



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

August 7, 1990

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

Kellahin, Kellahin & Aubrey
P.O. Box 2265
Santa Fe, NM 87504-2265

Attention: W. Thomas Kellahin
General Counsel for Meridian Oil, Inc.

RE: Unorthodox coal gas well location request dated July 31, 1990. Rosa Unit Well No. 305 to be drilled 375' FSL - 1125' FWL (Unit M) of Section 22, Township 31 North, Range 4 West, NMPM, Basin-Fruitland Coal Gas Pool, Rio Arriba County, New Mexico.

Dear Mr. Kellahin:

In reviewing the subject application to be set for hearing on the August 22, 1990 docket, it appears that this matter can be considered administratively and does not require hearing for resolution. I am therefore returning the subject request for hearing to you since it is deemed unnecessary at this time.

Please submit the required information for administrative review pursuant to the Special Rules and Regulations for the Basin-Fruitland Coal Gas Pool, as promulgated by Division Order No. R-8768, and pursuant to Memorandum 1-90, attached.

Should you have any questions concerning this matter, please contact me.

Sincerely,

Michael E. Stogner
Chief Hearing Officer/Engineer

MES/ag

cc: Oil Conservation Division - Aztec Meridian Oil, Inc. - Farmington
William J. LeMay, Director US Bureau of Land Management - Farmington
US Forest Service - Blanco



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

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SANTA FE, NEW MEXICO 87504
(505) 827-5800

No. 1-90

MEMORANDUM

TO: All Operators

FROM: William J. LeMay, Director *WJL*

SUBJECT: Administrative Applications for Unorthodox Locations

DATE: March 21, 1990

Division Memorandum No. 3-89, dated March 24, 1989, advised the industry that the OCD would no longer automatically approve unopposed unorthodox location applications. Unorthodox locations can be approved administratively in accordance with the Rules and Regulations or applicable special pool rules if surface conditions truly prevent the use of a legal location and if directional drilling to a legal location is not feasible.

Topographic conditions which will be considered to justify an unorthodox location include such traditional factors as terrain features (steep slopes, arroyos, etc.) which make drilling impractical. In addition, approval may be given to avoid archeological sites which may not be disturbed without substantial mitigation, incompatible surface uses such as buildings, recreation areas, etc. Applications should fully document the reason an unorthodox location is required.

The attached guidelines state the minimum information which should be submitted with applications for administrative approval of unorthodox locations. Failure to provide the necessary information will probably result in processing delays.

If the surface of the proration unit or proposed drill site is controlled by a Federal Surface Management Agency, a copy of the application must be sent to the appropriate agency office.

If there are legal locations within the proration unit which are drillable, but the operator chooses not to drill those locations for geological reasons the application cannot be approved administratively and a hearing will be required.

NEW MEXICO OIL CONSERVATION DIVISION

SUBMITTAL GUIDELINES FOR ADMINISTRATIVE APPROVAL OF NON-STANDARD LOCATION APPLICATIONS

- I. If the well is located on Federal or Indian Lands, the Federal Surface Management Agency must be notified and an on-site inspection conducted prior to filing the application. If an Application for Permit to drill or a Notice of Staking has been prepared, a copy must be submitted.
- II. Completed C-102 showing the well location, proration unit, leases within the unit and other required information.
- III. Land plat showing offset operators and working interest owners and any offsetting wells producing from the same pool or formation.
 - A. This information may be shown on the topo map if it does not impair the readability of the map.
 - B. The operator should certify that the information is current and correct.
- IV. Original or clear copy of topographic map, preferably 7.5 minute quad, showing contours and other mapped features impacting the location, with the following information marked thereon (In order to be able to adequately show all of the necessary surface conditions it may be necessary to enlarge the relevant portion of the topo map to provide room for detail):
 - A. The proposed well location and proration unit;
 - B. An outline of the orthodox drilling windows as provided in the applicable rules for the subject application;
 - C. The location of any wells to any formation within the area of the proration unit and a statement as to whether an existing pad can be used to drill the proposed well;
- V. An enlargement of the topo map showing the subject area with the applicable additional information:
 - A. Terrain features not shown on the map which make an orthodox location unusable;
 - B. Proposed access roads and pipelines if they affect the location selection;
 - C. The location of any surface uses which prevent use of a legal location;

- D. The location of any archeological sites identified in the archeological survey;
- E. The location and nature of any other surface conditions which prevent the use of an orthodox location.
- VI. If archeological sites are a reason for the unorthodox location request, a copy of the archeological survey, or a summary, identifying sites which cannot be disturbed or which must have any disturbance mitigated. In addition, the location of such areas should be marked on the enlarged topo so they can be clearly identified.
- VII. A narrative report of any on-site inspection of the potential locations. If such on-site has resulted in elimination of legal locations due to surface conditions, such information should also be noted on the enlarged topo.
- VIII. A statement of why directional drilling to reach a legal bottom-hole location is not feasible.
- IX. An affidavit that notice has been sent to all parties entitled thereto, under the Divisions Rules and Regulations with return receipt cards showing date of receipt of notice.

KELLAHIN, KELLAHIN AND AUBREY

ATTORNEYS AT LAW
EL PATIO BUILDING
117 NORTH GUADALUPE
POST OFFICE BOX 2265

TELEPHONE (505) 982-4285
TELEFAX (505) 982-2047

W. THOMAS KELLAHIN
KAREN AUBREY

CANDACE HAMANN CALLAHAN

SANTA FE, NEW MEXICO 87504-2265

JASON KELLAHIN
OF COUNSEL

July 31, 1990

HAND DELIVERED

Mr. William J. LeMay
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501


Re: Meridian Oil Inc., on behalf of
El Paso Natural Gas Company
for Unorthodox Location,
Rosa Unit 305, Basin
Fruitland Coal Gas Pool,
Rio Arriba County, New Mexico

Dear Mr. LeMay:

Enclosed please find the original and one copy of Meridian Oil Inc.'s application on behalf of El Paso Natural Gas Company, for approval of an unorthodox location in the Basin Fruitland Coal Gas Pool, Rio Arriba County, New Mexico. Please set this application for hearing on the examiner docket on August 22, 1990.

By copy of this letter and Application to all parties, we are notifying them by certified mail, return-recipt requested, that they have the right to appear at the hearing, to make a statement to the Division, to present evidence and corss-examine witnesses either in support of in opposition to the Application.

Sincerely,


W. Thomas Kellahin

WTK/tic
Encl.

xc: Mr. Alan Alexander
Meridian Oil Inc.
P.O. Box 4289
Farmington, New Mexico 87499-4289

Certified mail return-receipt
All parties listed on Exhibit "A"
of application

RECEIVED

JUL 31 1990
OIL CONSERVATION DIV.
SANTA FE

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION
OF MERIDIAN OIL INC, FOR APPROVAL
OF AN UNORTHODOX LOCATION, BASIN
FRUITLAND COAL GAS POOL, RIO ARRIBA
COUNTY, NEW MEXICO

Case No. _____

A P P L I C A T I O N

COMES NOW Meridian Oil Inc., by and through it
attorneys, KELLAHIN, KELLAHIN & AUBREY, and applies to the
New Mexico Oil Conservation Division for approval of an
unorthodox Basin Fruitland Coal gas well location for its
Rosa Unit No. 305 well, 375 feet FSL and 1125 feet FWL (SW/4
SW/4) of Section 22, T31N, R4W, Rio Arriba County, New
Mexico.

1. Meridian is the operator of the above-described
proration and spacing unit which is part of the Rosa Unit.

2. Applicant proposes to form a standard proration
and spacing unit consisting of all of Section 22, in
accordance with the rules governing the Basin Fruitland Coal
Pool.

3. Due to Carson National Forest considerations, Applicant proposes to drill its Rosa Unit No. 305 well at an unorthodox gas well location 375 feet FSL and 1125 feet FWL (SW/4 SW/4) of Section 22, T31N, R4W, Rio Arriba County, New Mexico.

4. Attached as Exhibit A is a plat showing the described acreage and the proposed well location.

5. The offsetting owners or operators to be notified are shown on Exhibit "A".

WHEREFORE, Applicant requests that after notice and hearing, the application be granted.

KELLAHIN, KELLAHIN & AUBREY

A handwritten signature in dark ink, appearing to read 'W. Thomas Kellahin', is written over a horizontal line.

W. Thomas Kellahin
Post Office Box 2265
Santa Fe, New Mexico 87504
(505) 982-4285

Attorneys for Meridian Oil Inc.

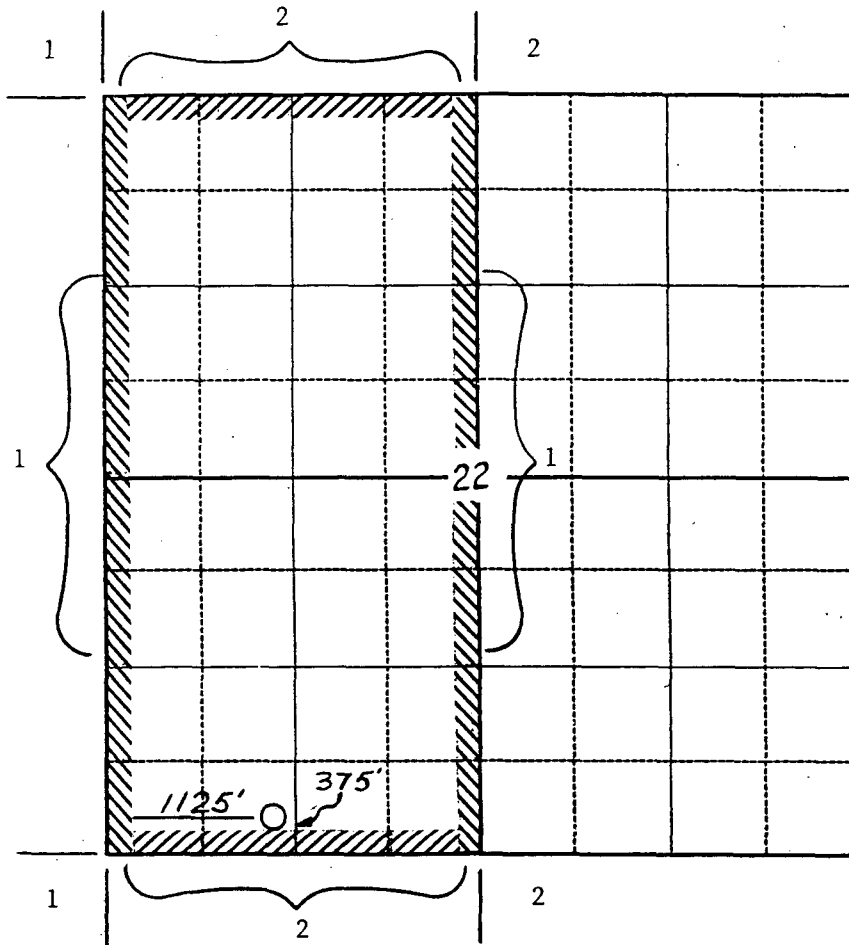
MERIDIAN OIL INC

Well Name Rosa Unit #305

Footage 375' FSL; 1125' FWL

APPLICATION FOR NON-STANDARD LOCATION

County Rio Arriba State New Mexico Section 22 Township 31N Range 4W



Remarks 1) Meridian Oil Inc
2) Mitchell Energy Corp

Exhibit A

OIL CONSERVATION DIVISION
RECEIVED

OIL CONSERVATION DIVISION MERIDIAN OIL '90 SEP 13 AM 9 09

RECEIVED
SEP 05 1990
OIL CON. DIV.
DIST. 13

August 16, 1990

Att: Mike Sfogner

To: Offset Owners/Operators

This is notification that Meridian Oil Inc. is seeking a revision to the New Mexico Oil Conservation Division's Administrative Order NSL-2836, for the Rosa Unit #306, due to a change of the location and a well name change.

A copy of the C-102 showing the revised location and name of this well, along with a topographic map, and a copy of the NSL-2836 are enclosed.

A copy of this application is being submitted to all offset owners/operators by certified mail with a request that you furnish the New Mexico Oil Conservation Division, PO Box 2088, Santa Fe, NM 87501 with a Waiver of Objection, and return one copy to this office.

Sincerely yours,

Peggy Bradford

Peggy Bradford

encl.

WAIVER

Mitchell Energy Corp. hereby waives objection to Meridian Oil Inc.'s application for an unorthodox location for their Rosa Unit #305 as proposed above.

By: *Joe Hernandez* Date: August 28, 1990

cc: Mitchell Energy Corp., PO Box 4000, The Woodlands, TX 77387-4000

MERIDIAN OIL

OIL CONSERVATION DIVISION
RECEIVED

SEP 20 1990

'90 SEP 25 AM 8 40

September 12, 1990

Re: Rosa Unit #306
375' FSL, 1125' FWL, Section 22, T-31-N, R-4-W
Rio Arriba County, New Mexico

To: Offset Owners/Operators

This is notification that Meridian Oil Inc. is seeking administrative approval for a non-standard location for the Rosa Unit #306 in the Fruitland Coal formation.

This application for the referenced location is due to Carson National Forest considerations, archaeological and wildlife concerns. A copy of the C-102 showing the location and a topographic map are enclosed.

A copy of this application is being submitted to all offset owners/operators by certified mail with a request that you furnish the New Mexico Oil Conservation Division, PO Box 2088, Santa Fe, NM 87501 with a Waiver of Objection, and return one copy to this office.

Sincerely yours,



Peggy Bradfield

encl. *OK*



WAIVER

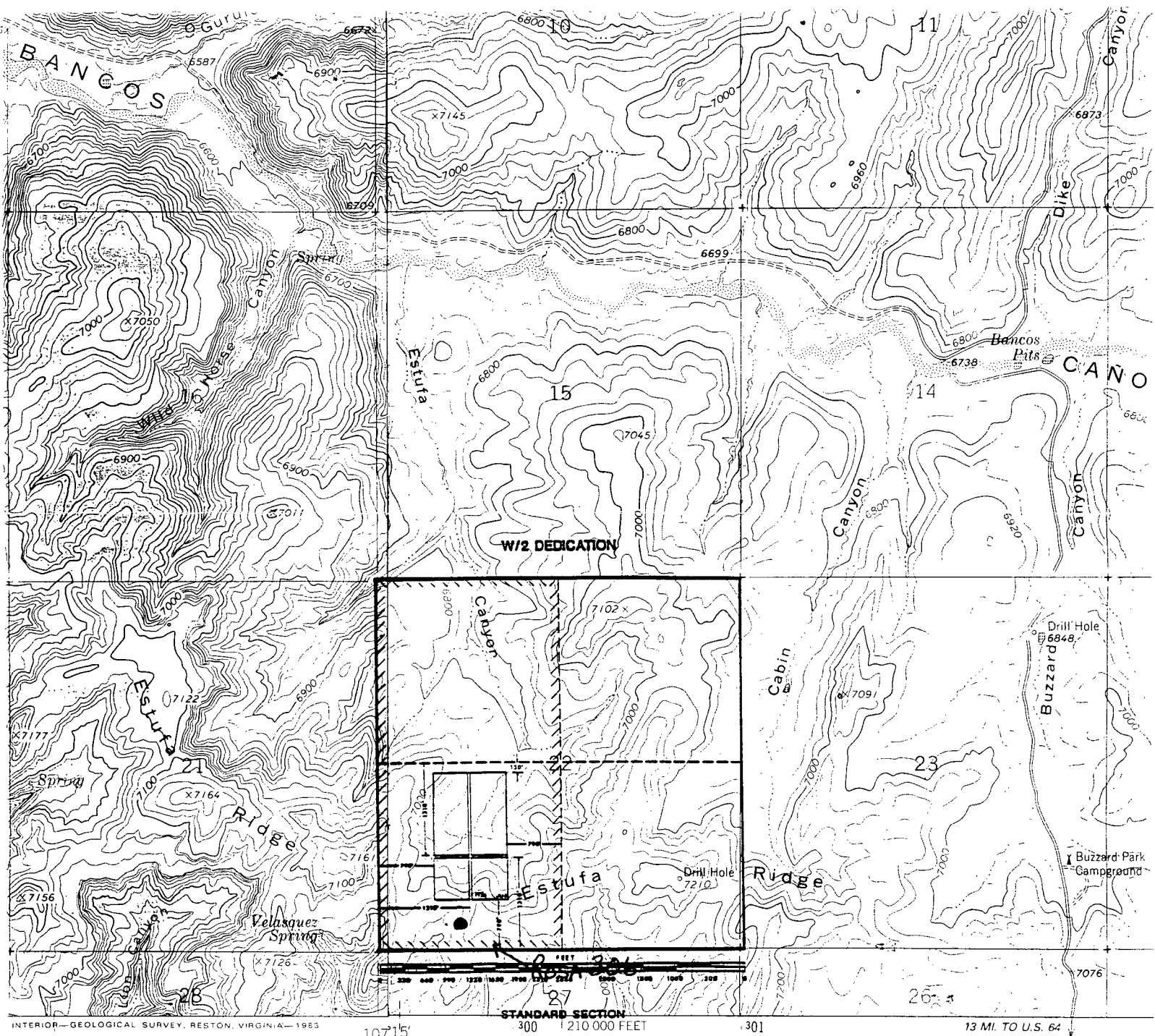
MITCHELL ENERGY

CORPORATION

_____ hereby waives objection to Meridian Oil Inc.'s application for a non-standard location for their Rosa Unit #306 as proposed above.

By: *J. W. Taylor* Date: September 21, 1990
J. W. TAYLOR, District Land Manager

Mitchell Energy Corp., PO Box 4000, The Woodlands, TX 77387-4000



ROAD CLASSIFICATION

— duty ——— Unimproved dirt ———

BANCOS MESA, N. MEX

N3652.5-W10715/7.5

1963

PHOTOGRAPHED 1961

DMA 4557 IV NE-SERIES V661

Mapped, edited, and published by the Geological Survey

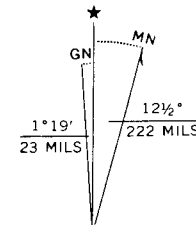
Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs
photographs taken 1958 and 1962. Field checked 1963

Polyconic projection. 1927 North American datum
10,000-foot grid based on New Mexico coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks,
zone 13, shown in blue

To place on the predicted North American Datum 1983
move the projection lines 2 meters north and
54 meters east as shown by dashed corner ticks

There may be private inholdings within the boundaries
of the National or State reservations shown on this map



UTM GRID AND 1982 MAGNETIC NO
DECLINATION AT CENTER OF SHEET

Revisions shown in purple compiled
from aerial photographs taken 1981
and the source data. Partial field check
U.S. Forest Service. Map edited 1982

MERIDIAN

Submit to Appropriate
District Office
State Lease - 4 copies
Fee Lease - 3 copies

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised 1-1-89

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

DISTRICT I
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

Operator Meridian Oil Inc.			Lease Rosa Unit (SF-078893)		Well No. 306
Unit Letter M	Section 22	Township 31N	Range 4W	County Rio Arriba	
Actual Footage Location of Well: 375 feet from the South line and 1125 feet from the West line					
Ground level Elev. 7035'	Producing Formation Fruitland Coal		Pool Basin	Dedicated Acreage: 320 Acres	

1. Outline the acreage dedicated to the subject well by colored pencil or highlight markers on the plat below.

2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc.?

☒ Yes ☐ No If answer is "yes" type of consolidation unitization

If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary).

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, force-pooling, or otherwise) or until a non-standard unit, eliminating such interest, has been approved by the Division.

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Signature

Peggy Bradfield

Printed Name

Regulatory Affairs

Position

Meridian Oil Inc.

