

State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



FOR OGCC USE ONLY

EARTHEN PIT REPORT/PERMIT

This form is to be used for both reporting and permitting pits. Rule 903 describes when a Permit with prior approval, or a Report within 30 days, is required for pits. Submit required attachments and forms.

Complete the Attachment Checklist

Oper OGCC

Detailed Site Plan	✓	
Topo Map w/ Pit Location	✓	
Water Analysis (Form 25)		
Source Wells (Form 26)		
Pit Design/Plan & Cross Sect		
Design Calculations		
Sensitive Area Determ.		
Mud Program	✓	
Form 2A		

FORM SUBMITTED FOR:

☐ Pit Report☒ Pit Permit

OGCC Operator Number: 28600

Name of Operator: Exxon Mobil Corporation

Address: P.O. Box 4358; CORP-MI-207

City: Houston State: Tx. Zip: 77210-4358

Contact Name and Telephone:

Mark Cornett

No: 281-654-1925

Fax: 281-654-1940

API Number (of associated well): 05-103-11640-00

OGCC Facility ID (of other associated facility): Freedom Unit 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9, C10

Pit Location (QtrQtr, Sec, Twp, Rng, Meridian): NENW, Sec. 31, T1S, R97W 6th P.M.

Latitude: 39.926028 Longitude: 108.326014 County: Rio Blanco

Pit Use: ☐ Production ☒ Drilling (Attach mud program) ☐ Special Purpose (Describe Use):Pit Type: ☒ Lined ☐ Unlined Surface Discharge Permit: ☐ Yes ☐ NoOffsite disposal of pit contents: ☒ Injection ☐ Commercial Pit/Facility Name: Freedom Unit 197-31C Pit/Facility No:

Attach Form 26 to identify Source Wells and Form 25 to provide Produced Water Analysis results.

Existing Site Conditions

Is the location in a "Sensitive Area?" ☐ Yes ☒ No Attach data used for determination.

Distance (in feet) to nearest surface water: 850 ground water: 900 water wells: 5192

LAND USE (or attach copy of Form 2A if previously submitted for associated well) Select one which best describes land use:Crop Land: ☐ Irrigated ☐ Dry Land ☐ Improved Pasture ☐ Hay Meadow ☐ CRPNon-Crop Land: ☒ Rangeland ☐ Timber ☐ Recreational ☐ Other (describe):Subdivided: ☐ Industrial ☐ Commercial ☐ Residential

SOILS (or attach copy of Form 2A if previously submitted for associated well)

Soil map units from USNRCS survey: Sheet No: Soil Complex/Series No: 73

Soils Series Name: Rentsac Channery Loam Horizon thickness (in inches): A: 5 ; B: 4 ; C: 7

Soils Series Name: Horizon thickness (in inches): A: ; B: ; C:

Attach detailed site plan and topo map with pit location.

Pit Design and Construction

Size of pit (feet): Length: 160 Width: 145 Depth: 12 & 15

Calculated pit volume (bbbls): 30890 w/2' frbd. Daily inflow rate (bbbls/day): Various

Daily disposal rates (attach calculations): Evaporation: NA bbbls/day Percolation: 0 bbbls/day

Type of liner material: Impermeable synthetic woven coated polyethylene w/8 oz geotextile felt pad Thickness: 24 mil

Attach description of proposed design and construction (include sketches and calculations).

Method of treatment of produced water prior to discharge into pit (separator, heater treater, other):

Is pit fenced? ☒ Yes ☐ No Is pit netted? ☒ Yes ☐ No

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Mark Cornett

Signed: *Mark Cornett*

Title: Regulatory Specialist

Date: 05/24/2010

OGCC Approved: Title: Date:

CONDITIONS OF APPROVAL, IF ANY:

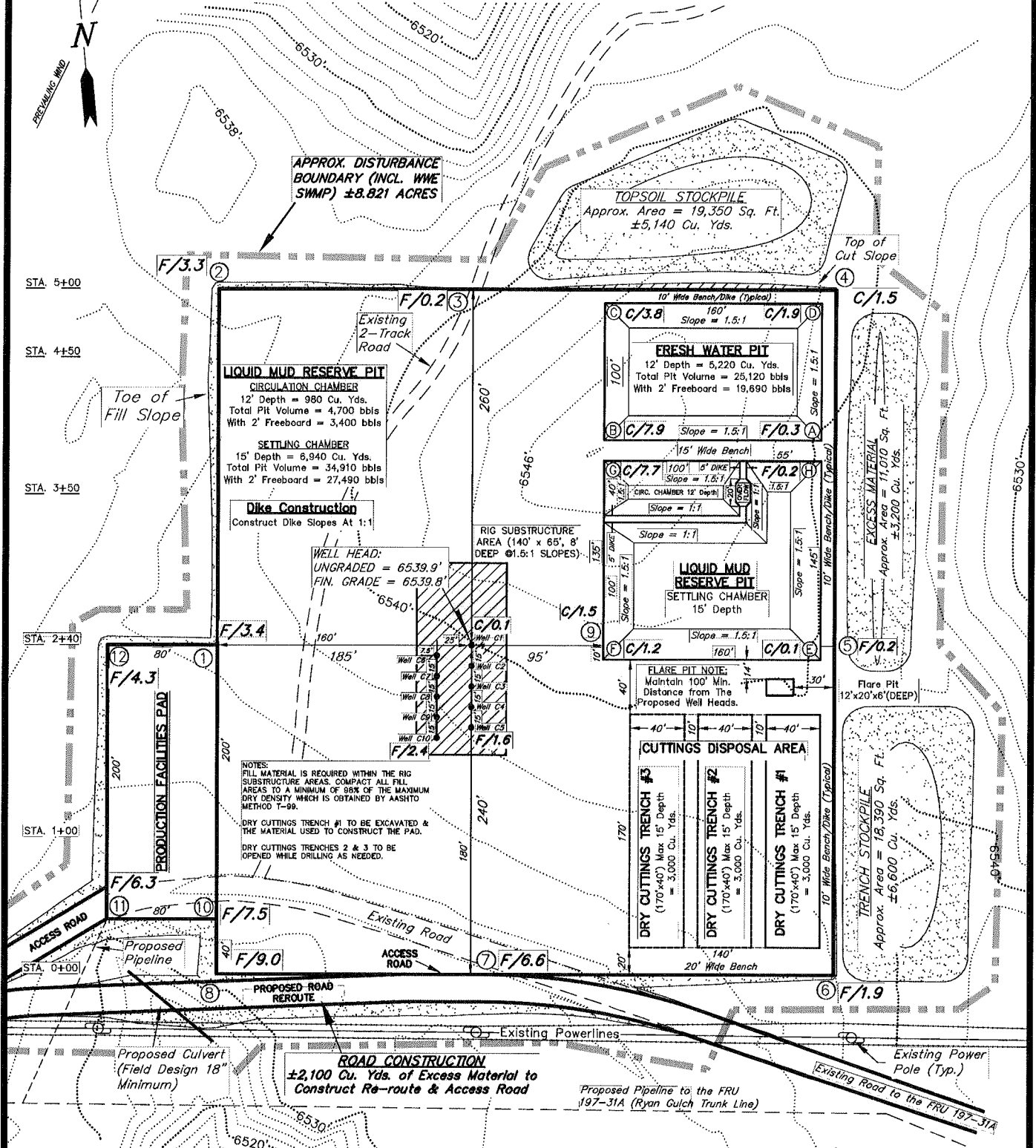
FACILITY NUMBER:

EXXON MOBIL CORPORATION

FIGURE #1

LOCATION LAYOUT

WELL PAD (FREEDOM UNIT 197-31C)
FREEDOM UNIT 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10
Section 31, T1S, R97W, 6th P.M.



