 0.64 acres of new surface disturbance. Total new surface disturbance for the access road is 1.07 acres.
4. The maximum grade for the road improvements will not exceed 8 percent.
5. No turnouts will be constructed on existing access roads.
6. A gate will be installed at the entry of the access road from Country Road 2800.
7. The proposed access road will be improved completed with 6 inches of compacted road base.
8. No additional right-of-way grant is needed for road reconstruction.

9. No culverts are necessary for road improvements.
10. No low water crossings will be installed during road reconstruction.
11. The proposed access road is located on level ground; no lead-off ditches will be constructed.
12. Construction will include ditching, draining, crowning and capping or sloping and dipping the roadbed as necessary to provide a well-constructed and safe road.

C. Location of Existing Wells

Wells within one-mile radius of the proposed location is presented in Plate 3 and is summarized below. Well sources are from the New Mexico Office of the State Engineer (OSE) and the New Mexico Oil Conservation Division (NMOCD) databases that are in the public domain.

a. Water Wells – Thirteen water wells are listed in NM Office of State Engineer GIS database within 1-mile of proposed location. Six of the locations are identified with dual water well permits. These dual well permit locations are located along the eastern edge of the one-mile radius. One water well (SJ 03798) shows a depth to water (DTW) of 12 feet. The completion date of this well is June 15, 2007. Depth of the well is reported at 35 feet below ground surface.
b. Single Oil Completion Wells – One oil production well is identified within one mile radius of the location as Holy Federal 001. The location of this well was confirmed on a 2015 Google Aerial Image
c. Plugged Single Oil Completion Wells – Three plugged and abandoned single oil completion wells were identified within one mile radius of the location.

D. Location of Existing and/or Proposed Production Facilities

The production equipment and facility layout will be deferred until the well's production characteristics can be evaluated after completion. In accordance with the Onshore Oil and Gas Order No. 1, Section VIII Part A; the operator will submit facility/production information before construction and installation of facilities.

E. Location and Types of Water Supply

1. Water for drilling and completion operations will be purchased from one or more of the following locations:
    a. Harper Valley Water Users Association
2. The operator will use established or constructed oil and gas roads to transport water to the well site. The operator will utilize the identified access route in the surface use plan.
3. Produced water may also be recycled for use in drilling and completion activities. Rule 19.15.34.12 NMAC allows the disposition of produced water for use as a drilling or completion fluid at a drilling site. If re-use is not possible, produced water will be disposed at one of the following facilities for proper disposal:
    a. Public disposal facility located at Agua Moss.

F. Construction Materials

The construction phase of the project is anticipated to last approximately 2 to 3 weeks.

a. Access Road
    1. The operator proposes to construct a new access road at the intersection with County Road 6800. Shown on Plate 2 and as discussed in Section B.
    2. The access roads will be designed, constructed, and maintained as a resource road in accordance with the BLM Gold Book Standards, BLM Handbook 9113-1 (Roads Design),

and BLM Handbook 9113-2 (Roads Inventory and Condition Assessment Guidance and Instructions), and per landowner specifications. Construction will include ditching, draining, crowning and capping, or sloping and dipping the roadbed, as necessary, to provide a well-constructed and safe road.

3. All construction materials for access road improvements will consist of native borrow and subsoil accumulated on site. If additional fill or surfacing material is required, it will be imported from Paul and Sons – PV #1 Pit; located approximately 6 miles east of Bloomfield, NM off of Highway 64. Imported material will be weed-free and authorized. The additional fill will be hauled in by trucks over existing access roads to the area.
4. Reconstruction of the existing access roads will take approximately 3-4 days.

b. Well Pad (See Plates 4a & 4b)

1. The construction phase of the project will commence upon receipt of the approved APD.
2. Vegetation removed during construction, including trees that measure less than 3 inches in diameter (at ground level) and slash/brush, will be chipped or mulched and incorporated into the topsoil as additional organic matter. If trees are present, all trees 3 inches in diameter or greater (at ground level) will be cut to ground level and delimbed. Tree trunks (left whole) and cut limbs will be stacked. The subsurface portion of trees (tree stumps) will be hauled to an approved disposal facility.
3. The upper 6 inches of topsoil (if available) will be stripped following vegetation and site clearing. Topsoil will not be mixed with the underlying subsoil horizons and will be stockpiled as a berm along the western perimeter of the well pad within the construction zone as shown on Plate 5. Topsoil shall be separated from subsoil or other excavated material. Topsoil will be tracked and temporarily mulched to minimize off site siltation. Straw wattles will be installed at the base of the topsoil stockpile to reduce stormwater and sediment runoff. Topsoil and sub-surface soils will be replaced in the proper order, prior to final seedbed preparation. Spreading shall not be done when the ground or topsoil is wet or frozen. Vehicle/equipment traffic will not be allowed to cross topsoil stockpiles.
4. Erosion control and stormwater management design features will be installed as necessary as discussed during the on-site meeting. The operator will utilize straw wattles around stockpiled soils, and at the base of fill slopes as necessary, to prevent sediment from leaving the construction site. Storm water conveyance diversion channels will be constructed above the cut slope to divert storm water around the well pad.
5. The well pad will be leveled to provide space and a level surface for vehicles and equipment. Excavated materials from cuts will be used on fill portions of the well pad to level the pad. The well pad would require a maximum fill of approximately 1.3 feet at the southwest corner, and a maximum cut of 1.7 feet at the northeast corner. No additional surfacing materials will be required for construction.
6. Well pad construction will involve preparing a level area for the equipment that will drill and complete the well. The existing well pad will be improved to accommodate a 425-foot by 450-foot level well pad area, resulting in approximately 4.39 acres of new surface disturbance. Construction of the well pad would include a 30-foot construction buffer zone around the perimeter of the pad, creating an additional 0.62 acres of new surface disturbance. The total permitted area for the construction of the well pad is 5.01 acres.
7. The well pad will be constructed from the earthen materials present on-site. Well pad will be topped with gravel to stabilize the driving surface.
8. Stormwater will be diverted to flow around the well pad at the upslope (western) side.
9. The operator has proposed a closed-loop system. No drilling pits will be used for the proposed project.
10. Construction of the well pad will take approximately two weeks.

G. Methods for Handling Waste

1. Cuttings – Drilling operations will utilize a closed-loop system with water based mud. All cuttings will be placed in roll-off bins and hauled to a commercial disposal facility or land farm. The operator will follow Onshore Oil and Gas Order No. 1 regarding the placement, operation and removal of the closed-loop systems. No blow pit will be used. Closed-loop tanks will be adequately sized for containment of all fluids.

2. Drilling Fluids

   a. 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 locations or returned to the vendor for re-use, as practical. Residual fluids will be vacuumed from the storage tanks and disposed of at an appropriate waste disposal facility.
   b. Drilling fluid storage tanks will be adequately sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.

3. 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 in an approved disposal facility, or recycled.

4. Spills – any spills of non-freshwater fluids will be immediately cleaned up and removed to an approved disposal site. Spills less than 10 barrels do not require reporting. Spills and releases will be reported according to NMOCD and BLM requirements.

5. Sewage – self-contained, chemical toilets will be provided for human waste disposal. The toilet holding tanks will be pumped by a 3rd party vendor, as needed, and the contents thereof disposed of in an approved sewage disposal facility. The toilets will be onsite during all operations.

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 approved landfill. No trash will be buried or burned on location. 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.

6. Hazardous waste-

   a. No chemicals subject to reporting under the Superfund Amendments and Reauthorization Act (SARA) 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 completing of proposed well.
   b. 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 drilling, testing or completing this well.

c. All fluids used during washing of production equipment will be properly disposed of to avoid ground contamination or hazard to livestock or wildlife.

H. Ancillary Facilities

1. 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.
2. Plate 6 shows the drilling layout and ancillary facilities.

I. Well Site Layout

The following information is presented in Plates 2, 4 – 6 as described below.

Plate 2	Access road entry/exit points
Plate 4a	Well pad and ROW survey
Plate 4b	Well pad survey and cut/fill
Plate 5	Storm Water Management & BMPs
Plate 6	Drilling rig layout and ancillary facilities
Plate 7	Proposed Interim Reclamation

No permanent living facilities are planned. Office trailers equipped with living quarters may be provided on location during drilling and completions operations.

Final production facility layout is being deferred until the well's production characteristics can be evaluated after completion.

J. Plans for Surface Reclamation

Reclamation Objective

i. The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize habitat and forage loss, visual impact, and weed infestation, during the life of the well or facilities.
ii. The long-term objective of final reclamation is to return the land to a condition similar to what existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity.
iii. The BLM will be notified at least 3 days prior to commencement of any reclamation procedures.
iv. If circumstances allow, interim reclamation and/or final reclamation actions will be completed no later than 6 months from when the final well on the location has been completed or plugged. The operator will ask for written permission from the BLM if more time is needed.

Interim Reclamation Procedures:

Please refer to Appendix B for complete details. Plate 7 shows the proposed interim reclamation areas.