Company

Date

8-30-90

SURVEYOR CERTIFICATION

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

Date Surveyed

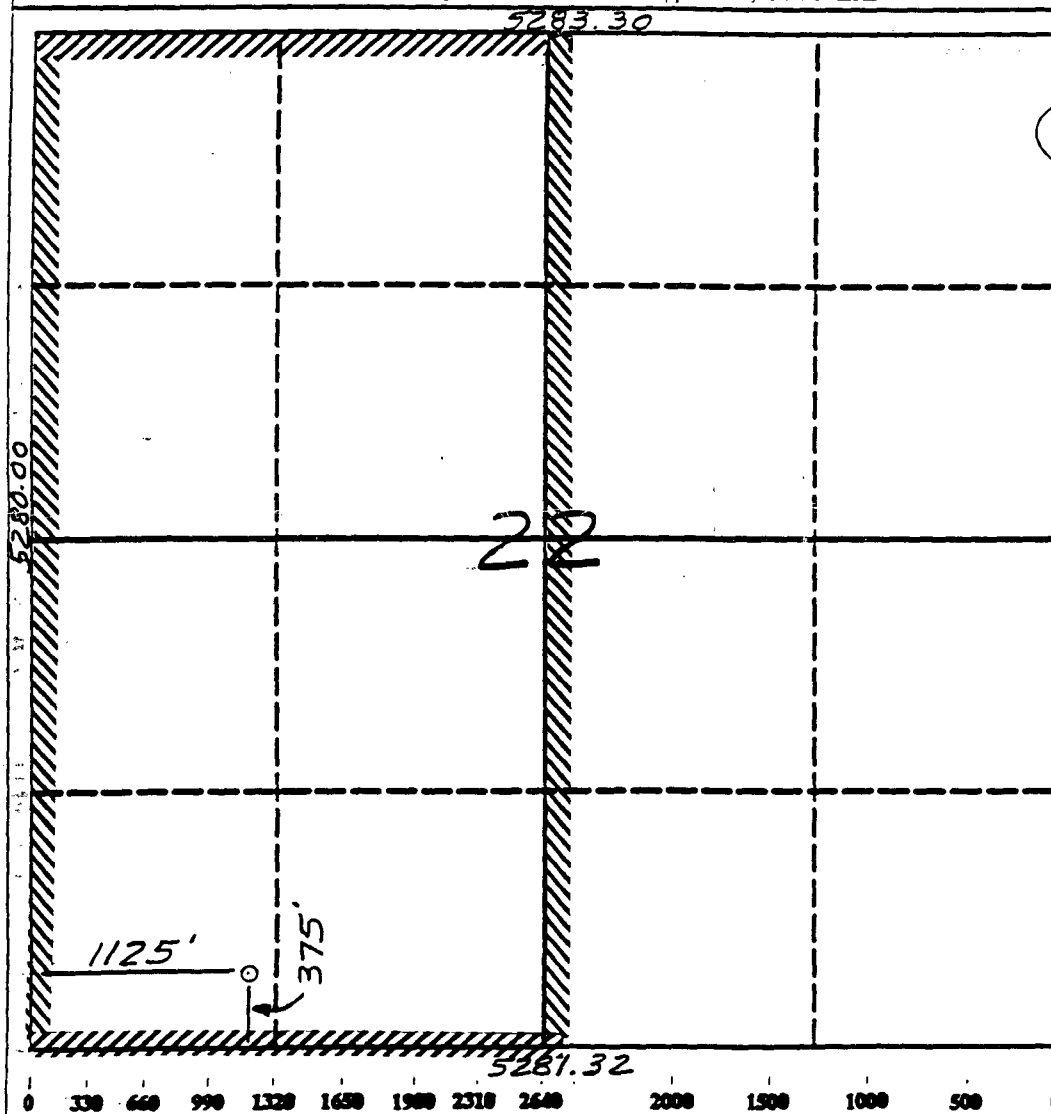
Signature of Surveyor

Professional Surveyor



Certificate No.

Neale C. Edwards



MERIDIAN OIL

September 13, 1990

Mr. William LeMay
New Mexico Oil Conservation Division
Post Office Box 2088
Santa Fe, New Mexico 87501

Re: Meridian Oil Inc. Rosa Unit #306
375'FSL, 1125'FWL, Section 22, T-31-N, R-4-W
Rio Arriba County, New Mexico

Dear Mr. LeMay:

Meridian Oil Inc. is applying for administrative approval of a non-standard location for the referenced location in the Fruitland Coal formation.

This application for the referenced location is due to Carson National Forest considerations, archaeological and wildlife concerns. Based on field conversations with the U.S. Forest Service, this is the only acceptable surface location for this well.

The following attachments are for your review:

1. Application for Permit to Drill.
2. Completed C-102 at referenced footages.
3. Offset operators/owners plat and affidavit of notification of offset operators/owners.
4. 7.5 minute topographic map showing the orthodox windows for the west-half dedication, and enlargement of the map to define topographic features.
5. This well would be deemed economically unfeasible if directionally drilled to a standard bottom hole location due to incremental directional drilling costs of \$75,000.00.
6. Archaeological report.

Please let me know if you require any other information.

Sincerely,


Peggy Bradfield

xc: Bureau of Land Management, Farmington
New Mexico Oil Conservation Division, Aztec District


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK DRILL	5. LEASE NUMBER SF-078893
1b. TYPE OF WELL GAS	6. IF INDIAN, ALL. OR TRIBE NAME
2. OPERATOR MERIDIAN OIL INC.	7. UNIT AGREEMENT NAME ROSA UNIT
3. ADDRESS & PHONE NO. OF OPERATOR P O BOX 4289 FARMINGTON, NM 87499	8. FARM OR LEASE NAME ROSA UNIT
4. LOCATION OF WELL 375' FSL 1125' FWL	9. WELL NO. 306
10. FIELD, POOL, OR WILDCAT BASIN FRUITLAND COAL	11. SEC. T. R. M OR BLK. SEC. 22 T31N R04W NMPM
14. DISTANCE IN MILES FROM NEAREST TOWN 25 MILES FROM GOVERNADOR	12. COUNTY RIO ARRIBA
	13. STATE NM
15. DISTANCE FROM PROPOSED LOCATION 375' TO NEAREST PROPERTY OR LEASE LINE.	16. ACRES IN LEASE 17. ACRES ASSIGNED TO WELL 320.00
18. DISTANCE FROM PROPOSED LOCATION TO NEAREST WELL DR. 3000' COMPL., OR APPLIED FOR ON THIS LEASE.	19. PROPOSED DEPTH 20. ROTARY OR CABLE TOOLS 3902' ROTARY
21. ELEVATIONS (DF, FT, GR, ETC.) 7035' GL	22. APPROX. DATE WORK WILL START

23. PROPOSED CASING AND CEMENTING PROGRAM

*SEE OPERATIONS PLAN

24. AUTHORIZED BY: 
REG. DRILLING ENGR.

8/30/90
DATE

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY _____ TITLE _____ DATE _____

NOTE: THIS FORMAT IS ISSUED IN LIEU OF US BLM FORM 3160-3.

Submit to Appropriate
District Office
State Lease - 4 copies
Fee Lease - 3 copies

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised 1-1-89

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

DISTRICT I

P.O. Box 1980, Hobbs, NM 88240

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- Outline the acreage dedicated to the subject well by colored pencil or hatchure marks on the plat below.
- If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
- If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc.?
☒ Yes ☐ No If answer is "yes" type of consolidation unitization
If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.)
No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interest, has been approved by the Division.

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Signature

Peggy Bradfield

Printed Name

Regulatory Affairs

Position

Meridian Oil Inc.

Company

Date

SURVEYOR CERTIFICATION

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

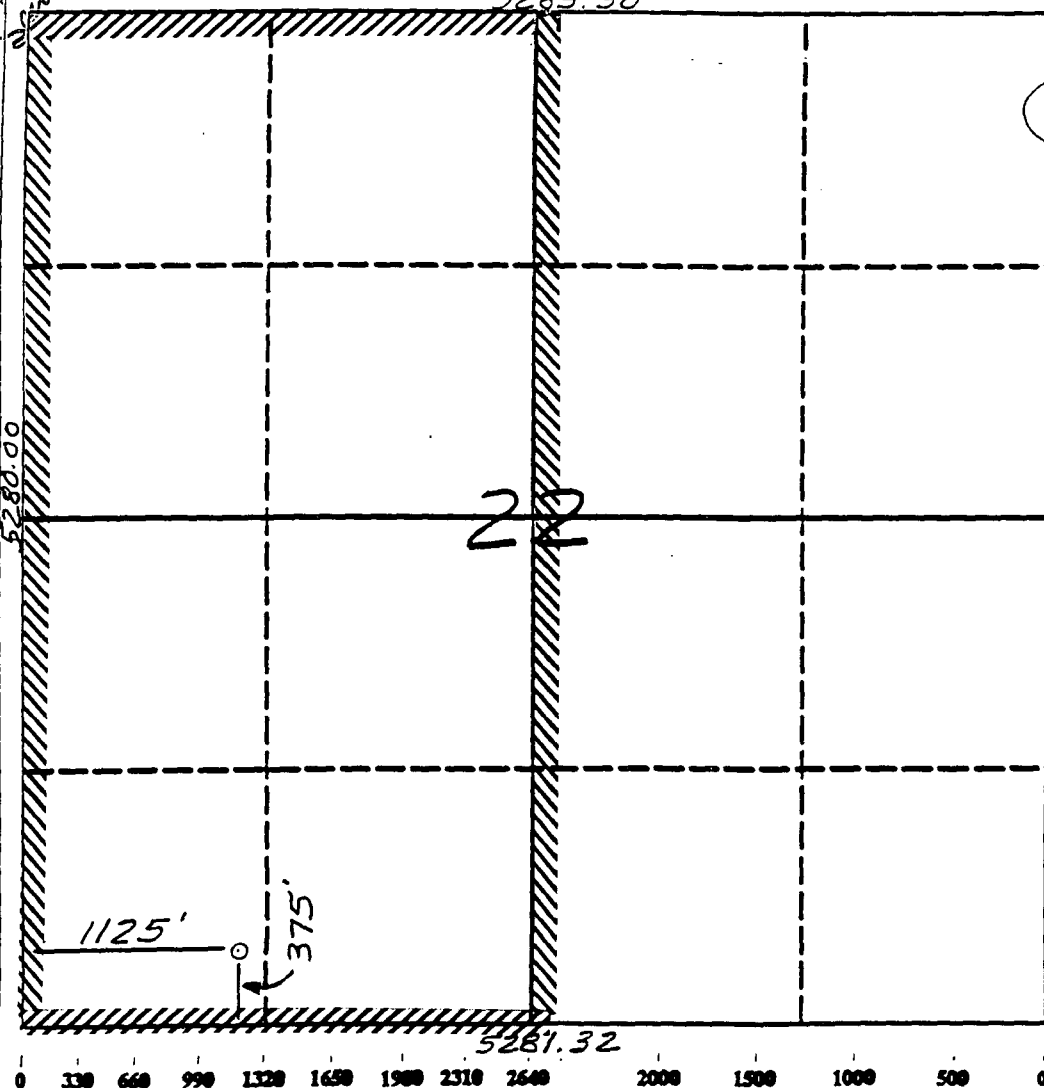
Date Surveyed

Signature of Surveyor



Certification

Neale G. Edwards



Well Name: 306 ROSA UNIT
 Sec. 22 T31N R04W
 BASIN FRUITLAND COAL

375'FSL 1125'FWL
 RIO ARRIBA NEW MEXICO
 Elevation 7035'GL

Formation tops: Surface- SAN JOSE

Ojo Alamo- 3335

Kirtland- 3478

Fruitland- 3743

Fruitland Coal Top- 3818

Fruitland Coal Base- 3901

Pictured Cliffs- 3905

Intermediate TD- 3768

Total Depth- 3902

Logging Program: Mud logs from intermediate to total depth.

Mud Program:	Interval	Type	Weight	Visc.	Fl. Loss
	0 - 200	Spud	8.4 - 8.9	40-50	no contro
	200 - 3768	Non-dispersed	8.4 - 9.1	30-60	no contro.
	3768 - 3902	Formation Water	8.4		no contro.

Casing Program:	Hole Size	Depth Interval	Csg. Size	Weight	Grade
	12 1/4"	0 - 200	9 5/8"	32.3#	H-40
	8 3/4"	0 - 3768	7"	20.0#	K-55
	6 1/4"	3718 - 3902	5 1/2"	15.5#	K-55
Tubing Program:		0 - 3902	2 7/8"	6.5#	J-55

Float Equipment: 9 5/8" surface casing - saw tooth guide shoe. Centralizers will be run in accordance with Onshore Order #2.

7" intermediate casing - guide shoe and self-fill insert float valve. Three centralizers run every other joint above shoe. Run insert float one joint above the guide shoe. Two turbolizing type centralizers - one below and one into the base of the Ojo Alamo @ 3478'. Standard centralizers thereafter every fourth joint up to the base of the surface pipe.

5 1/2" production casing - float shoe on bottom and a pre-drilled liner run to the 7" casing with a minimum 50' overlap. Liner hanger is a double slip grip type.

Wellhead Equipment: 9 5/8" x 7" x 2 7/8" x 11" 3000 psi xmas tree assembly.

Cementing:

9 5/8" surface casing - cement with 160 sacks of class "B" cement with 1/4# flocele/sack and 3% calcium chloride (189 cu ft. of slurry, 200% excess to circulate to surface). WOC 12 hours. Test casing to 600 psi for 30 minutes.

7" intermediate casing - lead with 560 sacks of 65/35 class "B" poz with 6% gel, 2% calcium chloride and 1/2 cu ft. Perlite/sack (10.3 gallons of water/sack) tail with 100 sacks of class "B" with 2% calcium chloride. 1199 cu ft. of slurry, 110% excess to circulate to surface. If hole conditions permit, a 600 ft spacer will be run ahead of the cement slurry to avoid mud contamination of the cement. WOC 12 hours. If cement does not circulate to surface, a temperature log will be run after 8 hours to determine TOC.

5 1/2" liner - do not cement.

BOP and Tests:

Surface to intermediate TD - 11" 2000 psi(minimum) double gate BOP stack (Reference Figure #1). Prior to drilling out surface casing, test rams to 600 psi for 30 minutes.

Intermediate TD to TD - 7 1/16" 2000 psi(minimum) double gate BOP stack (Reference Figure #2). Prior to drilling out intermediate casing, test blind rams and casing to 2500 psi for 30 minutes; all pipe rams and casing to 2500 psi for 30 minutes each.

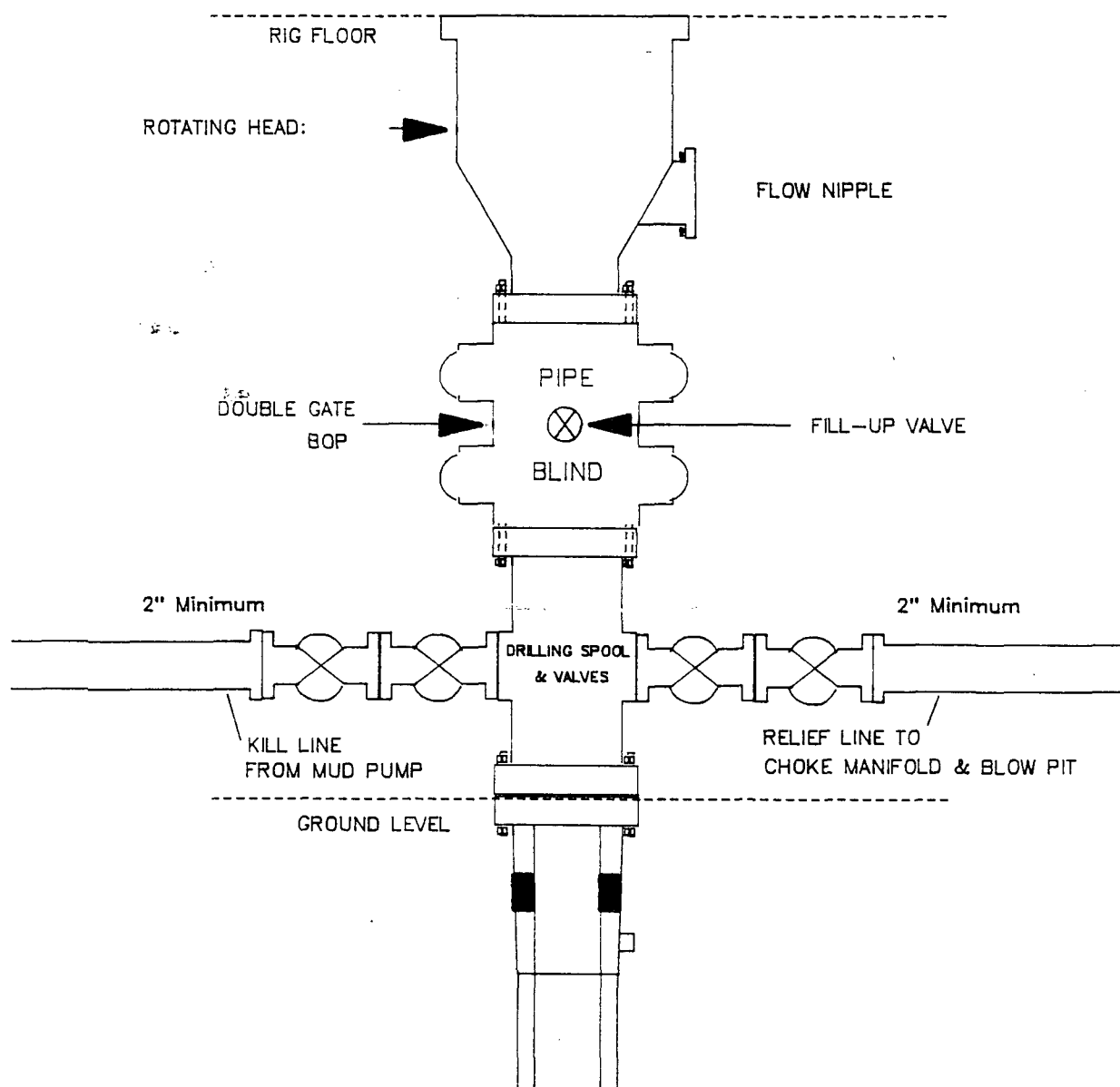
From surface to TD - choke manifold (Reference Figure #3).

Pipe rams will be actuated at least once each day and blind rams actuated once each trip to test proper functioning. An upper kelly cock valve with handle and drill string safety valves to fit each drill string will be maintained and available on the rig floor.

Additional Information:

- * The Fruitland coal formation will be completed.
- * Anticipated Fruitland pore pressure is 1228 psi.
- * This gas is dedicated.
- * The E/2 of Section 22 is dedicated to this well.
- * New casing will be utilized.
- * Cementing Contractor will provide the BLM with a chronological log including the pump rate and pressure, and the slurry density and volume for all cement jobs.
- * Pipe movement (either rotation or reciprocation) will be done if hole conditions permit.