NOTE:
CUTS AND FILLS SHOWN ARE FOR THE INITIAL CONSTRUCTION OF PAD TO A SINGLE ± LEVEL ELEVATION. ADDITIONAL EARTHWORK IS REQUIRED TO COMPLETE THE FINISH GRADING PLAN AS SHOWN ON SHEET 5.

SURVEYED BY: D.P.	DATE SURVEYED: 01-02-06
DRAWN BY: F.T.M.	DATE DRAWN: 02-15-06
SCALE: 1" = 100'	REVISED: 04-27-10 D.COX

Tri State
Land Surveying, Inc.
180 NORTH VERNAL AVE. VERNAL, UTAH 84078
(435) 781-2501

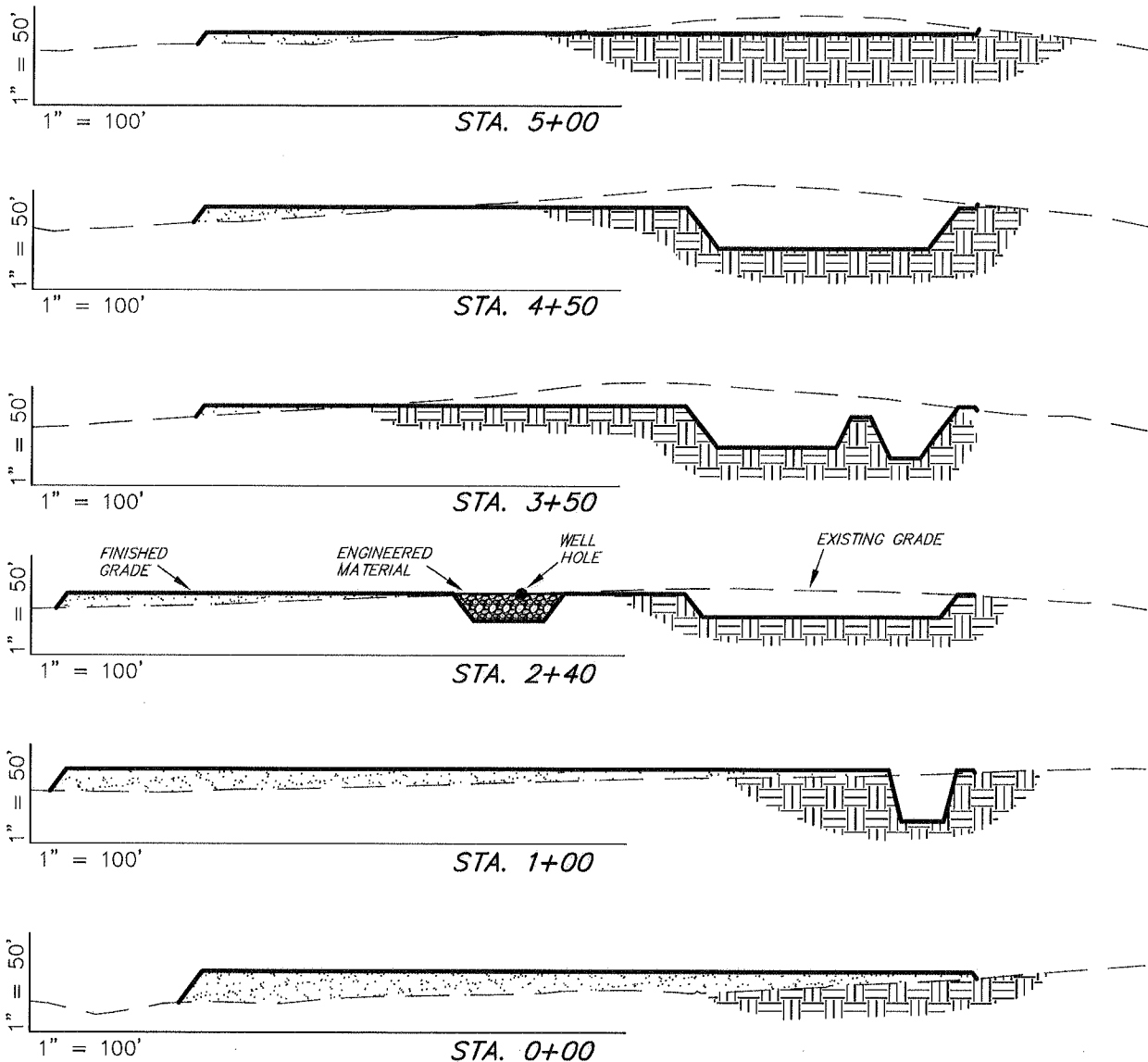
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OF 9

EXXON MOBIL CORPORATION

FIGURE #2

CROSS SECTIONS

WELL PAD (FREEDOM UNIT 197-31C)
FREEDOM UNIT 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10
Section 31, T1S, R97W, 6th P.M.



NOTES:

- 1.) UNLESS OTHERWISE NOTED, CUT SLOPES ARE AT 1:1 & FILL SLOPES ARE AT 1.5:1.
- 2.) RIG SUBSTRUCTURE TO BE EXCAVATED AND USED TO CONSTRUCT THE LOCATION.
- 3.) RIG SUBSTRUCTURE MATERIAL TO BE REPLACED WITH ENGINEERED MATERIAL TO ALLOW FOR 98% COMPACTION.
- 4.) $\pm 2,100$ CU. YDS. OF EXCESS MATERIAL TO CONSTRUCT RE-ROUTE & ACCESS ROAD

ESTIMATED EARTHWORK QUANTITIES (No Shrink or swell adjustments have been used) (Expressed in Cubic Yards)

ITEM	CUT	FILL	6" TOPSOIL	EXCESS
SUBSTRUCTURE	2,020	0	Topsoil is not Included in Pad Cut	2,020
PITS	13,140	0		13,140
PAD	11,040	21,190	4,670	-10,150
TOTALS	26,200	21,190	4,670	5,010

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EXXON MOBIL CORPORATION

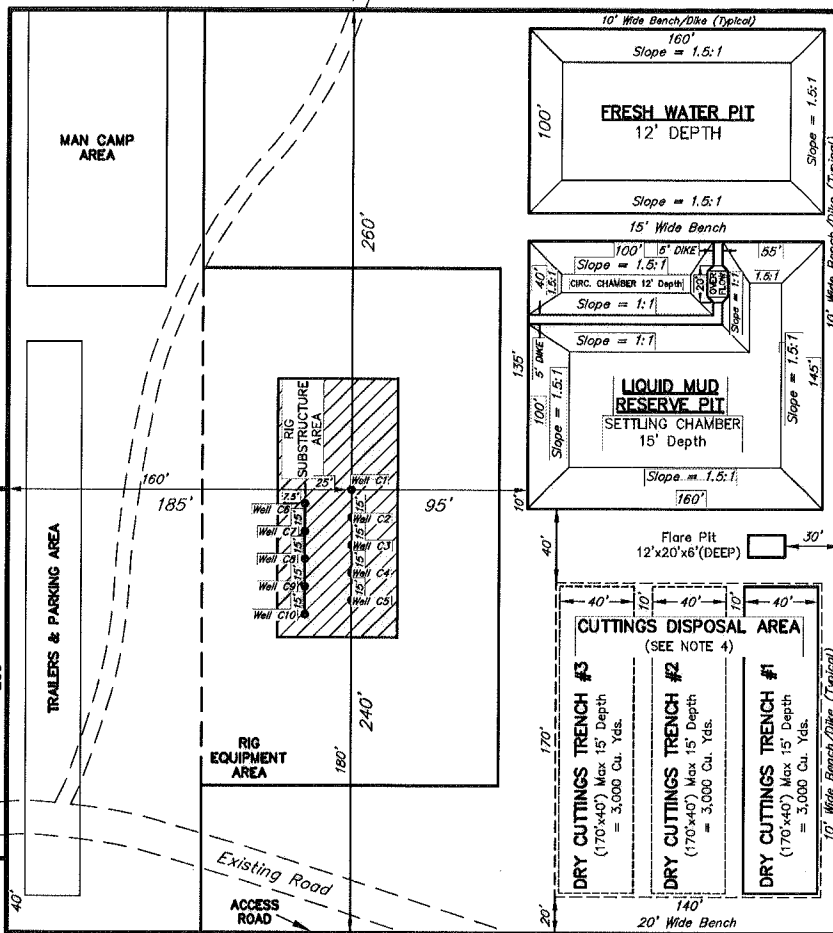
FIGURE #3

TYPICAL RIG LAYOUT

WELL PAD (FREEDOM UNIT 197-31C)
FREEDOM UNIT 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10
Section 31, T1S, R97W, 6th P.M.