- Within 30 days of well completion, the well location and surrounding areas will be cleared of, and maintained free of, all materials, trash, and equipment not required for production.
- In areas planned for interim reclamation, all the surfacing material used to build the well pad will be removed and returned to the original source or recycled to repair or build roads and well pads.
- The areas planned for interim reclamation will then be recontoured to blend with the surrounding topography as much as possible. The interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the blend with surrounding topography during interim reclamation.
- Topsoil will be evenly respread and revegetated over the entire disturbed area not needed for all-weather operations including cuts & fills. To seed the area, the proper BLM seed mixture, free of noxious weeds, will be used. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.
- Proper erosion control methods will be used on the area to control erosion, runoff and siltation of the surrounding area.
- The interim reclamation will be monitored periodically to ensure that vegetation has reestablished and that erosion is controlled.

Final Reclamation Procedures:

Please refer to Appendix B for complete details -

- Prior to final reclamation procedures, the well pad, road, and surrounding area will be cleared of material, trash, and equipment.
- All surfacing material will be removed and returned to the original source pit or recycled to repair or build roads and well pads.
- All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be recontoured to the contour existing prior to initial construction or a contour that blends with the surrounding topography. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation.
- After all the disturbed areas have been properly prepared, the areas will be seeded with the proper BLM seed mixture, free of noxious weeds.
- Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.
- Proper erosion control methods will be used on the entire area to control erosion, runoff and siltation of the surrounding area.
- All unused equipment and structures including pipelines, electric line poles, tanks, etc. that serviced the well will be removed for proper disposal.
- All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not redisturbed, and that erosion is controlled.

K. Surface Ownership

1. The entire proposed project is located on private land.

Contact Name:	Public Service Company of New Mexico
Address:	414 Silver Ave. NW
	Albuquerque, NM 87102
Phone:	(505) 241-2700

L. Other Information

1. A Class III Cultural Resource Inventory of the proposed project area was conducted by Aztec Archeological Consultants, Aztec, NM. The archaeological report was prepared and submitted to the BLM in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities* (BLM 2005).

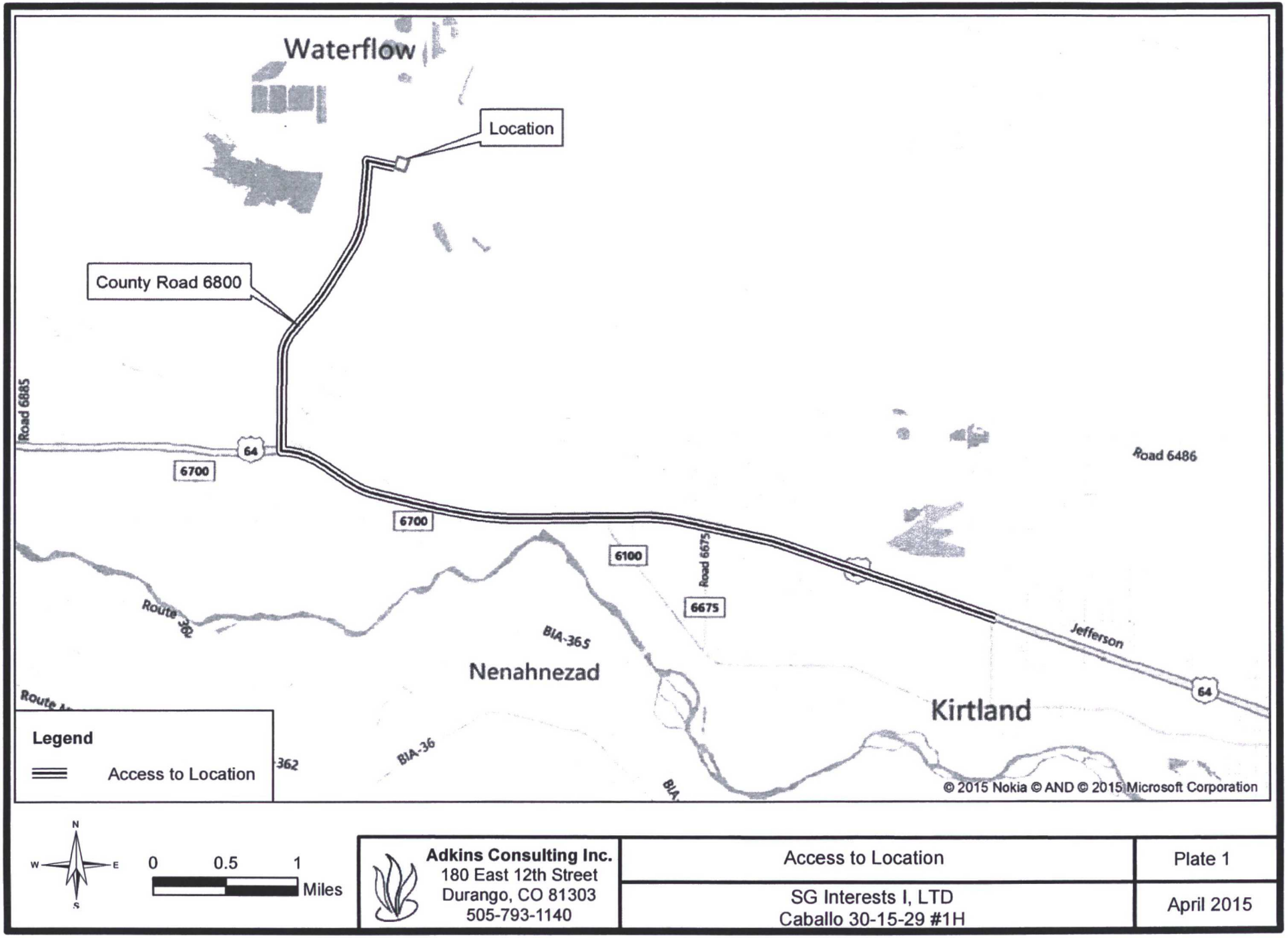
2. Construction and/or reclamation contractors will call New Mexico One-Call (or equivalent) to identify the location of any marked or unmarked pipelines or cables located in proximity to the proposed project area at least two working days prior to ground disturbance.

3. The operator will be responsible to monitor, control, and eradicate all invasive, non-native plant species within the proposed project area throughout the life of the project. The operator's weed-control contractor will contact the BLM-FFO regarding acceptable weed-control methods. If the contractor does not hold a current Pesticide Use Permit, a Pesticide Use Permit would be submitted prior to pesticide application. Only pesticides authorized for use on BLM lands would be used. The use of pesticides would comply with federal and state laws. Pesticides would be used only in accordance with their registered use and limitations. The operator's weed-control contractor would contact the BLM-FFO prior to using these chemicals.

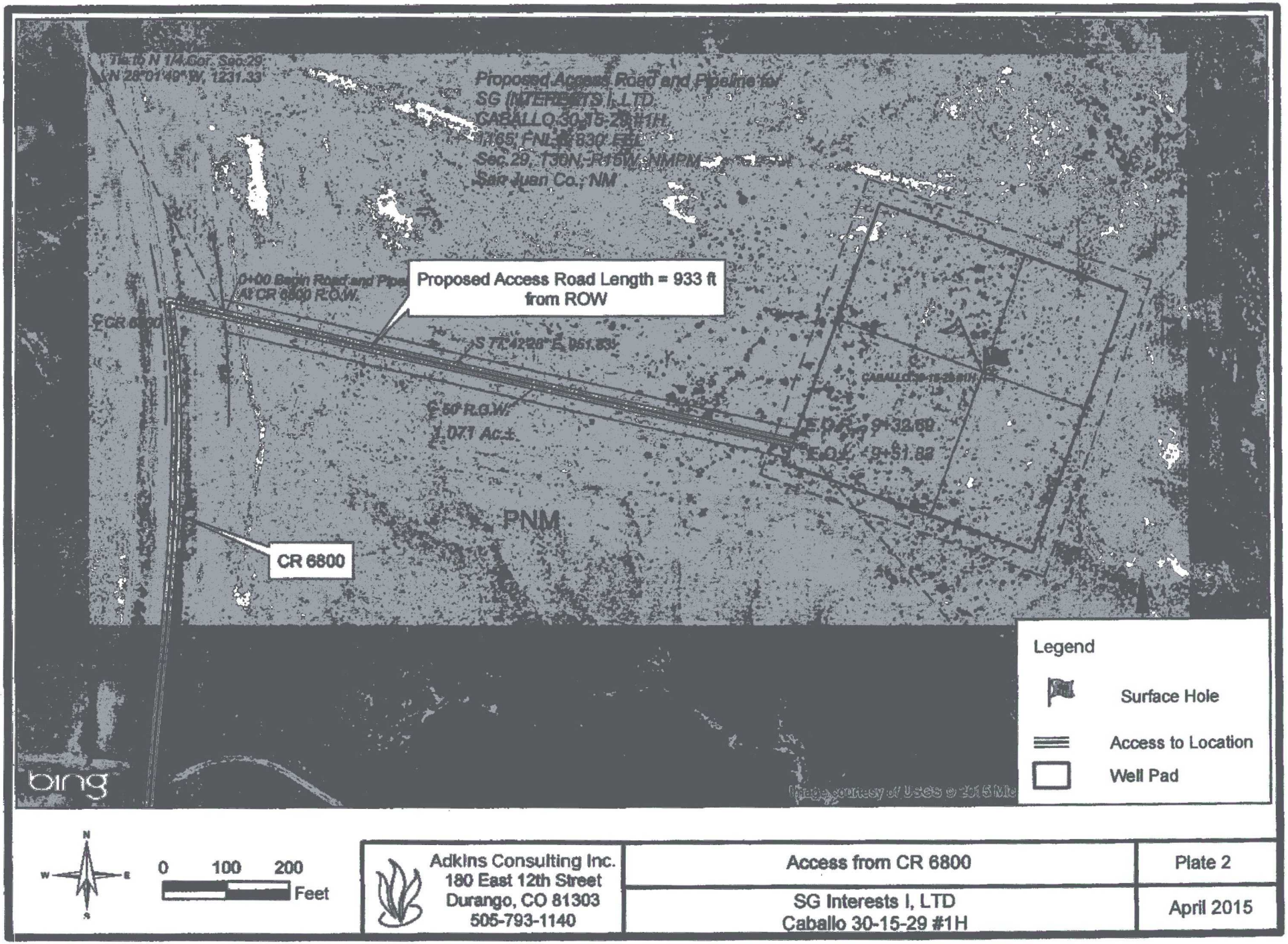
4. All operations will be conducted in such a manner that full compliance is made with the applicable laws and regulations, an approved Application for Permit to Drill (APD), and applicable Notice(s) to Lessees.