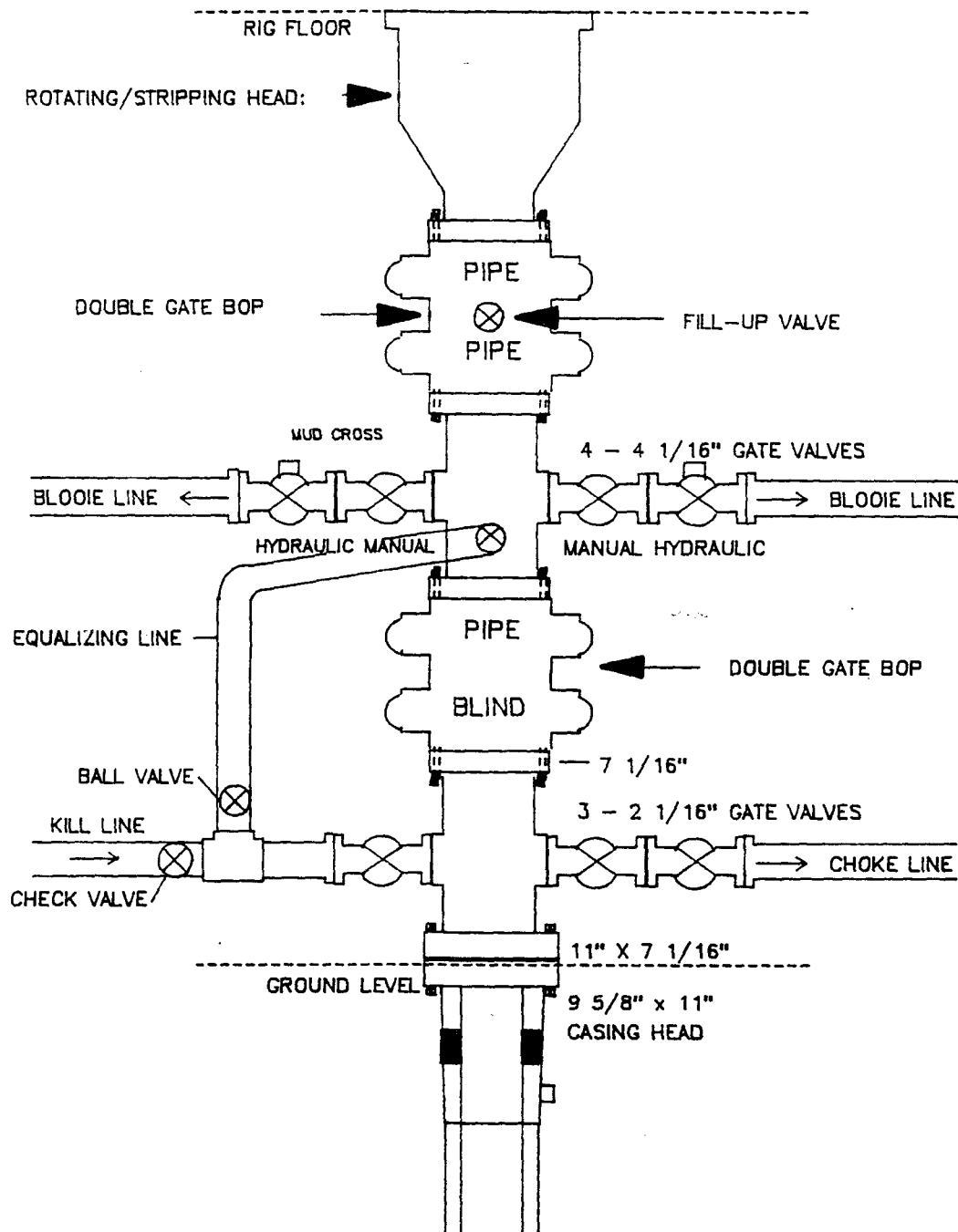
MERIDIAN OIL INC.
Drilling Rig
BOP Configuration



Minimum BOP installation for a typical Fruitland Coal well from surface to Intermediate casing point. 11" Bore (10" Nominal), 2000psi minimum working pressure double gate BOP to be equipped with blind and pipe rams. A Schaffer Type 50 equivalent rotating head to be installed on the top of BOP. All equipment is 2000psi working pressure/or greater.

Figure #1

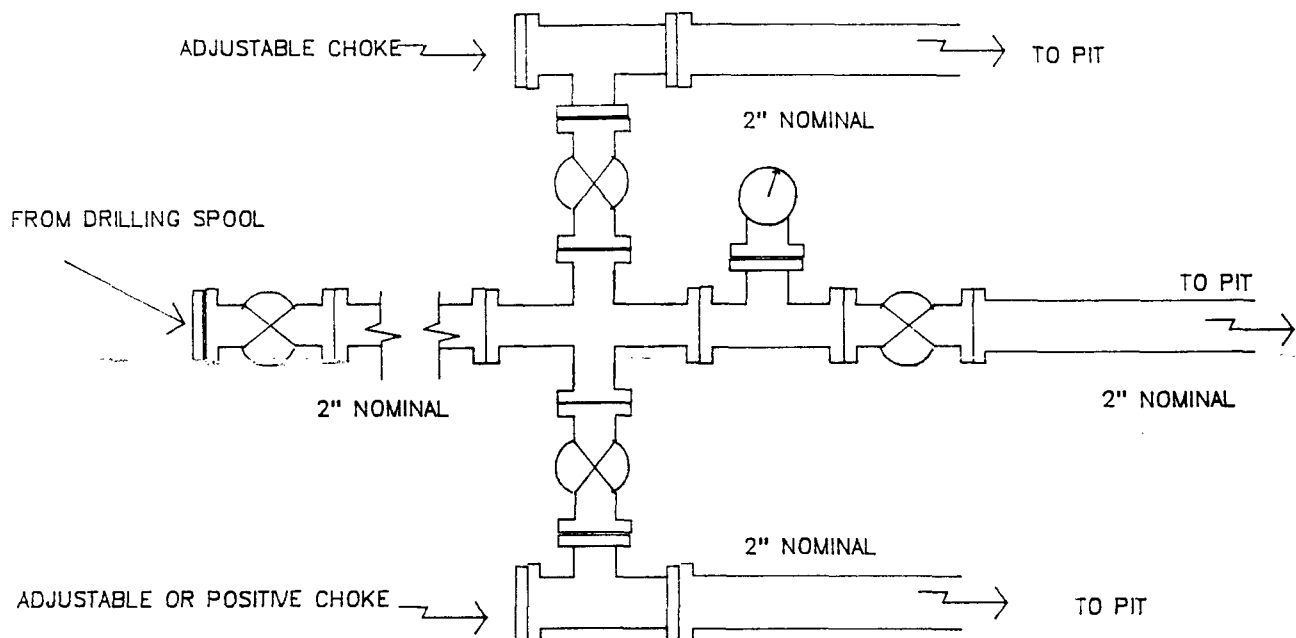
MERIDIAN OIL INC.
Completion Rig
BOP Configuration



Minimum BOP installation for a typical open-hole Fruitland Coal well from intermediate TD to TD. 7 1/16" Bore (6" Nominal), 2000psi working pressure/ or greater double stack double gate BOP equipped with three pipe and one blind ram.

Figure #2

MERIDIAN OIL INC.
Typical Fruitland Coal Well
Choke Manifold Configuration




Minimum choke manifold installation for a typical Fruitland Coal well from surface to Total Depth. 2", 2000psi working pressure equipment with two chokes.

Figure #3

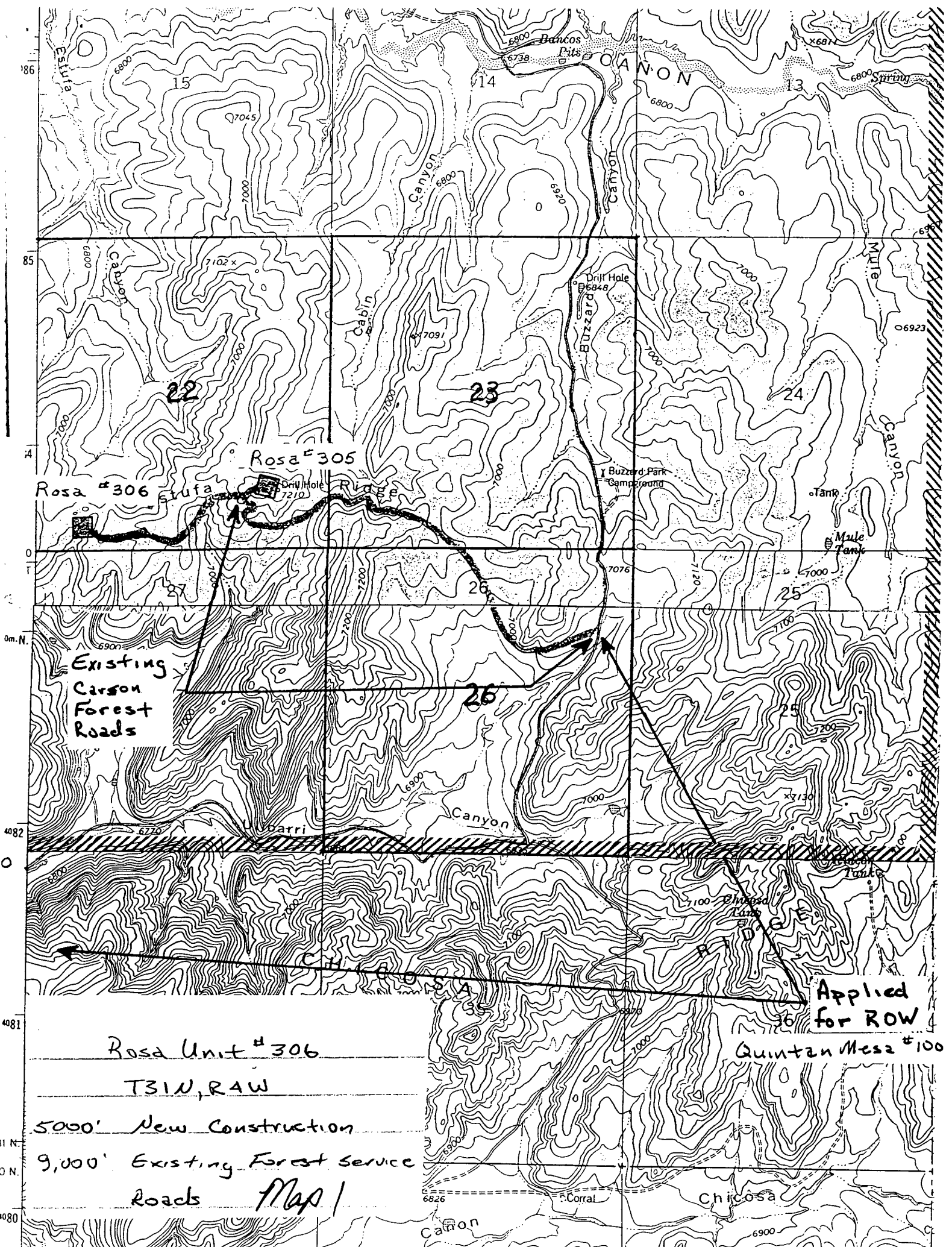
Multi-Point Surface Use Plan
Meridian Oil Inc.
Rosa Unit #306

1. Existing Roads - Refer to Map No. 1. Existing roads used to access the proposed location will be properly maintained for the duration of the project. Bureau of Land Management right-of-way has been applied for as shown on Map No. 1.
2. Planned Access Road - Refer to Map No. 1. The required new access road is shown on Map No. 1. The gradient, shoulder, crowning and other design elements will meet or exceed those specified by the responsible government agency. The new access road surface will not exceed twenty feet (20') in width. No additional turnarounds or turnouts will be required. Upon completion of the project, the access road will be adequately drained to control soil erosion. Approximately 5,000' of access road will be constructed. Pipelines are indicated on Map No. 1A.
3. Location of Existing Wells - Refer to Map No. 1A.
4. Location of Existing and/or Proposed Facilities if Well is Productive -
 - a. On the Well Pad - Refer to Plat No. 1, anticipated production facilities plat.
 - b. Off the Well Pad - Anticipated facilities off the well pad will be applied for as required.
5. Location and Type of Water Supply - Water will be hauled by truck for the proposed project and will be obtained from La Jara Water Hole located in SW/4 Section 11, T-30-N, R-06-W, New Mexico.
6. Source of Construction Materials - If construction materials are required for the proposed project, such materials will be obtained from a commercial quarry.
7. Methods of Handling Waste Materials - All garbage and trash materials will be removed from the site for proper disposal. A portable toilet will be provided for human waste and serviced in a proper manner. If liquids are left in the reserve pit after completion of the project, the pit will be fenced until the liquids have had adequate time to dry. The location clean-up will not take place until such time as the reserve pit can be properly covered over to prevent run-off from carrying waste materials into the watershed. All earthen pits will be so constructed as to prevent leakage from occurring; no earthen pit will be located on natural drainage. Hazardous waste will be disposed of in accordance with Federal Regulations.
8. Ancillary Facilities - None anticipated.
9. Wellsite Layout - Refer to the location diagram (Plat No. 2) and to the wellsite cut and fill diagram (Plat No. 2A). The Blow Pit will be constructed with a 2'/160' grade to allow positive drainage to the Reserve Pit and prevent standing liquids in the Blow Pit.

10. Plans for Restoration of the Surface - After completion of the proposed project, the location will be cleaned and leveled. The location will be left in such a condition that will enable reseeding operations to be carried out. Seed mixture as designated by the responsible government agency will be used. The reseeding operations will be performed during the time period set forth by the responsible government agency. The permanent location facilities will be painted as designated by the responsible government agency.
11. Surface Ownership - Carson National Forest.
12. Other Information - Environmental stipulations as outlined by the responsible government agency will be adhered to. Refer to the archaeological report for a description of the topography, flora, fauna, soil characteristics, dwellings, historical and cultural sites.
13. Operator's Representative and Certification - Meridian Oil Regional Drilling Manager, Post Office Box 4289, Farmington, NM 87499, telephone (505) 326-9700. I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Meridian Oil Inc. and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

