Drilling Prognosis

Well: GP 23 Pad Well **Field:** McElmo Dome

Location: SHL: 1544' FNL & 448' FEL, Section 32, T37N, R18W, NMPM
BHL: Horizontal Well, 1914 FNL & 1868 FWL, Section 32 T37N, R18W 262 deg azimuth from SHL (2000' lateral extension)
County: Montezuma, Colorado

Objective: Leadville **GL Elevation: 6460'** **Estimated KB 20'** **KB Elevation 6480'**

A FOCUSED EFFORT WILL BE EXPECTED BY ALL PARTIES TO ELIMINATE ANY / ALL ACCIDENTS DURING THE EXECUTION OF THIS DRILLING PROJECT. H2S IS ANTICIPATED WHILE DRILLING THE KILLER SHALES.

Geology / Formation Tops

FORMATION	TVD	MD
MANCOS	0	200
CONDUCTOR CSG	80'	80'
DAKOTA	200'	200'
MORRISON	400'	400'
SUMMERVILLE	1000'	1000'
ENTRADA	1853'	1848'
CHINLE	2657'	2657'
SHINARUMP	3341'	3341'
CUTLER	3415'	3415'
13-3/8" SFC CSG	3565	3565
KOP	3600	3600
BUILD ANGLE TO 12.5 deg at casing point		
U. HERMOSA	4898'	4922'
PARADOX	6043'	6095'
DESERT CREEK	6405'	6466'
PARADOX SALT	6588'	6653'
KILLER SHALES	6897'	6970'
BASE SALT	7815'	7910'
L.HERMOSA	8091'	8193'
MOLAS	8187'	8291'
LEADVILLE	8319'	8427'
9-5/8" PROD CSG	8344'	8452'
TOP OF PRODUCTION	8344'	8452'
PILOT HOLE TOP	8344'	8452'
PILOT HOLE TD	8719'	8836'
LATERAL EST KOP (5' BELOW CSG SHOE)	8348'	8457'
DEPTH AT END OF LATERAL	8489'	10518'

Proposed Pilot Hole TD Location
132.65 S & 1080.37 W
1679' FNL & 1528' FWL

Well Program

Drilling Procedure

24.0" Hole Drill a 24.0" hole to 80' TVD/MD. Set the conductor pipe & cement back to surface.

17-1/2" Hole

Drilling: Drill a 17-1/2" hole to 3565' TVD/MD, Casing Point ~150' below the top of the Cutler

Survey: Drop inclination surveys at 500' intervals

Evaluation: A Temperature Survey will be run after the 13-3/8" casing is set and cemented if cement is not circulated to surface

Fluids: Fresh water native, maintain fluid as clean as possible, pump viscous sweeps for hole cleaning & prior to running the 13-3/8" csg, possible seepage problems while drilling interval

Casing:

13-3/8" 54.5# K-55 STC	Top: 0	Bottom: 1980' TVD/MD	
13-3/8" 61.0# K-55 STC	Top: 1980' TVD/MD	Bottom: 3080' TVD/MD	
13-3/8" 68.0# K-55 STC	Top: 3080' TVD/MD	Bottom: 3565' TVD/MD	

Cement:

Conventional	Lead: 2355 sxs	65/35 Poz 12.4 lb/gal & 1.87 yield	Caliper + 100% excess
	Tail: 385 sx	Premium Cmt 15.6 lb/gal & 1.18 yield	Caliper + 100% excess

12-1/4" Hole

Drilling: Drill a 12-1/4" hole to 8344' TVD/8452' MD, Casing Point ~25' below the top of the Leadville

Survey: MWD surveys

Evaluation: CBL log to show the 9-5/8" casing cement bond, 2-Man mudlog from 5500' TVD/ 5539' MD to TD, 200' above top Leadvile pick up open hole GR & log during drilling

Fluids: Surface Casing to 100' above Desert Creek: Clean, fresh water, circulate the reserve pit to keep solids at a minimum. 100' above Desert Creek - Displace fresh water system w/ clean, salt saturated NACL brine prior to the Desert Creek, circulate the salt section of the Brine reserve pit, pre-treat for H2S prior to drilling the shales

Casing:

9-5/8" 43.5# P110	Top: 0	Bottom: 6305' TVD/6363' MD	(100' above paradox
9-5/8" 53.5 P110	Top: 6305' TVD/ 6363' MD	Bottom: 8052' TVD/ 8152' MD	(thru Paradox & 300'
9-5/8" 47# CR 13 Fox	Top: 8052' TVD/ 8152' MD	Bottom: 8344' TVD/ 8452' MD	(from 300' above TD)

Cement:

Foam	Lead: 2230 sx	50/50 POZ Class G foamed additions Yield w/ N2 added 2.05 w/ caliper + 150% excess
	Tail: 350 sx	50/50 POZ Class G. 13.5 lb/gal & 1.28 yield + 150% excess

6" Pilot Hole

Drilling: Drill 6" pilot hole from 8344' TVD/ 8452' MD to 8719' TVD/8836' MD, ~400' below the top of the Leadville for evaulation purposes

Survey: Run a Directional Survey sub with open hole log suite to get hole angle & azimuth at TD

Evaluation: CAL/LDT/CNL/GR/DLL/MLL, run open hole logs up inside casing 500'

Fluids: Fresh water supplemented with Aquagel & Envirotorq, maintain fluid loss control to minimize seepage

Casing: NONE

Cement: Pilot Hole/KOP Cement w/ TRT tool — 150 sx — Class C plug w/ 0.3% KCL + 0.3% HR-5 + 0.15% HR-25

4-3/4" Lateral Hole

Drilling: Drill 4-3/4" lateral hole from KOP at 8348' TVD/ 8457' MD to 8489' TVD/10,518' MD. A curve radius ~ 140' is anticipated.
***** If the target allows a larger radius of curve the lateral will be upsized to 6.0" hole***

Survey: Run a Gyro to orient directional tools. Directional surveys with EM tool.

Evaluation: No open hole logs , cores, or formation testing

Fluids: Fresh water

Casing: NONE

Cement: NONE

Max BHP = 2000 psi **Max lateral length 2000 ft**

Total Depth 8489' TVD/ 10,518' MD

Completion: Open hole lateral with 7" 29# 13 Chrome tubing set in 9-5/8" with a packer ~ 8098' TVD/ 8200' MD
Open hole will be treated with 28% HCL acid

SECTION 1 & 2 – Estimated Geologic Markers/Formations, Anticipated Fluids, and Isolation Plan

*** TVD values based on a 20' KB from log picks for tops and bottom of formations

Formation	Top (TVD, ft)	Bottom (TVD, ft)	Composition	Anticipated Fluids
Mancos	0	200	Shale	None
Dakota	200	400	Sandstone/ Shale	None
Morrison	400	1000	Sandstone/ Shale	None
Summerville	1000	1853	Shale	None
Entrada	1853	2657	Sandstone	Fresh Water
Chinle	2657	3341	Sandstone	Fresh Water
Shinarump	3341	3415	Sandstone/Shale	Fresh Water
Cutler	3415	4898	Shales	None Anticipated
Upper Hermosa	4898	6043	Carbonate	None Anticipated
Paradox	6043	6405	Carbonate/Anhydrite	None Anticipated
Desert Creek	6405	6588	Carbonate	Gas
Paradox Salt	6588	6897	Carbonate/Anhydrite	None Anticipated
Killer Shales	6897	7815	Shales	Gas, **Hydrogen Sulfide**
Base Salt	7815	8091	Carbonate/Anhydrite	None Anticipated
Lower Hermosa	8091	8187	Carbonate/Shale/Anhydrite	None Anticipated
Molas	8187	8319	Siltstones/Shale	None Anticipated
Leadville	8319	8645	Carbonate	Gas, Carbon Dioxide

13-3/8” Surface casing will be set ~ 150’ into the Cutler formation and cemented to surface to isolate the usable quality fresh water bearing sandstone formations above.

9-5/8” Production casing will be set 25’ into the Leadville producing formation and cemented to surface to isolate all zones above, including the killer shale section which may contain hydrogen sulfide gas.

A detailed explanation of the casing and cementing program is shown in Section 4 Casing Detail, and a contingency plan to mitigate the hydrogen sulfide hazard is referenced in Section 10 as Attachment 1.

SECTION 3 – Pressure Control Equipment

A 3M psi system will be utilized. The following procedures, diagrams, and guidelines are included for review with all personnel, and MUST be adhered to at all times:

- Kinder Morgan 3M BOP and Associated Equipment Installation and Testing Procedure for Goodman Point Wells.
- Kinder Morgan BOP and Choke Manifold diagrams including minimum requirements.
- BLM 43 CFR 3160 Section III-A 3M specifications for pressure control equipment including minimum requirements.

3M BOP and Associated Equipment Installation and Testing Procedure

Kinder Morgan CO_2 Company, L.P.

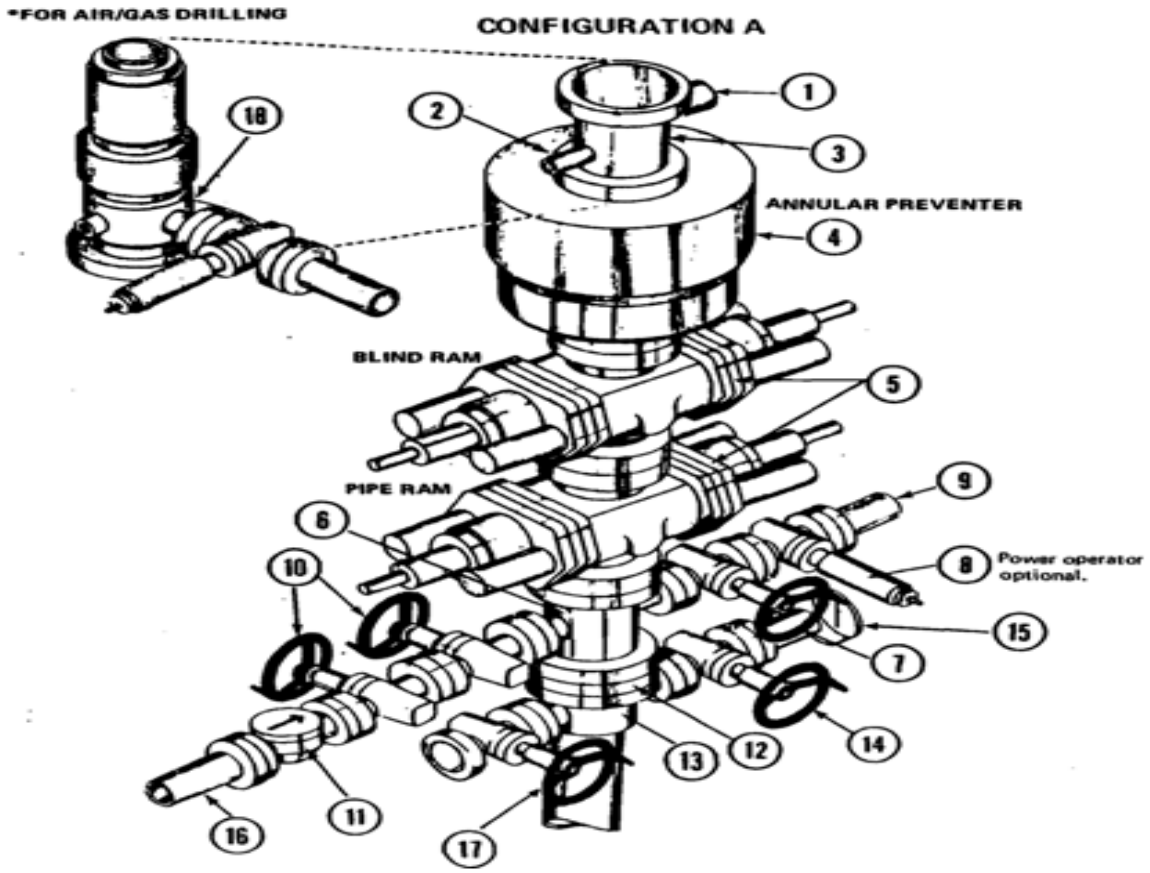
Doe Canyon and Goodman Point Wells

1. **NIPPLE UP ON 13-3/8" X 13-5/8" 3000# SCREW ON WELLHEAD**
2. **INSTALL 13-5/8"X 13-5/8" 3000# SPOOL W/TWO SIDE OUTLET (4" OUTLET & 2" OUTLET)**
3. **INSTALL 13-5/8" 3000# SINGLE HYDRAULIC BOP (NO RAM BLOCK INSTALLED)**
4. **INSTALL 13-5/8"X 13-5/8" 3000# SPACER SPOOL (8" TO 10" LONG)**
5. **INSTALL 13-5/8" 3000# DOUBLE RAM BOP (BLIND RAMS ON TOP, PIPE RAMS ON BOTTOM)**
6. **INSTALL 13-5/8" 3000# HYDRIL ANNULAR BOP**
7. **INSTALL 13-5/8"3000# ROTATING HEAD**
8. **NIPPLE UP FLOW LINES TO ROTATING HEAD**
9. **INSTALL 4" 3000# MANUAL VALVE ON SIDE OF SPOOL**
10. **INSTALL 4" 3000# HCR VALVE ON SIDE OF MANUAL VALVE**
11. **NIPPLE UP HCR VALVE TO 3000# CHOKE MANIFOLD (IF H2S IS EXPECTED A HYDRAULIC SUPER CHOKE SHOULD BE INSTALLED)**
12. **FUNCTION TEST BLIND RAMS, PIPE RAMS, HCR VALVE (USE CLEAR WATER TO TEST AND MAKE SURE ALL BOP's ARE HOOKED UP TO ACCUMULATOR AND ALL RAMS, HYDRIL AND HCR VALVE FUNCTION PROPERLY)**
13. **CLOSE BLIND RAMS AND TEST 13-3/8" CSG & BLIND RAMS TO 300# & 1000# PSI 30 MIN. FOR A TEST NOT UTILIZING A TEST PLUG. (IF A DECLINE OF MORE THAN 10% PERCENT IN 30 MINUTES OCURS, THE TEST SHALL BE CONSIDERED FAILED)**
14. **INSTALL TEST PLUG IN 13-3/8" X 13-5/8" 3000# WELL HEAD (WITH ALL VALVES OPEN BELOW TEST PLUG)**
15. **MAKE SURE BOP's ARE FULL OF WATER AND VALVES SHALL BE TESTED FROM WORKING PRESSURE SIDE DURING BOP TEST**
16. **CLOSE PIPE RAMS (TEST TO 300# PSI FOR 10 MINUTES & 1000# PSI FOR 10 MINUTES WITH NO PRESSURE LOST)**
17. **REMOVE DRILL PIPE WITH TEST PLUG IN PLACE**
18. **CLOSE BLIND RAMS (TEST BLIND RAMS, HCR VALVE, MANUAL VALVE & CHOKE MANIFOLD TO 300# & 3000# PSI 10 MINS)**
19. **OPEN BLIND RAMS, INSTALL DRILL PIPE**
20. **CLOSE HYDRIL (TEST HYDRIL TO 300# PSI & 1500# PSI FOR 10 MINUTES EACH WITH NO LOST IN PRESSURE)**