The operator will be fully responsible for the actions of its subcontractors. A complete copy of an approved APD will be furnished to the field representatives and will be on location during all construction, drilling, completions, and reclamation operations.

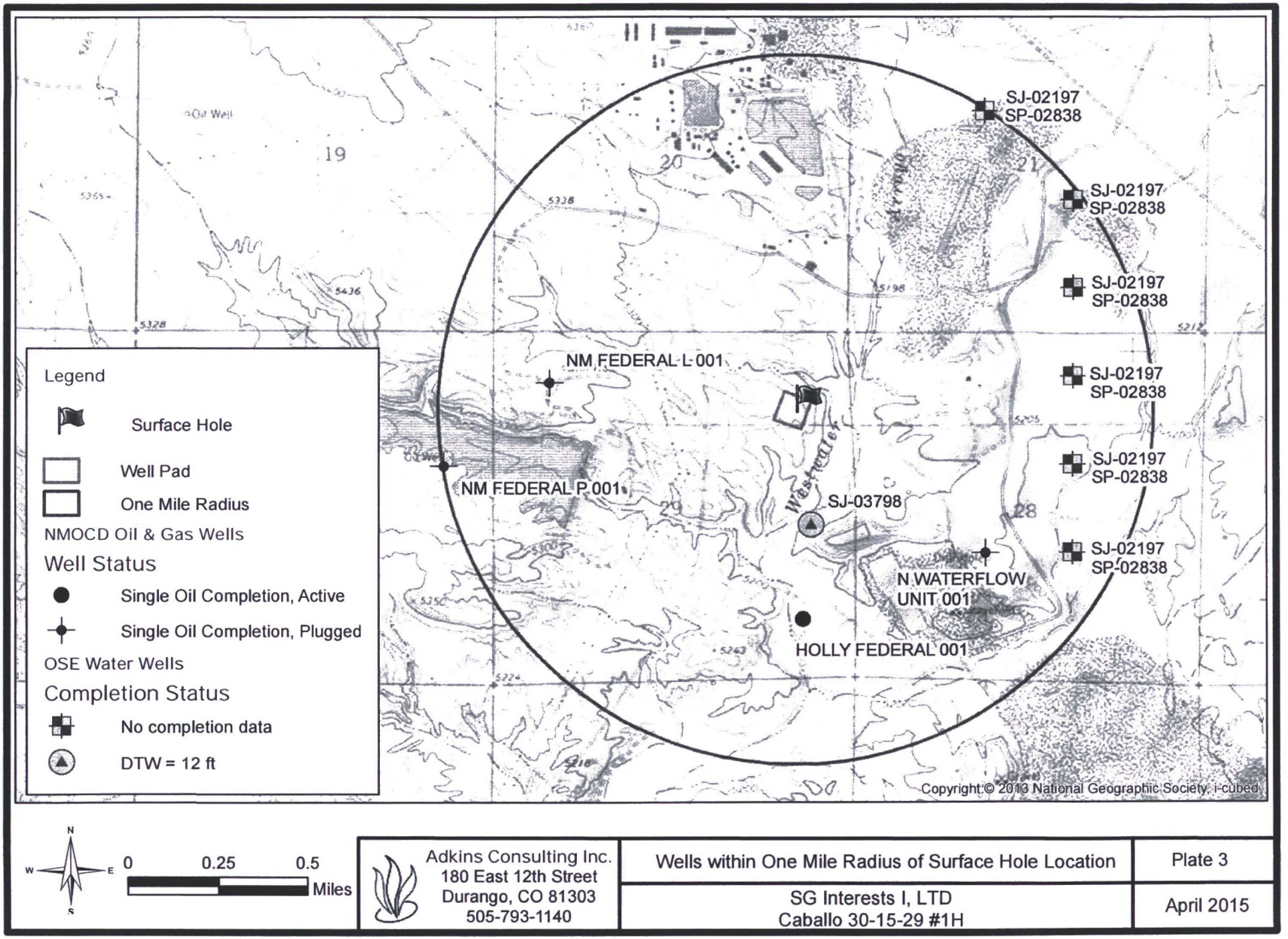
Plates



Adkins Consulting Inc. 180 East 12th Street Durango, CO 81303 505-793-1140	Access to Location	Plate 1
	SG Interests I, LTD Caballo 30-15-29 #1H	April 2015



Adkins Consulting Inc. 180 East 12th Street Durango, CO 81303 505-793-1140	Access from CR 6800	Plate 2
	SG Interests I, LTD Caballo 30-15-29 #1H	April 2015


Legend
Surface Hole
Well Pad
One Mile Radius
NMOCD Oil & Gas Wells
Well Status
Single Oil Completion, Active
Single Oil Completion, Plugged
OSE Water Wells
Completion Status
No completion data
DTW = 12 ft
SJ-02197 SP-02838
SJ-02197 SP-02838
SJ-02197 SP-02838
SJ-02197 SP-02838
SJ-02197 SP-02838
SJ-02197 SP-02838
NM FEDERAL L 001
NM FEDERAL P 001
SJ-03798
N WATERFLOW UNIT 001
HOLLY FEDERAL 001
Westwater
Oil Well
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Copyright © 2013 National Geographic Society, i-cubed
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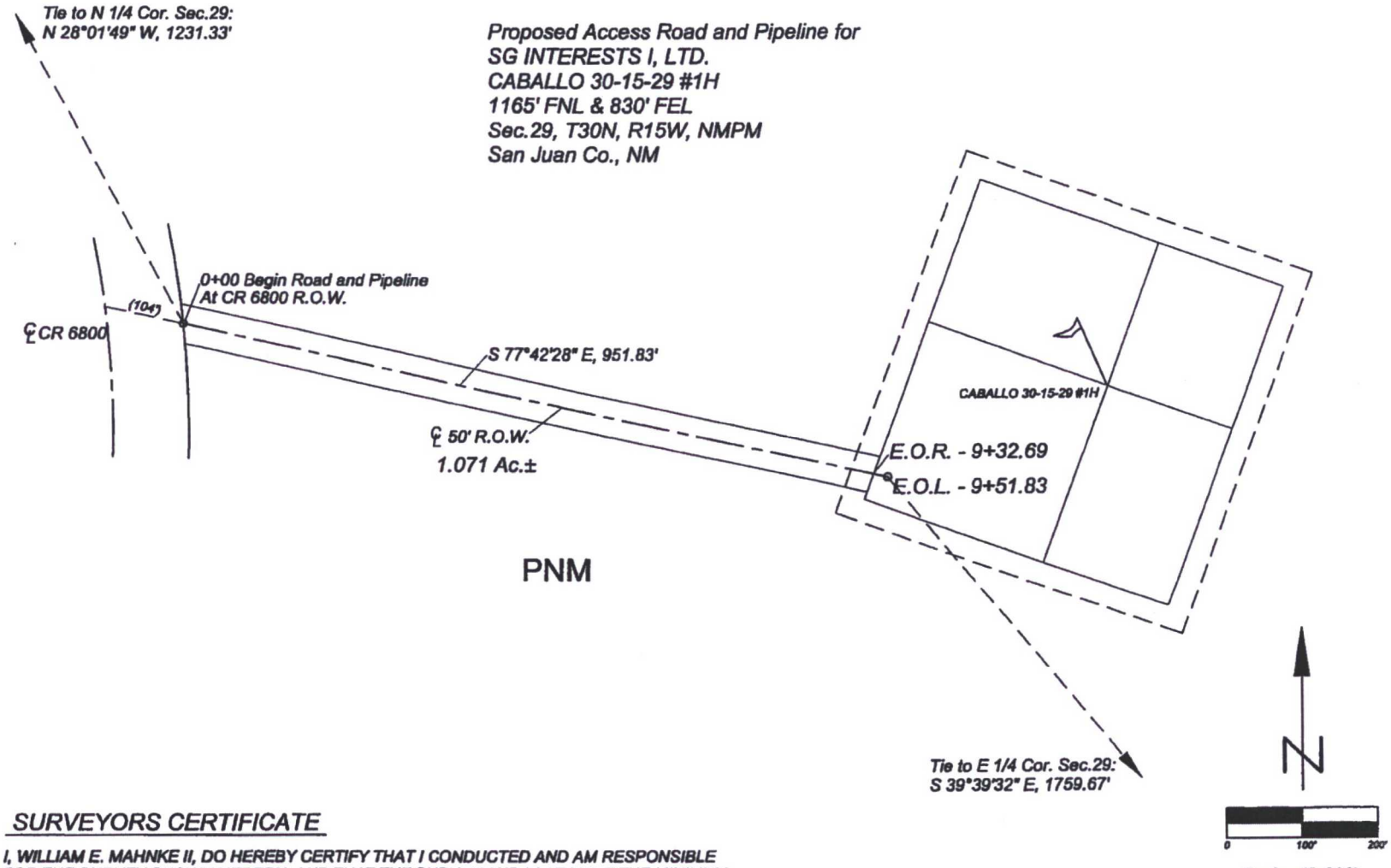
Miles
Adkins Consulting Inc.
180 East 12th Street
Durango, CO 81303
505-793-1140
Wells within One Mile Radius of Surface Hole Location
Plate 3
SG Interests I, LTD
Caballo 30-15-29 #1H
April 2015