Existing
2-Track
Road



FRESH WATER PIT

12' Depth = 5,220 Cu. Yds.
Total Pit Volume = 25,120 bbls
With 2' Freeboard = 19,690 bbls

LIQUID MUD RESERVE PIT

CIRCULATION CHAMBER
12' Depth = 980 Cu. Yds.
Total Pit Volume = 4,700 bbls
With 2' Freeboard = 3,400 bbls

SETTLING CHAMBER
15' Depth = 6,940 Cu. Yds.
Total Pit Volume = 34,910 bbls
With 2' Freeboard = 27,490 bbls

Dike Construction

Construct Dike Slopes At 1:1

FLARE PIT NOTE:
Maintain 100' Min.
Distance from The
Proposed Well Heads.

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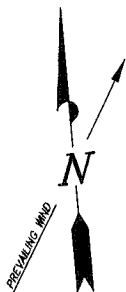
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EXXON MOBIL CORPORATION

TYPICAL FINISH GRADING PLAN

WELL PAD (FREEDOM UNIT 197-31C)
FREEDOM UNIT 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10
Section 31, T1S, R97W, 6th P.M.

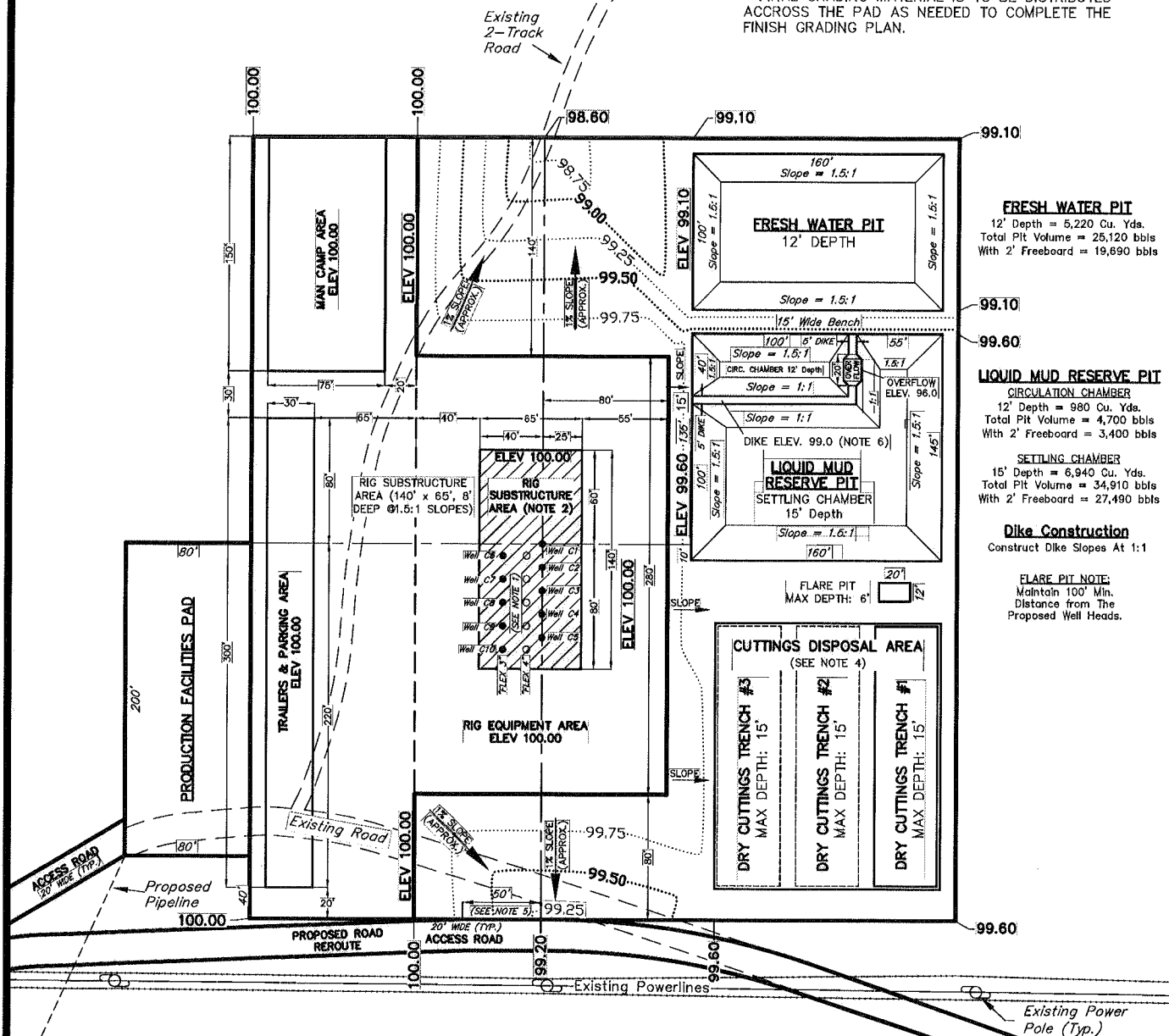
FIGURE #4



CONTOUR AND ELEVATION NOTE:

THE REFERENCE ELEVATION OF 100.00 IS EQUAL TO THE ACTUAL FINISHED GRADE ELEVATION ON THE LOCATION LAYOUT (SHEET 2). ALL OTHER ELEVATIONS ARE RELATIVE TO THIS REFERENCE ELEVATION.

* FINAL GRADING MATERIAL IS TO BE DISTRIBUTED ACROSS THE PAD AS NEEDED TO COMPLETE THE FINISH GRADING PLAN.



FRESH WATER PIT

12' Depth = 5,220 Cu. Yds.
Total Pit Volume = 25,120 bbls
With 2' Freeboard = 19,690 bbls

LIQUID MUD RESERVE PIT

CIRCULATION CHAMBER
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Dike Construction

Construct Dike Slopes At 1:1

FLARE PIT NOTE:
Maintain 100' Min.
Distance from The
Proposed Well Heads.