*******CALL CO&G & BLM FOR ALL BOP TESTS*******

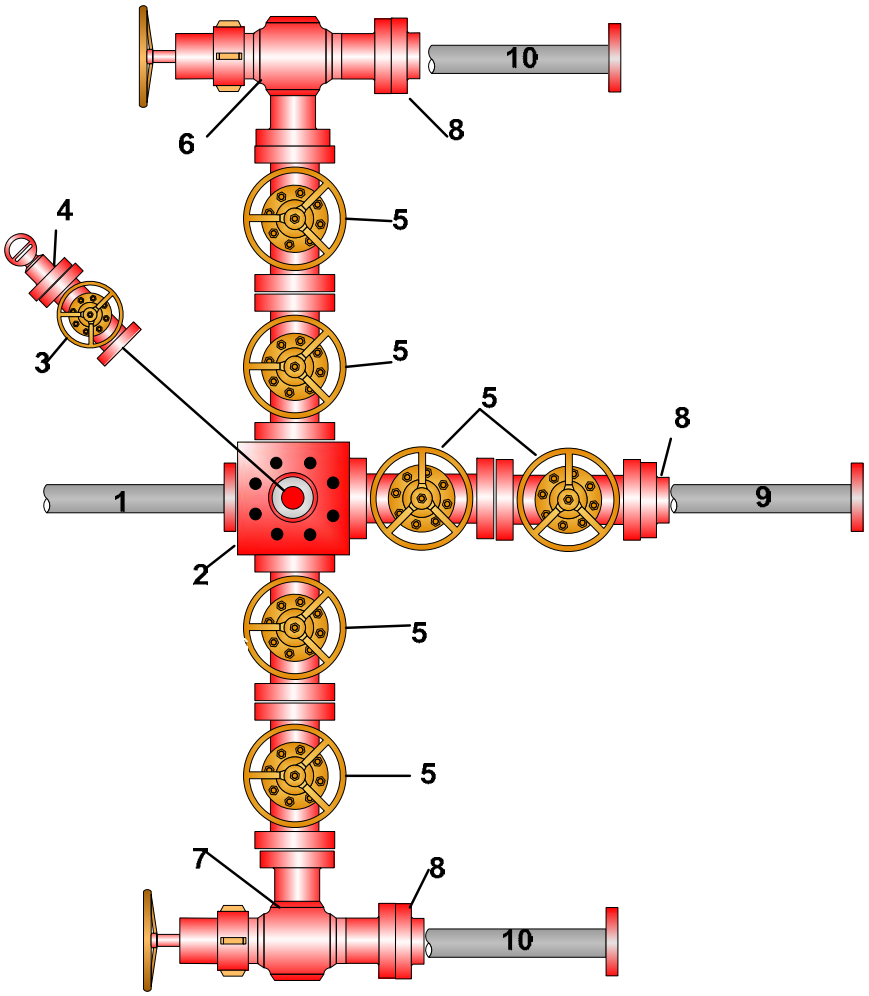
*******ALL TESTS MUST BE CHARTED FOR CO&G & BLM*******

BOP CONFIGURATION



KINDER MORGAN MINUMUM BOP STACK REQUIREMENT			
No.	**Item**	**Min.I.D.**	**Min. Nominal**
1	Flowline		7"
2	Fill up line		2"
3	Drilling nipple		
4	Annular preventer		
5	Two single or one dual hydraulically operated rams		
6	Drilling spool with 2" and 3" outlets		
7	Gate valve	3-1/8"	
8	Gate valve-(power operated optional)	3-1/8"	
9	Line to choke manifold		3"
10	Gate valve	2-1/16"	
11	Check valve	2-1/16"	
12	Wear Flange or Bore Protector		
13	Casing spool		
14	Gate valve	1-13/16"	
15	Compound pressure gauge connector		
16	Kill line to rig mud pump manifold		2"
17	Gate valve (optional)	3-1/8"	
18	Auxulliary Choke line (optional)		3"
19	Flanged control plug or valve (optional)	1-13/16"	
20	Rotating head (optional)		
21	Gate valve (power operated-optional)(optional)	6"	

CHOKE MANIFOLD



1: Line from drilling spool
2: Cross, 4" 5M 4 way x 2" thrd one way
3: Ball Valve 2" LP x 3M
4: Pressure Gauge 2" LP X 6000 #
5: Manual Gate Valve 4" 5M
6: Choke Adjustable 2" 5M
7: Choke Hydraulic 3" 5M
8: Companion Flanges
9 & 10: Lines

BUREAU OF LAND MANAGEMENT
43 CFR 3160

Federal Register / Vol. 53, No. 223
Friday, November 18, 1988
Effective date: December 19, 1988

Onshore Oil and Gas Operations; Federal and Indian Oil and Gas Leases;
Onshore Oil and Gas Order No. 2, Drilling Operations

III. Requirements

A. Well Control Requirements

1. Blowout preventer (BOP) and related equipment (BOPE) shall be installed, used, maintained, and tested in manner necessary to assure well control and shall be in place and operational prior to drilling the surface casing shoe unless otherwise approved by the APD. Commencement of drilling without the approved BOPE installed, unless otherwise approved, shall subject the operator to immediate assessment under 43 CFR 3163.1(b)(1). The BOP and related control equipment shall be suitable for operations in those areas which are subject to sub-freezing conditions. The BOPE shall be based on known or anticipated sub-surface pressures, geologic conditions, accepted engineering practice, and surface environment. The working pressure of all BOPE shall exceed the anticipated surface pressure to which it may be subjected, assuming a partially evacuated hole with a pressure gradient of 0.22 psi/ft.

2. The gravity of the violations for many of the well control minimum standards listed below are shown as minor. However, very short abatement periods in this Order are often specified in recognition that by continuing to drill, the violation which was originally determined to be of a minor nature may cause or threaten immediate, substantial and adverse impact on public health and safety, the environment, production accountability, or royalty income, which would require it reclassification as a major violation.

a. Minimum standards and enforcement provisions for well control equipment.

i. A well control device shall be installed at the surface that is capable of complete closure of the well bore. This device shall be closed whenever the well is unattended.

iii. 3M system:

- Annular preventers*
- Double ram with blind rams and pipe rams*
- Drilling spool, or blowout preventer with 2 side outlets (choke side shall be a 3-inch minimum diameter, kill side shall be at least 2-inch diameter)*

- Kill line (2 inch minimum)
- A minimum of 2 choke line valves (3 inch minimum)*
- 3 inch diameter choke line
- 2 kill line valves, one of which shall be a check valve (2 inch minimum)*

- 2 chokes (refer to diagram in Attachment 1)
- Pressure gauge on choke manifold
- Upper kelly cock valve with handle available
- Safety valve and subs to fit all drill string connections in use
- All BOPE connections subjected to well pressure shall be flanged, welded, or clamped*
- Fill-up line above the uppermost preventer.

vi. If repair or replacement of the BOPE is required after testing, this work shall be performed prior to drilling out the casing shoe.

vii. When the BOPE cannot function to secure the hole, the hole shall be secured using cement, retrievable packer or a bridge plug packer, bridgeplug, or other acceptable approved method to assure safe well conditions.

b. Minimum standards and enforcement provisions for choke manifold equipment.

i. All choke lines shall be straight lines unless turns use tee blocks or are targeted with running tees, and shall be anchored to prevent whip and reduce vibration.

Violation: Minor.
Corrective Action: Install the equipment as specified.
Normal Abatement Period: 24 hours.

ii. Choke manifold equipment configuration shall be functionally equivalent to the appropriate example diagram shown in Attachment 1 of this Order. The configuration of the chokes may vary.

Violation: Minor.
Corrective Action: Install the equipment as specified.
Normal Abatement Period: Prompt correction required.

iii. All valves (except chokes) in the kill line choke manifold, and choke line shall be a type that does not restrict the flow (full opening) and that allows a straight through flow (same enforcement as item ii).
iv. Pressure gauges in the well control system shall be a type designed for drilling fluid service (same enforcement as above).

[57 FR 3025, Jan. 27, 1992]

c. Minimum standards and enforcement provisions for pressure accumulator system.

i. 2M system accumulator shall have sufficient capacity to close all BOP's and retain 200 psi above precharge. Nitrogen bottles that meet manufacturer's specifications may be used as the backup to the required independent power source.
Violation: Minor.
Corrective Action: Install the equipment as specified.
Normal Abatement Period: 24 hours.
ii. 3M system accumulator shall have sufficient capacity to open the hydraulically-controlled choke line valve(if so equipped), close all rams plus the annual preventer, and retain a minimum of 200 psi above precharge on the closing manifold without the use of the closing pumps. this is a minimum requirement. The fluid reservoir capacity shall be double the usable fluid volume of the accumulator system capacity and the fluid level shall be maintained at the manufacturer's recommendations. The 3M system shall have 2 independent power sources to close the preventers. Nitrogen bottles (3 minimum) may be 1 of the independent power sources and, if so, shall maintain a charge equal to the manufacturer's specifications.

d. Minimum standards and enforcement provisions for accumulator precharge pressuretest. This test shall be conducted prior to connecting the closing unit to the BOP stack and at least once every 6 months. The accumulator pressure shall be corrected if the measured precharge pressure is found to be above or below the maximum or minimum limit specified below (only nitrogen gas may be used to precharge):

Accumulator working pressure rating	Minimum acceptable operating pressure	Desired precharge pressure	Maximum acceptable precharge pressure	Minimum acceptable precharge pressure
1,500 psi	1,500 psi	750 psi	800 psi	700 psi
2,000 psi	2,000 psi	1,000 psi	1,100 psi	900 psi
3,000 psi	3,000 psi	1,000 psi	1,100 psi	900 psi

e. Minimum standards and enforcement provisions for power availability. Power for the closing unit pumps shall be available to the unit at all times so that the pumps shall automatically start when the closing valve manifold pressure has decreased to the pre-set level.

f. Minimum standards and enforcement provisions for accumulator pump capacity. Each BOP closing unit shall be equipped with sufficient number and sizes of pumps so that, with the accumulator system isolated from service, the pumps shall be capable of opening the hydraulically-operated gate valve (if so equipped), plus closing the annular preventer on the smallest size drill pipe to be used within 2 minutes, and obtain a minimum of 200 psi above specified accumulator precharge pressure.

g. Minimum standards and enforcement provisions for locking devices. A manual locking device (i.e., hand wheels) or automatic locking devices shall be installed on all systems of 2M or greater. A valve shall be installed in the closing line as close as possible to the annular preventer to act as a locking device. This valve shall be maintained in the open position and shall be closed only when the power source for the accumulator system is inoperative.

h. Minimum standards and enforcement provisions for remote controls. Remote controls shall be readily accessible to the driller. Remote controls for all 3M or greater systems shall be capable of closing all preventers. Remote controls for 5M or greater systems shall be capable of both opening and closing all preventers. Master controls shall be at the accumulator and shall be capable of opening and closing all preventers and the choke line valve (if so equipped). No remote control for a 2M system is required.

i. Minimum standards and enforcement provisions for well control equipment testing.

i. Perform all tests described below using clear water or an appropriate clear liquid for subfreezing temperatures with a viscosity similar to water.
ii. Ram type preventers and associated equipment shall be tested to approved (see item I.D.1. of this order) stack working pressure if isolated by test plug or to 70 percent of internal yield pressure of casing if BOP stack is not isolated from casing. Pressure shall be maintained for at least 10 minutes or until requirements of test are met, whichever is longer. If a test plug is utilized, no bleed-off of pressure is acceptable. For a test not utilizing a test plug, if a decline in pressure of more than 10 percent in 30 minutes occurs, the test shall be considered to have failed. Valve on casing head below test plug shall be open during test of BOP stack.

iii. Annular type preventers shall be tested to 50 percent of rated working pressure. Pressure shall be maintained at least 10 minutes or until provisions of test are met, whichever is longer.

iv. As a minimum, the above test shall be performed:

A. when initially installed:
B. whenever any seal subject to test pressure is broken:
C. following related repairs: and
D. at 30-day intervals.

v. Valves shall be tested from working pressure side during BOPE tests with all down stream valves open.

vi. When testing the kill line valve(s), the check valve shall be held open or the ball removed.

vii. Annular preventers shall be functionally operated at least weekly.
viii. Pipe and blind rams shall be activated each trip, however, this function need not be performed more than once a day.

ix. A BOPE pit level drill shall be conducted weekly for each drilling crew.

x. Pressure tests shall apply to all related well control equipment.

xi. All of the above described tests and/or drills shall be recorded in the drilling log.

Violation: Minor.
Corrective action: Perform the necessary test or provide documentation.
Normal Abatement Period: 24 hours or next trip, as most appropriate.

[54 FR 39528, Sept. 27, 1989]

SECTION 4 – Drilling Equipment, Casing, and Cementing Programs

PROSPECT INFORMATION

The GP #23 will be one of multiple wells to be drilled during the 2011 drilling program at McElmo Dome. The wellplan calls for a 13-3/8" X 9-5/8" casing program, and a full string of 7" 29#, 13-chrome production tubing landed with a packer in the 9-5/8" casing.

WELL OBJECTIVE

The main objectives for the drilling operation on the GP #23 are:

1. Maintain a focused effort by everyone on location to eliminate all accidents.
2. Drill, evaluate, case and complete (horizontal leg of 500' to 2000') the well in less than the approved AFE cost estimate.
3. Run a full string of 9-5/8" casing to 25' below the top of the Leadville formation.
4. Isolate the 9-5/8" casing to surface with high quality cement.
5. Drill the 6.0" pilot hole for formation evaluation and run open hole logs. Plug back the pilot hole up into the 9-5/8" casing with cement. Then dress off the cement to the KOP for the lateral.
6. Drill the 4-3/4" lateral production hole with minimal fluid loss / damage to the formation. The lateral is planned to be drilled using managed pressure drilling techniques if circulation is lost. Underbalanced drilling is a contingency to this plan.
   ****** IF the target formation depth allows a larger radius of curvature then the lateral hole will be upsized to 6.0" when drilled.***
7. Run an open hole completion with 7" 29# 13-chrome tubing and packer assembly as the production string landed in the 9-5/8" casing with the packer set at 8098' TVD/ 8200' MD and run to surface.

LATERAL PROCEDURE

1. The pilot hole will be drilled from 8344' TVD/ 8452' MD – 8719' TVD/ 8836' MD logged, and then be plugged back with cement up inside the 9-5/8" casing shoe. The cement will be drilled out down to hard cement at the planned KOP.
2. The cement plug will be used as a kick off plug for the lateral.
3. Planned lateral KOP is estimated at 8348' TVD/ 8457' MD'.
4. The 4-3/4" lateral hole will be directionally drilled from the KOP to TD. The estimated target interval is from 8319' TVD/ 8427' MD to 8645' TVD/ 8761' MD. A string of 2-7/8" drill pipe will be picked up and the 4-3/4" hole will be drilled to a horizontal section target length of 500' to 2000'. A directional drilling well plan is attached to this prognosis, See Attachment 4.
   - ***The lateral may be upsized to a 6.0" hole if the target formation depth allows for a larger radius of curve.***
5. The lateral section will not contain a production string in the wellbore from TD to the KOP. The lateral is an open hole completion stimulated only with HCL.

POTENTIAL PROBLEMS

The main problems for the GP #23 are the typical problems expected while drilling in the area:

1. **Lost Circulation in the 17-1/2" Surface Hole:** Lost circulation can be expected at any depth while drilling the surface hole. Maintain a clean fresh water system, circulating the reserve pit, while drilling this hole section. Pump LCM pills as required to control the losses. No losses in surface hole were encountered on offsets.

2. **Gas Kick from the Desert Creek @ 6466' TVD / 6405' MD:** Gas kicks have been encountered while drilling the Desert Creek formation. A planned mud weight schedule will be utilized to help minimize the chance of kicks in this section.

3. **Gas and H2S from the Killer Shales:** The geo-pressured shales on down will contain varying amounts of gas and associated H2S. Circulate the salt water portion of the reserve pit to remove excess gas. Pre-treat the mud using H2S scavenger for H2S contamination.