 8/30/90
Regional Drilling Engineer

JWC/adw



Rosa Unit #306

T31N, RAW

5000' New Construction

9,000' Existing Forest Service Roads

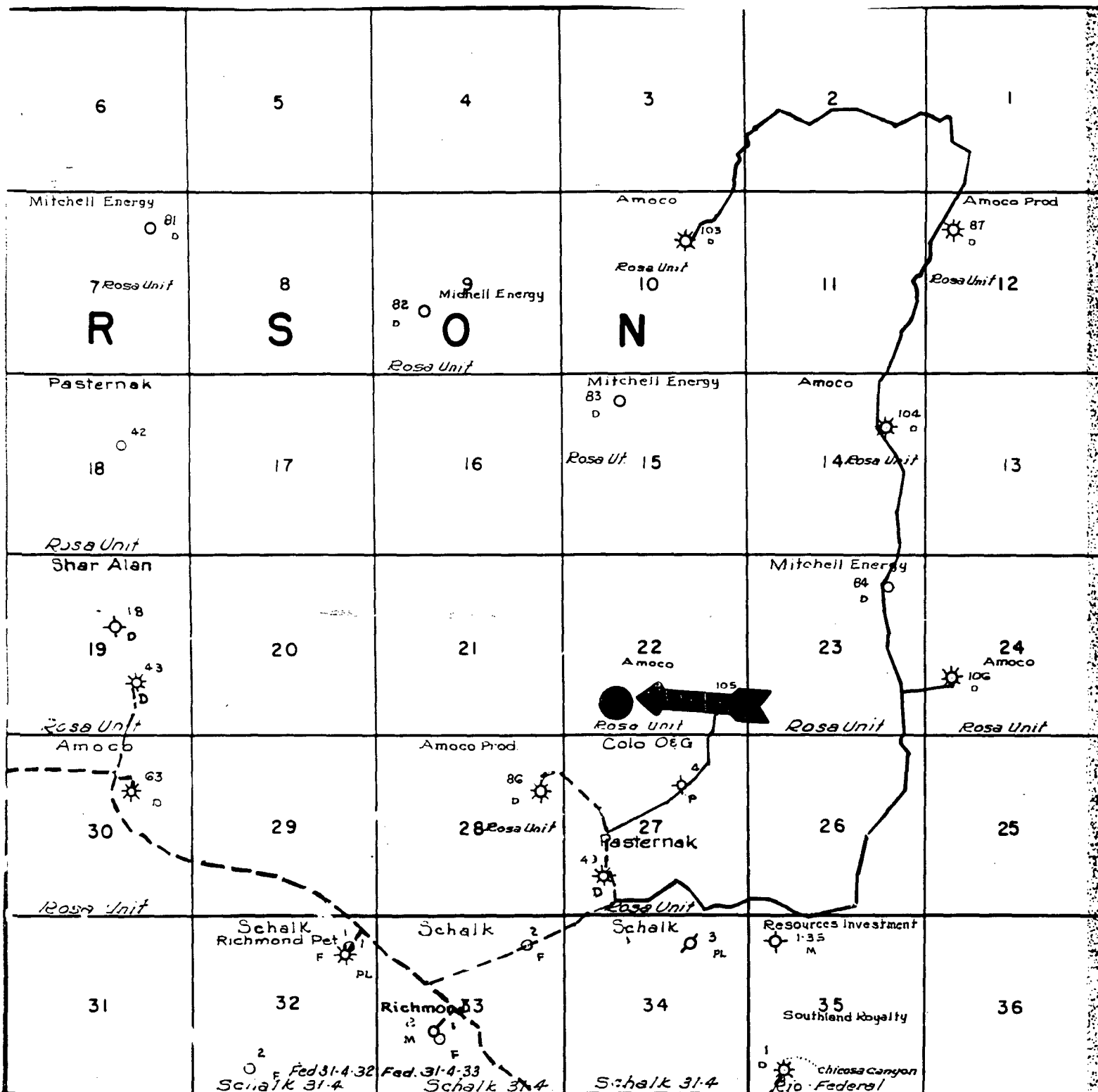
Map 1

Applied for ROW

Quintan Mesa #100

Canyon

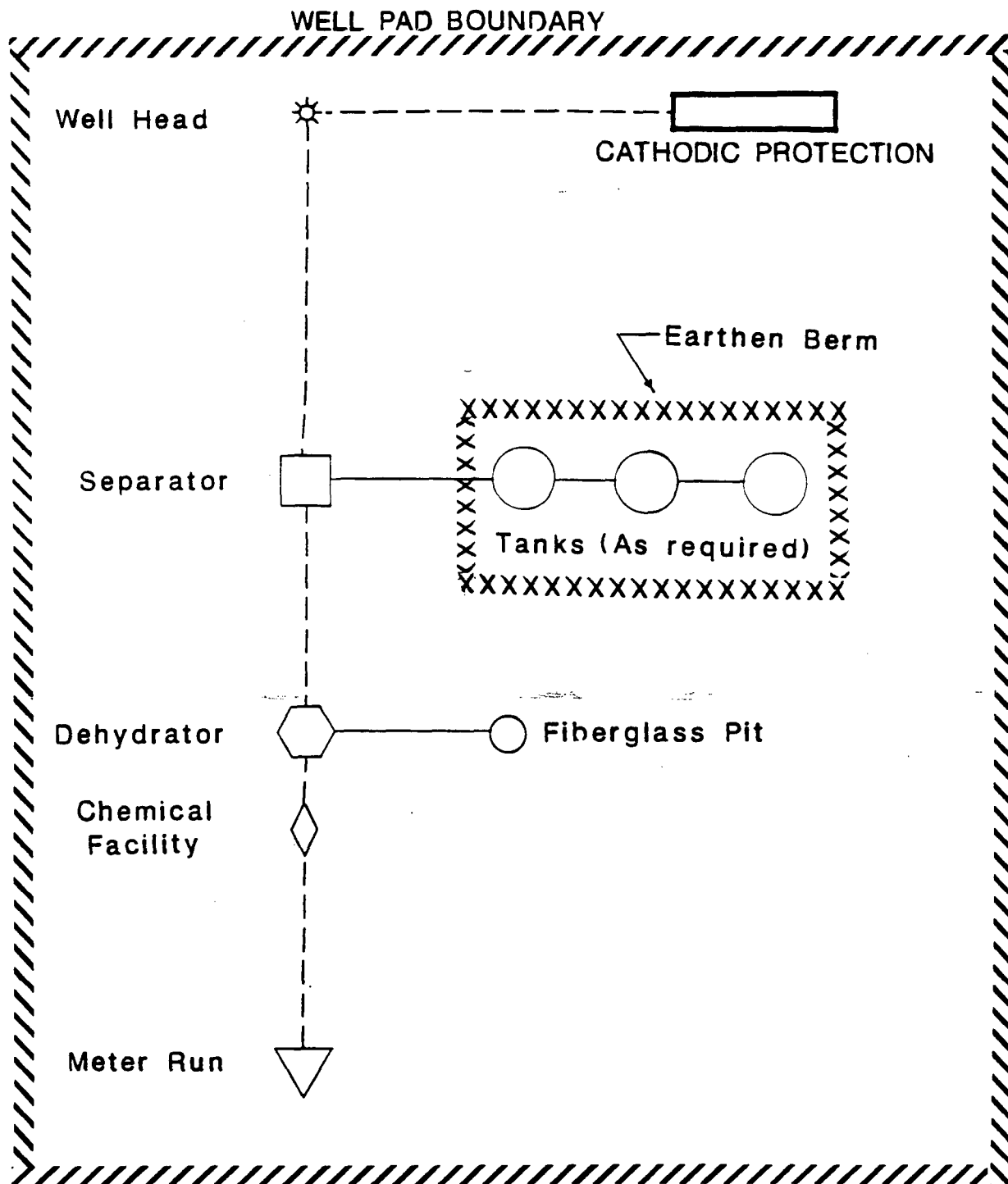
Chicosa



MERIDIAN OIL INC.
 Pipeline Map
 T-31-N, R-04-W
 Rio Arriba County, New Mexico

MAP 1A
 ROSA UNIT #306

01/90 adw



PLAT #1

MERIDIAN OIL
ANTICIPATED
PRODUCTION FACILITIES
FOR A
FRUITLAND WELL

KFR 2/90

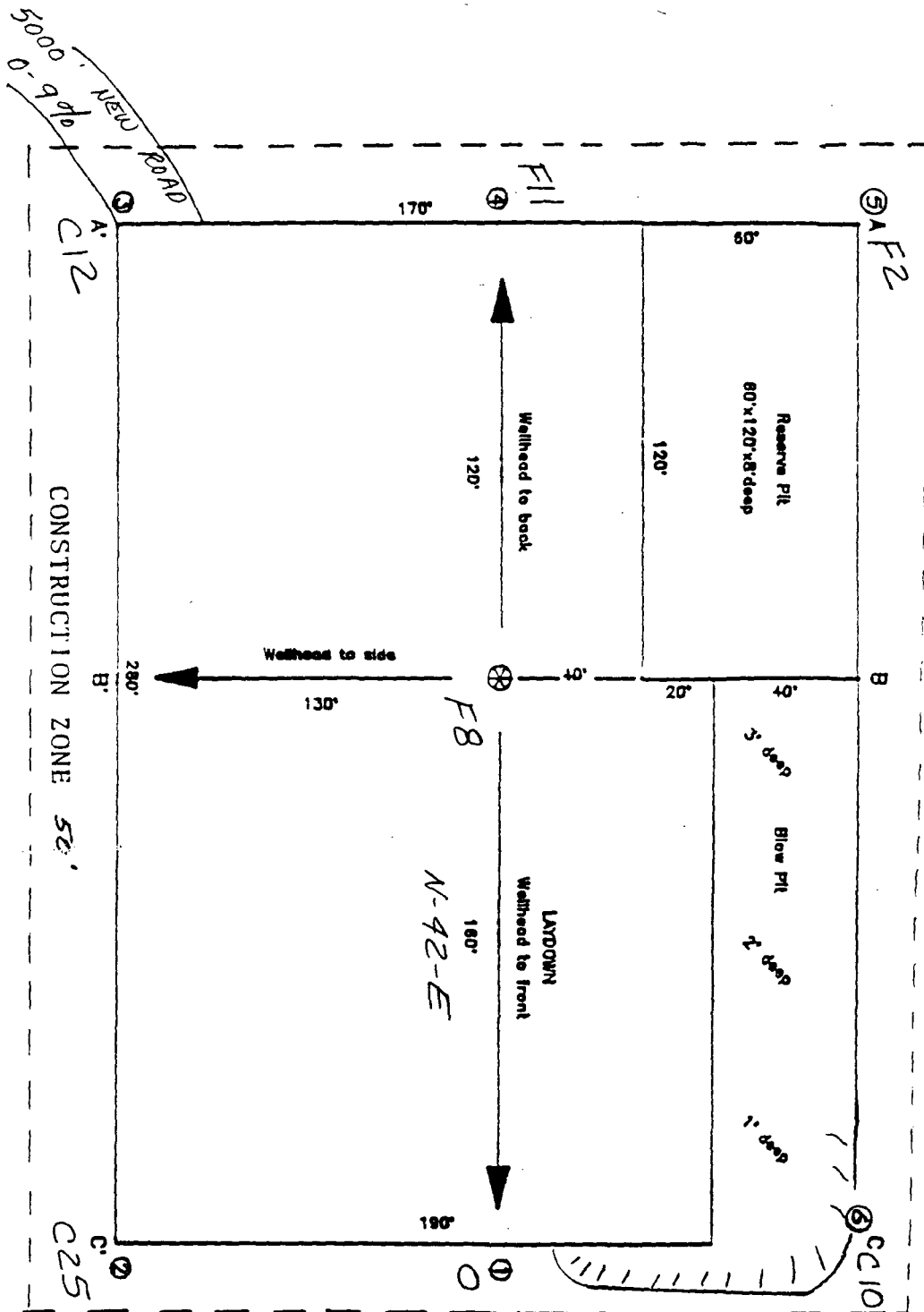
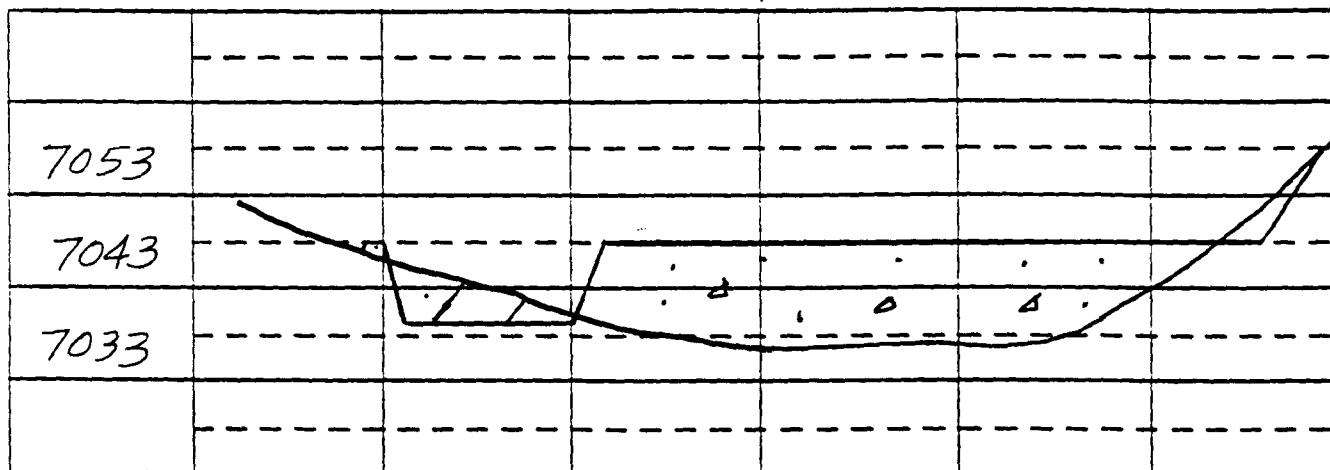


EXHIBIT: <u>PLAT 2</u>	
Name: <u>MOI ROSA UNIT #306</u>	
Footage: <u>375' FSL 1125' FWL</u>	
Sec <u>22</u> T- <u>31</u> -N, R- <u>4</u> -W NMPM	
Co. <u>RIO ARRIBA</u>	St. <u>NM</u>
Elevation: <u>7035'</u>	Date: <u>7-18-90</u>

Plat 2
2/3/90

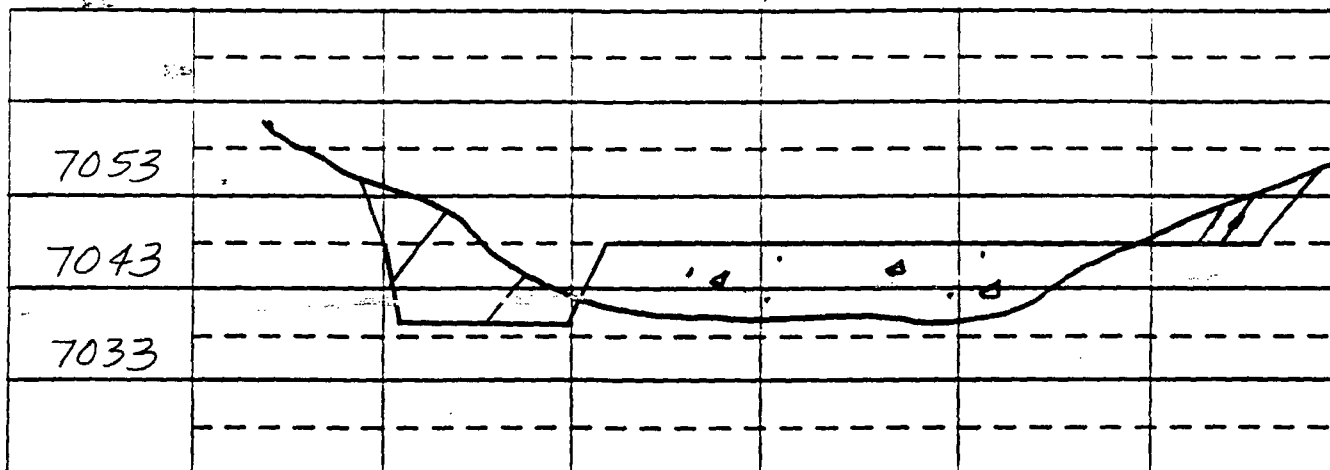
A - A' Vert: 1" = 20' Horiz: 1" = 50'

C/L



B - B'

C/L



C - C'

C/L

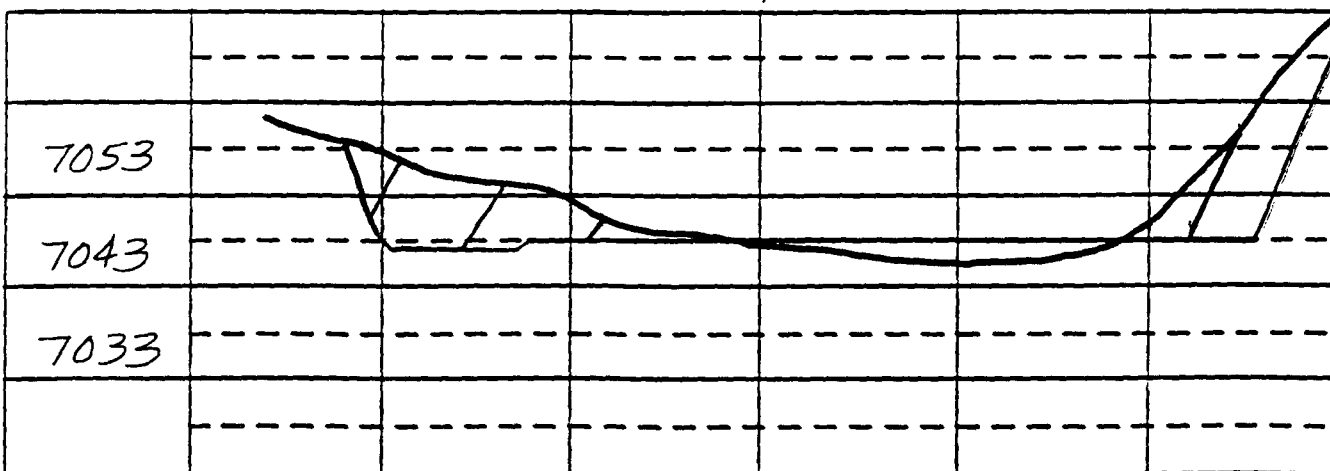


EXHIBIT: PIAT 2A

Name: MOI ROSA UNIT #306

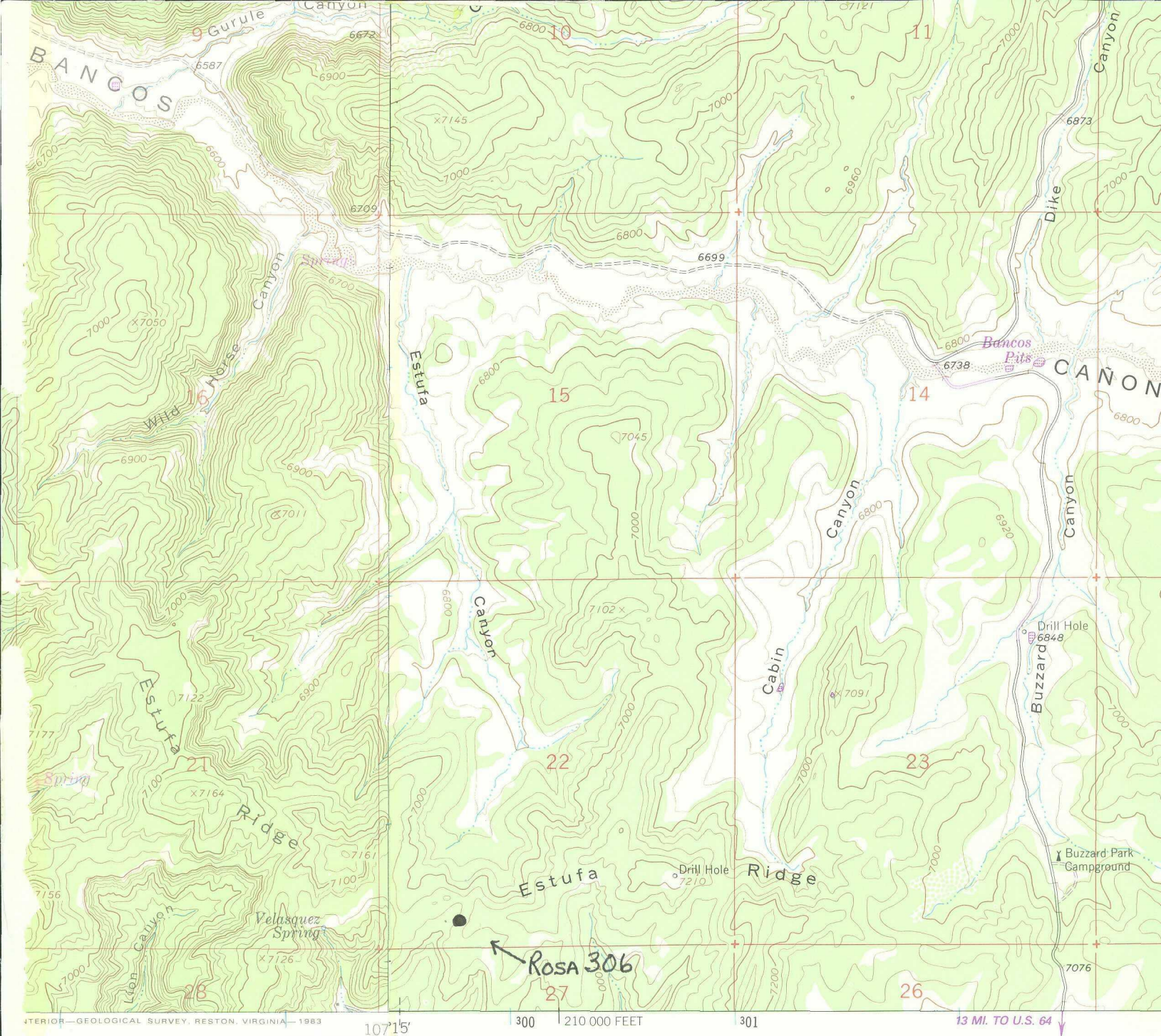
Footage: 375' FSL 1125' FWL

Sec 22 T- 31 -N,R- 4 -W NMPM

Co. RIO ARRIBA St. N.M.

Elevation: 7035' Date: 7-18-90

Plot XC
2/4/90



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1958 and 1962. Field checked 1963

Polyconic projection. 1927 North American datum
10,000-foot grid based on New Mexico coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks,
zone 13, shown in blue

To place on the predicted North American Datum 1983
move the projection lines 2 meters north and
54 meters east as shown by dashed corner ticks

There may be private inholdings within the boundaries
of the National or State reservations shown on this map

ROAD CLASSIFICATION

Full-duty ————— Unimproved dirt - - - - -

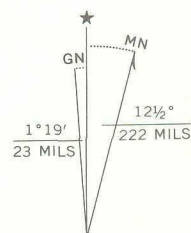
BANCOS MESA, N. MEX.

N3652.5-W10715/7.5

1963

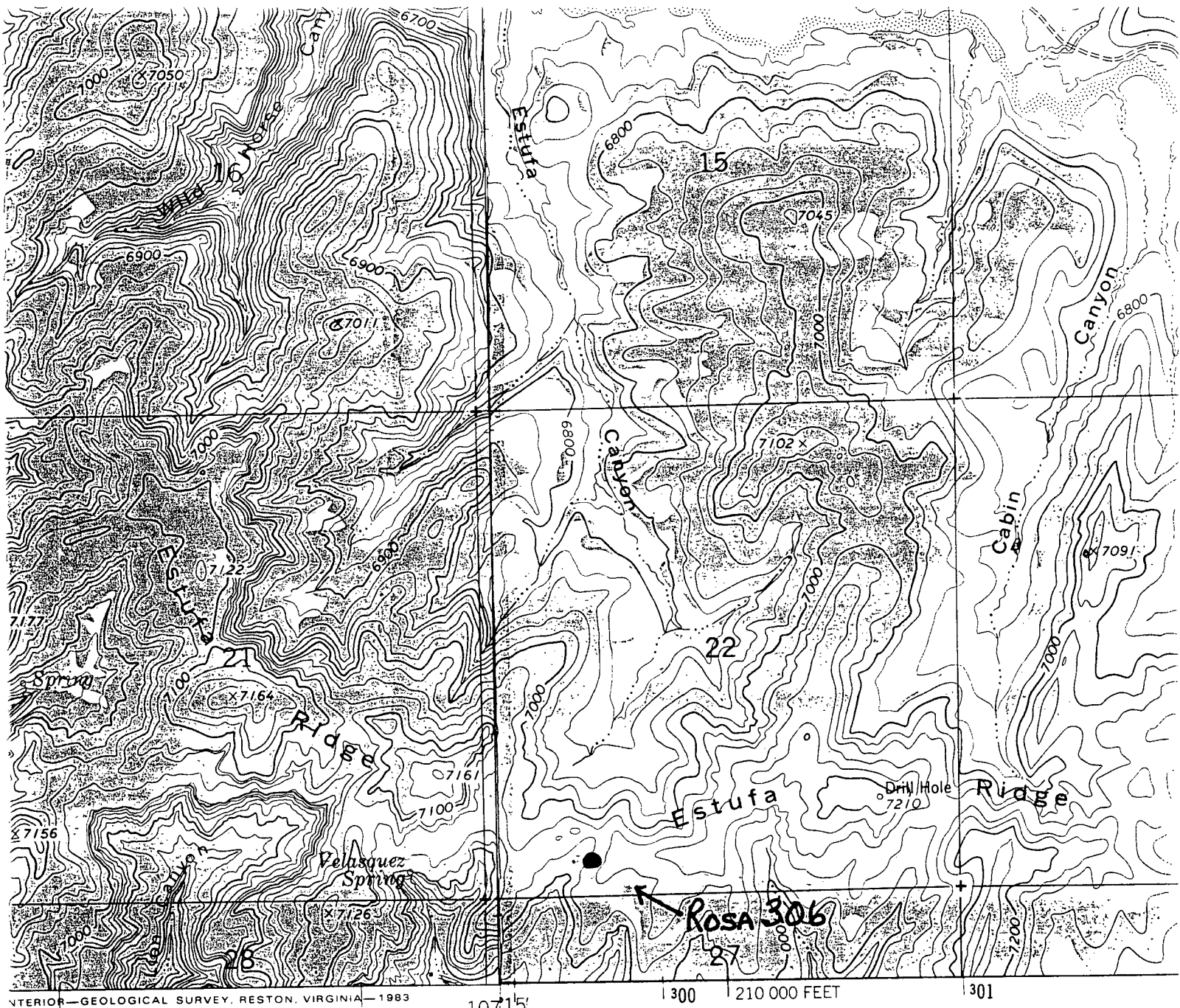
PHOTOREVISED 1982

DMA 4557 IV NE-SERIES V881



UTM GRID AND 1982 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Revisions shown in purple compiled from aerial photographs taken 1981 and other source data. Partial field check by U.S. Forest Service. Map edited 1982



INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1983

10715'

300 210 000 FEET

301

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs
photographs taken 1958 and 1962. Field checked 1963

Polyconic projection. 1927 North American datum
10,000-foot grid based on New Mexico coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks,
zone 13, shown in blue

To place on the predicted North American Datum 1983
move the projection lines 2 meters north and
54 meters east as shown by dashed corner ticks

There may be private inholdings within the boundaries
of the National or State reservations shown on this map

ROAD CLASSIFICATION

duty..... Unimproved dirt =====

BANCOS MESA, N. MEX.