SURVEYORS CERTIFICATE

I, WILLIAM E. MAHNKE II, DO HEREBY CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THE SURVEY SHOWN HEREON, AND THAT THE SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN THE STATE OF NEW MEXICO.
I FURTHER CERTIFY THAT THIS IS NOT A SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT AND THAT THIS IS A SURVEY OF A PROPOSED PIPELINE RIGHT-OF WAY AND PROPOSED ACCESS ROAD.

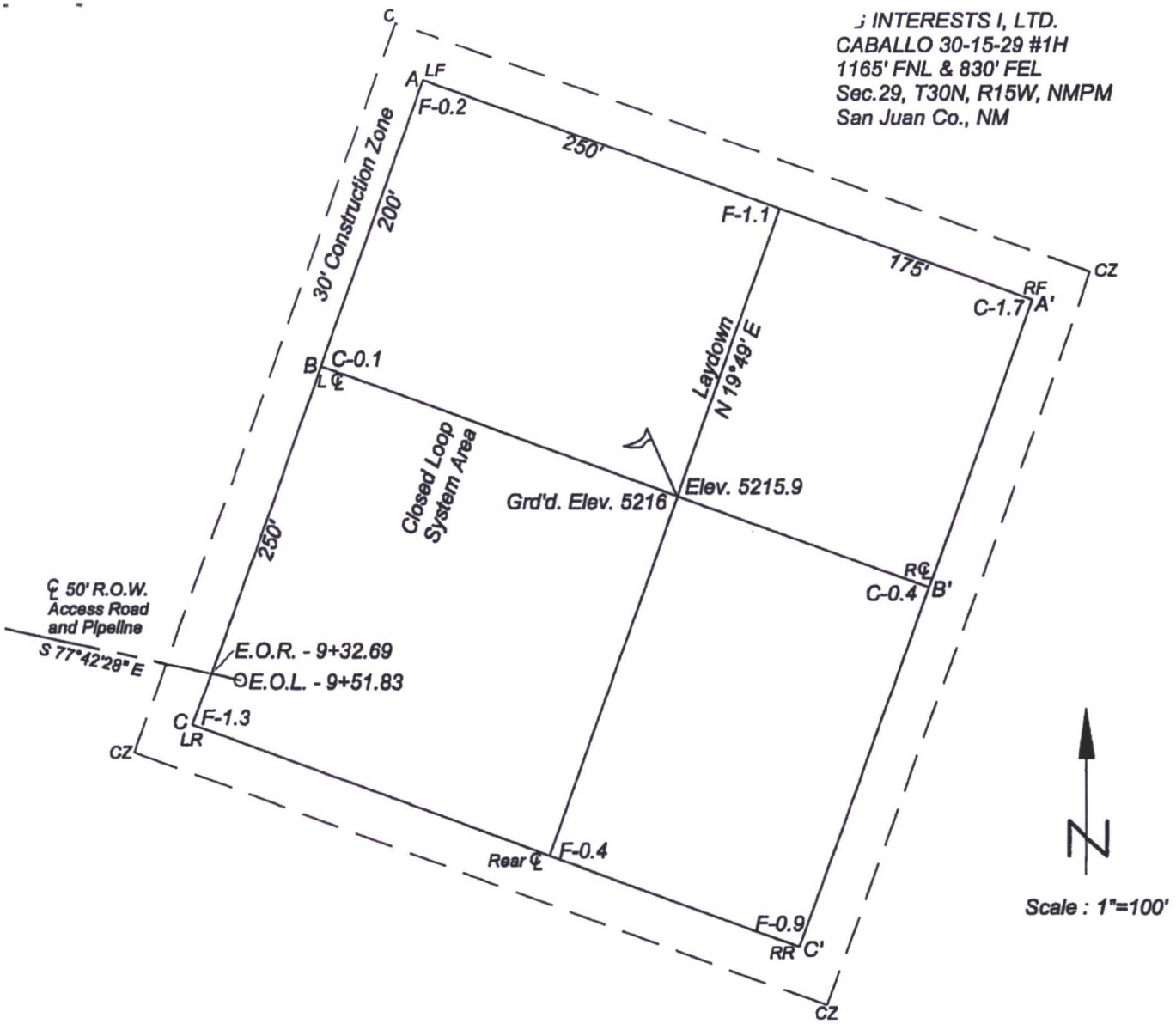
WILLIAM E. MAHNKE II
NEW MEXICO P.L.S. # 8466

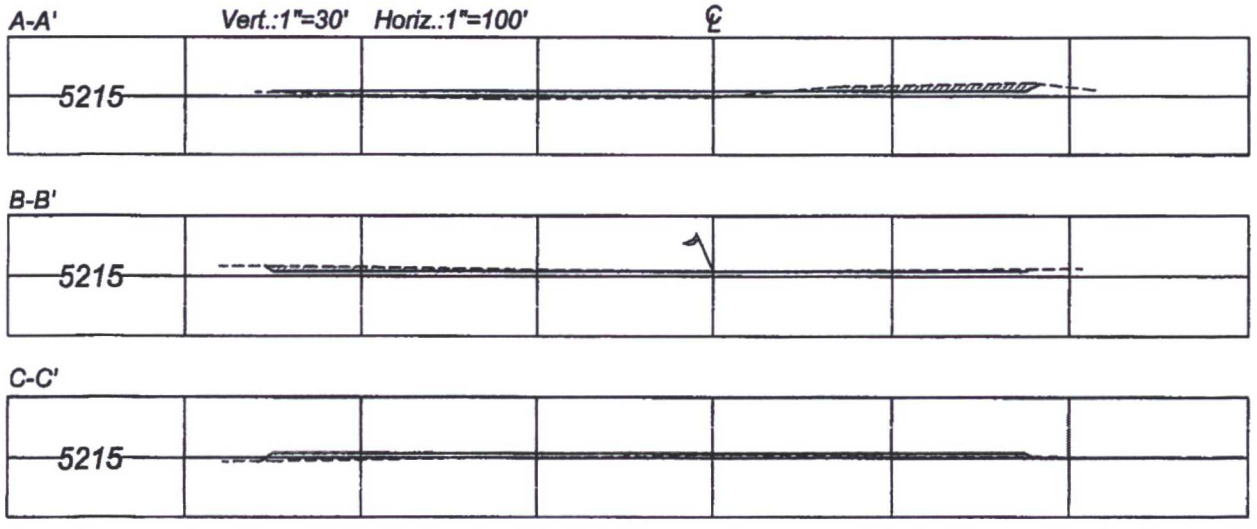
WILLIAM E. MAHNKE II
NEW MEXICO
#8466
11 Feb 2013
REGISTERED PROFESSIONAL LAND SURVEYOR

Field Completion Date: 04 Feb 2013

ENERGY SURVEYORS, INC.
P.O. BOX 991
FARMINGTON, NM 87499
FAX: 801-659-4246
OFFICE: 505-325-4005
CELL: 505-360-8142

Plate 4a


INTERESTS I, LTD.
CABALLO 30-15-29 #1H
1165' FNL & 830' FEL
Sec.29, T30N, R15W, NMPM
San Juan Co., NM
C
A
LF
F-0.2
250'
F-1.1
175'
RF
A'
C-1.7
CZ
30' Construction Zone
200'
B
C-0.1
℄
Laydown
N 19°49' E
Closed Loop
System Area
Grd'd. Elev. 5216'
Elev. 5215.9
250'
℄ 50' R.O.W.
Access Road
and Pipeline
S 77°42'28" E
E.O.R. - 9+32.69
E.O.L. - 9+51.83
RC
C-0.4
B'
C
LR
F-1.3
CZ
Rear ℄
F-0.4
F-0.9
RR
C'
CZ
N
Scale : 1"=100'