4. **Stuck Pipe in the Killer Shales:** The Killer Shale is a high pressure, low volume shale which "flows" into the well causing stuck pipe. A list of recommendations for drilling the Killer Shale, titled "Paradox Salt Drilling Procedure", (See the Attachment 2). The recommendations have proven to be very successful in recent drilling programs and are strongly recommended they be followed. Educate the drillers prior to drilling the killer shale and discuss in detail the procedure for drilling the shale.

5. **Lost Circulation in the Lower Hermosa:** Lost circulation problems have been encountered during the production casing cement job in the Lower Hermosa. The fracture gradient is estimated at 12 ppg. The problem has been successfully eliminated with single stage foam cementing.

6. **Pilot Hole Cementing:** The pilot hole cement plug should not be over 150 sks. If the first plug does not fill into the casing, spot a second plug which does not exceed 50 sks. Over-displacement is reservoir-dependent.

GENERAL DRILLING PROCEDURE

A 24" hole will be drilled and a 20" conductor pipe will be set at ~80' TVD/MD prior to moving in the drilling rig. It is necessary to rig up a 21-1/4" 3M annular preventer with diverter to drill the surface hole.

A 17-1/2" hole will be drilled from surface to 3565'TVD/MD, located approximately ~125' below the top of the Cutler. The casing point is selected based on formation picks from offset well logs. A cross-section was developed for the top of the Cutler from the offset well data. This data is presented in Attachment 3, Figure 1&2. The casing point for the GP #22 & GP #23 need to be offset on the pad to prevent communication between the surface casing shoes. A Gyro will be run at TD of the surface hole as a tie in to the intermediate directional hole. A string of 13-3/8" surface casing will be run to 3565'TVD/MD with cement circulated to surface. A Temperature Survey will be run if cement is not circulated to surface. The 13-3/8" surface casing will protect the groundwater in the area and isolate the Shinarump formation. After the casing is run and cemented, screw on the 13-3/8" X 13-5/8" 3M casing head housing and nipple-up the 13-5/8" 3M BOP. Wait on cement 12 hours and pressure test the casing to 1500 psi and the BOP's to their rating prior to drilling out. Drill to 3600' TVD/MD for the KOP using a 12-1/4" bit.

A 12-1/4" hole will be drilled out directionally from the KOP point of ~3600'TVD/MD to a maximum angle of 12.5 degrees. Freshwater will be utilized to drill the 12-1/4" hole down to 100' above the Desert Creek formation. A salt saturated brine will be utilized from 100' above the Desert Creek formation to the setting depth of the 9-5/8" casing. The attached directional plan, See Attachment 4, specifies an azimuth of 262 degrees from the surface location. No wireline logs will be run at casing point. The directional tools will be laid down at the12-1/4" hole section total depth. A mixed string of 9-5/8" P110 and 300' of 13-Chrome casing on bottom will be run and set 25' into the Leadville. The 9-5/8" casing will be cemented back to surface in one stage with foam cement. A CBL log will be run. The well integrity is dependent on the casing being handled and run correctly. The 300' of the 9-5/8" 13-Chrome will require special handling and is to be handled according to the procedures specified on site.

A 6.0" pilot hole will be drilled out with a bit and BHA from the 9-5/8" casing to 400' below the Leadville top to a depth of 8719' TVD/8836' MD. The pilot open hole will then be logged from TD to 500' inside the 9-5/8" casing shoe. A directional sub will be placed on the logging suite and used to get the directional angle and azimuth of the pilot hole total depth. Planned pilot hole TD location is 8719' TVD/ 8836' MD and 1679' FNL & 1528' FEL. The pilot hole will be plugged back with cement and the KOP dressed off 5' below the casing shoe.

A 4-3/4" lateral hole will be drilled out from the KOP to TD. The build rate and target elevation of the lateral will be determined from pilot hole log analysis. Target zones are typically 100' to 150' below the top of the Leadville.

- *****IF the target formation depth allows for a larger radius of curve then the lateral hole will be upsized to 6.0".***

A mixed string of 2-7/8" and 3-1/2" DP will be picked up and a 4-3/4" hole will be drilled to a horizontal section operational target range of 500' to 2000'. A directional drilling plan is attached to this prognosis, See Attachment 4

SURVEY DETAIL

Inclination surveys:

- 500' intervals from spud to the 13-3/8" casing point
- A Gyro will be run at TD of the surface hole as a tie in to the intermediate directional hole.
- MWD surveys will be taken in the 12-1/4" hole to the 9-5/8" casing point TD.
- Run a directional sub in the open hole log suite when open hole logs are run in the pilot hole section.
  - Directional company will use the Gyro to orient for kick off and assume KOP 5' below 9-5/8" csg point
  - Leadville target depth will be picked from Gamma & the CAL/LDT/CNL/GR/DLL/MLL logs run in 6.0" pilot hole
- A gyro survey will be run at KOP to orient the directional tools and, EM directional surveys only will be taken while drilling the lateral.
- EM surveys will be used due to minimal returns and a lack of a good MWD signal while drilling the lateral section.

CASING DETAIL **CASING RATING / DESIGN FACTORS**

Size	Interval	Description	Tension D.F. 1.6	Collapse D.F. 1.0	Burst D.F. 1.33
CASING	Depths (MD)		1000 lbs/D.F.	1000 lbs/D.F.	1000 lbs/D.F.
13-3/8"	0' – 1980' MD	54.5# K-55 STC	547 / 1.81	1130 / 1.27	2730 / 1.36
13-3/8"	1980' – 3080' MD	61.0# K-55 STC	633 / 2.78	1540 / 1.09	3090 / 1.53
13-3/8"	3080' – 3565' MD	68.0# K-55 STC	718 / 3.85	1950 / 1.20	3450 / 1.70
9-5/8"	0' – 6363' MD	43.5# P110 STC	1106 / 2.28	4430 / 1.3	8770 / 3.0
9-5/8"	6363' – 8152' MD	53.5# P110 STC	1213 / 2.95	5310 / 1.0	9440 / 3.33
9-5/8"	8152' – 8452' MD	47.0# CR13 FOX	1086 / 1.33	4750 / 1.12	6870 / 2.46
TUBING					
7" tubing	0'- 8200' MD	29# 13CR STL	676 / 1.43	7020 / 1.55	8160 / 5.07

CASING DESIGN ASSUMPTIONS:

13-3/8" Surface	Tension:	Buoyed weight in 8.4 ppg fresh water
	Collapse:	Full evacuation w/ 9.0 ppg on outside
	Burst:	2000 psi shut in pressure at the surface
9-5/8" Production	Tension:	Buoyed weight in 10.0 ppg brine
	Collapse:	Full evacuation in 10.0 ppg brine for 47#
	Burst:	2500 psi shut in pressure at the surface with 10.0 ppg inside and 9.0 ppg outside

CEMENTING PROCEDURE

13-3/8" SURFACE CASING => 1-stage

Use API 13-3/8" drift on location

Shoe Type:	Regular Guide Shoe
Collar Type:	Regular Float collar, 40' above shoe
Centralizers:	21 required => Place centralizers on shoe joint, and every 4th joint to surface
Flag Joints:	None Required
Other Equipment:	Stop clamp, thread lock the bottom 2 joints of casing + all float equipment, top and bottom plugs
Reciprocate:	Not required, limit of 204,130 lbs based on 54.5#, 61#, 68# K-55 STC
Preflush:	40 bbls => Fresh water @ 10 bbls / min
Lead CMT Slurry:	2355 sks => Light Premium => 5 lbm/sk Gilsonite (LC) + 0.125 lbm/sk Poly E Flake (LC)
Specifications:	12.4 ppg / 1.868 ft3 / sk / 9.378 gal / sk
100% Excess	
Tail CMT Slurry:	385 sks => Premium Cement Class G => 94 lbm/sk Standard Cement + 0.125 lbm/sk Polyflake (LC)+ 0.1% Halad R-9 (Fluid Loss)
Specifications:	15.6 ppg / 1.18 ft3 / sk / 5.19 gal / sk
100% Excess	
Displacement:	~537.9 bbls => Fresh Water @ 8 - 10 bbls / min
Volume Based:	All volumes listed are estimates only, for calculations use 17-1/2" X 13-3/8" annulus + 100% excess + shoe joints + ~100 sks circulated @ surface, attempt to circulate cement to surface, excess volume is based on experience.
Pressure Limits:	2000 psi while pumping or bumping plug due to collapse rating of the 13 3/8" 68# K-55 STC w/ a 1.0 SF
Test Required:	Lab test w/ field water, want a 2 hr minimum @ 105° BHST
Temperature Survey:	Required if cement does not circulate at surface, call Todd Gentles @ (713) 369-8487 or 713-249-2805 for details
Wellhead:	Install section "A" assembly
Special Note:	1. Report the volume of cement circulated to the surface. 2. WOC for a minimum of 12 hours prior to drilling out. 3. NU 3M - 13-5/8 - BOP and test to rating. 4. Test the casing to 500 psi. 5. Cement Co. => Send copy of pressure charts, job log and summary to: Kinder Morgan, Attn: Todd Gentles, 500 Dallas, Suite 1000, Houston, TX 77002.

CEMENTING PROCEDURE

9-5/8" PRODUCTION CASING => Single stage foam

Shoe Type:	Differential Fill Float Shoe
Collar Type:	Differential Fill Float Collar, 80' above shoe
Centralizers:	69 required => 10' above shoe and every other joint
Flag Joints:	Cross overs from 43.5# to 53.5# and to the 47# Chrome will serve as flag joints
Other Equipment:	Thread lock the bottom 3 joints of casing + all float equipment.
Reciprocate:	If required, limit @ 390,209 lbs
Preflush:	40 bbls => Fresh water @ 10 bbls / min 10 bbls => Water Spacer 20 bbls => Mud flush 10 bbls => Fresh water
Foamed Lead Slurry: Specifications:	2230 sks => 50/50Poz Standard (0.2% Versaset + 0.1% FDP-D766-05 + 2% Zoneseal 4000 13.0 ppg / 1.44 ft3 / sk / 6.7 gal / sk 50% Excess
Tail Slurry: Specifications:	350 sks => 50/50 Poz Standard 13.0 lbm/sk + 0.1% HR-5 13.5 ppg / 1.28 ft3 / sk / 5.73 gal / sk 50% Excess
Cement Cap Slurry: Specifications:	100 sks => Standard Cement 94lbm/sk + 2% CaCO3 + 5% Cal-Seal 15.6 ppg / 1.20 ft3 / sk / 5.26 gal / sk
Displacement:	~615.5 bbls freshwater @ 8 - 10 bbls / min
Volume Based:	Use 13" hole diameter to calculate cement volume
Test Required:	Lab test w/ field water, 3.25 hr minimum @ 200° BHST Lab test w/ field water, 3.50 hr minimum @ 170° BHST
Temperature Survey:	Required if cement does not circulate at surface, call Todd Gentles @ (713) 369-8487 or 713-249-2805 for details
CBL Survey:	A CBL will be run after setting and cementing of this casing.
Wellhead:	Install section "B" assembly

Special Note:

1. Circulate 3 annular volumes prior to cementing @ maximum rate possible.
2. Displace cement at the maximum rate possible.
3. Report volumes of cement circulated.
4. Report any circulation problems on the morning report.
5. Cement Co. => Send copy of pressure charts, job log and summary to:
   Kinder Morgan, Attn: Todd Gentles, 500 Dallas, Suite 1000, Houston, TX 77002.

CEMENTING PROCEDURE
6.0" PILOT HOLE 8344' TVD/ 8452' MD– 8719' TVD / 8836' MD

- The pilot hole section will be plugged back using 150 sacks of cement.
- The cement will be placed across the open hole section through 2-7/8" fiberglass pipe with a Tubing Release Tool (TRT) suspended in the open hole section from the drill string.
  - If the first plug does not fill up into the 9-5/8 " casing, the cement will be dressed off and a second plug will be spotted in the same manner and which does not exceed 50 sacks.
- The cement plug will then be dressed off with a bit down to hard cement to the planned KOP for the lateral.

Preflush:	20 bbls => Water Spacer
Lead Slurry: Specifications:	150 sks => Premium Cement (0.3% Clay Control + 0.3% HR-5 Retarder + 0.15% HR-25 Retarder 17.3 lb/gal / 0.96 ft3 / sk / 3.54 gal / sk
Volume Based:	Use 6.0" hole diameter to calculate cement volume (gauge + 100% for excess)

SECTION 5 – Mud Program

The mud program utilizes lessons learned from drilling previous McElmo Dome vertical and lateral wells.

No oil based mud will be used drilling this well.

A full list of possible Onsite Rig Site Location Chemical List is included, See Attachment 5.

Mud General Summary Table

Depth Feet	Weight Lb/gal	Vis. Sec./Qt.	Filtrate mls	pH	PV cps	YP lbs/100ft²	Undissolved Solids %
Spud w/ FW using HV / DRILLING PAPER sweeps @ 100'; Circulate thru reserve pit to control solids							
0' – 3,565' MD	8.3 - 8.4	27 - 28	No Control	8.0 – 9.0	1-1	0-0	<1
3,565' – 6,363' MD	8.3 - 8.5	27 - 28	No Control	8.0 – 10.0	1-2	0-1	<1
Displace Freshwater with Saturated NaCl Brine / DEXTRID at 6,363' (100' above the desert creek)							
6,363' MD - 6,970' MD	10.0 - 10.2	28 - 30	< 20	9.5 - 10.5	1-4	0-1	<1
6,970' MD – 8,452' MD	10.0 - 10.3	28 - 30	< 12	10.5 -10.8	1-4	0-2	<1
Pilot: Displace Sat NaCl w/ Freshwater; Use FILTER CHEK and DEXTRID for API FLC							
8,452' MD – 8,836' MD	8.3 - 8.4	28 - 30	< 12	9.5 – 10.0	1-3	0-1	< 1
Curve and Lateral: Freshwater and Nitrified / Misted Mineral Oil / BARARESIN-VIS Sweeps							
8,836' MD –10,518' MD	8.3 - 8.4	28 - 30	< 20	9.5 – 10.0	1-3	0-1	< 1

Surface - 3565' TVD/ 3565' MD (13-3/8" Casing Point):

Hole Size: 17-1/2"
Mud Type: Fresh water
Issues: Hole Cleaning, Loss Circulation

Spud the 17-1/2" surface hole with fresh water and circulate the fresh water section of the reserve pit. Maintain the fluid as clean as possible to help prevent lost circulation. Use paper to control any seepage and pump LCM sweeps if lost circulation becomes a problem. Pump viscous sweeps if tight connections are encountered and prior to running the 13-3/8" casing.

- Pre-mix 40 bbls high viscosity mud in slugging pit using ±12-15 ppb AQUAGEL GS, 0.3 ppb Soda Ash, 2-3 ppb DRILLING PAPER and 2-3 ppb FIBER PLUG to be used for hole sweeps.
- Add BARACAT to the freshwater reserve pit at 5 gal per 200' drilled to increase flocculation and settling of solids.
- Insert corrosion coupon in drill string (top of DC) at beginning of interval. Retrieve coupon before setting casing, ideally with a minimum of 24 hours exposure.
- Circulate 20 bbl HV pre-mix AQUAGEL Gold Seal / LCM sweep each 60 ft drilled.

Note: Possible lost returns during the surface portion of the hole. Circulating HV / LCM sweeps at 60' intervals starting from surface to help to establish returns effectively. Frequency can be adjusted based upon hole conditions.

3565' TVD/3565' MD - 6305' TVD/ 6363' MD (100' above the Desert Creek):

Hole Size: 12-1/4"
Mud Type: Fresh water
Problems: Seepage, lost circulation, hole cleaning

Directionally drill out of the 13-3/8" casing with clean fresh water. Circulate the reserve pit to keep solids to a minimum. Sweep the hole as required for hole cleaning and / or lost circulation problems. Use paper to control any seepage problems.