Notes

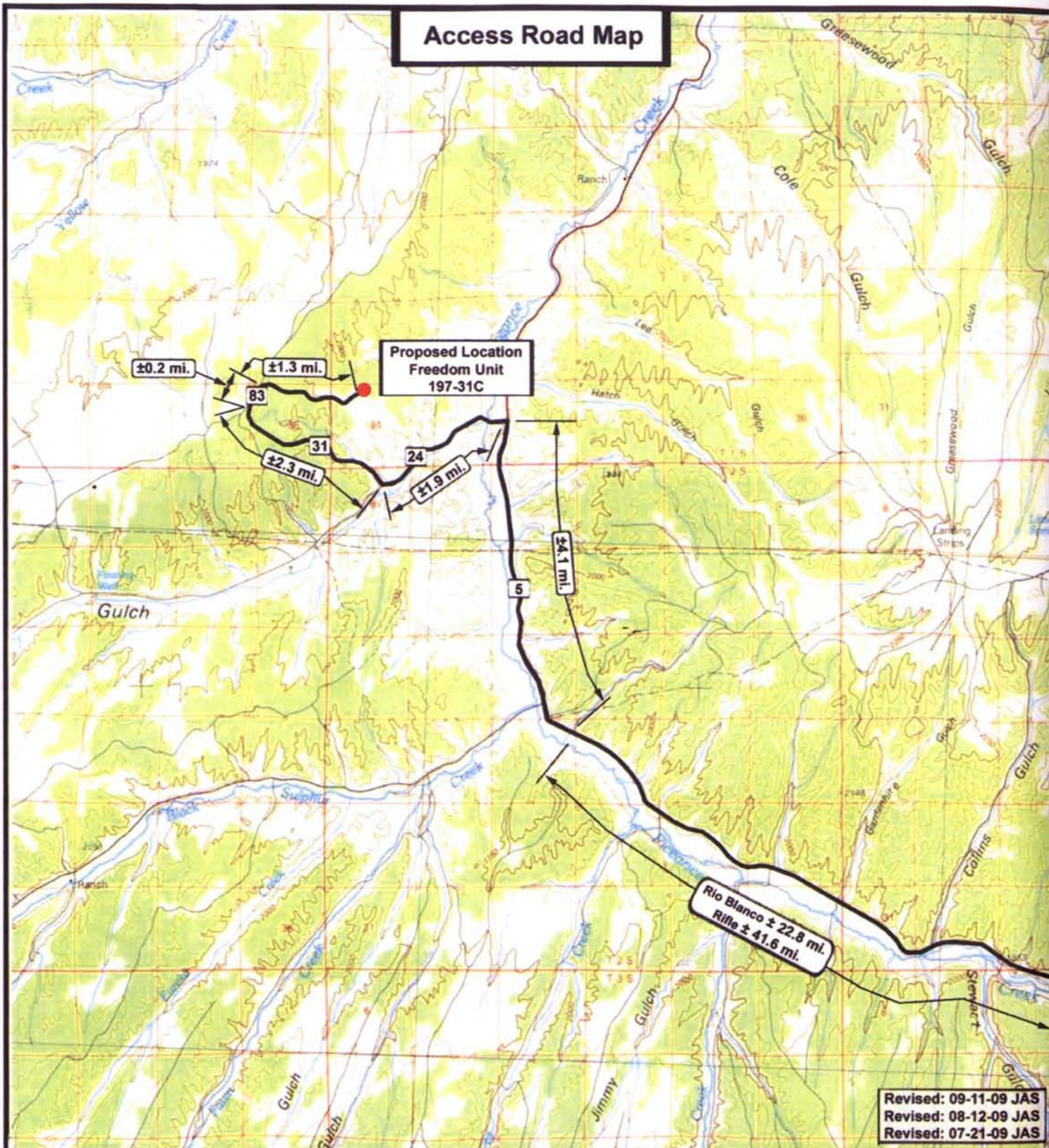
1. Indicated row spacing for H&P "Flex 3" Drill Rig. H&P "Flex 4" will require 10'-0".
2. Rig Substructure Area to be level. Compaction and testing per wellpad construction specification.
3. Perimeter ditching not shown. Grading plan to be coordinated with approved Individual Storm Water Management Plan for each site.
4. Cuttings Trench #1 to be constructed with wellpad. Additional trenches (#2 & #3) will be constructed during drilling operations as required.
5. Indicated spacing may be increased to 75' based upon site topography. Alternate access location may be selected based upon site topography and direction of primary (existing) access.
6. Excavate Reserve Pit to initial 12' depth. Construct diversion dike with 3.0' additional excavation from settling chamber.

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Access Road Map



Exxon Mobil Corporation

**Freedom Unit 197-31C
SEC. 31, T1S, R97W, 6th P.M.**



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(435) 781-2501
180 North Vernal Ave. Vernal, Utah 84078

SCALE: 1 : 100,000
DRAWN BY: mw
DATE: 02-21-2006

Legend

Existing Road

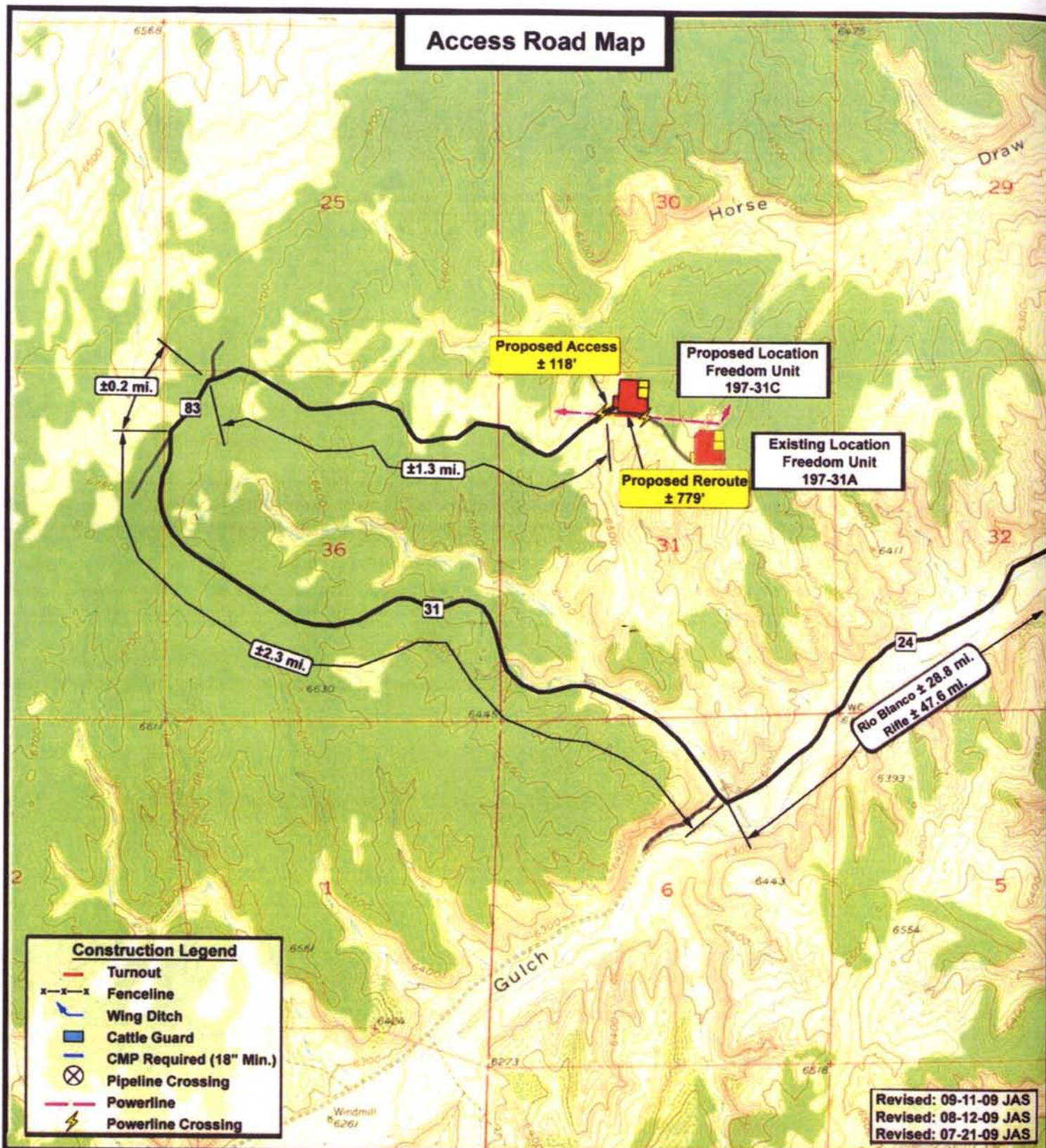
Proposed Access

TOPOGRAPHIC MAP

"A"