N3652.5-W10715/7.5

1963

PHOTOREVISED 1982

DMA 4557 IV NE-SERIES V881

Revis
from
and
U.S.

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State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised 1-1-89

OIL CONSERVATION DIVISION

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P.O. Box 2088

Santa Fe, New Mexico 87504-2088

DISTRICT II
P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

Operator Meridian Oil Inc.			Lease Rosa Unit (SF-078893)		Well No. 306
Unit Letter M	Section 22	Township 31N	Range 4W	County Rio Arriba	
Actual Footage Location of Well: 375 feet from the South line and 1125 feet from the West line					
Ground level Elev. 7035'	Producing Formation Fruitland Coal		Pool Basin	Dedicated Acreage: 320 Acres	

1. Outline the acreage dedicated to the subject well by colored pencil or hectare marks on the plat below.

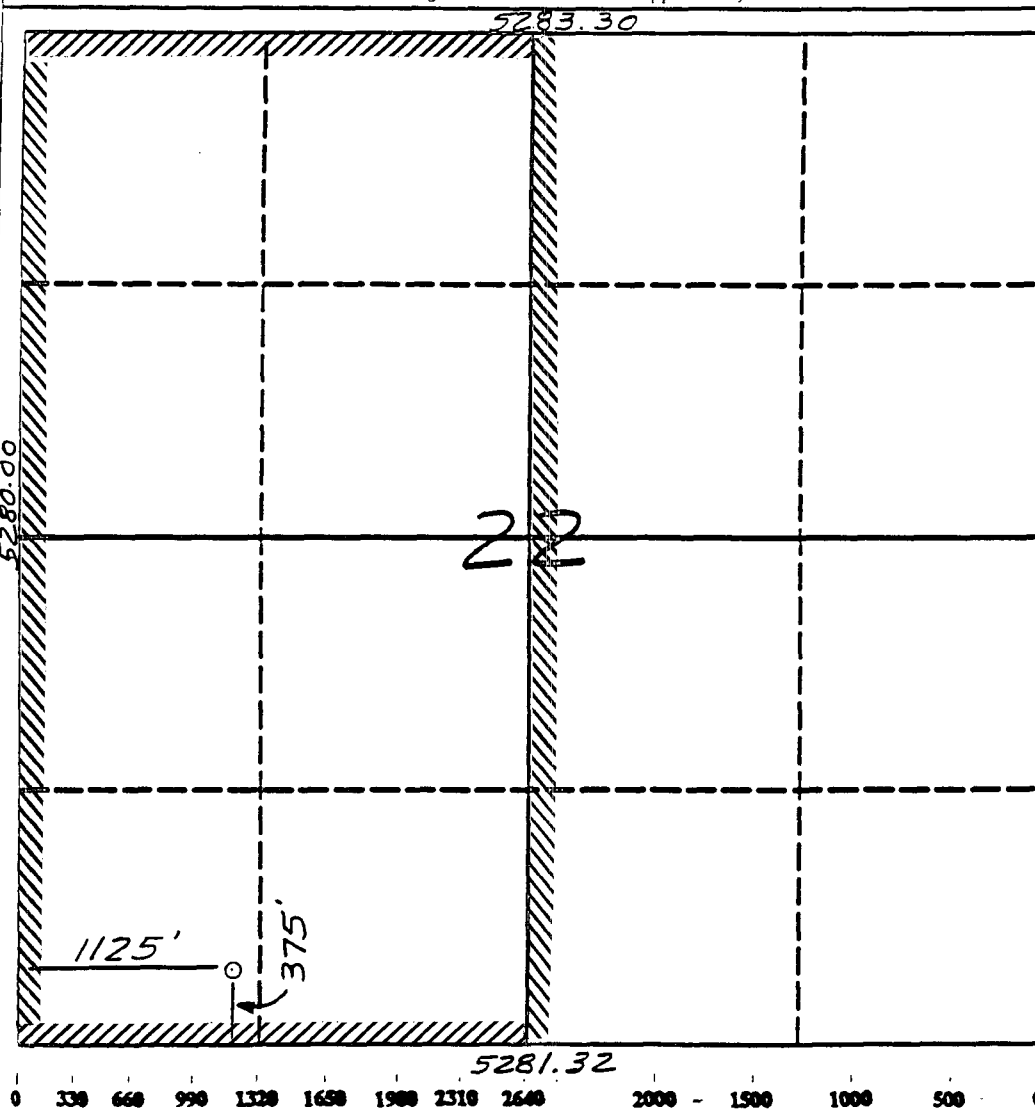
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc.?

☒ Yes ☐ No If answer is "yes" type of consolidation unitization

If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.)

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interest, has been approved by the Division.



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Signature

Peggy Bradfield
Printed Name

Regulatory Affairs
Position

Meridian Oil Inc.
Company

Date

SURVEYOR CERTIFICATION

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

Date Surveyed

Signature of Surveyor
Professional Surveyor



Certificate No. 6857
Neale C. Edwards

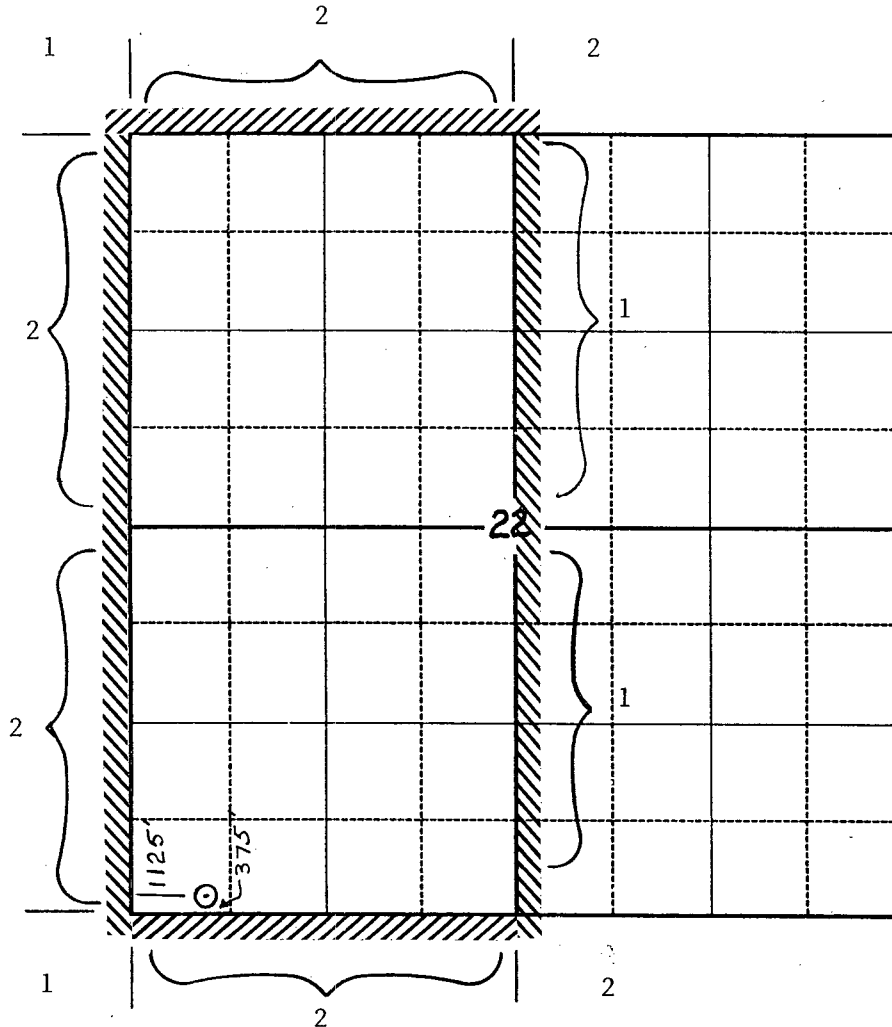
MERIDIAN OIL INC

Well Name Rosa Unit #306

Footage 375' FSL; 1125' FWL

APPLICATION FOR NON-STANDARD LOCATION

County Rio Arriba State New Mexico Section 22 Township 31N Range 4W



Remarks 1) Meridian Oil Inc
2) Mitchell Energy Corp

MERIDIAN OIL

Rosa Unit #306
375' FSL, 1125' FWL Section 22, T-31-N, R-4-W
Rio Arriba County, New Mexico

I hereby certify that the following offset operators/owners have been mailed notification of our application for non-standard location to drill the subject well.

Mitchell Energy Corp.
PO Box 4000
The Woodlands, TX 77387-4000



Peggy A. Bradfield

San Juan County
State of New Mexico

September 12, 1990

My commission expires August 17, 1992

**A CULTURAL RESOURCES INVENTORY FOR
A PROPOSED WELL PAD AND
ACCESS ROAD/PIPELINE RIGHT-OF-WAY
CENTRALLY LOCATED ON ESTUFA RIDGE
IN THE CARSON NATIONAL FOREST,
RIO ARriba COUNTY, NEW MEXICO**

**ROSA UNIT NO. 306
375 FSL, 1125 FWL, SECTION 22, T31N, R4W**

**CONDUCTED FOR:
MERIDIAN OIL, INC.**

MERIDIAN OIL

**SEP 14 1990
FARMINGTON, NEW MEXICO
Construction Supervisor**

**PREPARED BY:
CINDY J. BUNKER**

**SUBMITTED BY:
LARRY L. BAKER**



DAGGETT & CHENAULT, INC
OIL & GAS PROPERTY MANAGEMENT
3539 E. 30th STREET, SUITE 7B
FARMINGTON, N.M. 87401



**REPORT NO. 90-DCI-030
U.S. FOREST SERVICE, CARSON NATIONAL FOREST SPECIAL USE PERMIT
MAY 22, 1990**

SEPTEMBER 14, 1990

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INTRODUCTION

Nine crew days were spent between July 6 and August 1, 1990, conducting the archaeological survey and recording sites on the proposed Rosa Unit No. 306 well pad and associated access road/pipeline. The archaeological survey was conducted by personnel of Daggett and Chenault, Inc. Archaeological Services Department. The project area for the proposed well pad and access/pipeline is located on lands administered by the Carson National Forest within Rio Arriba County, New Mexico. A Class III cultural resources inventory of the proposed well pad and access/pipeline was completed under the authority of the U.S. Forest Service, Carson National Forest Special Use Permit, May 22, 1990.

Greater awareness and public concern for the preservation of our cultural heritage has prompted legislation by federal, state, and tribal governments to protect historical, ethnographic, and archaeological cultural resources. Cultural resource management investigations are mandated and authorized by federal legislation and stipulations. These regulatory acts include: 1) the Federal Antiquities Act of 1906 (P.L. 59-209); 2) the National Historic Preservation Act of 1966 (P.L. 89-665); 3) the National Environmental Protection Act of 1969 (P.L., 91-190); 4) Executive Order 11593: "Protection and Enhancement of the Cultural Environment", 1971 (36 F.R. 8921); 5) the Archaeological Resources Protection Act of 1979 (P.L. 95-96); and 6) the American Indian Religious Freedom Act of 1979 (P.L. 95-341). Work conducted in conjunction with this project is intended to comply with the statutes contained in these laws.

The project was undertaken at the request of Mr. Charles Werner for Meridian Oil, Inc. The project was administered by Larry L. Baker, Director of Archaeological Services, Daggett and Chenault, Inc. The survey was conducted by Cindy J. Bunker, Douglas D. Dykeman, and Melba Wilcox, Staff Archaeologists. The project area was staked prior to the time of the survey and the archaeologists were accompanied in the field at times by Wally Bergstrom of Meridian Oil, Inc., Neale Edwards, land surveyor, and Jim Tensfield, USFS Jicarilla Ranger District.

The proposed well pad and access/pipeline project is located approximately 13 miles north of Highway 64 on an east-west-trending finger of Estufa Ridge (Figure 1). The archaeological inventory included two well locations, designated Alternate A and Alternate B and three access roads/pipeline rights-of-way, designated Alternate A, Alternate B, and Alternate C. The total area inspected for cultural resources includes 41.94 acres.

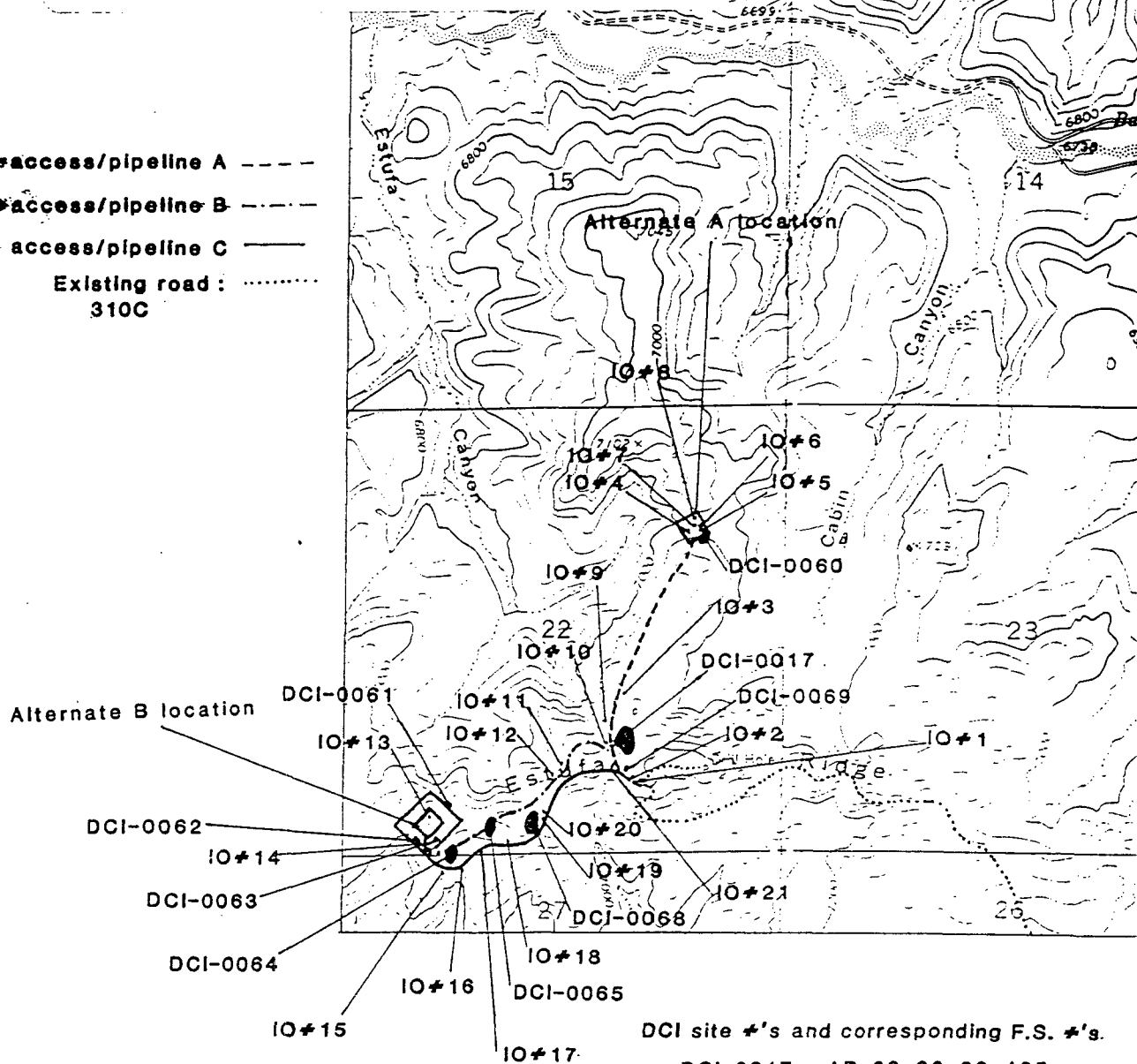
During the survey of the area, 9 archaeological sites and 21 isolated occurrences were documented. Six of the archaeological sites encountered have been evaluated as potentially eligible for inclusion on the National Register of Historic Places. Through recordation, the research potential of the isolates has been

Figure 1. Vicinity map for the proposed
Rosa Unit No. 306.
(90-DCI-030)
(USFS Report No. 1990-02-132)

FOR OFFICIAL USE ONLY

Disclosure of site locations is prohibited.
(36 CFR 296.18)

Alternate access/pipeline A - - - -
Alternate access/pipeline B - - - -
Alternate access/pipeline C - - - -
Existing road :
310C



DCI site #'s and corresponding F.S. #'s.

DCI-0017 - AR-03-02-03-435
DCI-0060 - AR-03-02-03-231
DCI-0061 - AR-03-02-03-436
DCI-0062 - AR-03-02-03-437
DCI-0063 - AR-03-02-03-438
DCI-0064 - AR-03-02-03-439
DCI-0065 - AR-03-02-03-440
DCI-0068 - AR-03-02-03-441
DCI-0069 - AR-03-02-03-445

Carracas Canyon, New Mexico
7.5' USGS Quadrangle (1963)
Photorevised 1982
SW 1/4, Section 22, T.31 N., R.4 W., NMPM
Rio Arriba County, New Mexico

exhausted. All the archaeological sites can be avoided by use of the Alternate location and access/pipeline as detailed in this report. Archaeological clearance is recommended for construction of Rosa Unit No. 306 well pad and access road/pipeline with stipulations. Details of the project, survey, cultural resources, and recommendations are included later in this report.

PREFIELD RECORDS SEARCH

Searching existing records is essential in any cultural resources management undertaking in order to determine what portions of an area have been previously inspected and what sites, if any, have been identified. On July 6, 1990, a records search of the Jicarilla District Ranger's files was completed for the project. The file search was completed prior to initiating field work for the project. The locations of previously recorded sites are illustrated on the Nearby Sites Map in Appendix A which is included only with the Forest Service's copies of this report.

The high incidence of Anasazi Pueblo I and early Navajo sites in this area are consistent with the findings of the adjacent Navajo Reservoir Survey (Dittert, Hester and Eddy 1961). Despite the results of the large scale Navajo Reservoir Survey and excavation project (Eddy 1966), and subsequent smaller scale surveys and excavations conducted mostly in the context of cultural resource management, research needs in the circum-Navajo Reservoir District remain basic and include (cf. Stuart and Gauthier 1981):

1. Definition of refined absolute chronologies reliably linked with prehistoric and historic cultural variability, development and change.
2. Definition of the full temporal and behavioral range of cultural usage.
3. Definition of cultural feature and material variability through time.
4. Definition of inter and intra-cultural variability and relationships through time.
5. Definition of synchronic and diachronic models of settlement and subsistence/resource usage.
6. Definition of synchronic and diachronic models of variation in resource availability and their relationships to #5.