Add 5 gallons of BARACAT at shaker each 200 feet of new hole drilled to help flocculate and settle drill solids.

Circulate HV / LCM sweeps once/hour, or 100' max new hole drilled. Use pre-mixed gel mud w/ ±5 ppb Drilling Paper for hole cleaning and seepage.

6305' TVD/ 6363' MD – 8344' TVD/ 8451' MD (25' into the Leadville / 9-5/8" Casing Point)

Hole Size: 12-1/4"
Mud Type: Salt saturated brine
pH: 11+, as required to control H2S
Problems: H2S, killer Shale gas influx, directionally drilling through Paradox Salt, hole cleaning, lost circulation

Displace the fresh water system with salt saturated brine fluid system 100' above the Desert Creek formation. Circulate all returns through the brine salt water section of the reserve pit to maintain a clean fluid and to assist in breaking out any entrained gas.

Pre-treat the mud for H2S prior to drilling the Shale.

In the event of an encounter with H2S then the H2S plan will be implemented immediately, (see Attachment 2).

- Onsite monitors, alarms, respirator packs, safety personnel, windsocks, and designated safe areas will be on the location as part of the contingency plan.

Follow the guidelines for drilling the Killer Shale, titled "Paradox Salt Drilling Procedure", (see Attachment 1).

DETAILS:

- Check all brine deliveries for potential H2S. Pre-treat trucks if necessary
- Displace freshwater with 9.9 – 10.0 ppg NaCl Brine. Make sure brine is saturated (188k ppm).
- Circulate 20 bbl HV / LCM sweeps every 60-90 ft or based on hole conditions using 12 ppb ZEOGEL w / 2-3 ppb DRILLING PAPER and 2-3 ppb FIBER PLUG for hole cleaning and seepage.
- Add 1 – 3 ppb DEXTRID and 1ppb FILTER-CHEK to gradually reduce API Fluid Loss to 12-14 cc range by interval TD.
- Add 0.10 – 0.25 ppb LIQUI-DRIL to reduce adhesion of salt crystals on metal
- Add BARABRINE DEFOAM as needed for foam.
- Below 6,300':
  - Treat system with 1 - 2 lb/bbl ZINC LIGNOSULFONATE (H2S scavenger)
  - Add 0.5 ppb OXYGON oxygen scavenger
  - Run corrosion coupons in drill string and adjust OXYGON as necessary.
  - Keep pH above 11.0 with Caustic Soda
  - Maintain API Fluid Loss at 12-14 cc range with DEXTRID and FILTER-CHEK
- Drilling Paradox Salt & Killer Shales
  - Keep annular velocity at minimum 200'/min
  - Drill a maximum of 5' of salt or a 1-2' of shale before picking up 20' and reaming back to bottom.

- Do not shut down and leave the DP still while drilling Paradox Salt- could result in stuck pipe.
  - Surveys
  - Testing BOP's
  - Routine rig service

- Spot HV / LCM / high pH ZINC LIGNOSULFONATE pill in open hole from TD to above Desert Creek before tripping out to run 9-5/8" casing.

Pilot Hole (8344' TVD/ 8452' MD – 8719' TVD/ 8836' MD)

Hole Size: 6.0"
Mud Type: Fresh water / Baradril-N Sweeps
pH: 9-9.5 with caustic soda
Problems: LC, Hole cleaning

Displace the saturated brine system with a 8.33 #/gal freshwater system to drill the pilot hole section.

KOP For Lateral (8348' TVD / 8457' MD – 8489' TVD/ 10,518' MD) with maximum Lateral Length 2000'):

Hole Size: 4-3/4" *or 6.0"*
Mud Type: Fresh water / Baradril-N Sweeps
pH: 9-9.5 with caustic soda
Problems: LC, Hole cleaning, Lubricity

Build 400-500 bbls Freshwater/Bardril-N for sweeps. Expect complete losses while drilling the lateral. Drill blind with freshwater at normal pump rates. Circulate 20-30 Bardril-N sweeps each stand drilled to keep cuttings moving up the hole. Add Enviro-Torque with each sweep for lubricity. Circulate 10 bbls 15% BDF-408 while drilling to prevent cuttings bed build-up.

If circulation is lost and unable to be regained, nitrogen will be added to the mud system to help lift the fluid for circulation and cuttings movement. A specific description of this process is discussed in Section 10 of this prognosis.

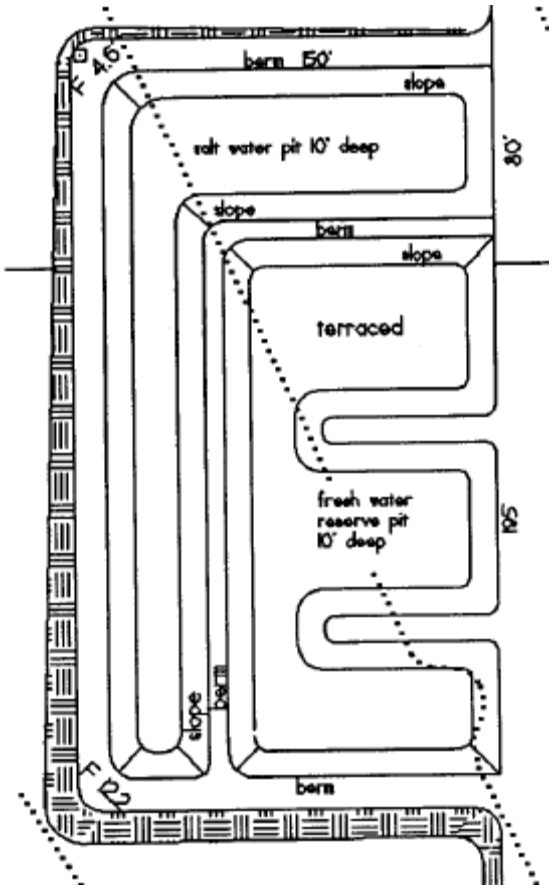
DETAILS:

- Add 3 ppb DEXTRID and 0.25-0.50 ppb PAC-R to reduce Fluid loss to 12 cc range
- Use 5-10 ppb N-SEAL (acid soluble spun mineral rock) if loss returns are encountered.
- Drill blind if complete losses occur in Leadville. Continue pumping freshwater while drilling blind.
- Keep hole full with water on trips by filling backside.
- Consider closing in the surface volume for more efficient treatment of the fresh water.
- Keep mud weight at minimum to avoid loss circulation.
- Pre-mix 100 bbls Mineral oil with 12-15 ppb BARARESIN-VIS and plumb storage tank to misting tank.
- Drill interval using freshwater supplemented with HOWCO SUDS STICKS. Follow with nitrogen-assisted misting of 5-10 bbl Mineral Oil / BARARESIN-VIS sweeps to drill curve and lateral.
- Drill blind if complete losses occur in Leadville. Continue pumping freshwater and MO sweeps.
- Keep hole full with water on trips.
- Consider closing in the surface volume for more efficient treatment of the fresh water.
- Keep mud weight at minimum to avoid loss circulation.

SECTION 6 DISPOSAL AND RECLAMATION

A. Well Site Layout

Drilling Fluids pit layout



1. Prior to rigging up, a one-foot high berm will be constructed around the perimeter of the well pad to prevent storm water runoff and contain any spills. Alternatively, a lined sump pit may be utilized to contain such fluids.

2. The freshwater containment pit will be constructed in a "E" shaped design (as shown above) with the fresh water containment pit in the middle.

3. The brine containment pit will be constructed in the "L" shape as shown above outside the freshwater pit. Separation of the pits allows for contained brine drilling fluid system while drilling the Paradox Salt and the killer shales formations.

4. The drilling fluids pits will be constructed with at least one-half of the capacity in cut, and will be sealed to prevent leakage of the fluids. To insure containment of drilling fluids in the pit, the inside of the pits will be lined with 30 mil plastic. The 30 mil exceeds the requirement of a 12 mil liner. The bottom of the pit will be smooth and free of any sharp rocks. If the pit has a rocky bottom, it will be bedded with material to avoid the possibility of puncturing the liner.

    - A 2-foot freeboard will be maintained in the pit at all times.
    - All oil or floating debris will be removed from the pit immediately after the drilling phase of the well.

5. Three sides of the reserve pit will be fenced with four strands of barbed wire before drilling starts. The fourth side will be fenced as soon as the drilling is completed.

B. Methods of Handling Waste Material

1. Produced water will either be re-used at another drill site in connection with this project or hauled to the Class I non-hazardous disposal well (MWD-1) located 2800' FSL & 600' FEL Section 16, 37N, R17W in Montezuma County, Colorado.

2. Any produced water containing significant quantities of produced oil will be treated and the oil sold, recycled, or disposed of in a state-licensed treatment facility.

3. Well area and lease premises will be maintained in a workmanlike manner with due regard to safety, conservation and appearance. All wastes other than sewage, drilling fluids and drill cuttings will be contained in a skid-mounted refuse container/trailer. These solid waste and garbage resulting from drilling operations will be hauled to the Montezuma County landfill or any other landfill permitted for this waste type.

4. Sewage from onsite sanitary facilities will be stored in an onsite, Montezuma County-approved closed system and then hauled under existing permit to the licensed sewer treatment plant in Dolores, CO.

5. Drilling fluids will be recycled whenever practical. The following will be conducted to accomplish the task of handling the drilling fluids and drill cuttings waste materials.

    a. The free liquids from the reserve pit will be removed via vacuum truck. The liquids will either be hauled for reuse to another drilling location in connection with this project or disposed of in the Kinder Morgan disposal well; MWD #1 located at 2800' FSL and 600' FEL Section 16, T37N, R17W in Montezuma County, CO.

    b. Pit design keeps fresh water cuttings separated from the salt formation and brine water cuttings. The contents of each pit will be tested separately using the COGCC rule 910-1 procedures. Proper BLM notification will be given in advance for the purpose of witnessing any sample gathering. The sample test results will dictate the disposal methods for the cuttings.

        1. Regardless of test results, all cuttings from both the fresh water and brine containment pits will be removed and kept separate. The temporary containment and storage method of the cuttings for the purpose of drying and waiting on test results will be determined at a future date and the procedure will be reviewed and approved prior to use by the proper BLM authorities. Some of the possible options include but are not limited to; centrifuge dewatering, steel tanks, concrete base and bermed containment area on Kinder Morgan property, shallow bermed synthetically lined drying area or other options being investigated.

        2. The liners from each containment pit will then be removed and disposed of at an approved solid waste disposal site. The site of preference being the Montezuma County Land Fill located south of Cortez, CO.

        3. If regulatory limits are exceeded for either of the cuttings they will be dried and transported to a licensed land farm for non-hazardous material. Site of preference will be 'Contract Environmental Services Inc. (CES)' located ¼ mile west of the Hovenweep NM off of Road 10 in Utah. The CES main office is located at 410 N Auburn Ave., Farmington, NM. 87401.

        4. If regulatory limits are met for either of the cuttings, they will be dried and buried on site in their original containment pit and mixed with the native soil recovered from the original pit construction.

SECTION 7 – EVALUATION PROGRAM

No open hole logs will be run in the surface hole. A CBL log will be run after the 9-5/8" casing string is set and cemented to show the quality of the cement job.

A measure while drilling (MWD) tool with gamma ray (GR) capability will be run from the surface casing shoe at 3565' MD/TVD to the 9-5/8" chrome casing point. GR response, mud logs, and penetration rate will be used to determine the top of the Leadville formation and final casing point. A CBL log is required as per the APD conditions of approval.

Mud logging will be done from 5500' TVD/ 5539' MD to the interval TD. Samples of the cuttings from the open hole section will be collected while drilling the 12-1/4" hole section and will be examined and logged for formation characteristics by the mud logger.

- The samples will be taken every 10' in the 12-1/4" hole from 5500' TVD/ 5539' MD to the total depth to determine the formation type and also aid in selecting a casing shoe depth.

The 6" pilot hole will be logged with three runs as follows:

1st run	Density with PEF, Gamma Ray, Caliper data 9' from bottom
2nd run	Neutron, Gamma Ray – data 4' from bottom
3rd run	Laterolog Resistivity, Microresistivity, Gamma Ray- data 3' and 13' from bottom

Mud logging will be done in the lateral. Samples of the cuttings from the lateral open hole section will be collected while drilling the interval and will be examined for formation characteristics.

- The samples frequency will be every 10.0 feet while drilling the curve and lateral.

No cores or formation testing will be done in any hole section in this well.

SECTION 8 – EXPECTED PRESSURES AND IDENTIFIED HAZARDS

BOTTOM HOLE PRESSURE

The Leadville formation bottom hole pressure is ~ 2,000 psi in the Goodman Point area. Given the well depths of approximately 9000', a fresh water column provides approximately 3,900 psi for well control. The anticipated formation pressure for the formation underlying the Leadville which will be penetrated by the pilot hole is estimated to be less than ~3900 psi. A disposal well MWD #1 was deepened into the formation and experienced loss of circulation while drilling with a freshwater system which equates to a formation pressure of <3900 psi..

H2S POTENTIAL

H2S is expected to be circulated to the surface during the drilling of the Killer Shales located within the Paradox Salt interval located at 6588' TVD/6653' MD to the base of the Paradox Salt at 7815' TVD/7910' MD. The H2S Contingency Plan, See Attachment 1, that was used in the previous programs has been updated and revised and will be in force. All the necessary precautions, drills, and training will be done to protect personnel on location. H2S monitors and safety equipment will be on location and operational prior to drilling the section and remain until rig release.

SECTION 9 COMPLETION PROGRAM

- The completion for the lateral will be an open hole completion stimulated with 28% hydrochloric foamed acid to clean up the formation.
- No casing will be run in the lateral section from TD up to the KOP.
- 13-Chrome tubing will be run from surface and set in the 9-5/8" casing in the well.
- Zone for the completion is the Leadville interval targeting the CO2 reserves for production.

SECTION 10 – Other Items

LOST CIRCULATION CONTINGENCY PLAN

Circulation may be lost in the 4-3/4" horizontal production hole. In this situation, managed pressure drilling techniques will be implemented. A normal fresh water fluid column of water is approximately 3,500 psi downhole pressure, and the reservoir pressure is 2,000 psi - therefore an overbalanced condition exists. The fracture gradient of the formation is estimated at 0.6 to 0.7 psi/ft, which equates to approximately 4,800 to 5,600 psi downhole pressure, which indicates fractures are not being induced; however, when a high porosity zone is encountered in the Leadville, the pore volume exists to take the fluid at the applied hydrostatic pressure. At this point, there is a high probability of sticking drill pipe as the cuttings flowing up the annulus immediately fallback.

A nitrogen managed pressure/underbalanced drilling package will be on standby on location while drilling the curve and lateral should this situation occur. The nitrogen will be added into the mud system to lighten and regain circulation in a managed pressure scenario. Managed pressure/underbalanced drilling equipment will be used to handle the return flow of nitrogen and any influx of CO2 gas through a separator and vent stack. Well control is maintained by reducing or stopping the flow of nitrogen, which will kill the well. A dedicated rig pump and kill line are also hooked up and ready to boost the water flow if needed. Well control is also a critical part of the managed pressure drilling process; the electromagnetic (EM) tool has a pressure while drilling (PWD) sensor which feeds into the managed pressure drilling control system. The bottom hole pressure is constantly monitored to ensure the fluid column is sufficient to control the well and is used to adjust the water and nitrogen mix to maintain circulation while drilling.

In the event that the managed pressure/underbalanced system does not help regain circulation and carry cuttings out of the hole, the lateral will be stopped short of the maximum target length of 2000'.