SHEET
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OF 9

Access Road Map



Revised: 09-11-09 JAS
 Revised: 08-12-09 JAS
 Revised: 07-21-09 JAS

Exxon Mobil Corporation

**Freedom Unit 197-31C
 SEC. 31, T1S, R97W, 6th P.M.**

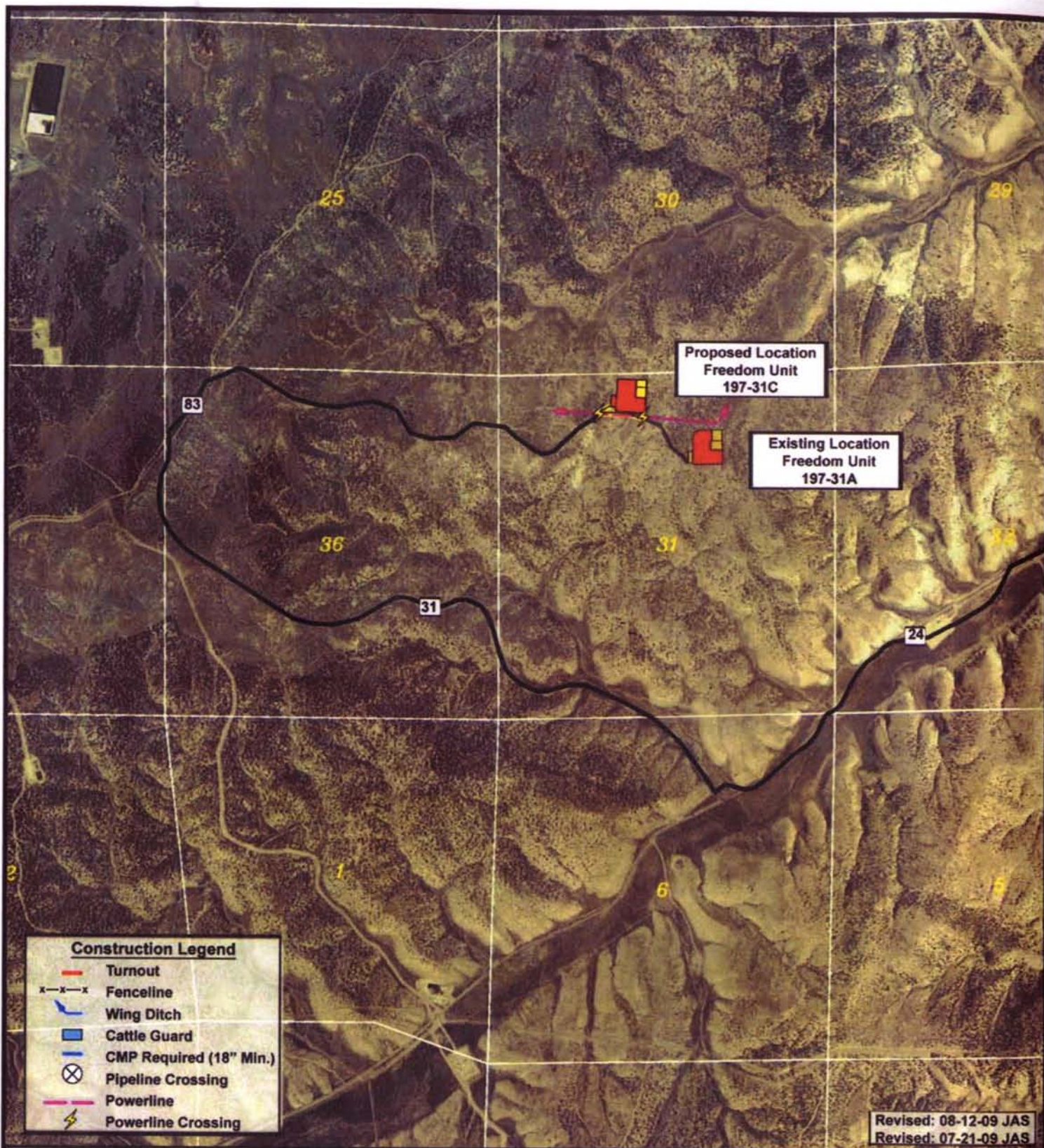


**Tri-State
 Land Surveying Inc.**
 (435) 781-2501
 180 North Vernal Ave. Vernal, Utah 84078

SCALE: 1" = 2,000'
 DRAWN BY: mw
 DATE: 02-21-2006

Legend
 Existing Road
 Proposed Access

TOPOGRAPHIC MAP
"B"
 SHEET
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Revised: 08-12-09 JAS
Revised: 07-21-09 JAS

Exxon Mobil Corporation

**Freedom Unit 197-31C
SEC. 31, T1S, R97W, 6th P.M.**



**Tri-State
Land Surveying Inc.**
(435) 781-2501
180 North Vernal Ave. Vernal, Utah 84078

SCALE: 1" = 2,000'
DRAWN BY: JAS
DATE: 07-21-2009

Legend
Existing Road
Proposed Access

ARIAL MAP
"B"
SHEET
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EXXON MOBIL CORPORATION

LIQUID MUD RESERVE PIT & FRESH WATER PIT DETAILS

WELL PAD (FREEDOM UNIT 197-31C)

FREEDOM UNIT 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10

Section 31, T1S, R97W, 6th P.M.

GENERAL NOTES:

All work shall be done in strict accordance with the COGCC Rules, Manufacturer's recommendations, and these drawings and specifications. Tri-State and the Operator shall be notified as soon as possible to any and all conflicts with the COGCC Rules, manufacturer's recommendations and these drawings and specifications.

It is the intent of these specifications that a quality safe finished product as described on the plans and specifications will be installed. It is the responsibility of the Contractor to take whatever measures that shall be deemed necessary and to coordinate with the Inspector and Operator to insure that this requirement is met. Site conditions may arise during construction that may require the use of a double geofabric and pit liner. The Contractor shall be flexible and open to such changes. If double liner or other major changes due to site conditions are needed, change orders will be given and the Contractor, Tri-State, and Operator will come to an agreement in writing.

A Tri-State representative will inspect the construction and materials of the pit. The following inspections will be done during the pit construction: 1) Finish Grade Surface Preparation, Anchor Trench, and Pit Materials, 2) In-Place Geofabric, 3) In-Place Pit Liner and Final Pit Inspection. Absolutely no material shall be placed in the pit above what is approved for until inspection approval in writing is given for that material as outlined in each of the (3) inspections. If approval in writing is not given, and pit materials above to that which is not approved is installed, the Contractor will be responsible to remove the materials. The following is a brief description of each of the pit inspections:

- 1) Finish Grade Surface Preparation, Anchor Trench, and Pit Materials - This inspection will check to see if the finish grade and anchor trench of the proposed pit is adequate for the installment of the geofabric and pit liner. This inspection will also check the initial pit design and make changes to the design, if needed, depending on site specific obstacles. The Inspector will watch for smooth uniform side slopes, compaction, and for any unwanted or potentially harmful materials that could damage the geofabric and pit liner. Before inspection, the Contractor is to have the pit constructed to the correct size and in the correct location and elevation. The pit is to be compacted solid, clean, and thoroughly trackwalked (several times and in several directions). After approval of the Finish Grade Surface Preparation and Pit Materials Inspection in writing, the Contractor may install the Geofabric.
- 2) In-Place Geofabric - This inspection will check to see if the Geofabric material is properly installed according to specifications. The Inspector will watch for pit coverage, material over lap, and any unwanted or potentially harmful materials that could damage the geofabric and pit liner. Before inspection the Contractor is to have the Geofabric installed, clean and free of debris. After approval of the In-Place Geofabric Inspection in writing, the Contractor may install the Pit Liner.
- 3) In-Place Pit Liner and Final Pit Inspection - This inspection will check to see if the pit liner and anchor trench is properly installed according to specifications. The Inspector will look in pit corners and gaps and other places where the liner might be stretched and could create potential tear problems. The Inspector will also verify that adequate excess material remains in corners and around edges so that the liner may expand and contract. The Inspector will also watch for bumps, imperfections, tears, holes, and any other defects in the liner. The Contractor shall notify and show any and all repairs to the liner to the Inspector. The pit liner is to be clean and contain no debris or any unwanted or potentially harmful materials that could damage the geofabric and pit liner on it. Before inspection the Contractor shall have the pit liner installed and the anchor trench backfilled and compacted.