A-A'
Vert.:1"=30'
Horiz.:1"=100'
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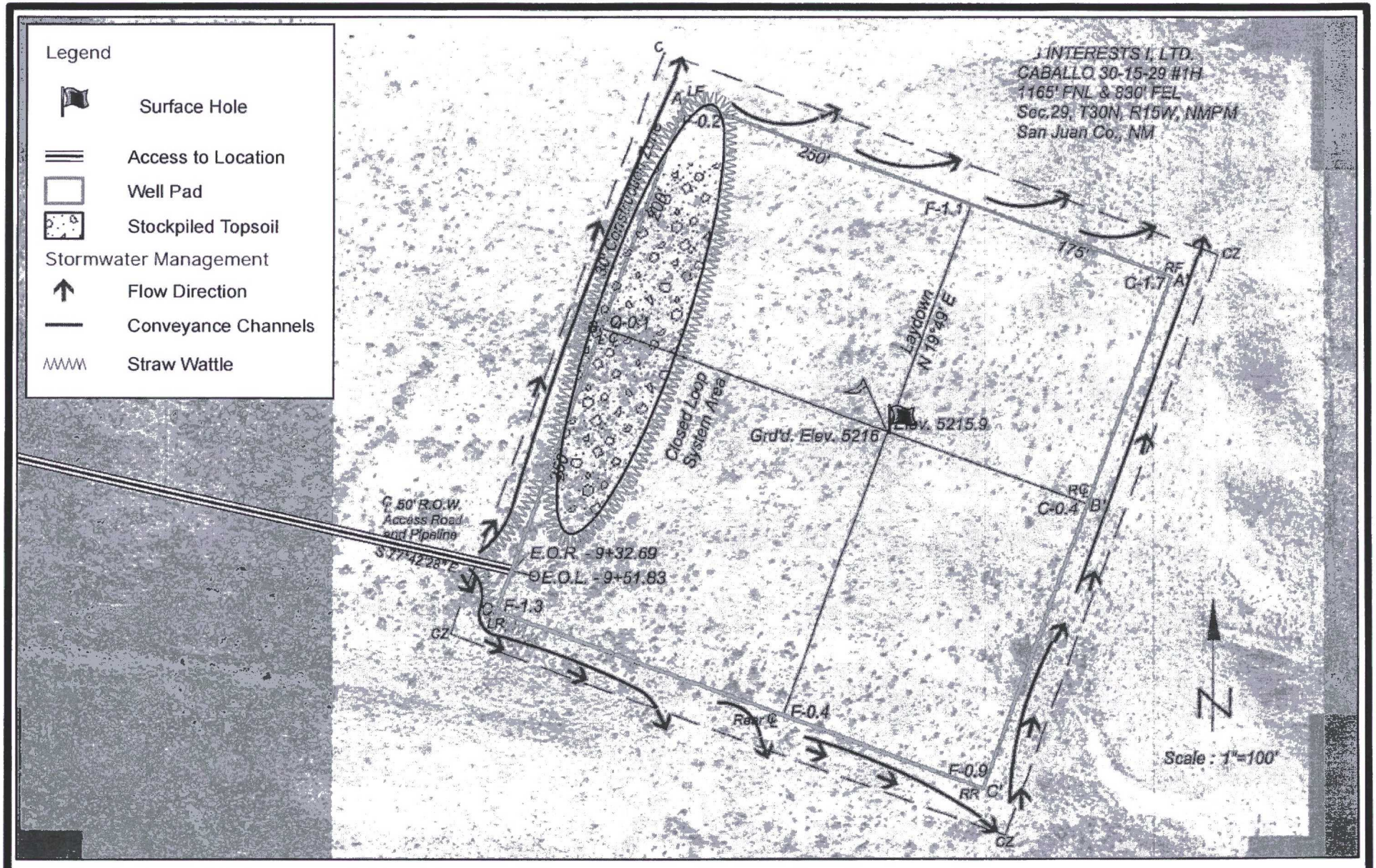
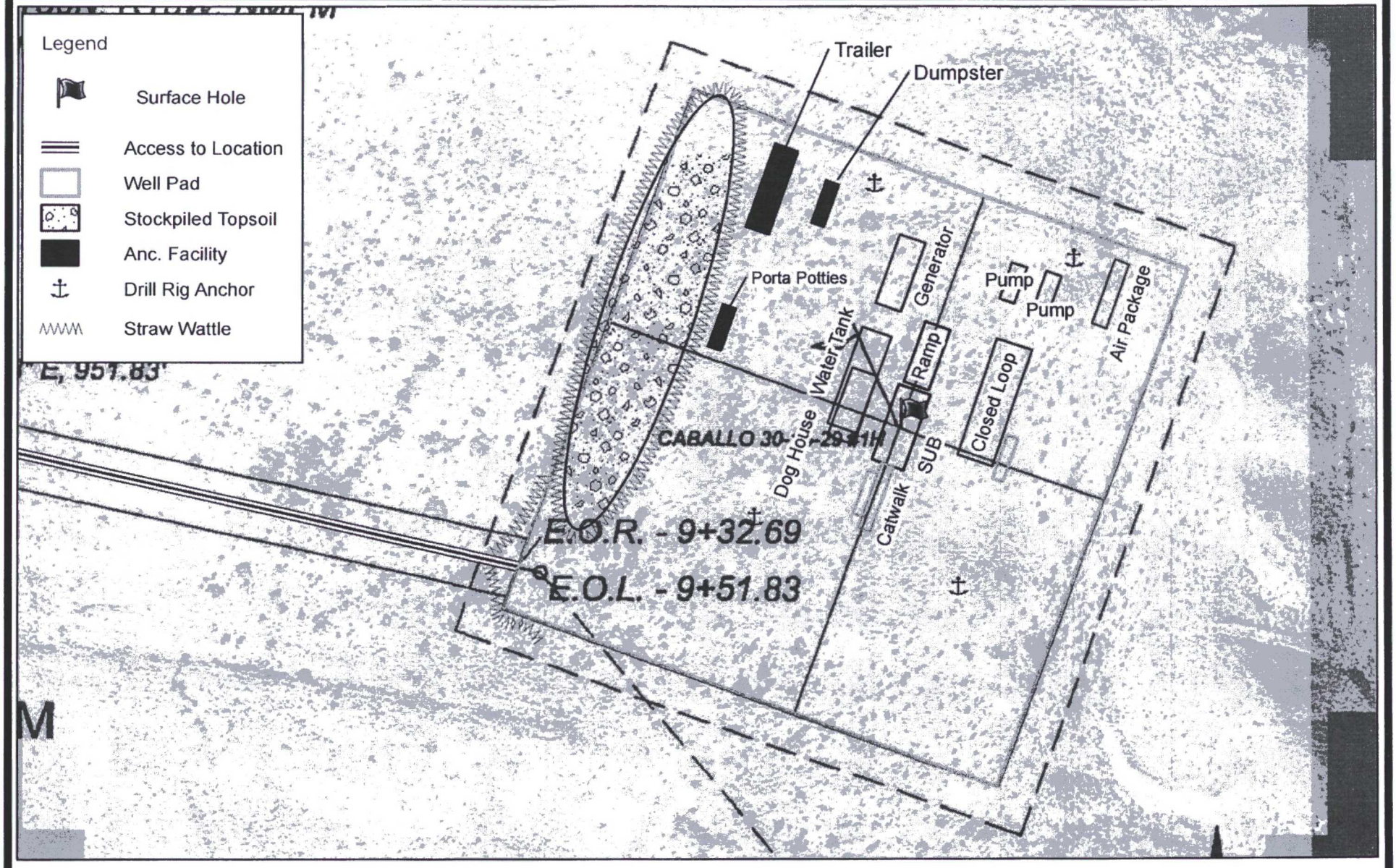
5215
B-B'
5215
C-C'
5215

Plate 4b



Adkins Consulting Inc. 180 East 12th Street Durango, CO 81303 505-793-1140	Storm Water Management & BMPs	Plate 5
	SG Interests I, LTD Caballo 30-15-29 #1H	April 2015



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Adkins Consulting Inc.
180 East 12th Street
Durango, CO 81303
505-793-1140

Drill Rig Layout & Ancillary Facilities	Plate 6
SG Interests I, LTD Caballo 30-15-29 #1H	April 2015

Adkins Consulting Inc.
150 East 12th Street
Durango, CO 81303
505-793-1140

Proposed Interim Reclamation

SG Interests I, LTD
Caballo 30-15-29 #1H

Plate 7

April 2015

Appendix A

Appendix A
SG Interests I, LTD
Road Maintenance Plan

The following Road Maintenance Plan will be implemented and followed by SG Interests I, LTD (the Operator) for roads utilized within the WC Basin Mancos Field. All roads will be constructed and maintained to meet 1) the Bureau of Land Management (BLM) Gold Book Standards and BLM Manual 9113-1 (Roads Design Handbook) and BLM Manual 9113-2 (Roads National Inventory and Condition Assessment Guidance and Instructions Handbook) and 2) landowner requirements.