The reason for attempting to extend the lateral length (past the point where circulation is lost) is to decrease well decline, improve success rate, and improve well productivity, which will ultimately decrease the number of infill wells in the future.

Well Prognosis Overview

This well prognosis is organized with ten sections to provide the required BLM data set for evaluating and approving an APD.

1. Estimated Tops of Important Geologic Markers and Formations.

2. Estimated depths at which top and bottom of the anticipated water (particularly fresh water), oil, gas, or other mineral-bearing formations are expected to be encountered and the lessee's or operator's plan for protecting such resources.

3. Lessee's or operator's minimum specifications for pressure control equipment to be used and a schematic diagram thereof showing the sizes, pressure ratings, (or API series), and the testing procedures and testing frequency.

4. Any supplementary information more completely describing the drilling equipment and casing program.

5. Type and characteristics of the proposed circulating medium to be employed in drilling the quantities and types of much and weighting material to be maintained , and the monitoring equipment to be used on the mud system.

6. Drilling Fluid and Cuttings Disposal and Reclamation.

7. The anticipated type and amount of testing, logging, and coring.

8. The expected bottom hole pressure and any anticipated abnormal pressures, temperatures, or potential hazards, such as hydrogen sulfide, expected to be encountered, along with contingency plans for mitigating such identified hazards.

9. The Completion Program.

10. Other Items in Section 10, describing the Lost Circulation Contingency Plan.

Attachments are referenced in the sections of the document.

1. **H2S Contingency Plan**
2. **Paradox Salt Drilling Procedure**
3. **Cross Section**
4. **Directional Well Plan**
5. **Onsite Chemical Inventory Reference List**

CONTACT	Office	Cell	Home
Drilling Director – Doug Frederick	**713-369-9208**	**281-433-2333**	
Operations Drilling Manager- Todd Gentles	**713-369-8487**	**713-249-2805**	**713-249-2805**
Geologist – Gerry Greer	**713-369-8995**	**832-515-4325**	**281-353-3704**

APPROVAL

_____

Douglas A. Frederick
Drilling Director
Kinder Morgan CO2 Company, L.P.

ATTACHMENT 1

H2S Contingency Plan

I. INTRODUCTION H2S is a toxic, poisonous gas that could cause death or injury. The objective of this contingency plan is to provide an organized plan of action for alerting and protecting the public from H2S exposure in the event a potentially hazardous volume is accidentally released to the atmosphere. This plan should be activated immediately if any such release occurs. The Drilling Superintendent is responsible for initiating and carrying out the plan.

II. INDIVIDUAL RESPONSIBILITIES

It is the responsibility of all personnel on the location to familiarize themselves with the procedures outlined in this contingency plan.

A. All Personnel:
   1. Responsible for his assigned safety equipment.
   2. Responsible for familiarizing himself with the location of all safety equipment.
   3. Responsible for reporting any indications of H2S to those in the area and to a supervisor.

B. Drilling Superintendent:
   1. Responsible for thoroughly understanding and seeing that all aspects of this contingency plan are enforced.
   2. Responsible for implementing all phases of this contingency plan.
   3. Responsible for keeping a minimum of personnel on the location during expected hazardous operations.
   4. Responsible for coordinating all well site operations and communications in the event that an emergency condition develops.
   5. Responsible for ensuring that all visitors receive an H2S Safety Orientation. A visitor's log will be maintained as well as a list of all personnel on the location after drilling has progressed to the suspected H2S formation.

III. LOCATION LAYOUT

A. The location of at least two pre-determined safe areas to assemble at in the event of an emergency. These locations should be located 180 degrees to one another, and in the direction of the prevailing winds.

B. H2S rig monitor with three (3) heads. One located at the bell nipple, one located at the shale shaker, and a third one on the rig floor. Indicate here any other additional H2S detector locations for this well:

   Type: Location:

   Type: Location:

C. The location and type of all air masks. Self-contained breathing apparatus for use by rig personnel will be kept in the following location(s):

   Type: 1-30 Min. Rescue Unit Location: Company Man's Trailer

   Type: 1-30 Min. Rescue Unit Location: Tools Pusher's Trailer

   Type: 2-30 Min. Rescue Units Location: Briefing Area #1

   Type: 2-30 Min. Rescue Units Location: Briefing Area #2

   Type: 5-5 Min. Escape Units Location: Rig Floor

   If a cascade system is utilized, indicate the locations(s).:

   Type: Location:

   Type: Location:

D. The location of windsocks or streamer. The wind direction indicators for this well will be located at:

   Type: Windsock Location: Briefing Area #1

Type: Windsock Location: Briefing Area #2

Type: Windsock Location: Pits

Type: Windsock Location: Rig Floor

E. The location of any other safety equipment used, such as flare guns or bug blowers:

Type: Hand Held Detector & Tubes Location: Rig Floor

Type: Location:

F. The location of all telephones and/or means of communication are as follows:

Type: Unknown at this time Location:

Type: Location:

G. Warning Signs:

1. "NO SMOKING" signs should be strategically located around the rig and rig location. The following locations are appropriate:
    a. Doghouse
    b. Rig Floor
    c. Substructure
    d. Lower landing of all stairs leading to rig floor
    e. Mud pits
    f. Shale shaker
2. "POISON GAS" signs should also be strategically located around the rig and rig location. The following locations are appropriate:
    a. All entrances leading to the location
    b. Lower landing of all stairs leading to the rig floor
    c. All areas around substructure, including mud pits and shale shaker
    d. Various points along the perimeter of the radius of exposure

    NOTE: All warning signs should be black and yellow in color and of readable size at a reasonable distance.

IV. OPERATING PROCEDURES The following operating procedures will be utilized for drilling in areas with H2S.

A. Plan of operating for handling gas kicks and other drilling problems. Any gas kick will be controlled by using approved well control techniques. Upon evidence that ambient H2S concentrations have reached 10 PPM, all non-essential personnel will be evacuated to pre-determined safe areas. Personnel remaining on the rig floor will continue to control the well until the situation indicates the area is safe to re-enter.

B. Special Operations

1. Drill Stem Tests. All drill stem tests must be closed chamber and conducted during daylight hours.
2. Coring. After a core has been cut, circulate bottoms up and monitor for H2S. If hole conditions (and/or detectors) indicate potentially hazardous conditions, put breathing equipment on 10 stands before core barrel reaches the surface. Breathing equipment will be worn by all personnel while core barrel is pulled, broken out and opened up, and until a safe atmosphere is indicated.

V. OPERATING CONDITIONS Operating conditions are defined in three categories. A description of each of these conditions and the required action to take are given below.

A. CONDITION I - Normal Operating Conditions, Potential Danger, Operations Under Control

Characterized by: Normal drilling operations and test operations in zones which contain or may contain H2S.

Warning Flag: Yellow

Alarm: None

Probable Occurrence: No detectable gas present at surface.

General Action: (1) Know location of safety equipment.

(2) Check safety equipment for proper function. Keep it available.

(3) Be alert for a condition change.

(4) Follow instructions of the supervisor.

B. **CONDITION II - Potential to Moderate Danger to Life**

Characterized by: H2S gas present. Concentration less than 10 PPM.

Warning Flag: Orange

Alarm: Flashing light at 10 PPM H2S.

Intermittent blasts on horn at 10 PPM H2S.

Probable Occurrence: (1) As drill gas.

(2) As trip gas when circulating bottoms up.

(3) When a core barrel is pulled.

(4) When a well kick is circulated out.

(5) Surface pressure, well flow or lost operations.

(6) Equipment failure during testing operations.

General Action: (1) Follow instructions of supervisor.

(2) Put on breathing equipment if directed, or conditions warrant it.

(3) Stay in "SAFE BRIEFING AREA" if instructed and not working to correct the problem.

(4) The Drilling Superintendent will initiate action to reduce the H2S concentration to zero.

C. CONDITION III – Moderate to Extreme Danger to Life

Characterized by: H2S present in concentrations at or above 10 PPM. Critical well operations or well control problems. In the extreme, loss of well control.

Warning Flag: Red

Alarm: Flashing light and continuous blast on horn at 10 PPM H2S.

Probable Occurrence: (1) As drill gas.

(2) As trip gas when circulating bottoms up.

(3) When a core barrel is pulled.

(4) When a well kick is circulated out.

(5) Surface pressure, well flow or lost returns problems.

(6) Equipment failure during testing operations.

General Action: (1) Put on breathing equipment. Move to "SAFE BRIEFING AREA" and remain there if not working to correct the problem.

(2) Follow instructions of Driller Superintendent or other supervisor.

(3) The Drilling Superintendent will initiate emergency action as provided in the contingency plan and as appropriate to the actual conditions. If testing operations are in progress the well will be shut in.

(4) The Drilling Superintendent will conduct any necessary operations with an absolute minimum of personnel. All persons in the immediate area will wear a breathing apparatus. All other personnel will restrict their movements to those directed by the superintendent.

(5) If gas containing hydrogen sulfide is ignited, the burning hydrogen sulfide will be converted to sulfur dioxide, which is poisonous.

VI. EMERGENCY PROCEDURES The procedures listed below apply to drilling and testing operations.

A. If at any time during Condition I, the Mud Logger, Mud Engineer, or any other person detects H2S, he will notify the Drilling Superintendent. All personnel should keep alert to the Drilling Superintendent's orders.

He will:

1. Immediately begin to ascertain the cause or the source of the H2S and take steps to reduce the H2S concentration to zero. This should include having the mud engineer run a sulfide and Ph determination on the flowline mud if water-base mud is in use. If an oil-base mud is in use, the Mud Engineer should check the lime content of the mud.
2. Order non-essential personnel out of the potential danger area.
3. Order all personnel to check their safety equipment to see that it is working properly and in the proper location. Persons without breathing equipment will not be allowed to work in a hazard area.
4. Notify the contract Supervisor of the condition and action taken.
5. Increase gas monitoring activities with portable H2S detectors and continue operations with caution.
6. Display the orange warning flag.

B. If the H2S concentration exceeds 10 PPM the following steps **will** be taken:

1. Put on breathing equipment.
2. Display red flag.
3. Driller – prepare to shut the well in.
   a. Pick up pipe and get Kelly out of BOP's
   b. Close BOP's if necessary.
4. If testing operations are in progress, the well will be shut-in.
5. Help anyone who may be affected by gas.
6. Evacuate quickly to the "SAFE BRIEFING AREA" if instructed or conditions warrant.

C. In the event a potentially hazardous volume of H2S is released into the atmosphere, the following steps must be taken to alert the public:

1. Remove all rig personnel from the danger area and assemble at a pre-determined safe area, preferably upwind from the well site.
2. Alert the drilling office, public safety personnel, regulatory agencies, and the general public of the existence and location of an H2S release. See List of Emergency Telephone Numbers.
3. Assign personnel to block any public road (and access road to location) at the boundary of the area of exposure. Any unauthorized people within the area should be informed that an emergency exists and be ordered to leave immediately.
4. Request assistance from public safety personnel to control traffic and/or evacuate people from the threatened area.

VII. TRAINING PROGRAM All personnel associated with the drilling operations will receive training to insure efficient and correct action in all situations. This training will be in the general areas of: (1) personnel safety, (2) rig operations, and (3) well control procedures.

A. Personnel Safety Training – All personnel shall have received H2S training in the following areas:

1. Hazards and characteristics of H2S.
2. Effect on metal components of the system.
3. Safety precautions.
4. Operation of safety equipment and life support systems.
5. Corrective action and shutdown procedures.

B. Rig Operations – All rig personnel shall have received training in the following areas:

1. Well control procedures.
2. Layout and operations of the well control equipment.

NOTE: Proficiency will be developed through BOP drills which will be documented by the Drilling Superintendent.

C. Service Company Personnel – All service personnel shall have been trained by their employers in the hazards and characteristics of H2S and the operation of safety equipment and life support systems.

D. Visitors – All first time visitors to the location will be required to attend a safety orientation. The Drilling Superintendent shall be responsible for this orientation and he shall see that every visitor is logged in correctly.

E. Public – The public within the area of exposure shall be given an advance briefing by the Drilling Superintendent. This briefing must include the following elements:

1. Hazards and characteristics of hydrogen sulfide. It is an extremely dangerous gas. It is normally detectable by its "rotten egg" odor, but odor is not a reliable means of detection because the sense of smell may be dulled or lost due to intake of the gas. It is colorless, transparent, and flammable. It is heavier than air and may accumulate in low places.
2. The necessity of an emergency action plan. Due to the danger of persons exposed to hydrogen sulfide and the need for expeditious action should an emergency occur, this action plan will be put into effect if and when a leak occurs.
3. The location of hydrogen sulfide within the area of exposure at the drilling location.
4. The manner in which the public will be notified of an emergency is by telephone or in person.
5. Steps to be taken in case of an emergency:
    a. Abandon danger area.
    b. Notify necessary agencies and request assistance for controlling traffic and evacuating people.

Attachment 2

Paradox Salt Drilling Procedure

Ten distinct shale bodies occur in the Paradox Salt formation. Most notably, shales numbers 4, 5 and 6, and their associated anhydrite, in the sequence of the Paradox Salt are called the "Killer Shales" for their high H_2S content and tendency to stick pipe.
The "Killer Shale" section lies approximately 400'-500' into the Paradox and usually has a 20'-30' salt section between shale number 4 and 5. Because these shales are subject to plastic flow, to prevent sticking, the following procedure has worked in the past and is recommended.

Preparing to drill the Paradox Salt Formation

1. Test the BOPs on the last bit trip prior to drilling the Paradox Salt.
2. Pick up a set of mechanical Daily Oil Tool drilling jars on the last bit trip prior to drilling in to the Paradox.
3. Run a survey to the top of the salt. This will help to avoid shutting down while drilling the sticky shales.
4. Use the salt formation cross-section as an indicator for predicting where each of the shale bodies will be encountered. Shales number 4, 5 and 6 are considered to be the most troublesome.
5. Increase flow rate to an annular velocity of at least 200 ft/min. Limitations of the rig's hydraulic system should be considered when selecting bit nozzle sizes.

Drilling the Paradox Salt Formation

6. The Driller will hand drill the interval beginning at the top of the Paradox Salt and continuing until all problem shales have been penetrated and normal conditions return.
7. Control drill the Paradox while noting the normal torque values for the salts. If there is any fluctuation in pump pressure or torque, pick up off bottom and ream until hole conditions stabilize. Drill a maximum of 5' of salt and 1'-2' of shale before picking up 15'- 20' and reaming to bottom slowly to clean the wellbore. The severity of torque, and increases in pump pressure, should dictate the interval lengths. Some portions of the hole may require drilling only a few inches before picking up and reaming.
8. After 1' to 2' of shale is penetrated, expect 50,000-100,000 lbs drag to free the bit initially. After freeing the bit, pick up 15'-20' and start reaming back to bottom. If the torque increases 20-30 ft-lb above normal, pick up and expect 25,000-50,000 lb drag.
9. On each Kelly down, have the Driller pick up a full Kelly plus one single, then ream back to bottom. Reaming serves two purposes:
    a. It conditions the walls of the wellbore
    b. It allows for the cuttings to be carried away from the bit and collars before making a connection.
10. Pipe should be pulled and run slowly to avoid problems in the tight sections of the hole. Torque should dictate the frequency of the short trips. Periodic short trips through the entire salt section have proven useful in reducing high torque due to sticky shale.

At the present time, the key to drilling these sticky shales in the Paradox Salt is **PATIENCE.** It should be noted that good gas shows are also present in these shale stringers, and as the gas out of the sticky shales starts to subside, the hole starts to stabilize.