Three previously documented sites and three known unrecorded sites are located within a 1-mile radius of the project area. The above-mentioned sites were all encountered during a project conducted by San Juan College (Hooton, 1984). The recorded sites

consist of Anasazi Pueblo I-Pueblo II sites, characterized by artifact scatters and surface rooms. One of the previously recorded sites, SJC 1121 (AR-03-02-03-231), was updated during this project and will be detailed in the Cultural Resources section of this report. None of the above-mentioned sites will be directly impacted by the proposed construction activities.

PROJECT LOCATIONS AND DESCRIPTIONS

Rosa Unit No. 306 Alternate B Well Location (Figures 1, 2, 3)

Legal Description:

Well Pad: SE 1/4, SW 1/4, SW 1/4,
and SW 1/4, SE 1/4, SW 1/4,
(375' FSL, 1125' FWL)
Section 22, T.31N, R.4W (NMPM),
Rio Arriba County, New Mexico

Elevation: 7,035 feet

Map Reference: Carracas Canyon, New Mexico
7.5' USGS Quadrangle, 1963
(Photorevised 1982)

Land Jurisdiction: US Forest Service
Carson National Forest

Project Area (Area of Effect):

Well Pad: 280 ft. X 230 ft. (1.49 acres)
Well Pad and Construction Zone:
380 ft. X 330 ft. (2.88 acres)
Total Area of Effect: 2.88 acres

Area Surveyed (Area of Effect and Cultural Buffer Zone):

Well Pad: 580 ft. X 530 ft. (7.06 acres)
Total Area Surveyed: 7.06 acres

Rosa Unit No. 306 Alternate C Access/Pipeline (see Figure 1)

Legal Description:

Access/Pipeline right-of-way:

N 1/2, SW 1/4, SE 1/4, and S 1/2, SE 1/4, SW 1/4,
and SE 1/4, SW 1/4, SW 1/4,
Section 22,

and NW 1/4, NE 1/4, NW 1/4,
and NE 1/4, NW 1/4, NW 1/4
Section 27, T.31N, R.4W (NMPM),
Rio Arriba County, New Mexico

Map Reference: Carracas Canyon, New Mexico
7.5' USGS Quadrangle, 1963
(Photorevised 1982)

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OIL CONSERVATION DIVISION

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Santa Fe, New Mexico 87504-2088

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P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
P.O. Drawer 00, Artesia, NM 88210

DISTRICT III
1000 Rio Benito Rd., Aztec, NM 87410

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

Operator Meridian Oil Inc.			Lease Rosa Unit (SF-078893)		Well No. 306
Unit Letter M	Section 22	Township 31N	Range 4W	County Rio Arriba	
Actual Footage Location of Well: 375 feet from the South line and 1125 feet from the West line					
Ground level Elev. 7035'	Producing Formation Fruitland Coal		Pool Basin	Dedicated Acreage 320 Acres	

as starts on the plat below.

Figure 2. Well location plat for the
proposed Rosa Unit No. 306.
(90-DCI-030)
(USFS Report No. 1990-02-132)

ownership thereof (both as to working interest and royalty).

the interest of all owners being consolidated by communitization.

consolidation unitization

is consolidated. (Use reverse side of

plat (by communitization, unitization, forced-pooling, or otherwise)

and approved by the Division.

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Signature

Peggy Bradfield

Printed Name

Regulatory Affairs

Position

Meridian Oil Inc.

Company

Date

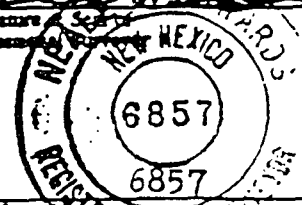
SURVEYOR CERTIFICATION

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

Date Surveyed

Signature of Surveyor

Professional Surveyor



Certificate of Survey

Neale S. Edwards

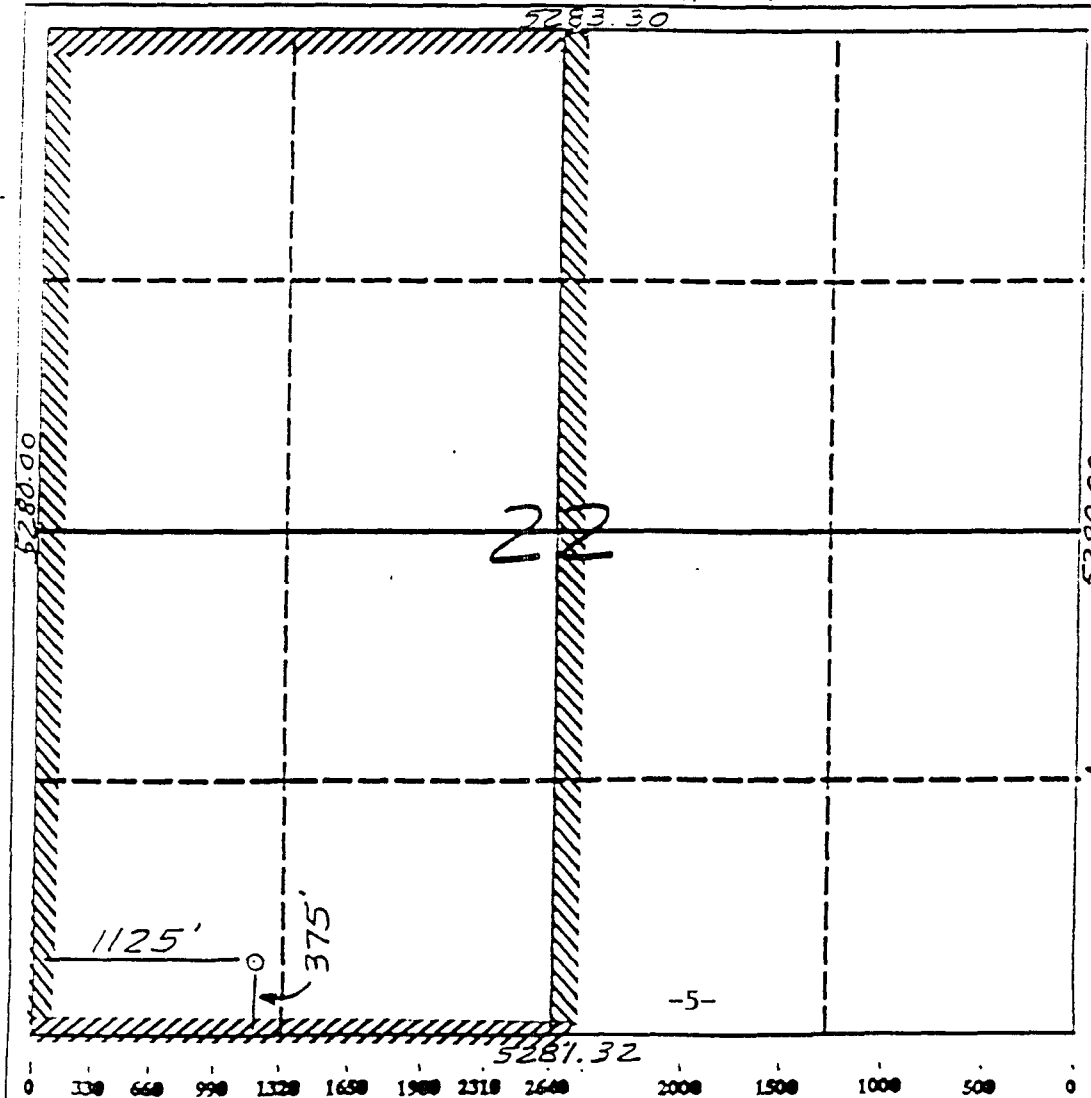
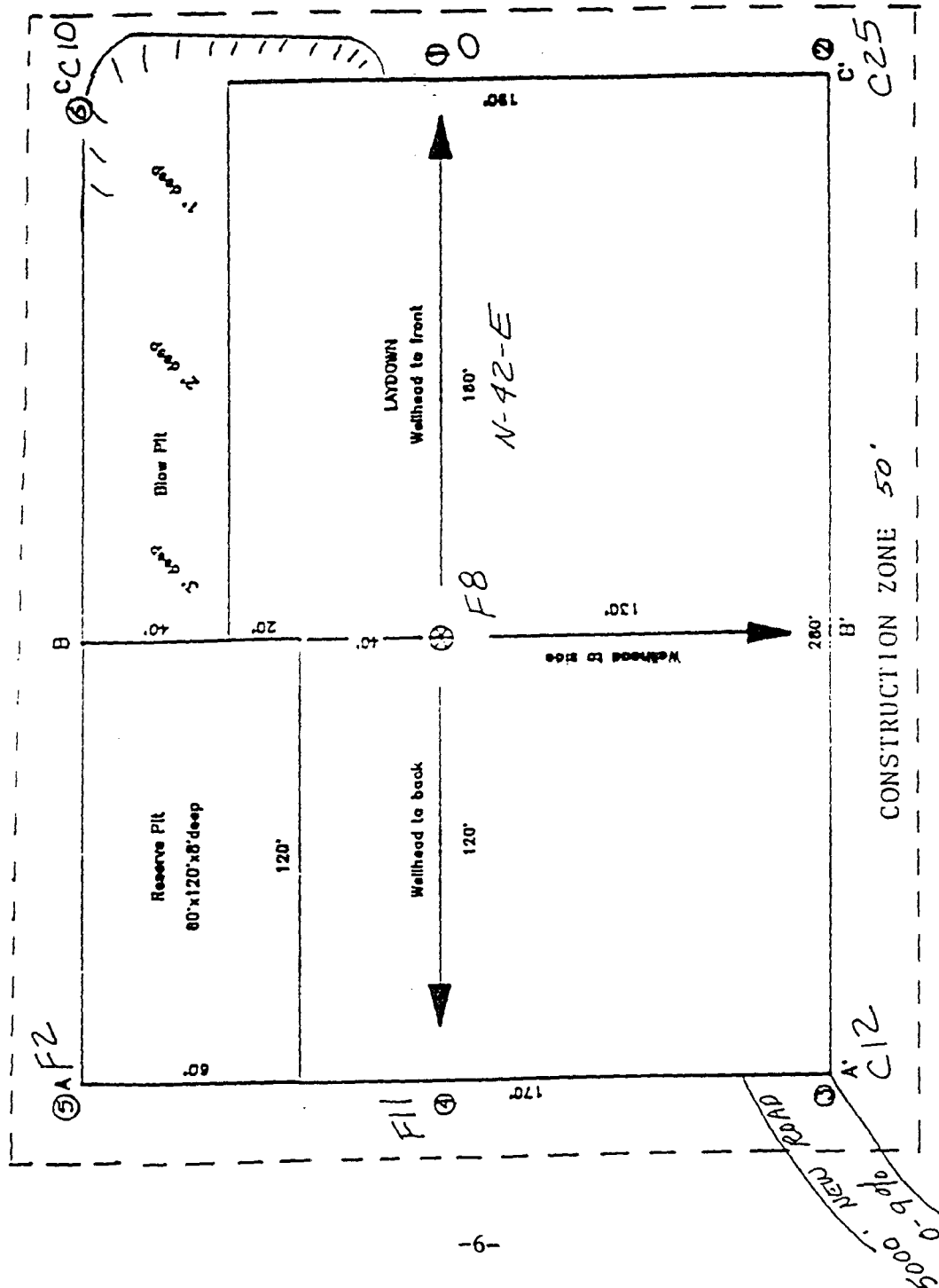


Figure 3: Diagrammatic sketch for the
Rosa Unit No. 306.
(90-DCI-030)
(USFS Report No. 1990-02-132)



Land Jurisdiction: US Forest Service
Carson National Forest

Project Area (Area of Effect):
Access Road/Pipeline: 3,300 ft. X 50 ft. (3.79 acres)
Total Area of Effect: 3.79 acres

Area Surveyed (Area of Effect and Cultural Buffer)
Access/Pipeline right-of-way:
3,300 ft. X 150 ft. (11.36 acres)
Total Area Surveyed: 11.36 acres

Rosa Unit No. 306 Alternate A Well Location and Access/Pipeline
(see Figure 1)

Legal Description:

Well Pad: SW 1/4, NE 1/4, NE 1/4,
and NW 1/4, SE 1/4, NE 1/4
Section 22, T.31N, R.4W (NMPM),
Rio Arriba County, New Mexico

Access/Pipeline right-of-way:
NE 1/4, SW 1/4, SE 1/4
and E 1/2, NW 1/4, SE 1/4,
and SE 1/4, SW 1/4, NE 1/4
and W 1/2, SE 1/4, NE 1/4
Section 22, T.31N, R.4W (NMPM),
Rio Arriba County, New Mexico

Elevation: 7,000 feet

Map Reference: Carracas Canyon, New Mexico
7.5' USGS Quadrangle, 1963
(Photorevised 1982)

Land Jurisdiction: US Forest Service
Carson National Forest

Project Area (Area of Effect):
Well pad: 280 ft. X 230 ft. (1.48 acres)
Access Road/Pipeline right-of-way:
3,600 ft. X 50 ft. (4.13 acres)
Total Area of Effect: 5.61 acres

Area Surveyed (Area of Effect and Cultural Buffer Zone):
Well Pad: 280 ft. X 230 ft. (1.48 acres)
Access Road/Pipeline right-of-way:
3,600 ft. X 150 ft. (12.40 acres)
Total Area Surveyed: 13.88 acres

Remarks:

Due to the density of cultural resources on the Alternate A well location, neither a construction zone nor cultural buffer were inventoried.

Rosa Unit No. 306 Alternate B Access/Pipeline (see Figure 1)

Legal Description:

Access/Pipeline right-of-way:

N 1/2, SW 1/4, SE 1/4
and NE 1/4, SE 1/4, SW 1/4
and S 1/2, SE 1/4, SW 1/4
and SE 1/4, SW 1/4, SW 1/4,
Section 22, T.31N, R.4W (NMPM)
Rio Arriba County, New Mexico

Map Reference: Carracas Canyon, New Mexico
7.5' USGS Quadrangle, 1963
(Photorevised 1982)

Land Jurisdiction: US Forest Service
Carson National Forest

Project Area (Area of Effect):

Access Road/Pipeline right-of-way:
2,800 ft. X 50 ft. (3.21 acres)
Total Area of Effect: 3.21 acres

Area Surveyed (Area of Effect and Cultural Buffer Zone):

Access Road/Pipeline right-of-way:
2,800 ft. X 150 ft. (9.64 acres)
Total Area Surveyed: 9.64 acres

General Remarks:

The presence of cultural resources resulted in the survey of two well pad locations and three access road/pipeline rights-of-way in order to establish an acceptable location for the proposed actions. In total, 41.94 acres were inventoried for cultural resources.

FIELD METHODOLOGY

The proposed well pads were staked in the field prior to the archaeological inspection. The well centers were marked with a steel fence post and the four corners, rear end, and laydown were marked with lath. The proposed access roads/pipeline rights-of-way were marked with red flagging. The archaeological survey was conducted by walking a series of parallel transects spaced not more than 10 meters or 33 feet apart. Weather conditions at the time of the field work were partly cloudy but warm, facilitating the survey and field observations. The ground surface was clear but damp at the time of the survey and the vegetative cover was approximately 15 percent.

When artifacts were observed during survey, their distribution was delineated by marking artifact locations with pin flags. Archaeological sites and isolated artifacts are recorded on Museum of New Mexico Laboratory of Anthropology, Archaeological Site Survey Forms and US Forest Service Archeological and Historical Site Inventory Forms and Carson National Forest Isolated Occurrence Forms, respectively. Completed Forest Service forms documenting these cultural resources are included in Appendices B and C. Site and isolated occurrence definitions utilized did not substantially differ from those employed in the Forest Service's Cultural Resources Handbook.

The presence of numerous archaeological sites in the vicinity of the originally proposed Alternate A location and access road/pipeline in part, resulted in the need to find a new location. The Jicarilla Ranger District determined the original location and access/pipeline to be unacceptable, and Meridian Oil, Inc. complied by moving the location to the southwest. The archaeologists, in turn, updated previously recorded Site SJC-1121 and recorded the isolates encountered on the Alternate A well pad. However, the construction zone and cultural buffer of the Alternate A well location were not surveyed. A new location was proposed for the well pad (designated Rosa Unit No. 306 Alternate B location) and the Alternate B access road/pipeline was surveyed. The presence of two large archaeological sites resulted in establishing a third (Alternate C) access road/pipeline.

PHYSIOGRAPHY AND ENVIRONMENT

Natural Setting

The project area is located on Estufa Ridge with Estufa Canyon to the north and an unnamed tributary of the Ulibarri Canyon drainage system located to the south. The sediments consist of fine to medium-grained sand and support a vegetative cover consisting of sparse ponderosa pine (*Pinus ponderosa*), pinyon (*Pinus edulis*), juniper (*Juniperus* sp.) mountain mahogany (*Cercocarpus* sp.), antelope brush (*Purshia tridentata*), currant, gambels oak (*Quercus gambelii*), sagebrush (*Artemisia tridentata*), fendler (*Fendlera rupicola*), snakeweed (*Gutierrezia sarothrae*), bittercherry, broadleaf yucca (*Yucca baccata*), prickly pear cactus (*Opuntia* sp.), and various other cacti as well as various grasses. Fauna inhabiting the area include deer (*Odocoileus* sp.), elk (*Cervus canadensis*), coyote (*Canis latrans*), bear (*Ursus* sp.), porcupine (*Erethizon dorsatum*), rabbits, small rodents, various birds.

Potential Resources

Prehistorically, native flora and fauna observed during survey could have been used by aboriginal populations for food, clothing and select types of tools. Non-food resources in the area include sandstone and cobbles for building material and stone implements, clay for ceramics and construction material, and trees for building materials and fuel.

Modern Cultural Setting

The area is presently used for a variety of activities. Oil and gas extraction has been and currently is active in the area. Through the construction of numerous roads for energy resources development, the area has been made more accessible for hunting and camping. Evidence of woodcutting and wild horse herds is also present.

CULTURAL RESOURCES

The archaeological survey of the proposed Rosa Unit No. 306 alternate well pad locations, access roads and pipelines, resulted in the documentation of 8 new sites, the update of a previously recorded site, and documentation of 21 isolated occurrences. The new sites include DCI-0017 (AR-03-02-03-435), DCI-0061 (AR-03-02-03-436), DCI-0062 (AR-03-02-03-437), DCI-0063 (AR-03-02-03-438), DCI-0064 (AR-03-02-03-439), DCI-0065 (AR-03-02-03-440), DCI-0068 (AR-03-02-03-441), and DCI-0069 (AR-03-02-03-445). The updated site was given the number DCI-0060, but was previously recorded as SJC-1121 (Hooton 1984) and has previously been assigned the Forest Service number of AR-03-02-03-231.

The locations of these resources in relation to the proposed project area are shown in Figure 1. Additional data has been submitted on the appropriate Forest Service and Laboratory of Anthropology/ARMS Management forms which have been supplied to the appropriate reviewing agency only.

Alternate A Access/Pipeline

Isolates #1, #2 and #3 are located on the east side of Alternate A access/pipeline and Isolate #9 is located on the west side. Site DCI-0069 (AR-03-02-03-445) is located just north and east of the intersection of Alternate A with Alternate C and DCI-0017 (AR-03-02-03-435) is located approximately 250 feet north of DCI-0069 (AR-03-02-03-445), on the east side of Alternate A.

FIGURE 4 DELETED FROM CLIENT COPY

Alternate A well location

Isolates #4, #5, #6, #7, and #8 are located on the Alternate A well location (Figure 4) and one archaeological site, DCI-0060 (AR-03-02-03-231 or SJC-1121), is located in the southeastern cultural buffer and construction zone.

Alternate B Access/Pipeline

Isolates #10, #11, and #12 are located along the north side of the Alternate B access/pipeline. Sites DCI-0065 (AR-03-02-03-440) and DCI-0064 (AR-03-02-03-439) are located such that the Alternate B bisected the northern portion of both sites.