Road Inspection

1. The Operator's representative or designated inspector will inspect all newly constructed or reconstructed roads that will be used to construct, operate, maintain, and terminate the Operator's oil and gas operations.

2. Road inspections will be conducted monthly or within 72 hours of an extreme weather event (e.g., summer thunderstorms). The inspector will observe road conditions as they drive to and from locations.

Maintenance Procedures

The Operator's maintenance plan contains provisions for maintaining the travelway of newly constructed or reconstructed roads. Identified items during inspection will be reviewed and corrected as necessary by the Operator or designated contractors.

1. Road Crown
   If the road crown surface becomes rutted, not adequately draining, or in a roughened condition, the Operator will utilize a maintainer to re-grade and/or re-surface the road crown.

2. Culverts
   If culverts or silt traps are plugged or are not functioning properly, the Operator will excavate and remove debris or sediment impeding the function of the culvert.

3. Ditches
   If road side ditches become blocked or are not functioning properly, the Operator will use a maintainer or the necessary equipment to clean or blade the ditch.

4. Silt Traps or Water Control Structures
   If silt traps or water control structures are found to be filled with sediment or are not functioning properly, the Operator will use the appropriate equipment to clean out sediment or repair/modify the structure.

5. Dust Abatement
   Dust emissions will be controlled on the road and location, as necessary, with the application of dust suppressants (e.g., Magnesium Chloride) and/or water. Dust control will be implemented when dust plumes become larger than normal road use conditions or when directed by the administrative agency.

Road Inspection and Maintenance Report Form

Road Inspected (Site ID): _____

Inspector: Inspector Title: Date:

Road Type:	❑BLM Resource or FS Local	Low-volume, single lane; 12-14′ travelway; connect terminal facilities to higher-class roads
	❑BLM Local or FS Collector	Single- or double-lane; 12-24′ travelway; capable of carrying highway loads; collect traffic from resource or local roads and connect to arterial roads or public highways
	❑BLM Collector or FS Arterial	Double-lane, graded, drained and surfaced; 20-24′ travelway; serve large areas and are major access route into development areas with high average daily traffic rate

Road Condition Check List

Road	Good	Poor	Action Needed	Comments
Surface Condition				
Surface Drainage				
Culvert(s)				
Culvert(s) Inlet Protection				
Culvert(s) Outlet Protection				
Roadside Ditches/Turnouts				
Run-On Diversion(s)				
Revegetation				
Sediment Control	**Good**	**Poor**	**Action Needed**	**Comments**
Check Dam				
Silt Trap/Stock Pond				
Filter Berm				
Sediment Basin				
Straw Wattles				
Silt Fence				

Appendix B

United States Department of the Interior
Bureau of Land Management and/or
Bureau of Indian Affairs

Surface Reclamation
&
Re-vegetation Plan

For the Proposed:

Caballo 30-15-29 #1H
Well Pad and Access Road

Sponsored by:

SG Interests I, LTD
Houston, Texas

April 6, 2015

U.S. Department of the Interior
Bureau of Land Management
Farmington District
Farmington Field Office
6251 N. College Blvd., Ste. A
Farmington, NM 87402
Phone: (505) 564-7600
FAX: (505) 564-7608

U.S. Department of the Interior
Bureau of Indian Affairs
Gallup Regional Office
P. O. Box 1060
Gallup, NM 87305
Phone: (505) 863-8336

BLM

Contents

Reclamation Plan (Procedure B)

Applicant	SG Interests I, LTD (the Operator)
Project Type	Oil & Gas Well
Well, Oil and Gas Lease, or Right-of-Way (ROW) Name	Caballo 30-15-29 #1H
Legal Location	Sec. 29, T30N. R15W.; NMPM San Juan County, NM Lat: 36.78917 Long: -108.43419

Introduction

This reclamation plan has been prepared based on requirements and guidelines of the Bureau of Land Management (BLM) Farmington Field Office (FFO) Bare Soil Reclamation Procedures (BLM 2013a) and Onshore Oil and Gas Order No. 1.

The Operator's contact person for this Reclamation Plan is:

Mike Mankin, Agent for SG Interests I, LTD
Mankin Land Company, LLC
(505) 634-6393
mgcattle@yahoo.com

Vegetation Reclamation Procedure B

Completion of a Vegetation Reclamation Plan based on Procedure B of the BLM/FFO Bare Soil Reclamation Procedures is recommended given that the proposed action would result in bare mineral soil **across an area greater than or equal to 1 acre**, not including working areas routinely used to operate and maintain facilities or improvements.

Revision of the Reclamation Plan

The Operator may submit a request to the BLM to revise the Reclamation Plan at any time during the life of the project in accordance to page 44 of the Gold Book (USDI-USDA 2007). The Operator will include justification for the revision request.

Project Description

The development proposed by the Operator includes one well pad, and associated access roads. The proposed project is located on surface owned by the Public Service Company of New Mexico (PNM) and would develop a federal mineral lease administered by the BLM/FFO. The proposed project site is approximately 2.2 miles north of the intersection of County Road 6800 and US Highway 64; 5 miles west of Kirtland, NM. The immediate vicinity generally slopes to the east toward Westwater Arroyo. Westwater Arroyo is located approximately 300-feet east of the proposed location. An unnamed wash is located approximately 200-feet north of the proposed location. Local terrain consists of gently rolling terrain located within the Great Basin Desert Scrub habitat.

Estimated Total Area of Disturbance

Development would include expanding the existing well pad to accommodate a 425-ft by 450-ft well pad, resulting in approximately 4.39 acres of new surface disturbance, with an additional 30-foot construction buffer zone on all four sides encompassing an additional 0.62 acres. The total permitted area for the construction of the well pad is 5.01 acres.

To access the well site, the Operator will construct a new access at the intersection of County Road 6800. The proposed access road is 933-ft in length by 20-ft in width (0.43 acres). The ROW is 50-ft in width creating an additional 0.64 acres of new surface disturbance. Total new surface disturbance is 1.07 acres. The proposed access road will be constructed in accordance to the BLM Gold Book standards and landowner requirements.

Following the interim reclamation of unused portions of the well location and access road construction disturbance, long term disturbance will consist of the access road driving surface, well pad production areas and a tear drop shaped access through the well pad.

Pre-Disturbance Site Visit and Site Conditions

This plan is based on observations made during pre-disturbance site visits and compiled from information obtained from consultation with multiple agencies including BLM/FFO, PNM, and Mankin Land Company.

Vegetation Community

Based on observations made during pre-disturbance site visits, it has been determined that the vegetation community which best represents the proposed project area is Saltbush Shadescale/Winterfat Community. This community is comprised primarily of a sparse cover of shadscale saltbush interspersed with Indian ricegrass, four-winged saltbush, rabbitbrush, broom snakeweed, galleta (Hilaria jamesii), winterfat, greasewood, and big sagebrush. It is found on all aspects from about 3,284 to 10,204 feet mean seal level (msl).

Soils are comprised of the Badland-Monierco-Rock outcrop complex, moderately steep, and the Blancot-Notal association, gently sloping. The Badland-Monierco-Rock outcrop complex is composed of approximately 40 percent Badland and similar soils, 30 percent Monierco and similar soils, and 20 percent Rock outcrop.

Proposed Reclamation Seed Mix

Disturbance will be re-contoured to blend in with surrounding topography and topsoil will be redistributed and prepared for seeding by the construction contractor. Ripping, disking, and seeding of the site will be done by the Operator or the reclamation contractor. The Operator will use a BLM-approved seed mixture appropriate for reclamation within a Saltbush Shadescale/Winterfat Community (see Table 1 below).

Table 1. Menu based seed mix by habitat type for use in reclamation (minimum requirement)**

Common Name	*Scientific Names*	*Variety*	*Season*	*Form*	*PLS lbs/acre**
Plant two of the following:					
Fourwing saltbush	*Atriplex canescens*	VNS	--	Shrub	4.0
Shadscale saltbush	*Atriplex confertifolia*	VNS	--	Shrub	2.0
Winterfat	*Krascheninnikovia lanata*	VNS	--	Shrub	2.0
And one of the following:					
Indian ricegrass	*Achnatherum hymenoides*	Paloma or Rimrock	Cool	Bunch	4.0
Bottlebrush squirreltail	*Elymus elymoides*	Tusas or VNS	Cool	Bunch	3.0
And two of the following:					
Alkali sacaton	*Sporobolus airoides*	VNS	Warm	Bunch	0.25
Galleta	*Pleuraphis jamesii*	Viva florets	Warm	Bunch/sod forming	3.0
Sand dropseed	*Sporobolus cryptandrus*	VNS	Warm	Bunch	0.5
And one of the following:					
Western wheatgrass	*Pascopyrum smithii*	Arriba	Cool	Sod-forming	3.0
Siberian wheatgrass	*Agropyron fragile*	Vavilov	Cool	Bunch	3.0
And one of the following:					
Blue grama	*Bouteloua gracilis*	Alma or Hachita	Warm	Sod	2.5
Needleandthread	*Hesperostipa comata*	VNS	Cool	Bunch	2.5
And one of the following:					
Scarlett globemallow	*Sphaeralcea coccinea*	VNS	Warm	Forb	0.25
Narrow Leaf Penstemon	*Penstemon angustifolius*	VNS	Cool	Forb	0.25

**Based on 60 pure live seeds (PLS) per square foot, drill seeded. Double this rate (120 PLS per square foot) if broadcast or hydroseeded.