ATTACHMENT 3- CROSS SECTION

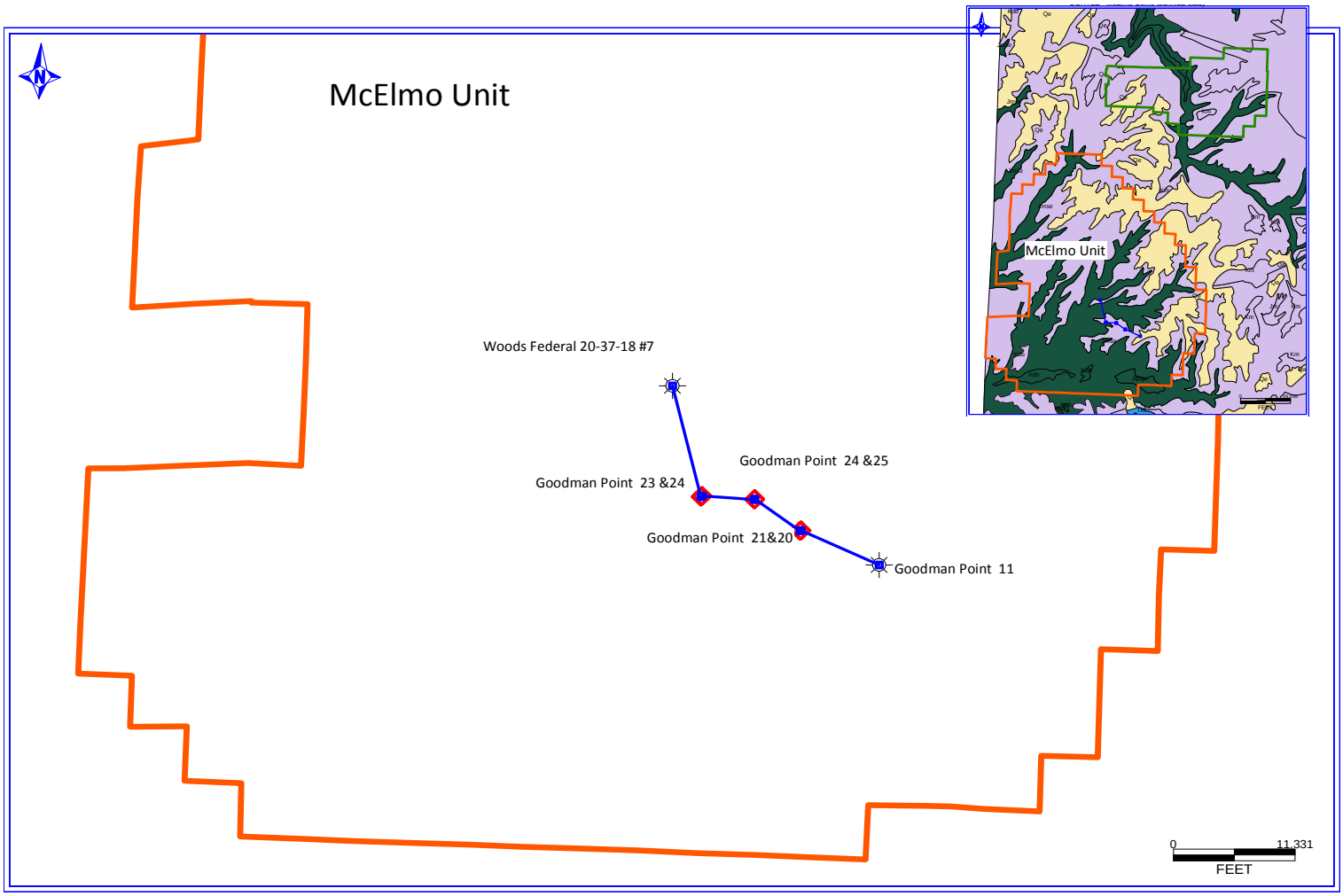


Figure 1 Cross Section of McElmo Dome- Goodman Point Area

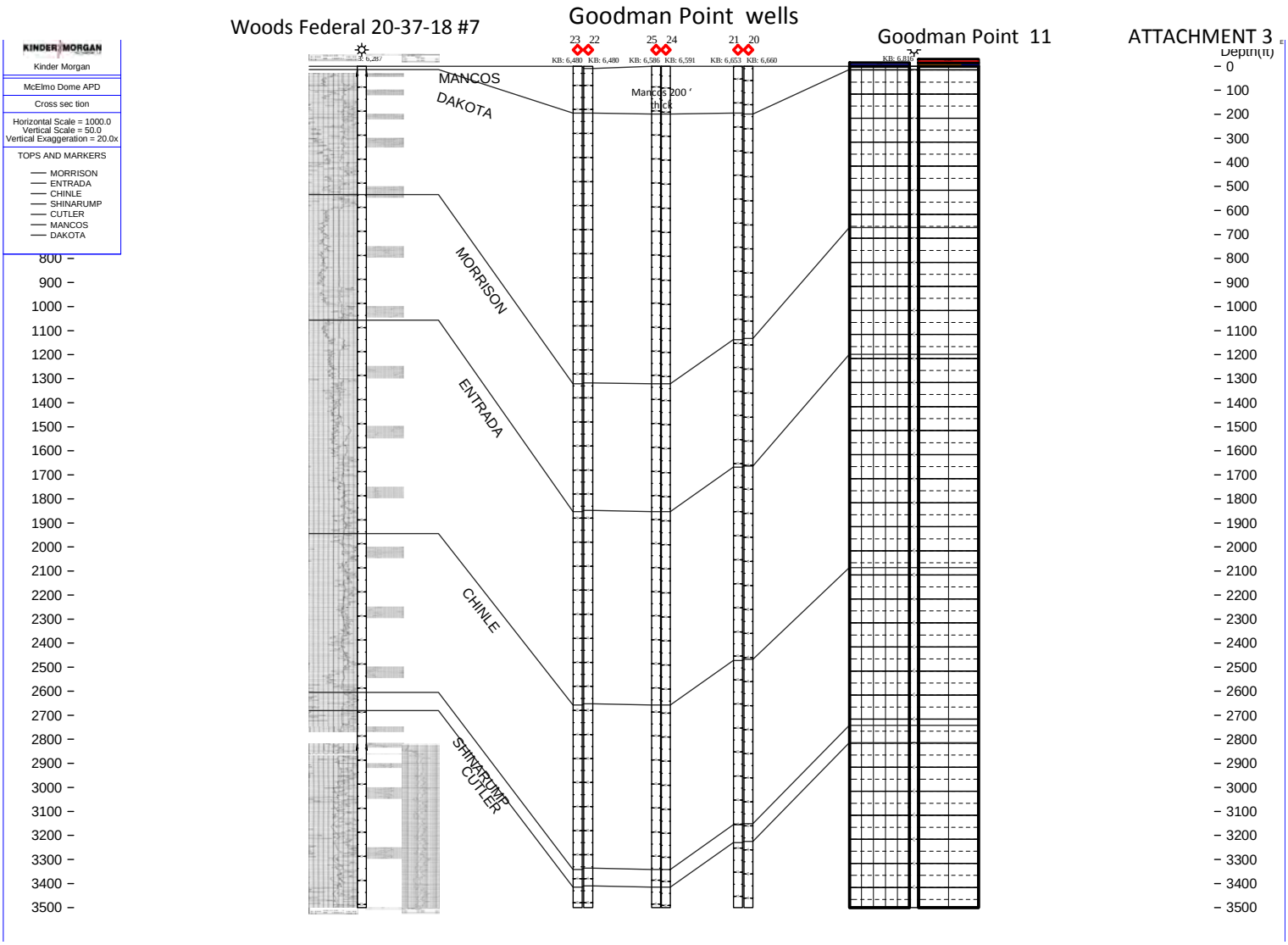


Figure 2 Cross Section of McElmo Dome- Goodman Point Area

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Drilling Services

Proposal

KINDER MORGAN CO2 COMPANY, L.P.

GOODMAN POINT #23

MONTEZUMA CO, COLORADO

WELL FILE: **PILOT HOLE PLAN 4**
LATERAL PLAN 4

MARCH 21, 2011

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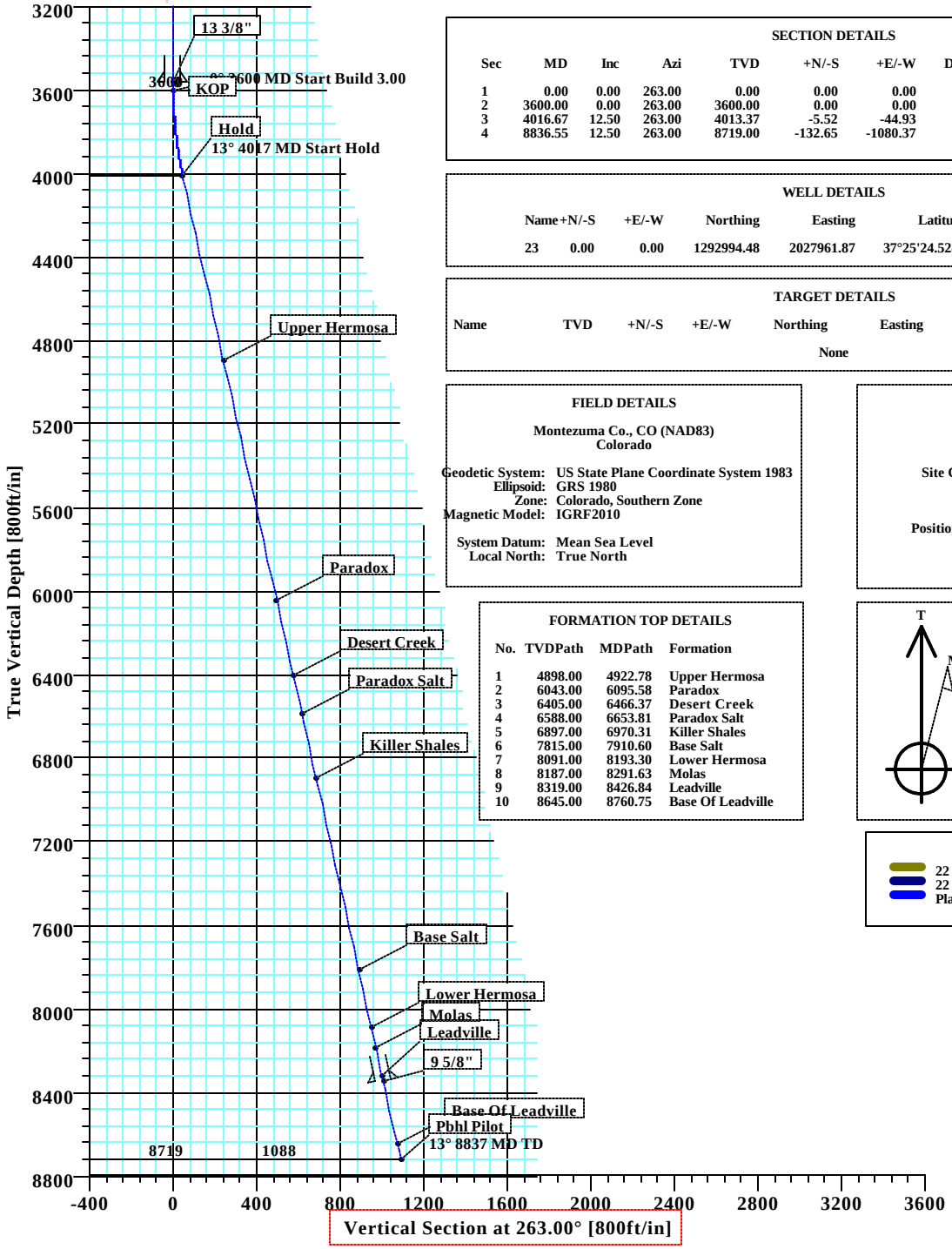
GOODMAN POINT #23
MONTEZUMA CO., COLORADO
Pilot Hole

KINDER MORGAN

KB ELEV: 6480'
GL ELEV: 6460'



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	263.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3600.00	0.00	263.00	3600.00	0.00	0.00	0.00	263.00	0.00	
3	4016.67	12.50	263.00	4013.37	-5.52	-44.93	3.00	263.00	45.27	
4	8836.55	12.50	263.00	8719.00	-132.65	-1080.37	0.00	0.00	1088.48	

CASING DETAILS

No.	TVD	MD	Name	Size
1	3565.00	3565.00	13 3/8"	13.375
2	8344.00	8452.44	9 5/8"	9.625

WELL DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
23	0.00	0.00	1292994.48	2027961.87	37°25'24.528N	108°50'52.836W	N/A

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
None								

FIELD DETAILS

Montezuma Co., CO (NAD83)
Colorado

Geodetic System: US State Plane Coordinate System 1983
Ellipsoid: GRS 1980
Zone: Colorado, Southern Zone
Magnetic Model: IGRF2010

System Datum: Mean Sea Level
Local North: True North

SITE DETAILS

Goodman Point #23
1544' FNL & 448' FEL

Site Centre Latitude: 37°25'24.528N
Longitude: 108°50'52.836W

Ground Level: 6460.00
Positional Uncertainty: 0.00
Convergence: -2.05

FORMATION TOP DETAILS

No.	TVDPath	MDPath	Formation
1	4898.00	4922.78	Upper Hermosa
2	6043.00	6095.58	Paradox
3	6405.00	6466.37	Desert Creek
4	6588.00	6653.81	Paradox Salt
5	6897.00	6970.31	Killer Shales
6	7815.00	7910.60	Base Salt
7	8091.00	8193.30	Lower Hermosa
8	8187.00	8291.63	Molas
9	8319.00	8426.84	Leadville
10	8645.00	8760.75	Base Of Leadville

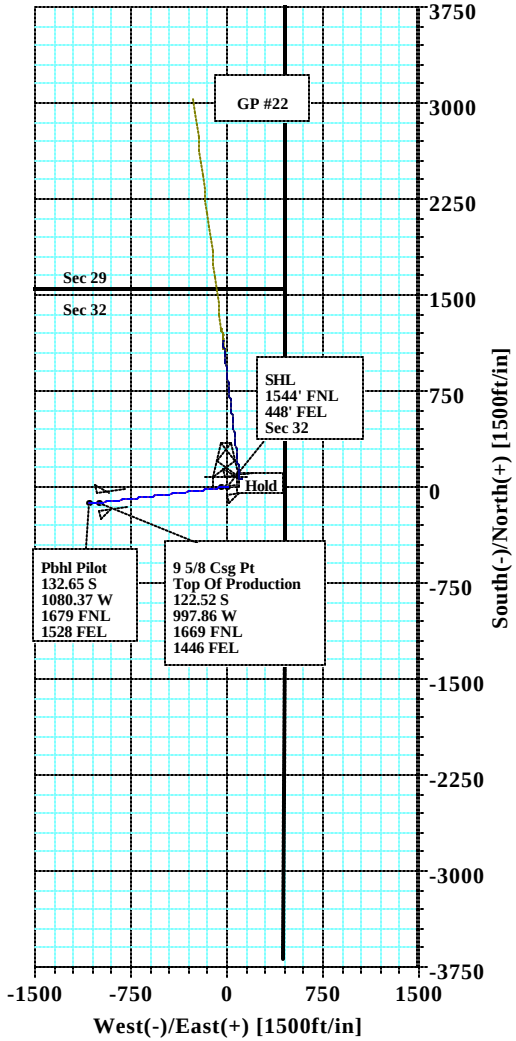
Azimuths to True North
Magnetic North: 10.40°

Magnetic Field
Strength: 50992nT
Dip Angle: 63.83°
Date: 10/15/2011
Model: IGRF2010