Alternate B well location

Isolate #13 is located on the proposed well pad and #14 is in the southeast portion of the construction zone. Three archaeological sites, DCI-0061 (AR-03-02-03-436), DCI-0062 (AR-03-02-03-437), and DCI-0063 (AR-03-02-03-438), are located in or on the edge of the cultural buffer of the well pad.

Alternate C Access/Pipeline

Isolates #15, #16, #17, and #18 are all located on the south side of Alternate C access/pipeline and Isolates #19, #20, and #21 are along the north side. One site, DCI-0068 (AR-03-02-03-441), is located on the north side, of and adjacent to the Alternate C access road/pipeline.

Isolated Occurrences

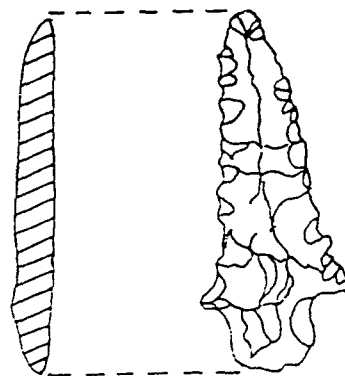
Twenty-one isolates were identified during the inventory. Table 1 presents a summary description of the IOs and Table 2 presents location information. The isolates include single or multiple occurrences of chipped stone, and/or sherds. IO #1 and IO #3 are projectile points. These are illustrated in Figures 6 and 7. All of the isolates are located in what appears to be secondary depositional context, and many of them are located on bedrock. Although the isolates appear in close proximity to sites, for the above mentioned reasons, they are not included in site boundaries.

Site Descriptions

DCI-0069 (AR-03-02-03-445)

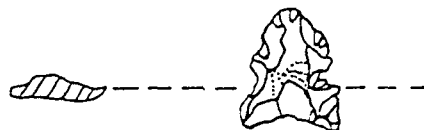
Site DCI-0069 (AR-03-02-03-445) is located on a north-south trending bench of Estufa Ridge and consists of an artifact scatter which covers an area 38 m x 50 m (Figure 8). This area has been heavily impacted by erosion. The sediments consist of alluvial sand of less than 5 cm in depth (pinflag probe). Bedrock has been exposed in several places.

FIGURE 5 DELETED FROM CLIENT COPY



10#1.
Projectile Point
Armijo Phase

Figure 6. Sketch of Isolated Occurrence #1.



CENTIMETERS






IO#3

Projectile Point

Pueblo side-notched

Figure 7. Sketch of Isolated Occurrence #3.

LEGEND

-  : tree w/site tag
-  : sandstone/bedrock
-  : dead trees
-  : drainage
-  : site boundary

DCI-0069

AR-03-02-03-445

CJ Bunker 7/25/90

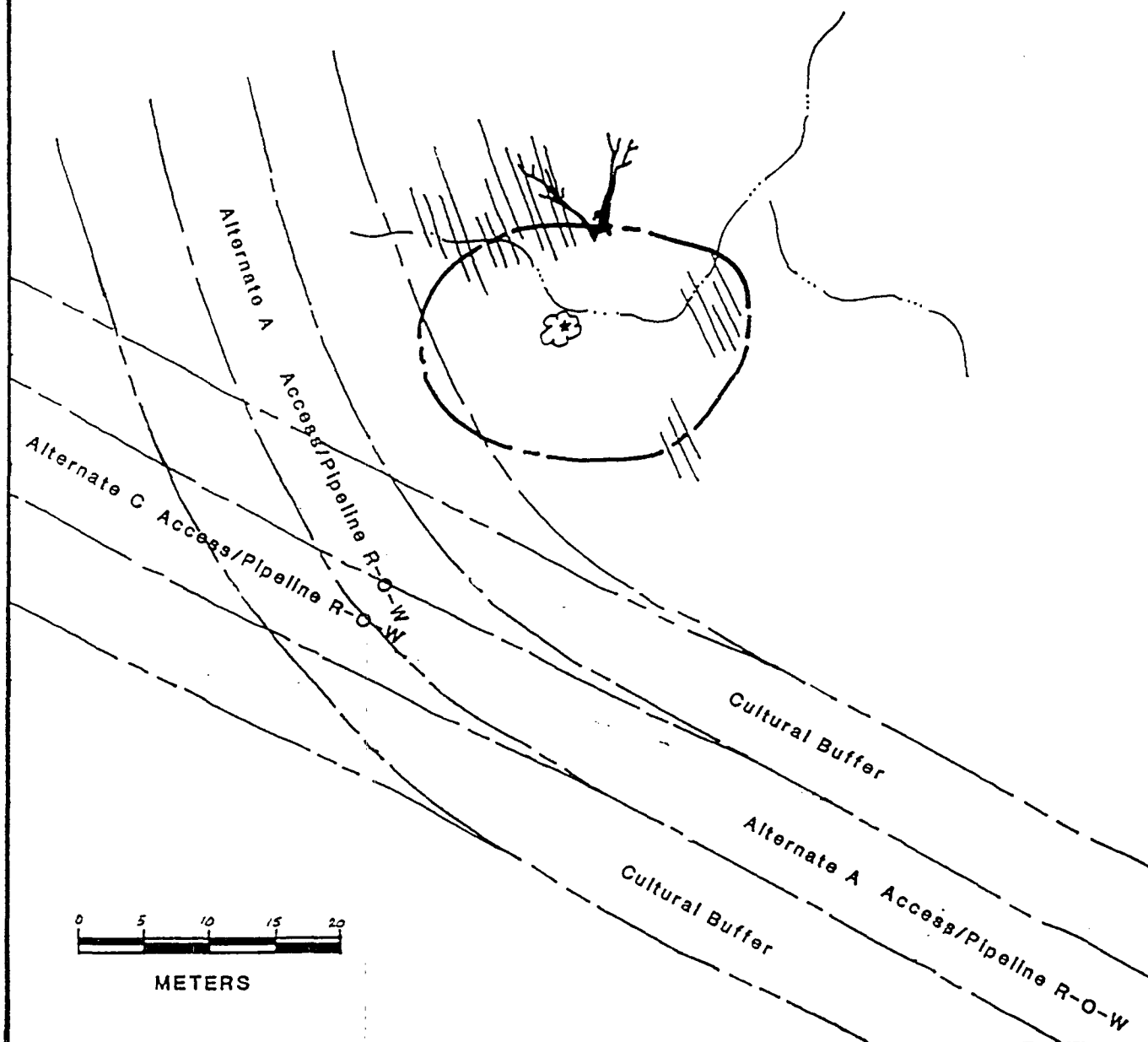


Figure 8. Plan map of Site DCI-0069 (AR-03-02-03-445)

DCI-0017 (AR-03-02-03-435)

DCI-0017 covers a 6,175 square meter area and consists of a structure, two features, and an artifact concentration as well as an overall artifact scatter (Figure 9). The site is located on a bench characterized by sandy and clayey soils. The vegetative community includes ponderosa pine, juniper, and a variety of woody shrubs. Overall, the condition of the site is good. It has been minimally impacted by erosion.

DCI-0060 (AR-03-02-03-231)

The site is located on a saddle of a NE/SW-trending ridge on Estufa Ridge proper. Originally this site was described as a Rosa Phase, single event, temporary camp in an area with numerous exploitable natural resources. The ceramics included a sparse scatter of gray utility and one corrugated sherd. The lithics consisted of a sparse scatter of chipped stone, predominately chert and one tertiary chalcedony flake exhibiting retouch. A single feature, represented by an charcoal/ash deposit containing fire-cracked rock with a diameter of 1 to 1.5 meters, (probably a hearth) was identified.

DCI-0065 (AR-03-02-30-440)

Site DCI-0065 (AR-03-02-03-440) is located on the southeast face of a NE/SW-trending slope in an area affected by erosion and scattered with dead and downed trees. The site covers an area of 60 x 45 meters and consists of an artifact concentration (C1), two pot drops, and an overall artifact scatter (Figure 11).

DCI-0064 (AR-03-02-03-439)

Site DCI-0064 (AR-03-02-03-439) is located on the southeast-facing slope of a NE/SW-trending ridge, due south of Estufa Canyon. This site covers an area 70 x 50 meters and consists of an overall artifact scatter and remnants of a structure (Figure 12). The overall condition of the site is excellent. It has been minimally affected by natural erosion.

DCI-0061 (AR-03-02-03-436)

Site DCI-0061 (AR-03-02-03-436) is located on the northwest slope of a northeast-southwest-trending ridge which forms the western side of a natural amphitheater. The site is a small artifact scatter which covers a 22 m x 22 m area (Figure 15). The condition of DCI-0061 (AR-03-02-03-436) is extremely poor; the general vicinity has deep erosional cuts throughout and is characterized by degraded clay bedrock.

DCI-0017

AR-03-02-03-435

CJ Bunker 7/7/90

LEGEND

- : site boundary
- : drainage
- . - : access/pipeline R-O-W
- . - : cultural buffer

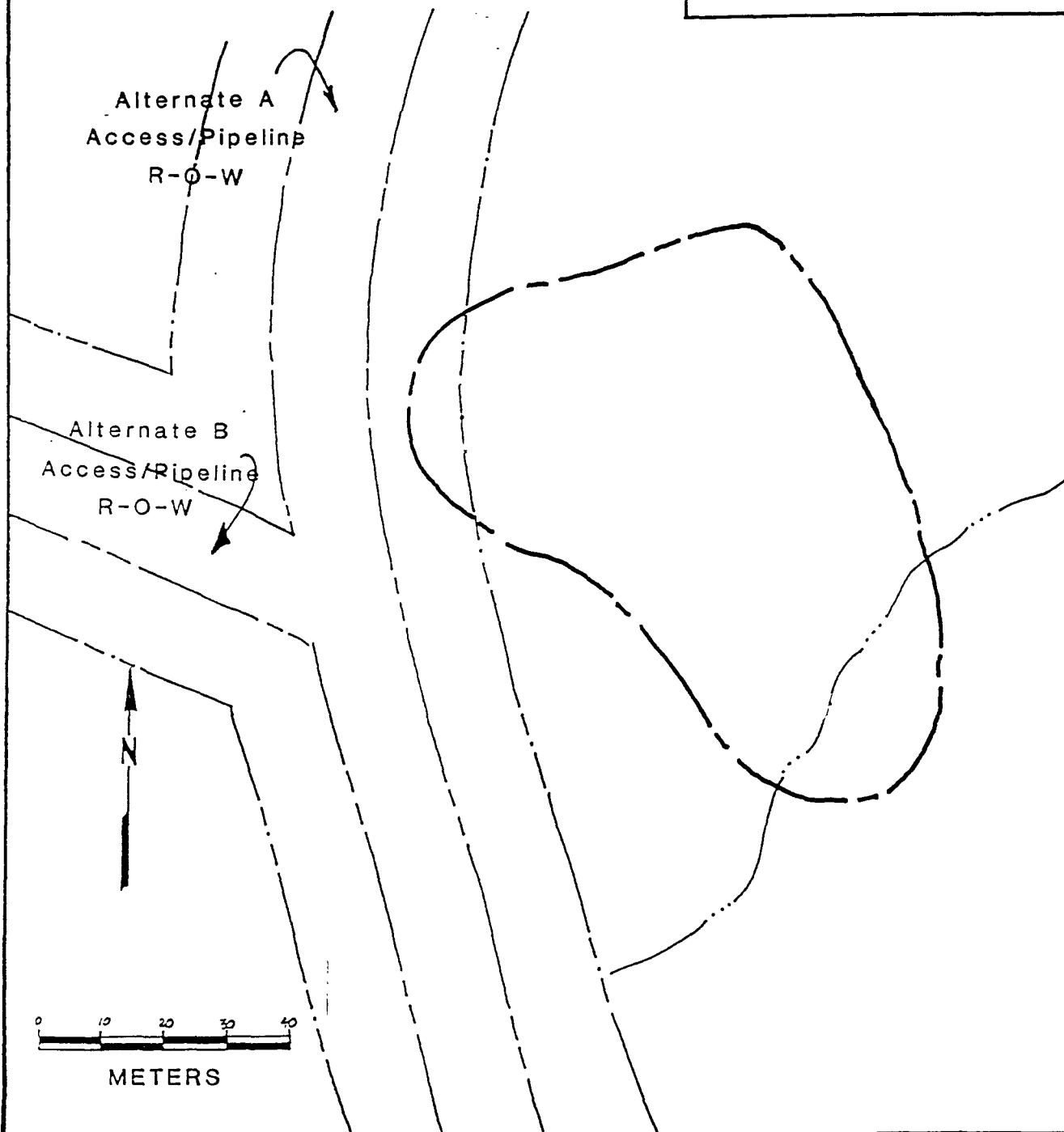


Figure 9. Plan map of Site DCI-0017 (AR-03-02-03-435).

DCI-0060

LEGEND

- : drainage
- - - : site boundary
- ☼ : pinyon /site tag

AR-03-02-03-231

SJC-1121

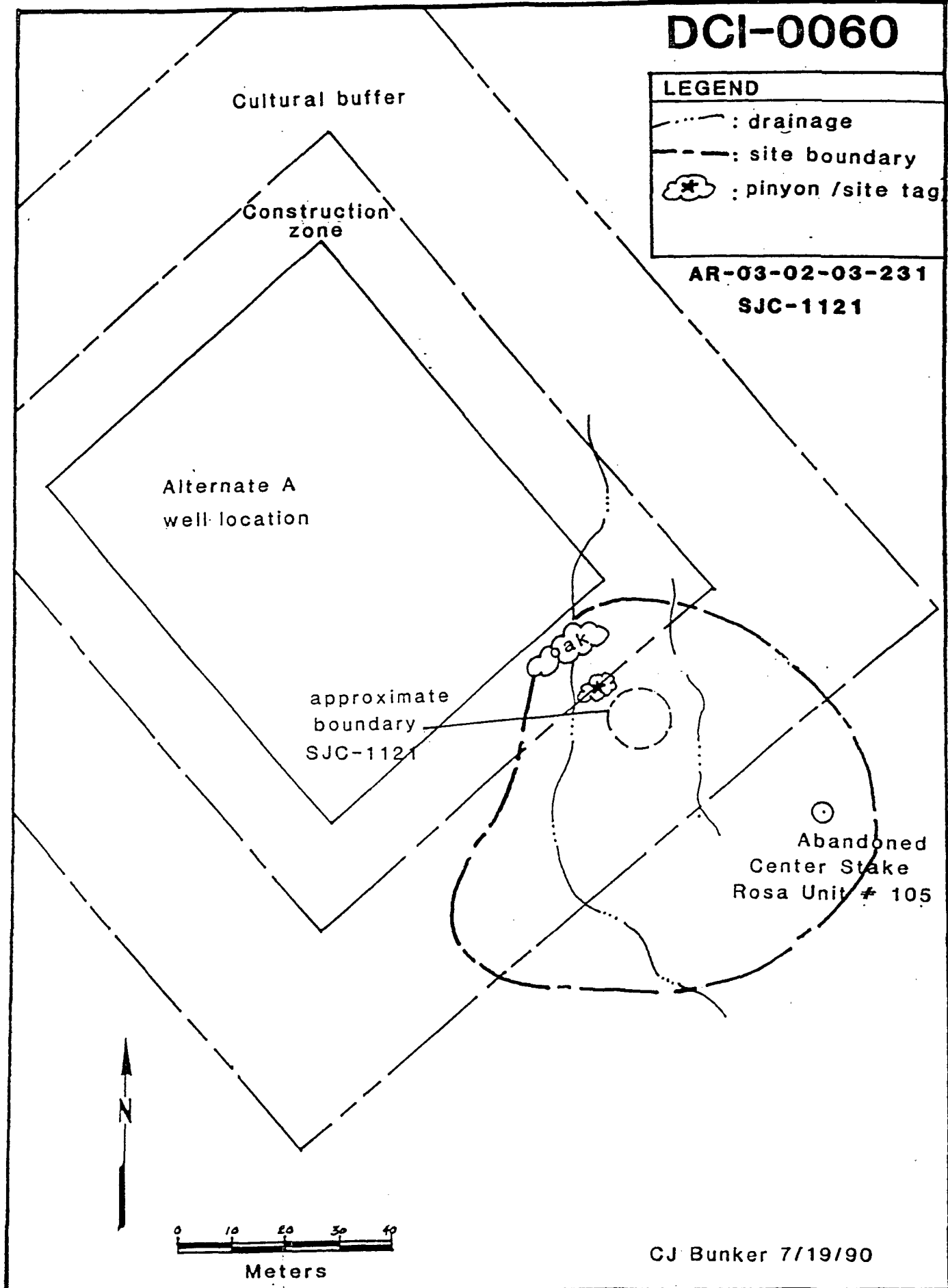


Figure 10. Plan map of Site DCI-0060 (AR-03-02-03-231).

LEGEND

- : drainage
- : slope direction
- - - : site boundary
- ☼ : tree w/site tag
- /// : sandstone/bedrock

DCI-0065

AR-03-02-03-440

CJ Bunker 7/23/90

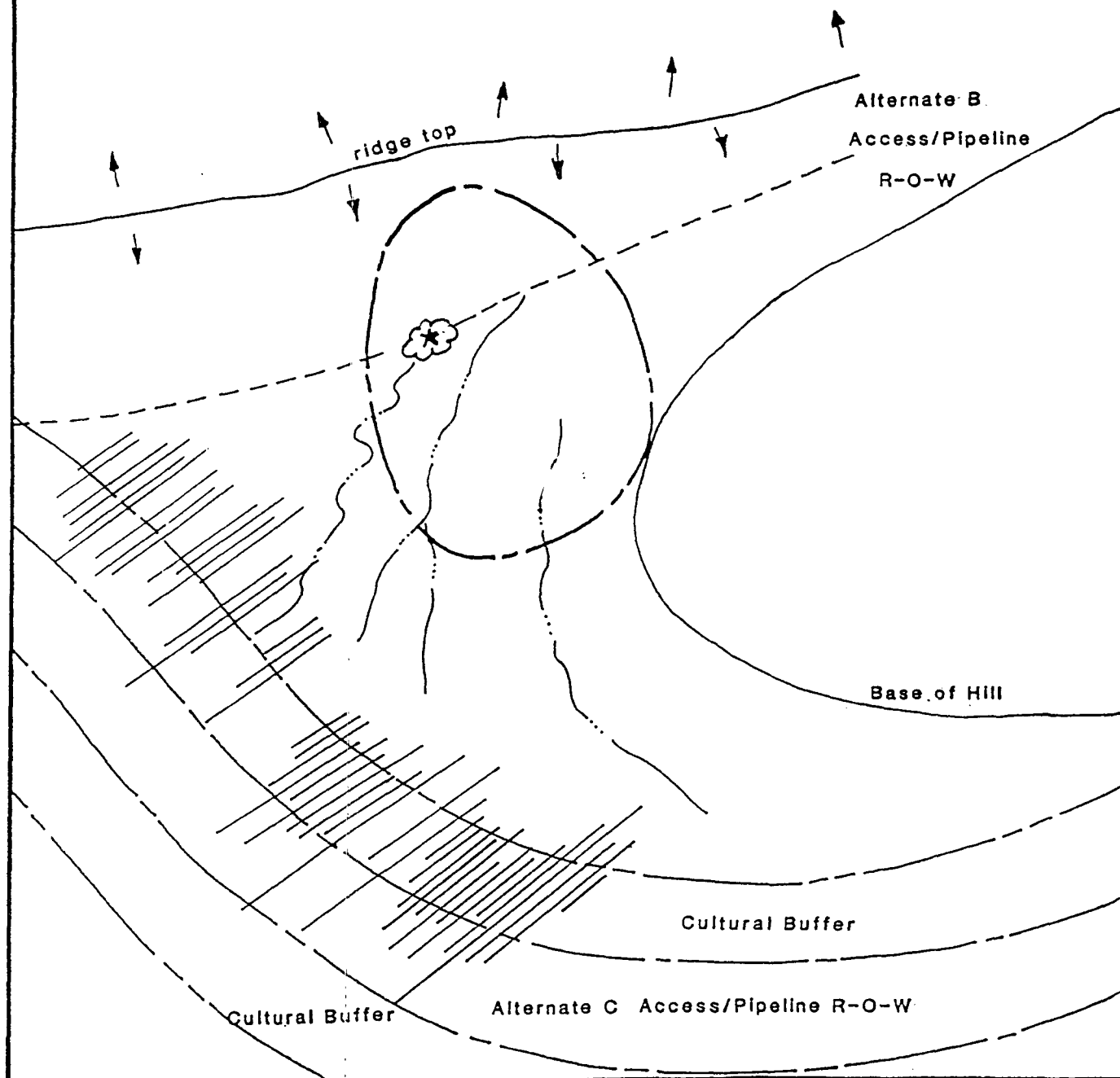
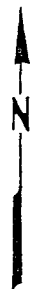


Figure 11. Plan map of Site DCI-0065 (AR-03-02-03-440).