PREPARATION:

The finish grade of the pit shall have smooth solid look on the bottom, slopes, and top edges of the area to be lined. The areas to be lined shall be dry and clean prior to installing the pit liner. The finish grade shall be free of all sharp, loose, and unstable material including large rocks, angular and sharp rocks, rubble, ice, trash, vegetation, holes, cracks, sharp and other penetrating or raised surfaces. All such potentially harmful surfaces shall be removed from the pit area. The pit shall meet the size, location, and elevations shown on the drawings and shall be smooth, dense, uniform, and have no sudden changes in grade. Inspection approval will not be given and pit materials cannot be placed if pit preparation is unacceptable. If approval from the inspection is not given, additional Finish Grade Surface Preparation and Pit Materials Inspections will be at the Contractor's expense.

The finish grade pit base material shall be native base materials. If the native base material is determined unsuitable and upon written approval from Tri-State and the Operator, the base materials may be obtained from an Operator specified borrow area. All base material shall be compacted to a minimum 95% compaction within 2% optimum moisture.

The finish grade pit base shall be trackwalked several times in several directions until the pit has a smooth solid look. It is the Inspector's prerogative to have the Contractor re-trackwalk the pit to insure pit preparation to the Inspector's satisfaction.

The finish grade of the pit shall be prepared immediately prior to the placing of the liner and shall not sit to be subject to weathering.



DRAWN BY: PAUL
DATE DRAWN: 10-9-2009
REVISED:

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SHEET
2a
OF 9

EXXON MOBIL CORPORATION

LIQUID MUD RESERVE PIT & FRESH WATER PIT DETAILS

WELL PAD (FREEDOM UNIT 197-31C)

FREEDOM UNIT 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10

Section 31, T1S, R97W, 6th P.M.

MATERIAL:

All material used for pit construction shall be visually inspected by the Contractor upon delivery to the site. The material shall be unloaded, handled, and stored in a safe manner to ensure no damage is done to the material from weather, construction or moving.

A geofabric of at least 100 mils thickness, weighing 8 ozs. per square yard with a minimum grab tensile strength of 275 lbs. per square inch and a minimum Mullen burst strength of 450 pounds per square inch, is required to be placed on the finished grade base under the pit liner.

The material used for the pit liner shall be a continuous sheet of 24 mils reinforced polyethylene (RPE) membrane and shall have been satisfactorily demonstrated by prior use and testing to be suitable, appropriate and durable for the purpose of this work. The liner shall be resistant to sunlight (UV), chemicals, extreme weather (Cold temperatures), puncturing, and tearing. The liner shall also be flexible, durable, liquid tight, free from pinholes, blisters, contaminants or other off specification defects. The liner shall be of sufficient size to include the excess needed for the anchor trench, edges, corners, and difficult areas. The Contractor shall never attempt to bridge gaps and corners by stretching the liner over gaps and corners.

INSTALLATION:

The Contractor is to ensure that the Inspector has approved the preparation of the pit in writing. If approval is not obtained, the Contractor will remove the installed material at the Contractor's expense and the installed material may not be reused. The Contractor is to ensure the pit liner material is the correct material to the correct size and shape as specified on the project construction plans specifications. No field modifications of the liner are acceptable. The Contractor is also to ensure that the pit is properly prepared as specified.

The geofabric sheets shall be placed in such a manner as to minimize overlapped edges. All seams are to be overlapped a minimum of 24". Only those pieces of fabric that can be installed and anchored during the workday shall be unpacked and placed in position. Do not place pit liner in extreme windy weather conditions. Do not try to repair damaged pieces of geofabric. Repaired pieces of geofabric may not be used.

The pit liner shall be preordered to fit the specific pit, and shall be one continuous factory built piece. The liner shall be placed over the approved prepared surface in such a manner as to assure a minimum of handling. Do not place pit liner in extreme windy or cold weather conditions. Any and all damage and defects to the liner that can be repaired will be shown to the Inspector. All repairs shall be done according to the recommendations of the manufacturer and shall be leak tested.

Sandbags and or other suitable weights may be used as required to hold the liner in position during the installation. The weights shall not have any sharp edges, which may snag or otherwise penetrate the liner fabric. Care should be taken to keep the liner as clean as possible and prevent potential liner damages.

No materials or equipment shall be dragged across the liner nor shall the workmen walk on or abuse the liner while installing the liner.

Pit liner and geofabric shall be placed in a "relaxed" condition, free from stress or tension. The geofabric and liner should closely fit around all protrusions and penetrations. All irregular projections, if any, shall be sealed and flashed with the fabricated boots or other approved sealing methods.

The edges of the liner and geofabric shall be secured by an anchor trench. The anchor trench shall be either an 18"x 36" 'V' trench or 24"x24" square trench. Slightly rounded corners will be provided in the trench where the liner adjoins the trench so as to avoid sharp bends in the liner. No loose soil or rocks will be allowed to underlie the liner or geofabric in the anchor trench. Leading edges of the anchor trench should be smooth and even. Care shall be taken when backfilling the trench so that no trench material falls into the pit.

The liner shall be installed according to manufacturer's recommendations. The Contractor is to ensure that the liner is laid out and installed in the correct direction and side. Liner shall be worked into corners and around bumps and into holes to prevent liner bridging situations. In addition, excess liner shall be given in corners, edges, and difficult areas to accommodate for liner expansion and contraction. Proper equipment and methods of pulling and installing the liner shall be used per the manufacturer's recommendations.



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EXXON MOBIL CORPORATION

LIQUID MUD RESERVE PIT & FRESH WATER PIT DETAILS

WELL PAD (FREEDOM UNIT 197-31C)
FREEDOM UNIT 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10
Section 31, T1S, R97W, 6th P.M.

SITE EXCAVATION, GRADING, AND COMPACTION:

DEFINITIONS:

COMPACTION:

The effort of getting an amount of soil into the smallest amount of space. The degree of compaction is specified as percent of the maximum dry density (MDD). For best compaction results in the field, a soil must be within 2%-3% of its optimum moisture content (OMC).

MAXIMUM DRY DENSITY (MDD):

MDD is calculated by lab testing. It is the greatest amount of soil compacted into an amount of space. MDD can only be reached when a soil is within its optimum moisture content (OMC).

OPTIMUM MOISTURE CONTENT (OMC):

OMC is calculated by lab testing. It is the amount of water needed in a soil to compact it to its maximum dry density (MDD). At OMC a soil reaches MDD with the least amount of compactive effort.

GRADING MATERIALS:

Grading materials will be native and can vary from site to site. The material shall be free from topsoil, vegetation, wood, roots, ice, garbage, or other unstable and extraneous material. Material can even vary within a site, and the Contractor shall use the best structural material available on site for the pit areas.

EXCAVATION & COMPACTION:

Careful planning and measurements shall be done so that the excavation does not exceed the specified lines and grades. If the Contractor excavates below grade, then the over excavated areas shall be replaced using good structurally sound material and placed as outlined in these specifications. If the over excavated sub-grade is unsuitable after excavation, the Contractor shall remove and replace all unsuitable material up to 36 inches.

Fill material shall consist of good clean structurally sound native material. Fill shall be brought up in uniform 12 inch maximum lifts and shall be compacted to a density of 95 percent of the MDD through every layer. The entire surface shall be maintained free from ruts and protrusions so that construction equipment can readily travel over any section.

It is strongly recommended that the Contractor conduct compaction trials at the start of the backfilling to establish a suitable compaction procedure. These trials will help to determine the fill layer thickness and moisture content to suit the soil and available compaction equipment. These trials will also help determine a suitable number of passes of the compaction equipment to achieve the minimum compaction requirements.