Total Correction to True North 10.40°

LEGEND

22 (Lat)
22 (Pilot Hole)
Plan #4



Weatherford

Plan: Plan #4 (23/Pilot Hole)
Created By: Keith Noack Date: 3/22/2011

KINDER MORGAN

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WFT Plan Report - X & Y's

Weatherford

Company:	Kinder Morgan	**Date:** 3/21/2011	**Time:** 12:56:30	**Page:**	1
Field:	Montezuma Co., CO (NAD83)	**Co-ordinate(NE) Reference:**	Well: 23, True North		
Site:	Goodman Point #23	**Vertical (TVD) Reference:**	SITE 6480.0		
Well:	23	**Section (VS) Reference:**	Well (0.00N,0.00E,263.00Azi)		
Wellpath:	Pilot Hole	**Survey Calculation Method:**	Minimum Curvature	**Db:**	Sybase

Plan:	Plan #4	**Date Composed:**	3/21/2011
		Version:	1
Principal:	Yes	**Tied-to:**	From Surface

Field:	Montezuma Co., CO (NAD83) Colorado		
Map System:	US State Plane Coordinate System 1983	**Map Zone:**	Colorado, Southern Zone
Geo Datum:	GRS 1980	**Coordinate System:**	Well Centre
Sys Datum:	Mean Sea Level	**Geomagnetic Model:**	IGRF2010

Site: Goodman Point #23

1544' FNL & 448' FEL

Site Position:			**Northing:**	1292994.48	ft	**Latitude:**	37 25 24.528	N
From:	Geographic		**Easting:**	2027961.87	ft	**Longitude:**	108 50 52.836	W
Position Uncertainty:		0.00 ft				**North Reference:**		True
Ground Level:		6460.00 ft				**Grid Convergence:**		-2.05 deg

Well: 23 **Slot Name:**

Well Position:	**+N/-S**	0.00 ft	**Northing:**	1292994.48	ft	**Latitude:**	37 25 24.528	N
	+E/-W	0.00 ft	**Easting :**	2027961.87	ft	**Longitude:**	108 50 52.836	W
Position Uncertainty:		0.00 ft						

Wellpath: Pilot Hole **Drilled From:** Surface

Tie-on Depth: 0.00 ft

Current Datum:	SITE	**Height** 6480.00 ft	**Above System Datum:**	Mean Sea Level	
Magnetic Data:	10/15/2011		**Declination:**	10.40	deg
Field Strength:	50992 **nT**		**Mag Dip Angle:**	63.83	deg

Vertical Section:	**Depth From (TVD)**	**+N/-S**	**+E/-W**	**Direction**
	ft	ft	ft	deg
	0.00	0.00	0.00	263.00

Plan Section Information

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	TFO deg	Target
0.00	0.00	263.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3600.00	0.00	263.00	3600.00	0.00	0.00	0.00	0.00	0.00	263.00	
4016.67	12.50	263.00	4013.37	-5.52	-44.93	3.00	3.00	0.00	263.00	
8836.55	12.50	263.00	8719.00	-132.65	-1080.37	0.00	0.00	0.00	0.00	

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
3500.00	0.00	263.00	3500.00	0.00	0.00	0.00	0.00	1292994.48	2027961.87	
3565.00	0.00	263.00	3565.00	0.00	0.00	0.00	0.00	1292994.48	2027961.87	13 3/8"
3600.00	0.00	263.00	3600.00	0.00	0.00	0.00	0.00	1292994.48	2027961.87	KOP
3700.00	3.00	263.00	3699.95	-0.32	-2.60	2.62	3.00	1292994.26	2027959.26	
3800.00	6.00	263.00	3799.63	-1.28	-10.38	10.46	3.00	1292993.58	2027951.44	
3900.00	9.00	263.00	3898.77	-2.87	-23.34	23.51	3.00	1292992.45	2027938.44	
4000.00	12.00	263.00	3997.08	-5.09	-41.42	41.74	3.00	1292990.88	2027920.29	
4016.67	12.50	263.00	4013.37	-5.52	-44.93	45.27	3.00	1292990.58	2027916.77	Hold
4100.00	12.50	263.00	4094.73	-7.72	-62.84	63.31	0.00	1292989.02	2027898.80	
4200.00	12.50	263.00	4192.36	-10.35	-84.32	84.95	0.00	1292987.16	2027877.23	
4300.00	12.50	263.00	4289.99	-12.99	-105.80	106.60	0.00	1292985.29	2027855.67	
4400.00	12.50	263.00	4387.62	-15.63	-127.28	128.24	0.00	1292983.42	2027834.11	
4500.00	12.50	263.00	4485.25	-18.27	-148.77	149.88	0.00	1292981.56	2027812.54	
4600.00	12.50	263.00	4582.88	-20.90	-170.25	171.53	0.00	1292979.69	2027790.98	
4700.00	12.50	263.00	4680.50	-23.54	-191.73	193.17	0.00	1292977.82	2027769.42	
4800.00	12.50	263.00	4778.13	-26.18	-213.21	214.82	0.00	1292975.96	2027747.85	
4900.00	12.50	263.00	4875.76	-28.82	-234.70	236.46	0.00	1292974.09	2027726.29	

KINDER MORGAN

Weatherford International Ltd.

WFT Plan Report - X & Y's

Weatherford

Company:	Kinder Morgan	**Date:** 3/21/2011	**Time:** 12:56:30	**Page:**	2
Field:	Montezuma Co., CO (NAD83)	**Co-ordinate(NE) Reference:**	Well: 23, True North		
Site:	Goodman Point #23	**Vertical (TVD) Reference:**	SITE 6480.0		
Well:	23	**Section (VS) Reference:**	Well (0.00N,0.00E,263.00Azi)		
Wellpath:	Pilot Hole	**Survey Calculation Method:**	Minimum Curvature	**Db:**	Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
4922.78	12.50	263.00	4898.00	-29.42	-239.59	241.39	0.00	1292973.67	2027721.38	Upper Hermosa
5000.00	12.50	263.00	4973.39	-31.45	-256.18	258.10	0.00	1292972.23	2027704.73	
5100.00	12.50	263.00	5071.02	-34.09	-277.66	279.75	0.00	1292970.36	2027683.16	
5200.00	12.50	263.00	5168.65	-36.73	-299.14	301.39	0.00	1292968.49	2027661.60	
5300.00	12.50	263.00	5266.28	-39.37	-320.63	323.04	0.00	1292966.63	2027640.04	
5400.00	12.50	263.00	5363.91	-42.01	-342.11	344.68	0.00	1292964.76	2027618.47	
5500.00	12.50	263.00	5461.54	-44.64	-363.59	366.32	0.00	1292962.90	2027596.91	
5600.00	12.50	263.00	5559.17	-47.28	-385.08	387.97	0.00	1292961.03	2027575.35	
5700.00	12.50	263.00	5656.80	-49.92	-406.56	409.61	0.00	1292959.16	2027553.78	
5800.00	12.50	263.00	5754.43	-52.56	-428.04	431.26	0.00	1292957.30	2027532.22	
5900.00	12.50	263.00	5852.06	-55.19	-449.52	452.90	0.00	1292955.43	2027510.66	
6000.00	12.50	263.00	5949.69	-57.83	-471.01	474.54	0.00	1292953.56	2027489.09	
6095.58	12.50	263.00	6043.00	-60.35	-491.54	495.23	0.00	1292951.78	2027468.48	Paradox
6100.00	12.50	263.00	6047.32	-60.47	-492.49	496.19	0.00	1292951.70	2027467.53	
6200.00	12.50	263.00	6144.95	-63.11	-513.97	517.83	0.00	1292949.83	2027445.97	
6300.00	12.50	263.00	6242.58	-65.75	-535.45	539.48	0.00	1292947.97	2027424.40	
6400.00	12.50	263.00	6340.21	-68.38	-556.94	561.12	0.00	1292946.10	2027402.84	
6466.37	12.50	263.00	6405.00	-70.13	-571.19	575.48	0.00	1292944.86	2027388.53	Desert Creek
6500.00	12.50	263.00	6437.84	-71.02	-578.42	582.76	0.00	1292944.23	2027381.28	
6600.00	12.50	263.00	6535.47	-73.66	-599.90	604.41	0.00	1292942.37	2027359.71	
6653.81	12.50	263.00	6588.00	-75.08	-611.46	616.05	0.00	1292941.36	2027348.11	Paradox Salt
6700.00	12.50	263.00	6633.10	-76.30	-621.38	626.05	0.00	1292940.50	2027338.15	
6800.00	12.50	263.00	6730.73	-78.93	-642.87	647.69	0.00	1292938.63	2027316.59	
6900.00	12.50	263.00	6828.36	-81.57	-664.35	669.34	0.00	1292936.77	2027295.02	
6970.31	12.50	263.00	6897.00	-83.43	-679.45	684.56	0.00	1292935.46	2027279.86	Killer Shales
7000.00	12.50	263.00	6925.99	-84.21	-685.83	690.98	0.00	1292934.90	2027273.46	
7100.00	12.50	263.00	7023.62	-86.85	-707.31	712.63	0.00	1292933.04	2027251.90	
7200.00	12.50	263.00	7121.24	-89.49	-728.80	734.27	0.00	1292931.17	2027230.33	
7300.00	12.50	263.00	7218.87	-92.12	-750.28	755.91	0.00	1292929.30	2027208.77	
7400.00	12.50	263.00	7316.50	-94.76	-771.76	777.56	0.00	1292927.44	2027187.21	
7500.00	12.50	263.00	7414.13	-97.40	-793.25	799.20	0.00	1292925.57	2027165.64	
7600.00	12.50	263.00	7511.76	-100.04	-814.73	820.85	0.00	1292923.70	2027144.08	
7700.00	12.50	263.00	7609.39	-102.67	-836.21	842.49	0.00	1292921.84	2027122.52	
7800.00	12.50	263.00	7707.02	-105.31	-857.69	864.13	0.00	1292919.97	2027100.95	
7900.00	12.50	263.00	7804.65	-107.95	-879.18	885.78	0.00	1292918.11	2027079.39	
7910.60	12.50	263.00	7815.00	-108.23	-881.45	888.07	0.00	1292917.91	2027077.10	Base Salt
8000.00	12.50	263.00	7902.28	-110.59	-900.66	907.42	0.00	1292916.24	2027057.83	
8100.00	12.50	263.00	7999.91	-113.22	-922.14	929.07	0.00	1292914.37	2027036.26	
8193.30	12.50	263.00	8091.00	-115.69	-942.18	949.26	0.00	1292912.63	2027016.14	Lower Hermosa
8200.00	12.50	263.00	8097.54	-115.86	-943.62	950.71	0.00	1292912.51	2027014.70	
8291.63	12.50	263.00	8187.00	-118.28	-963.31	970.54	0.00	1292910.80	2026994.94	Molas
8300.00	12.50	263.00	8195.17	-118.50	-965.11	972.35	0.00	1292910.64	2026993.14	
8400.00	12.50	263.00	8292.80	-121.14	-986.59	994.00	0.00	1292908.77	2026971.57	
8426.84	12.50	263.00	8319.00	-121.85	-992.35	999.81	0.00	1292908.27	2026965.78	Leadville
8452.44	12.50	263.00	8344.00	-122.52	-997.86	1005.35	0.00	1292907.80	2026960.26	9 5/8"
8500.00	12.50	263.00	8390.43	-123.78	-1008.07	1015.64	0.00	1292906.91	2026950.01	
8600.00	12.50	263.00	8488.06	-126.41	-1029.55	1037.29	0.00	1292905.04	2026928.45	
8700.00	12.50	263.00	8585.69	-129.05	-1051.04	1058.93	0.00	1292903.18	2026906.88	
8760.75	12.50	263.00	8645.00	-130.65	-1064.09	1072.08	0.00	1292902.04	2026893.78	Base Of Leadville
8800.00	12.50	263.00	8683.32	-131.69	-1072.52	1080.57	0.00	1292901.31	2026885.32	
8836.55	12.50	263.00	8719.00	-132.65	-1080.37	1088.48	0.00	1292900.63	2026877.44	Pbhl Pilot

Company:	Kinder Morgan	**Date:** 3/21/2011	**Time:** 12:56:30	**Page:**	3
Field:	Montezuma Co., CO (NAD83)	**Co-ordinate(NE) Reference:**	Well: 23, True North		
Site:	Goodman Point #23	**Vertical (TVD) Reference:**	SITE 6480.0		
Well:	23	**Section (VS) Reference:**	Well (0.00N,0.00E,263.00Azi)		
Wellpath:	Pilot Hole	**Survey Calculation Method:**	Minimum Curvature	**Db:**	Sybase

Targets

Name	Description	TVD	+N/-S	+E/-W	Map Northing	Map Easting	<---- Latitude ---->	<--- Longitude --->
	Dip. Dir.						Deg Min Sec	Deg Min Sec

Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
3565.00	3565.00	13.375	17.500	13 3/8"
8452.44	8344.00	9.625	12.250	9 5/8"

Annotation

MD ft	TVD ft	
3600.00	3600.00	KOP
4016.67	4013.37	Hold
8836.54	8718.99	Pbhl Pilot

Formations

MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
4922.78	4898.00	Upper Hermosa		0.00	0.00
6095.58	6043.00	Paradox		0.00	0.00
6466.37	6405.00	Desert Creek		0.00	0.00
6653.81	6588.00	Paradox Salt		0.00	0.00
6970.31	6897.00	Killer Shales		0.00	0.00
7910.60	7815.00	Base Salt		0.00	0.00
8193.30	8091.00	Lower Hermosa		0.00	0.00
8291.63	8187.00	Molas		0.00	0.00
8426.84	8319.00	Leadville		0.00	0.00
8760.75	8645.00	Base Of Leadville		0.00	0.00

KINDER MORGAN CO2 COMPANY, L.P.