Vegetation Reclamation Standards

Requirements for determining reclamation and if it is successfully completed for the selected vegetation community are determined by the reclamation percent cover standards for the community, as outlined in Table 2, below. Meeting these standards during post-disturbance monitoring indicate the attainment of vegetation reclamation standards.

Table 2. Reclamation Goal for Saltbush shadscale/Winterfat Community Cover

Functional Group	*Percent (%) Foliar Cover*	*Common Species*
Trees/Shrubs/Grasses/Forbs	>20	Utah juniper, pinyon pine; four-wing saltbush, Mormon tea, winterfat, shadscale, big sagebrush, Indian ricegrass, Galleta, Blue grama, Alkali sacaton, Western wheatgrass
Invasive/undesirables **10% allowed toward meeting standard of 20%.**	≤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, kochia.

Pre-Disturbance Weed Survey

During the pre-disturbance site visit, the proposed action area was surveyed for noxious weeds listed on the New Mexico Department of Agriculture's Class A and Class B list.

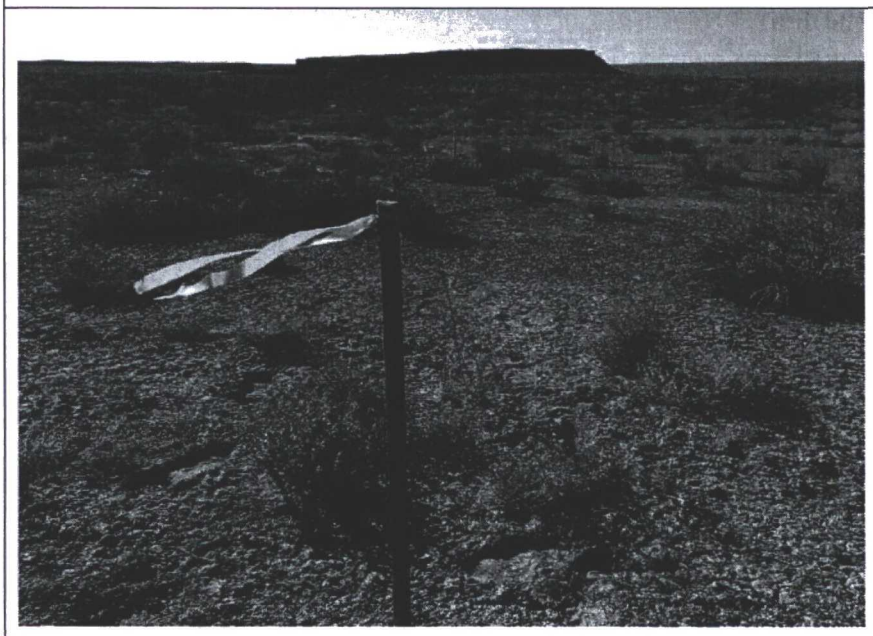
Several noxious and invasive weeds were documented near the proposed location. An outcrop of Russian knapweed exists along County Road 6800. Salt-cedar has established itself within the ephemeral drainages near the proposed location. Wiener-leaf is present along County Road 6800 and cheatgrass and Russian thistle has taken hold throughout the area.

Pre-Disturbance Soil Evaluation

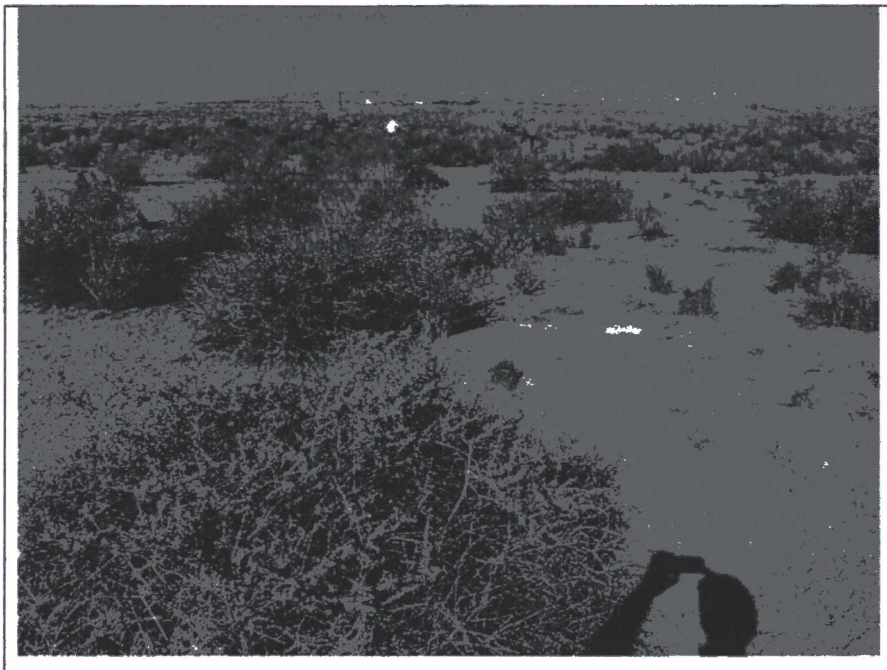
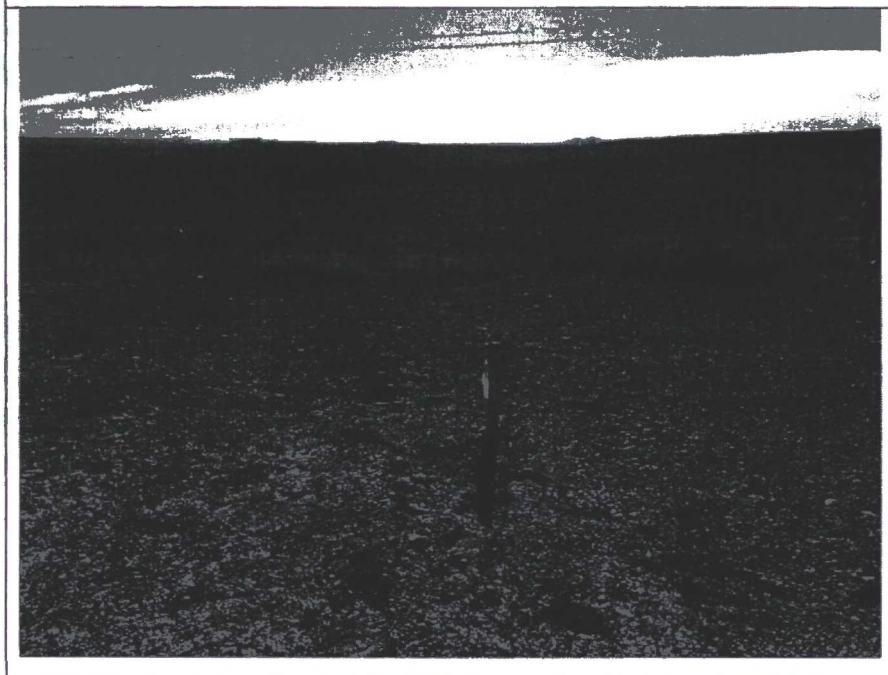
BLM and the Operator's representative collaboratively decided at the pre-disturbance site visit that no soil testing is necessary for the proposed project area.

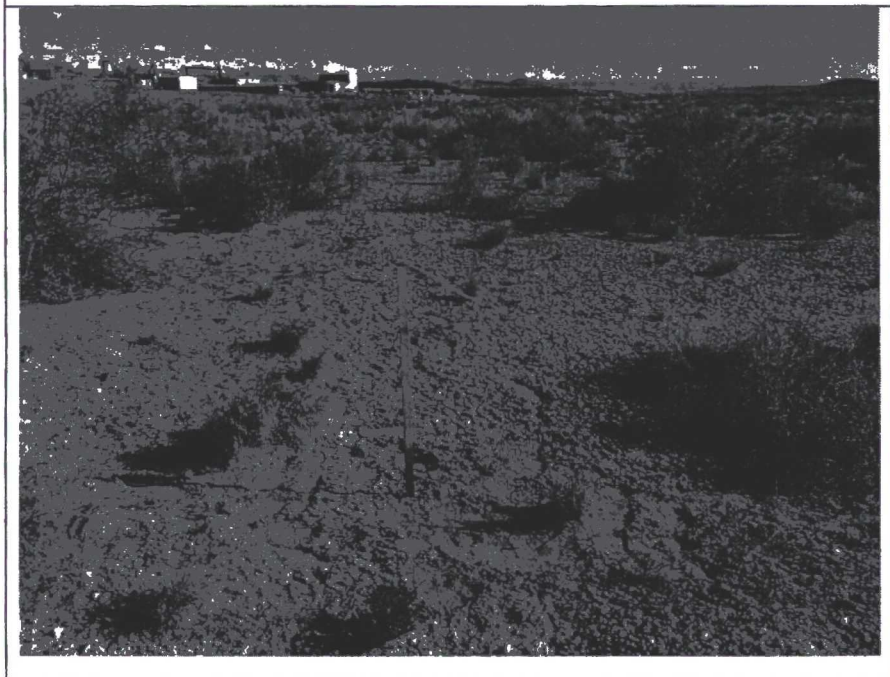
Pre-Disturbance Site Photographs

Photographs taken of pre-disturbance conditions were taken with a digital camera.