All excavation and fill work shall be done in a legal safe manner.

COMPACTION TESTING:

The Contractor is solely responsible for the compaction throughout the site. It may be in the Contractor's best interest to have soil testing and compaction testing for the compaction process. This could give the Contractor a better idea of the soil's OMC and amount of compaction effort to reach the desired % MDD. No testing will be provided by the Operator or the Inspector.

CONTRACTOR'S RESPONSIBILITY:

Neither the Operator nor the Inspector will test or inspect the placement of fill material or its compaction. Inspectors will visually inspect and make observations of the finish grade surface only. Fill material and compaction is the Contractor's sole responsibility. The Contractor will be held responsible for any damages resulting from use of unstable material and poorly compacted sites. The use of unstable material and poorly compacted sites can and will be tested for in the event of any site failure through undisturbed core sample drilling. It is in the Contractor's best interest to test material and compaction, log construction activities, and practice up-to-date sound construction techniques.



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SHEET
2c
OF 9

NOTES

— See Location Layout Drawing for Finish Grade Elevations and Slopes

EXXON MOBIL CORPORATION***LIQUID MUD RESERVE PIT & FRESH WATER PIT DETAILS***

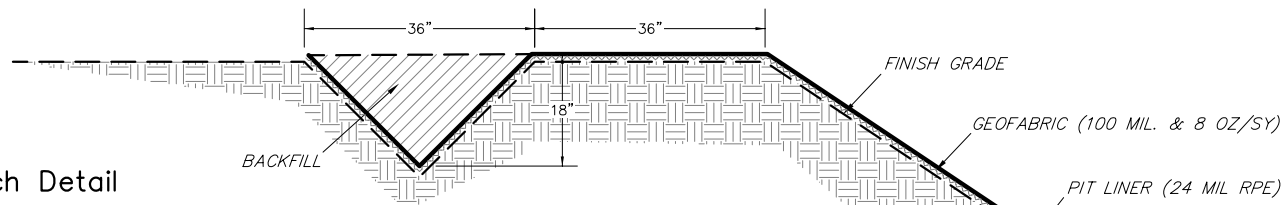
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FREEDOM UNIT 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9 & C10

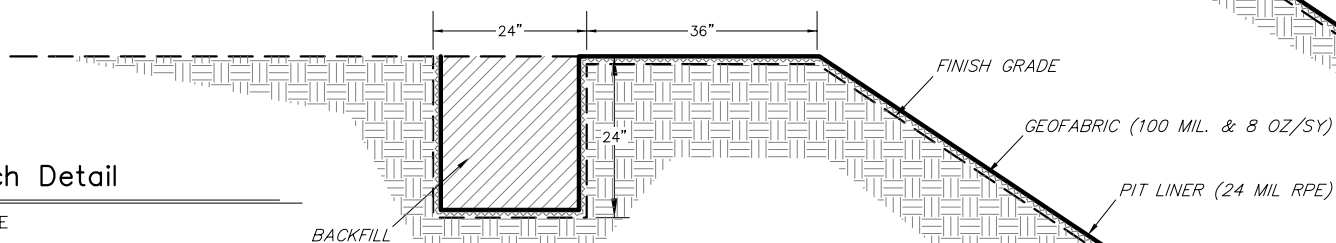
Section 31, T1S, R97W, 6th P.M.

'V' Anchor Trench Detail

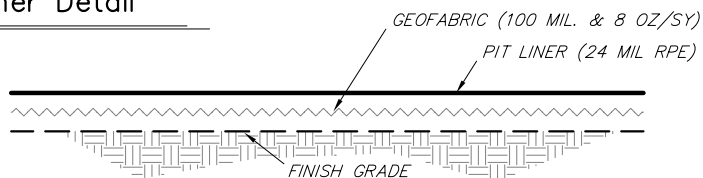
SCALE: NOT TO SCALE

**Anchor Trench Detail**

SCALE: NOT TO SCALE

**Pit GeoFabric & Liner Detail**

SCALE: NOT TO SCALE



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OF 9

Exxon Mobil Corporation

Freedom Unit 197-31C1, C2, C3, C4, C5, C6, C7, C8, C9, and C10 (Directional Wells)
Section 31, T1S, R97W
Rio Blanco Co., Colorado
BLM Drilling Plan

1. The Estimated Tops of Important Geologic Markers

Formation	TVD (ft)
A Groove	1450
B Groove	1650
Wasatch A	3150
Wasatch C	4150
Wasatch G	5950
Ohio Creek	7700
Williams Fork	8400
Cameo	11400
Rollins	11650
Cozzette	11850
Corcorran	12700
TD	12900

Tops are RKB with an estimated KB elevation of 6,562'

2. The estimated depths at which the top and the bottom of anticipated water, oil, gas or other mineral bearing formations are expected to be encountered

	Top (ft TVD)	Bottom (ft TVD)	How Protected
Fresh Water	Surface	3150	Surface casing cemented to surface
Gas	5950	TD	3 casing strings provide isolation

3. Minimum specifications for pressure control equipment

A. Wellhead and Tree Equipment:

"A" Section	-	10-3/4" SOW x 11" 5000 psi, sweet MultiBowl
"B" Section	-	11" 5000 psi x 11" 5000 psi, sweet Multibowl
Adapter	-	11" 5000 psi x 4-1/16" 10000 psi, sweet
Tubinghead	-	4-1/16" 10000 psi x 4-1/16" 10000 psi, sweet
Tubinghead adapter	-	4-1/16" 10000 psi x 2-1/16" 5000 psi, sweet
Tree	-	2-1/16" 5000 psi, sweet

B. Blowout preventer equipment:

Type	Pressure Rating	Installed on Casing
Type - RSRRAG	5,000 psi	10-3/4"
Type - RSRRAG	5,000 psi	7"

Additional preventers may be added and/or preventers with higher pressure ratings may be substituted depending on equipment provided by drilling contractor.

C. Testing:

- (1) Operational Testing - an operational test consisting of closing the pipe rams on the drill pipe and closing the blind rams on open hole will be performed on each round trip but not more than once each day.
- (2) Pressure Testing - An initial pressure test of 200 psi and 5,000 psi will be performed on the ram BOPs after nipping up on the surface casing string but prior to drilling out. The annular BOP will be tested to 200 psi and 5,000 psi upon installation. This initial test only may be performed on the "stump" and the BOP-wellhead flange will be tested when the stack is installed.

Subsequent pressure tests of the BOP equipment will be conducted as follows:

- (a) Upon any component change of the BOP stack and/or choke manifold.
- (b) At least every thirty (30) days.

Subsequent pressure tests will be at 200 psi and 5,000 psi for the ram BOPs, and the annular preventer will be tested to 200 psi and 3,500 psi. If a test plug is used, the rams will be tested to working pressure.

- (3) BOP drills - A drilling crew proficiency test to perform the well shut-in procedure will be performed at least once each week with each crew.

D. BOP control unit:

Unit will be hydraulically operated and have one control station on the rig floor readily accessible to the driller and one located at ground level a safe distance from the wellbore.

E. Remote controlled choke:

Unit will be installed prior to drilling intermediate hole.

4. Auxiliary equipment and proposed casing program

A. Auxiliary equipment:

- Kelly cocks - upper and lower installed on kelly.
- Safety valve - full opening ball type valve to fit each type and size of drill pipe in use will be available on the rig floor in the open position at all times for use when the kelly is not connected to the drill string.

B. Casing:

String	Hole Size	Size / Weight / Grade	Approximate Depth Interval (TVD)	Approximate Depth Interval (MD)
Conductor	26"	16" Line Pipe (0.25 wall)	0-120'	0-120'
Surface	14-3/4"	10 3/4" 45.5# J55	0-4,200'	0-4,300'
Intermediate	9-7/8"	7" 26# P110 or 7" 23# L80 or 7" 26# K55	0-8,700'	0-9,000'
Production	6-1/8"	4 1/2" 15.1# P110	0-12,900'	0-13,100'

Substitutions of weight or grade may be required due to availability or variations in design loads. All pipe is in new condition. All casing threads and couplings will be API. In the case of needing increased tensile or torque ratings, premium connections, such as Hydril or Vam connections, may be used.