GOODMAN POINT #23
MONTEZUMA CO., COLORADO
Lateral

Weatherford

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	8452.44	12.50	263.00	8344.00	-122.52	-997.85	0.00	0.00	1005.35	
2	8457.51	12.50	263.00	8348.95	-122.65	-998.94	0.00	0.00	1006.45	
3	8699.28	90.00	263.00	8489.00	-143.92	-1172.15	32.06	0.00	1180.95	
4	10518.33	90.00	263.00	8489.00	-365.61	-2977.64	0.00	0.00	3000.00	PBHL Lat

WELL DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
23	0.00	0.00	1292994.48	2027961.87	37°25'24.528N	108°50'52.836W	N/A

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL Lat	8489.00	-365.61	-2977.64	1292735.81	2024973.04	37°25'20.912N	108°51'29.749W	Point

FIELD DETAILS

Montezuma Co., CO (NAD83)
Colorado

Geodetic System: US State Plane Coordinate System 1983
Ellipsoid: GRS 1980
Zone: Colorado, Southern Zone
Magnetic Model: IGRF2010

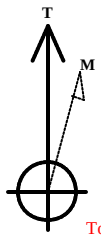
System Datum: Mean Sea Level
Local North: True North

SITE DETAILS

Goodman Point #23
1544' FNL & 448' FEL

Site Centre Latitude: 37°25'24.528N
Longitude: 108°50'52.836W

Ground Level: 6460.00
Positional Uncertainty: 0.00
Convergence: -2.05



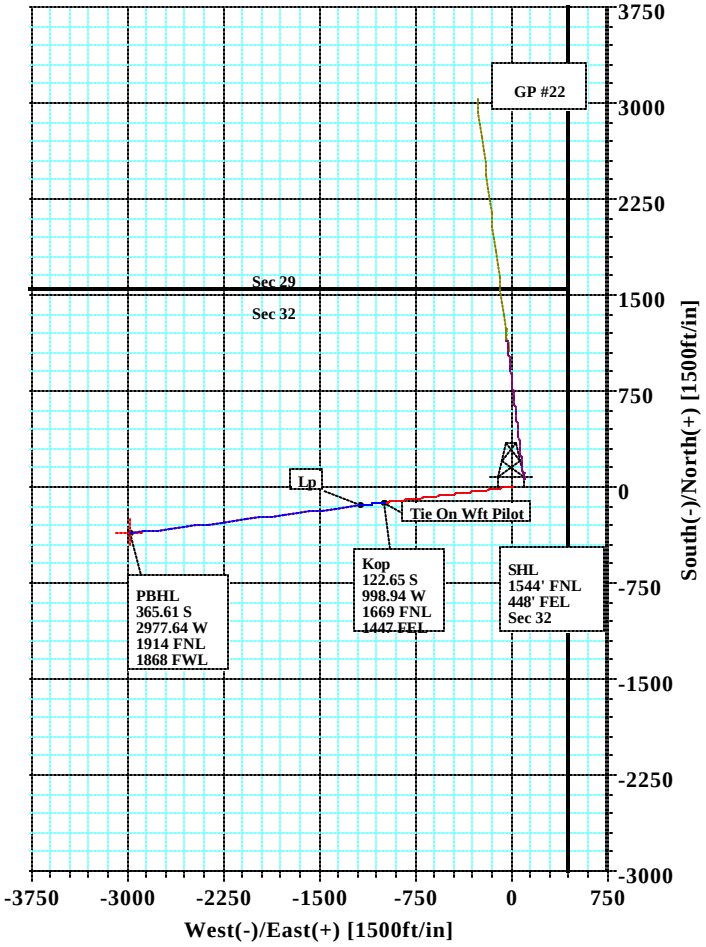
Azimuths to True North
Magnetic North: 10.48°

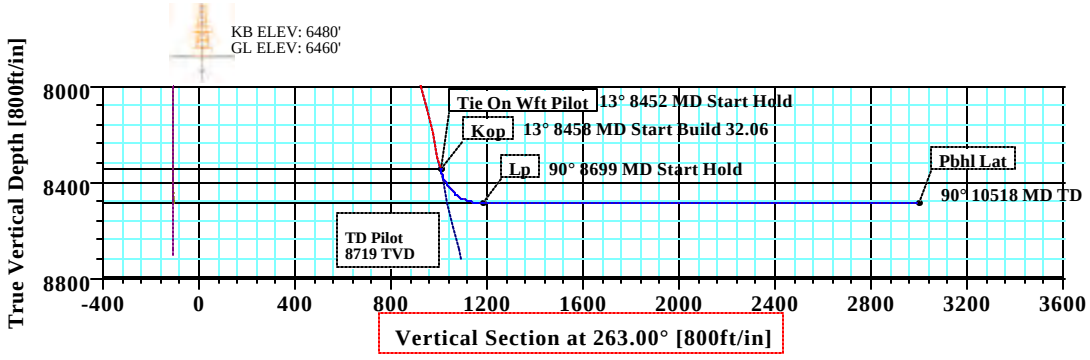
Magnetic Field
Strength: 51060nT
Dip Angle: 63.85°
Date: 2/1/2011
Model: IGRF2010

Total Correction to True North 10.48°

LEGEND

22 (Lat)
22 (Pilot Hole)
Plan #4





Plan: Plan #4 (23/Lat)
Created By: Keith Noack
Date: 3/22/2011

KINDER MORGAN

Weatherford International Ltd.

WFT Plan Report - X & Y's

Weatherford

Company:	Kinder Morgan	**Date:** 3/21/2011	**Time:** 13:54:08	**Page:**	1
Field:	Montezuma Co., CO (NAD83)	**Co-ordinate(NE) Reference:**	Well: 23, True North		
Site:	Goodman Point #23	**Vertical (TVD) Reference:**	SITE 6480.0		
Well:	23	**Section (VS) Reference:**	Well (0.00N,0.00E,263.00Azi)		
Wellpath:	Lat	**Survey Calculation Method:**	Minimum Curvature	**Db:**	Sybase

Plan:	Plan #4	**Date Composed:**	9/8/2010
		Version:	1
Principal:	Yes	**Tied-to:**	From: Definitive Path

Field:	Montezuma Co., CO (NAD83) Colorado		
Map System:	US State Plane Coordinate System 1983	**Map Zone:**	Colorado, Southern Zone
Geo Datum:	GRS 1980	**Coordinate System:**	Well Centre
Sys Datum:	Mean Sea Level	**Geomagnetic Model:**	IGRF2010

Site:	Goodman Point #23							
	1544' FNL & 448' FEL							
Site Position:		**Northing:**	1292994.48 ft	**Latitude:**	37	25	24.528	N
From:	Geographic	**Easting:**	2027961.87 ft	**Longitude:**	108	50	52.836	W
Position Uncertainty:	0.00 ft			**North Reference:**			True	
Ground Level:	6460.00 ft			**Grid Convergence:**			-2.05	deg

Well:	23				**Slot Name:**			
Well Position:	**+N/-S** 0.00 ft	**Northing:**	1292994.48 ft	**Latitude:**	37	25	24.528	N
	+E/-W 0.00 ft	**Easting :**	2027961.87 ft	**Longitude:**	108	50	52.836	W
Position Uncertainty:	0.00 ft							

Wellpath:	Lat		**Drilled From:**	Pilot Hole	
			Tie-on Depth:	8452.44	ft
Current Datum:	SITE	**Height** 6480.00 ft	**Above System Datum:**	Mean Sea Level	
Magnetic Data:	2/1/2011		**Declination:**	10.48	deg
Field Strength:	51060 **nT**		**Mag Dip Angle:**	63.85	deg

Vertical Section:	**Depth From (TVD)** ft	**+N/-S** ft	**+E/-W** ft	**Direction** deg
	8489.00	0.00	0.00	263.00

Plan Section Information

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	TFO deg	Target
8452.44	12.50	263.00	8344.00	-122.52	-997.85	0.00	0.00	0.00	0.00	
8457.51	12.50	263.00	8348.95	-122.65	-998.94	0.00	0.00	0.00	0.00	
8699.28	90.00	263.00	8489.00	-143.92	-1172.15	32.06	32.06	0.00	0.00	
10518.33	90.00	263.00	8489.00	-365.61	-2977.64	0.00	0.00	0.00	0.00	PBHL Lat

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
8452.44	12.50	263.00	8344.00	-122.52	-997.85	1005.35	0.00	1292907.80	2026960.26	Tie On Wft Pilot
8457.51	12.50	263.00	8348.95	-122.65	-998.94	1006.45	0.00	1292907.70	2026959.17	Kop
8552.44	42.93	263.00	8432.00	-127.97	-1042.25	1050.08	32.06	1292903.94	2026915.70	
8652.44	74.99	263.00	8482.90	-138.28	-1126.19	1134.64	32.06	1292896.65	2026831.45	
8699.28	90.00	263.00	8489.00	-143.92	-1172.15	1180.95	32.06	1292892.65	2026785.32	Lp
8752.44	90.00	263.00	8489.00	-150.40	-1224.91	1234.11	0.00	1292888.07	2026732.35	
8852.44	90.00	263.00	8489.00	-162.59	-1324.17	1334.11	0.00	1292879.45	2026632.73	
8952.44	90.00	263.00	8489.00	-174.77	-1423.42	1434.11	0.00	1292870.83	2026533.10	
9052.44	90.00	263.00	8489.00	-186.96	-1522.67	1534.11	0.00	1292862.20	2026433.47	
9152.44	90.00	263.00	8489.00	-199.15	-1621.93	1634.11	0.00	1292853.58	2026333.84	
9252.44	90.00	263.00	8489.00	-211.33	-1721.18	1734.11	0.00	1292844.96	2026234.22	
9352.44	90.00	263.00	8489.00	-223.52	-1820.44	1834.11	0.00	1292836.34	2026134.59	
9452.44	90.00	263.00	8489.00	-235.71	-1919.69	1934.11	0.00	1292827.71	2026034.96	
9552.44	90.00	263.00	8489.00	-247.90	-2018.95	2034.11	0.00	1292819.09	2025935.33	
9652.44	90.00	263.00	8489.00	-260.08	-2118.20	2134.11	0.00	1292810.47	2025835.71	
9752.44	90.00	263.00	8489.00	-272.27	-2217.46	2234.11	0.00	1292801.85	2025736.08	
9852.44	90.00	263.00	8489.00	-284.46	-2316.71	2334.11	0.00	1292793.22	2025636.45	

KINDER MORGAN

Weatherford International Ltd.

WFT Plan Report - X & Y's

Weatherford

Company:	Kinder Morgan	**Date:** 3/21/2011	**Time:** 13:54:08	**Page:**	2
Field:	Montezuma Co., CO (NAD83)	**Co-ordinate(NE) Reference:**	Well: 23, True North		
Site:	Goodman Point #23	**Vertical (TVD) Reference:**	SITE 6480.0		
Well:	23	**Section (VS) Reference:**	Well (0.00N,0.00E,263.00Azi)		
Wellpath:	Lat	**Survey Calculation Method:**	Minimum Curvature	**Db:**	Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
9952.44	90.00	263.00	8489.00	-296.64	-2415.97	2434.11	0.00	1292784.60	2025536.82	
10052.44	90.00	263.00	8489.00	-308.83	-2515.22	2534.11	0.00	1292775.98	2025437.20	
10152.44	90.00	263.00	8489.00	-321.02	-2614.48	2634.11	0.00	1292767.36	2025337.57	
10252.44	90.00	263.00	8489.00	-333.20	-2713.73	2734.11	0.00	1292758.74	2025237.94	
10352.44	90.00	263.00	8489.00	-345.39	-2812.98	2834.11	0.00	1292750.11	2025138.31	
10452.44	90.00	263.00	8489.00	-357.58	-2912.24	2934.11	0.00	1292741.49	2025038.69	
10518.33	90.00	263.00	8489.00	-365.61	-2977.64	3000.00	0.00	1292735.81	2024973.04	PBHL Lat

Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ----> Deg	Min	Sec		<--- Longitude ---> Deg	Min	Sec	
PBHL Lat			8489.00	-365.61	-2977.64	1292735.81	2024973.04	37	25	20.912	N	108	51	29.749	W

Casing Points

MD	TVD	Diameter	Hole Size	Name

Annotation

MD ft	TVD ft	
8452.44	8344.00	Tie On Wft Pilot
8457.51	8348.95	Kop
8699.28	8489.00	Lp
10518.33	8489.00	Pbhl Lat

Formations

MD	TVD	Formations	Lithology	Dip Angle	Dip Direction

Weatherford Drilling Services

GeoDec v5.03

Report Date:	March 21, 2011
Job Number:	
Customer:	Kinder Morgan
Well Name:	Goodman Point #23
API Number:	
Rig Name:	
Location:	Montezuma Co., CO
Block:	
Engineer:	KRN

Geodetic Latitude / Longitude	Geodetic Latitude / Longitude
System: Latitude / Longitude	System: Latitude / Longitude
Projection: Geodetic Latitude and Longitude	Projection: Geodetic Latitude and Longitude
Datum: North American Datum 1983	Datum: North American Datum 1983
Ellipsoid: GRS 1980	Ellipsoid: GRS 1980
Latitude 37.4234800 DEG	Latitude 37.4234800 DEG
Longitude -108.8480100 DEG	Longitude -108.8480100 DEG

Geodetic Location WGS84		Elevation =	0.0 Meters
Latitude =	37.42348° N		37° 25 min 24.528 sec
Longitude =	108.84801° W		108° 50 min 52.836 sec

Magnetic Declination =	10.40°	[True North Offset]	
Local Gravity =	.9993 g	CheckSum =	7453
Local Field Strength =	50987 nT	Magnetic Vector X =	22118 nT
Magnetic Dip =	63.83°	Magnetic Vector Y =	4059 nT
Magnetic Model =	IGRF-2010g11	Magnetic Vector Z =	45761 nT
Spud Date =	Oct 15, 2011	Magnetic Vector H =	22487 nT

Signed:_____ Date:_____

ATTACHMENT 5

Onsite Chemical Inventory Reference List
Anticipated Master Chemical List
MSDS sheets will be in a book on location

Note: Product brands may vary depending on Contractor selection criteria. The list is meant to be the primary chemicals found on the typical McElmo Dome / Doe Canyon Drill Site. The list may vary and be revised/ updated on an ongoing basis.

Weatherford- MSDS sheets will be available on location
55 gal. drums of Corr Foam 1 – Corrosion control
Royal Purple Manula Transmission Oil
WD-40
Royal Purple Compressor Oil-Snyfilm Recip
Royal Purple Gear Oil
Royal Purple Automatic Transmission Oil- Max ATF
Royal Purple Racing oil
Royal Purple Motor Oil
Zep Hand Soap
Zep Glass Cleaner
Windex

Patterson Drilling General Rig Chemical Inventory List
Product, Use, Manufacturer
Spray on Bolt Dressing- Sherwin Williams
Power Grip- Adaseal International
Loctite thread sealent for nuts and bolts- Henkel Corporation
Fullers Earth for drawworks, clutch and break lubricant- Humco Holding Inc
Diesel Fuel
Johnson's Starting Fluid 28% for motors- Technical Chemical Corp
Mystic JT-6 Grease- Citgo
Kopr Kote- for gaskets, bolt threads – Jet Lube Inc.
Desco Therm O Plate- anti-seize for bolts- South Coast Products Inc
WD-40
Jet Lube 21- tubular thread grease- Jet Lube Inc
PB Penetrating Catalyst- Blaster Corporation
Martin Decker Fluid- Geoservices AS
Marvel Mystery- internal motor oil- Marvel Oil Co Inc
W-16- All Purpose Fluid- Quadco
K-15- Torque Indicator Fluid- VK Enterprises
Lok Cease 20/20 – Thread Sealant- Certified
Engine Oil 15W-40, Motor Oil – Citgo
A/W Hydraulic – Hydraulic Oil- CITGO
Anti-Freeze- CITGO
Premium G.O. 80W-90- gear oil- CITGO
No-Tox 2- Air de-cant (compressed air tanks) – Tanner Systems
Krylon Paint- spray on paint for rig, equipment, tools – Sherwin Williams (several colors- yellow, red, green, black, white)
Rust Oleum- fluorescent spray paint- Rust Oleum Corp
GoJo- hand cleaner- Gojo Indust, Inc
Fast Orange- waterless hand cleaner- Permatex, Inc
Lectra Clean- Electrical Part Cleaner- GRC Industries
Glass Cleaner- Sprayway Inc
Hi-Build Gloss- Black Paint- Tnemec
Hi-Build Gloss- Safety Yellow Paint
Industrial Enamal- Safety Orange Paint- Sherwin Williams
Hi-Build Gloss- Safety Orange Paint- Tnemec
Hi-Build Gloss- National Blue Paint- Tnemec
Hi-Build Gloss- White Paint- Tnemec
No 1 Thinner- Paint Thinner- Tnemec
Tnemec Primer- Gray Primer- Tnemec

Baroid Mud Product List Halliburton- Baroid- MSDS sheets will be available on location

DA320
Caustic Soda
ZEOGEL
ALDACIDE G
Aluminum Sterate
AQUAGEL GOLD SEAL
BARACARB 50
BARACAT
BARACOR 700
BARA-DEFOAM 1
BARAZAN D
BAROID 41
BAROLIFT
Cedar Fiber
Desco CF
Diamond Seal
EZ SPOT
EZ-MUD
FILTER-CHECK
HOLEPLUG ¾
HYDRO-PLUG
IMPERMEX
Lime
N-VIS L
NXS-LUBE
OXYGON
Sawdust
Soda Ash
Sodium Chloride
STEELSEAL
WAL-NUT Med
LIQUI-DRIL
Drilling Paper
Bicarbonate of Soda