	Photograph of proposed surface hole location (wellhead) viewing north. Coal power plant is visible in background left.
	Photograph from NW corner viewing southeast toward wellhead.

	Photograph along west center edge viewing east toward wellhead.
	Photograph from the NE corner of well pad viewing north-northeast. A fluid management pond is visible in photo background at left. Westwater Arroyo is beyond the fluid pond and to the right.

	Photograph from southwest corner at the entry of the proposed access road ROW onto the well pad. Photo is viewing west toward County Road 6800.
	Photograph viewing east along proposed access road ROW. Photo is taken approximately 80-ft east of County Road 6800.

	Photograph of proposed wellhead location viewing south.
	Photo taken from south center edge of well pad viewing north toward wellhead.

Reclamation Techniques for Successful Revegetation

Vegetation and Site Clearing

Woody vegetation, such as large shrubs and trees, will be cleared from the staked project area and stockpiled for later use as soil mulch, visual mitigation, and/or wildlife shelter.

Surface rocks (where present and useful for reclamation) will be stockpiled adjacent to the topsoil stockpile. During reclamation activities, the surface rock will be placed within the area of reclamation for erosion control or in a manner that visually blends with the adjacent undisturbed area.

Topsoil Stripping, Storage, and Replacement

If available, the upper 6 inches of topsoil will be stripped, following vegetation and site clearing during construction activities. The Operator (or its contractor) will take care not to mix topsoil with the underlying subsoil horizons and will stockpile the topsoil separately from subsoil or other excavated material including during construction of pits. Topsoil and sub-surface soils will be replaced in the proper order, prior to final seedbed preparation.

Water Management/Erosion Control Features

The Operator will use appropriate erosion control/water management design features within the proposed project area. Potential erosion control or water management features that may be used include (but are not limited to), waterbars or rolling dips for roads, sediment basins or sediment traps, check dams, silt fencing, outlet protection for culverts, erosion control blankets or geotextiles, and straw wattles.

The Operator (or its contractors) will use erosion control blankets, straw bales, or straw wattles as appropriate to limit erosion and sediment transport from any stockpiled soils.

Seedbed Preparation

For cut and fill slopes, initial seedbed preparation will consist of backfilling and re-contouring to achieve a configuration as close to pre-disturbance conditions as possible. Areas to be reclaimed will be re-contoured to blend with the surrounding landscape, emphasizing restoration of existing drainage patterns and landform to pre-construction condition, to the extent practicable.

Seedbed preparation of compacted areas will be ripped to a minimum depth of 12 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping will be conducted in two passes at perpendicular directions. Disking will be conducted if large clumps or clods remain after ripping. Any tilling or disking that occurs along the contour of the slope and seed drills will also be run along the contour to provide terracing and prevent rapid run-off and erosion. If broadcast seeding is used, a dozer or other tracked equipment will track perpendicular to the slope prior to broadcast seeding.

Following final contouring, the backfilled or ripped surfaces will be covered evenly with stockpiled topsoil. Final seedbed preparation will consist or 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.

Soil Amendments

Based on information gathered at the pre-disturbance onsite inspection, and as a result of any soil testing conducted for the proposed project area, BLM and the Operator representatives have decided collaboratively that no soil amendments will be used during reclamation of the affected environment.

Seeding

Seeding will occur within 90 days of well completion, 120 days from spud date, or during the next favorable growing season.

A Truax seed drill or modified rangeland drill that allows for seeding species from different seed boxes at different planting depths will be used to seed the disturbed areas of the project area. The Operator or its reclamation contractor 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 1 to 2 inches. Small seeds (such as alkali sacaton and sand dropseed) will be planted at a depth of 0.25 inch. In situations where differing planting depths are not practicable using available equipment, the entire seed mix will be planted no deeper than 0.25 inch.

Drill seeding may be used on well-packed and stable soils that occur on gentler slopes and where equipment and drills can safely operate. Where drill seeding is not practicable due to topography, the reclamation contractor will hand-broadcast seed using a "cyclone" hand seeder or similar broadcast seeder. Broadcast application of seed requires a doubling of the drill-seeding rate. The seed will then be raked into the ground so the seed is planted no deeper than 0.25 inch below the surface.

Mulching

Hand seeding with hydro-mulch, excelsior netting, and/or mulch with netting may be required on cut and fill slopes. Mulch should be grass or straw spread at 2,000 to 3,000 pounds per acre, or approximately 1 to 2 inches deep. Mulching will consist of crimping certified weed-free straw or certified weed-free native grass hay into the soil.

Straw or native grass hay mulch can be applied by hand broadcasting or blowing to a relatively uniform depth of 2 to 3 inches, equivalent to a rate of approximately 2 tons per acre (one 74-pound bale per 800 square feet). When applied properly, approximately 20 to 40 percent of the original ground surface will be visible.

Straw or native grass hay mulch will then be anchored using one of the following methods:

- Hand Punching – a spade or shovel is used to punch mulch into the topsoil at 1-foot intervals until all areas have mulch standing perpendicular to the slope and the mulch is embedded at least 4 inches into the soil.
- Roller Punching – a roller is used to spread mulch over an area; the roller is equipped with straight studs not less than 6 inches long, from 4 to 6 inches wide, and approximately 1 inch thick.
- Crimper Punching – similar to roller punching, a crimper is used over the soil. The crimper has serrated disk blades about 4 to 8 inches apart that force the mulch into the soil. Crimping should be done in two directions with the final pass across the slope.

Mulch applications in extremely clayey soils should be evaluated carefully to avoid developing an adobe mixture. In these cases, a soil amendment may be beneficial.

Noxious and Invasive Weed Control

Inspection of the project area for noxious or invasive weeds listed by New Mexico Department of Agriculture as Class A or Class B will occur after earthwork and seeding activities. Should listed weeds be documented, the Operator will follow BLM or landowner requirements and instructions for weed treatments, including the period of treatment, approved herbicides that may be used, required documentation to be submitted to the BLM after treatment, and any other site-specific instructions that may be applicable. The Operator will manage weeds at the proposed site with the following general practices:

- Any "listed" weeds will be treated prior to commencement of construction to prevent incorporation into the soil.
- Equipment will be inspected and cleaned prior to entering the construction site, and earthmoving equipment will be cleaned prior to exiting the site.
- Potential weed introduction will be minimized by using only weed-free seed mix, straw, mulch or other materials that may be brought to the site.
- Ongoing weed inspection and appropriate treatment will continue until percentage cover standards have been attained and final abandonment has occurred.

Monitoring Requirements

Monitoring will be completed according to BLM requirements. Monitoring activities will be initiated after the project is completed, during the post-disturbance earthwork and seeding inspection process.

Percentage cover will be monitored annually until attainment of the vegetation reclamation cover standard has been met. The Operator will keep a record of the monitoring for future submittal to the BLM at reclamation attainment.

Final Abandonment

Upon final abandonment, the Operator will file for ROW Grant termination with the BLM. The Operator would relinquish ROW Grants for the well pad and access roads. Surface disturbances within the ROW Grant areas will be returned to pre-disturbance conditions as practicable according to BLM procedure and landowner requirements.

Cessation of Monitoring

Monitoring requirements will remain in effect as long as the ROW Grants remain in effect and until all infrastructure or associated facilities are abandoned by established BLM procedure and a FAN. The Operator will document that percent cover standards have been attained when submitting a request for a FAN or relinquishment.

References

43 CFR Part 3160, "Onshore Oil and Gas Order No. 1; Onshore Oil and Gas Operations; Federal and Indian Oil and Gas Leases; approval of Operations," 72 Federal Register 44 (March 2007), pp. 10328-10338.

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BLM. 2013b. Updated Reclamation Goals. Available at: http://www.blm.gov/nm/st/en/fo/Farmington_Field_Office/ffo_planning/surface_use_plan_of/updated_reclamation.html

State of New Mexico Oil Conservation Division (NMOCD). 2010. Pit Rule Guidance Document (v 1.0) for compliance with (19.15.17 NMAC or Part 17). December 2010. Available online: http://www.emnrd.state.nm.us/ocd/documents/201012-16DraftOCDPitRuleGuidanceDocument.pdf.

U.S. Department of the Interior, U.S. Department of Agriculture (USDI, USDA). 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.