A stage tool may be placed in the surface and intermediate hole casing strings. The setting depth of the surface hole stage tool will range from 1,200 to 2,200 ft TVD. When applicable, the intermediate hole stage tool will be installed at a depth between the Wasatch G and Ohio Creek formations. Final stage tool setting depth will be based on actual formation tops and lost returns zones encountered while drilling.

The following table details the minimum design criteria for each casing string, based on working stress design.

Load	Safety Factors
Burst	1.10 if no wear 1.21 with 10% wear*
Collapse	1.125
Tension	1.33 body 1.50 connection
Compression	1.33 body 1.33 connection

* 10% wear is the standard assumption for casing that will be drilled through when the subject load is applied.

C. Cement:

- A stage tool may be used in the surface hole cement job to ensure cement is circulated to surface.
- A stage tool may be used in the intermediate hole cement job to ensure adequate top of cement.

Hole Size (inches)	Casing Size (inches)	Top of Cement (ft MD)	Depth of Cement (ft MD)	Cement Type	Approximate Cement Volume (ft ³)
26	16	Surface	120	Class G	280
14.75	10.75	Surface	1175	Stage 2 Lead: Class G / Light	660
		1175	1675	Stage 2 Tail: Class G	280
		1675	3800	Stage 1 Lead: Class G / Light	1190
		3800	4300	Stage 1 Tail: Class G	280
9.875	7	3800	8500	Lead: Class G / Light	1250
		8500	9000	Tail: Class G	140
6.125	4.5	6700	13100	Lead: Class G / Light	630

- Cement volumes are based on gauge hole and will be revised as necessary (caliper data or mud log) to ensure coverage of all fresh water and hydrocarbon bearing formations. The surface and intermediate string cement jobs may be a 2 stage job. Intermediate and Production casing cement jobs may use foamed or low density cement.

Approximate cement formulation and properties:

Slurry	Typical Additives	Density (ppg)	Yield (ft ³ /sk)	Minimum Sacks
10-3/4" Lead Stage 1 (0% excess)	Lightweight, Fluid loss, Free water control	12.5	2.08	580
10-3/4" Lead Stage 2 (0% excess)	Lightweight, Fluid loss, Free water control	12.5	2.08	320
10-3/4" Tail Stage 1 (0% excess)	Fluid loss, Free water control, Retarder	15.6	1.21	240
10-3/4" Tail Stage 2 (0% excess)	Fluid loss, Free water control, Retarder	15.6	1.21	240
7" Lead (0% excess)	Lightweight, Fluid loss, Free water control	12.5	2.08	610
7" Tail (0% excess)	Fluid loss, Free water control, Retarder	15.6	1.21	120
4-1/2" Lead / Tail (0% excess)	Lightweight, fluid loss, free water control.	12	2.56	250

- Operator requests the option to substitute a single-stage foam cement job for the proposed job on the 7" intermediate and / or the 4-1/2" production string. The cement will have a lead ± 13 ppg base slurry with nitrogen added to reduce the density of the slurry to ± 10 ppg and a ± 15.5 ppg tail slurry. The minimum volume of cement pumped will meet or exceed the volume proposed previously in the intermediate job and production job.
- Operator requests the option to substitute lightweight cement on the 7" intermediate casing and / or 4-1/2" production casing cement jobs. The cement slurry will have a density of ± 10.5 ppg. Any low density cements utilized will meet or exceed the strength requirements for providing casing

structural support and hydraulic isolation. The minimum volume of cement pumped will meet or exceed the volume proposed previously in the 2 stage intermediate job and 1 stage production job.

Casing test pressures will meet or exceed the following:

String	Size	Test Pressure
Surface	10-3/4"	1,500 psi
Intermediate	7"	1,800 psi
Production	4-1/2"	2,800 psi

5. Circulating medium characteristics.

A. Type and anticipated characteristics of circulating medium:

Depth Interval (ft)	Mud Type	Weight (ppg)	FV (Sec/Qt)	YP (#/100 SF)	WL (cc/30 min)	pH
See 4B*	Spud	8.3-9.5	28-50	4-20	--	7.5-10.5
See 4B*	WBM	8.3-9.5	28-50	4-15	<15	8.0-11.0
See 4B*	WBM	8.6-10.5	28-50	4-15	<15	8.0-11.0

*Hole section depths correspond with casing setting depths as shown in 4B

- Operator requests the option to substitute OBM and / or salt mud during the drilling of the intermediate and / or production hole sections.

B. Quantities of mud and weighting materials:

A sufficient inventory of mud materials and treating equipment will be maintained to control mud properties adequately for well control and drilling requirements.

C. Mud system monitoring equipment:

- Trip tank - will be used to keep the hole full of fluid on trips and to monitor hole behavior during trips and wireline logging.
- Degasser - will be installed prior to drilling out the surface casing shoe.
- Flare Line System - will be installed prior to drilling out the surface casing shoe.

6. Anticipated type and amount of coring, testing and logging

A. Coring program: none anticipated

B. Drill stem tests: none anticipated

C. Logging program:

- If cement is not circulated to surface on the surface hole cement job, a log acceptable to the White River Field Office will be run to verify top of cement.
- A log acceptable to the White River Field Office will be run in the intermediate and production hole casing to verify top of cement.

Well	Logs	From (ft)	To (ft)
C1-C10	Cased-hole CBL/CCL/GR	4300	9000
C7	CML shuttle deployed triple combo	4300	TD

- Logging may be performed using LWD, tubing conveyance, or wireline.

7. Bottom Hole Pressure / Temperature and Other Potential Hazards.

- The bottom hole pressure is estimated to be 6,388 psi at 12,900' (TVD). This corresponds to an equivalent mud weight of 9.52 ppg.
- Abnormal pressure is not expected in any of these wells.
- Maximum anticipated surface pressure while drilling the 9-7/8" intermediate hole is 1,769 psi. This is based on an 11.83 ppg fracture gradient at 4,175' TVD with a 0.5 ppg safety factor and a pressure gradient of 0.22 psi/ft to surface.
- Maximum anticipated surface pressure while drilling the 6-1/8" production hole is 3,067 psi. This is based on a 10.51 ppg fracture gradient at 8,700' TVD with a 0.5 ppg safety factor and a pressure gradient of 0.22 psi/ft to surface.
- The greatest hazard that is foreseen for this drillwell is lost circulation. Offset wells in the area have had severe lost returns and have taken gas influxes and/or had stuck pipe as a result. The lost circulation risk will be mitigated by monitoring pit volumes and pumping lost circulation material in squeezes and sweeps as necessary.
- The anticipated bottomhole temperature is approximately 300° F.

8. Other Facets of the Proposed Operation.

- Conductor installation: The conductor casing may be pre-installed and cemented by a smaller air/mist drilling rig.
- Surface casing installation: The surface casing may be installed and cemented by a smaller conventional or air/mist drilling rig.

- C. Mud makeup water: Produced water from Piceance Creek Unit wells, Love Ranch wells, or Freedom Unit wells may be one of the sources of water for the mud system in the intermediate and production hole section.
- D. Subsurface hazard mitigation plans: A shallow drilling hazard evaluation was performed by ExxonMobil and no hazardous conditions were identified. Nonetheless, a diverter system will be rigged up on the conductor while drilling the surface hole such that gas flow can be routed to the reserve pits or sand trap, if necessary.
- E. Completion operations: Perforate and frac several intervals throughout the Mesa Verde formation based on wireline logs and shows.

Contact Katie Liddell at (281) 654-0025 with any questions concerning this Drilling Plan.