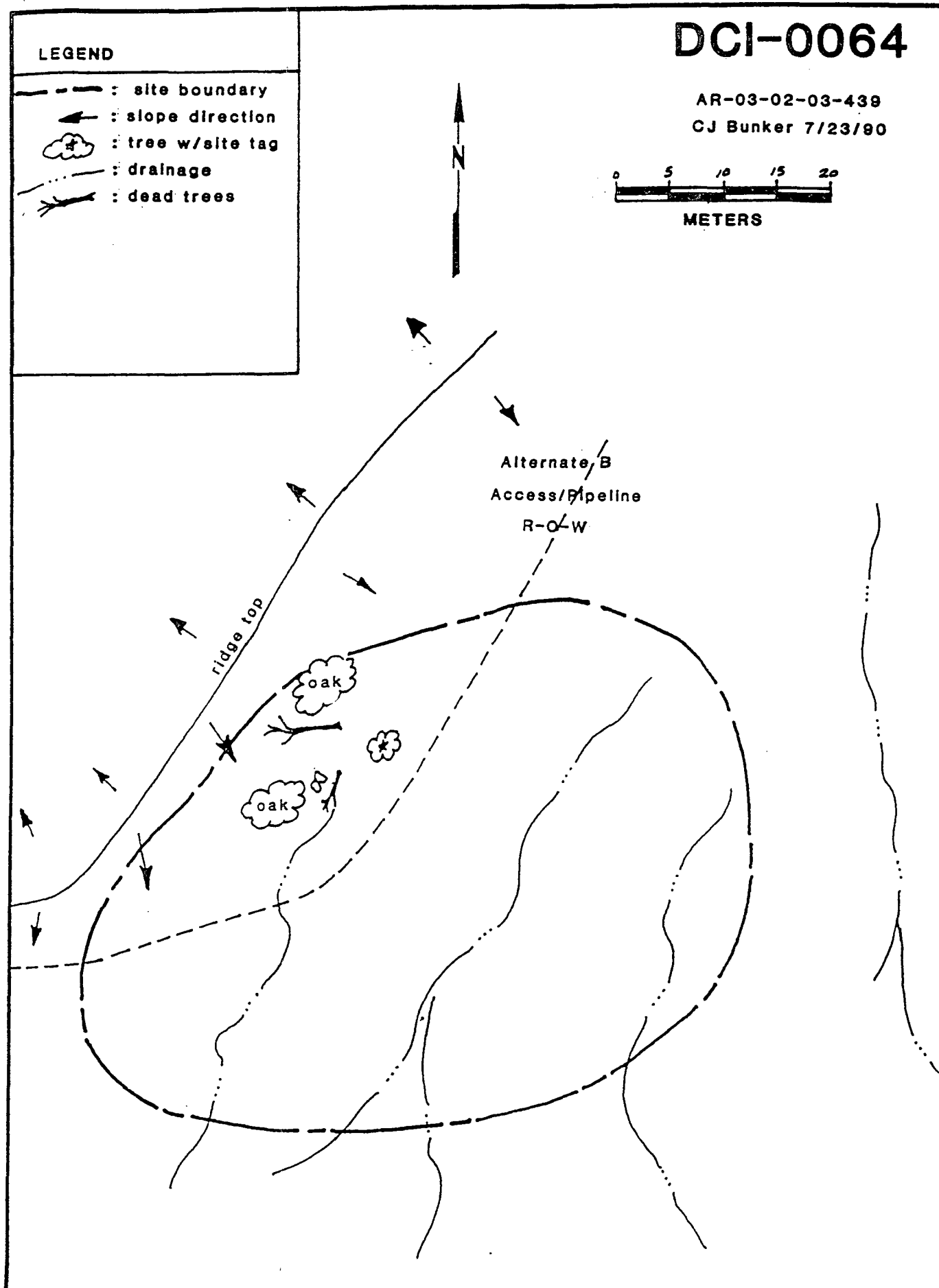
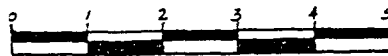
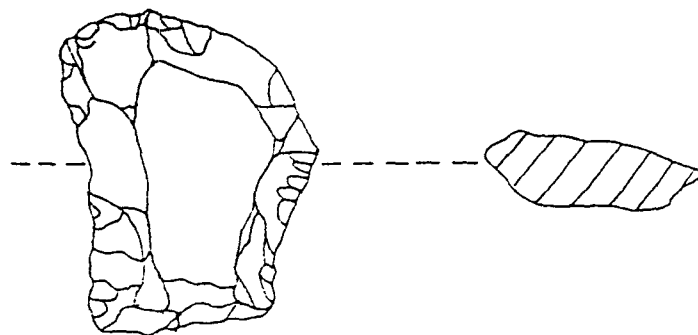


Figure 12. Plan map of Site DCI-0064 (AR-03-02-03-439).

**Site DCI-0064
(AR-03-02-03-439)**

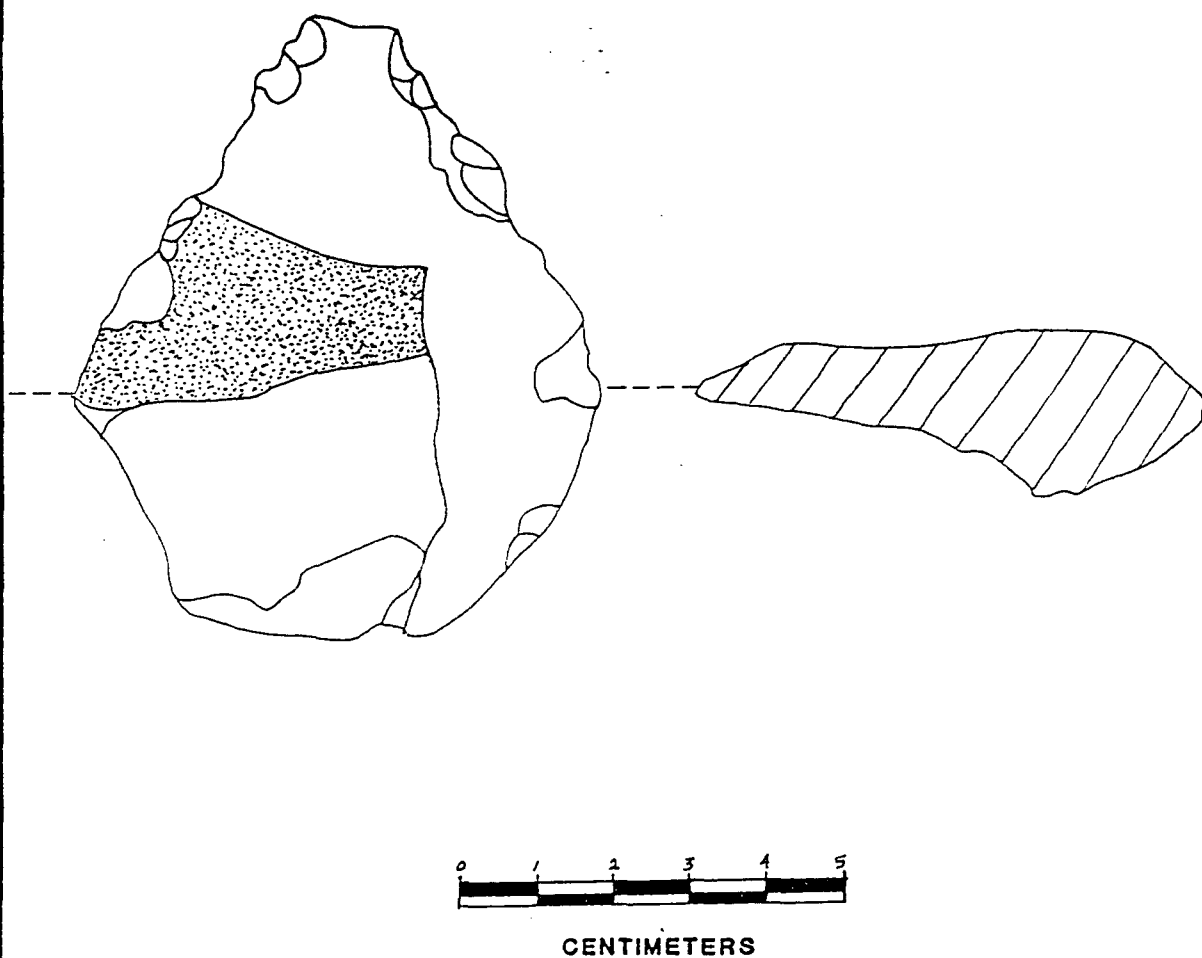


CENTIMETERS

White Chalcedony biface

Figure 13. Sketch of biface found on Site DCI-0064 (AR-03-02-03-439).

**Site DCI-0064
(AR-03-02-03-439)**



Black Basalt biface

Figure 14. Sketch of biface found on Site DCI-0064 (AR-03-02-03-439).

DCI-0061

AR-03-02-03-436

CJ Bunker 7/20/90

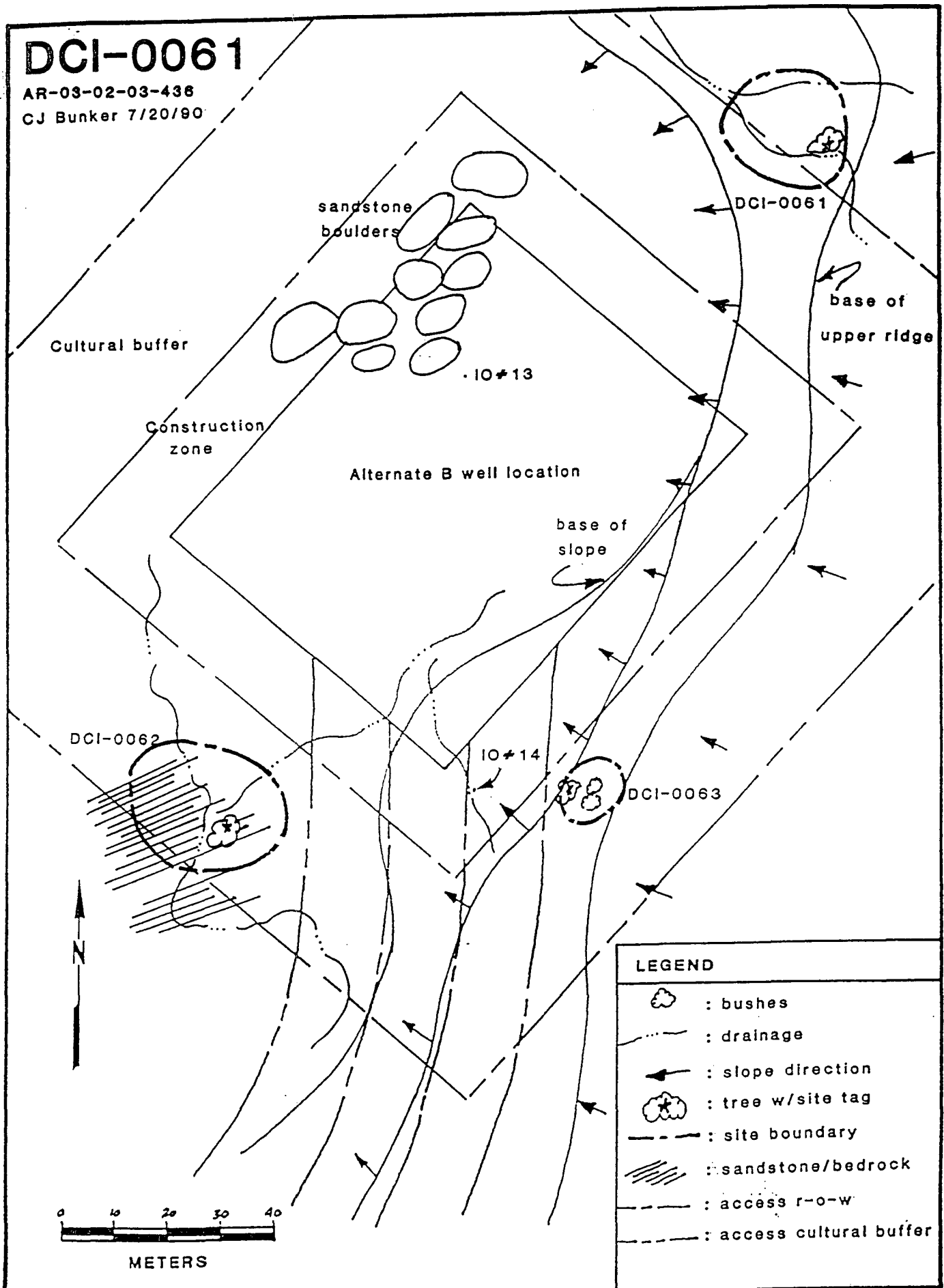


Figure 15. Plan map of Site DCI-0061 (AR-03-02-03-436).

DCI-0062 (AR-03-02-03-437)

Site DCI-0062 (AR-03-02-03-437) consists of a small, sparse artifact scatter covering an area 30 m x 25 m (Figure 16). The site is situated in a natural amphitheater which has been heavily affected by erosion, exposing bedrock. The prehistoric cultural remains are evident on the exposed bedrock and in the sandy fill which is less than 5 cm in depth.

DCI-0063 (AR-03-02-03-438)

Site DCI-0063 (AR-03-02-03-438) is located on a narrow bench at the base of a west-facing slope and covers an area 12 m x 10 m. The site consists of a sandstone alignment, a stain and a small artifact scatter (Figure 17). The overall condition of the site is good. It has been minimally affected by erosion.

DCI-0068 (AR-03-02-03-441)

Site DCI-0068 (AR-03-02-03-441) is located on a hilltop on Estufa Ridge, north of a tributary of the Ulibarri Canyon drainage system. The site covers a 90 m x 60 m area and consists of a possible pit structure, possible surface structure, pot drop, stain, and an overall artifact scatter (Figure 18). The condition of the site is excellent. It has been minimally affected by erosion.

ELIGIBILITY AND MANAGEMENT RECOMMENDATIONS

Eligibility Evaluations

Evaluation of eligibility to the National Register of Historic Places (36 CFR 60) is important for the current and future management of cultural resources. The eligibility status relates to cultural resource significance, which consequently provides guidance with respect to the treatment of properties relative to proposed actions. Thus appropriate recommendations can be made in consideration of both the resource and proposed action.

The evaluation of cultural resources for eligibility to the National Register is composed of three parts; 1) an assessment of integrity, 2) a consideration of eligibility criteria and exceptions, and 3) a consideration of the 50-year guideline. The assessment of integrity, according to Federal regulation (36 CFR 60.4), entails "objects that possess integrity of location, design, setting, materials, workmanship, feeling and association". The four criteria ordinarily applied in the evaluation of cultural resources are:

- (a) that are associated with events that have made a significant contribution to the broad patterns of our

DCI-0062

AR-03-02-03-437
CJ Bunker 7/20/90

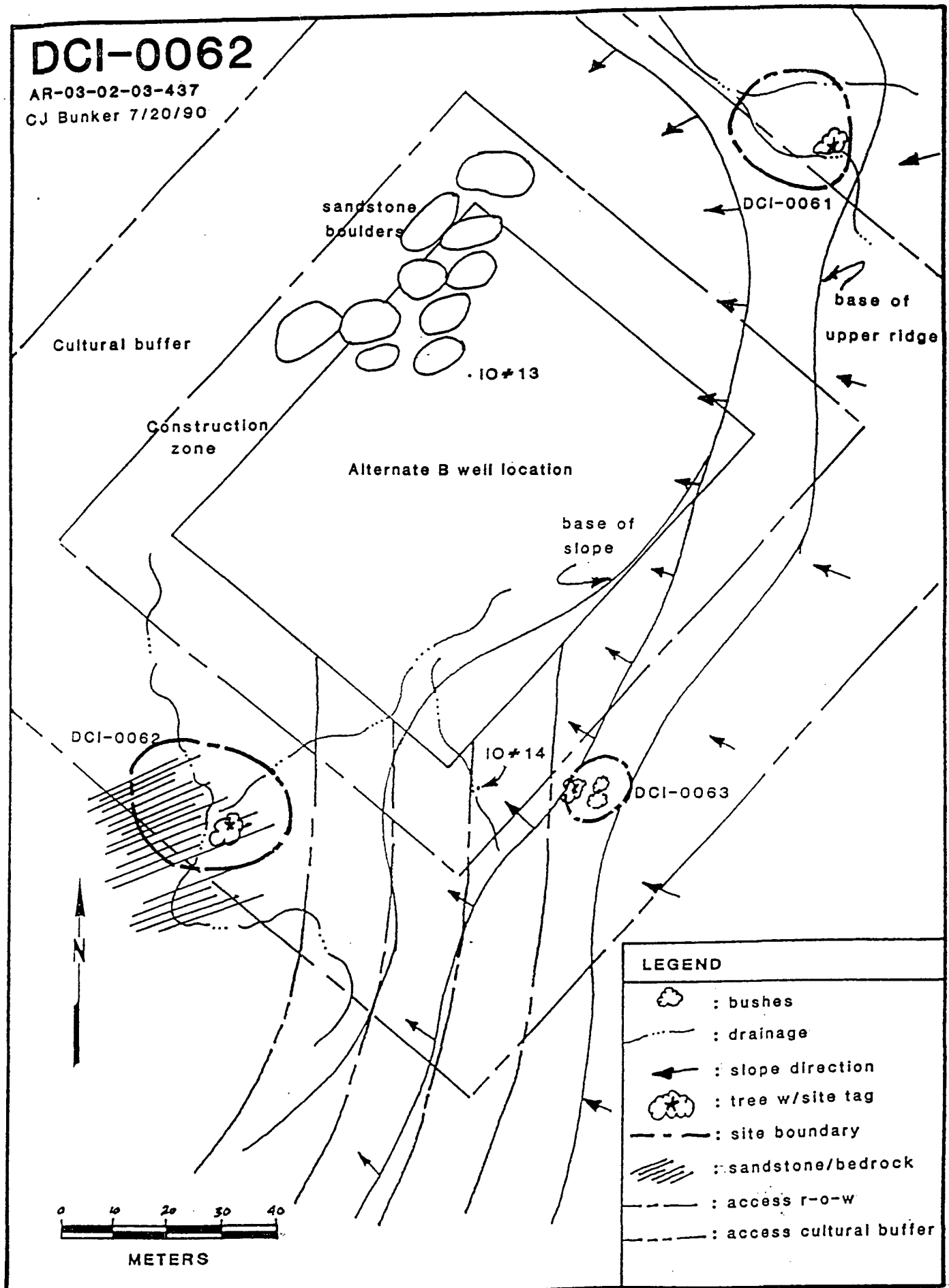


Figure 16. Plan map of Site DCI-0062 (AR-03-02-03-437).

LEGEND

- - - : site boundary
- ← : slope direction
- M : mountain mahogany
- A : antelope brush
- ☁* : tree w/site tag

DCI-0063

AR-03-02-03-438

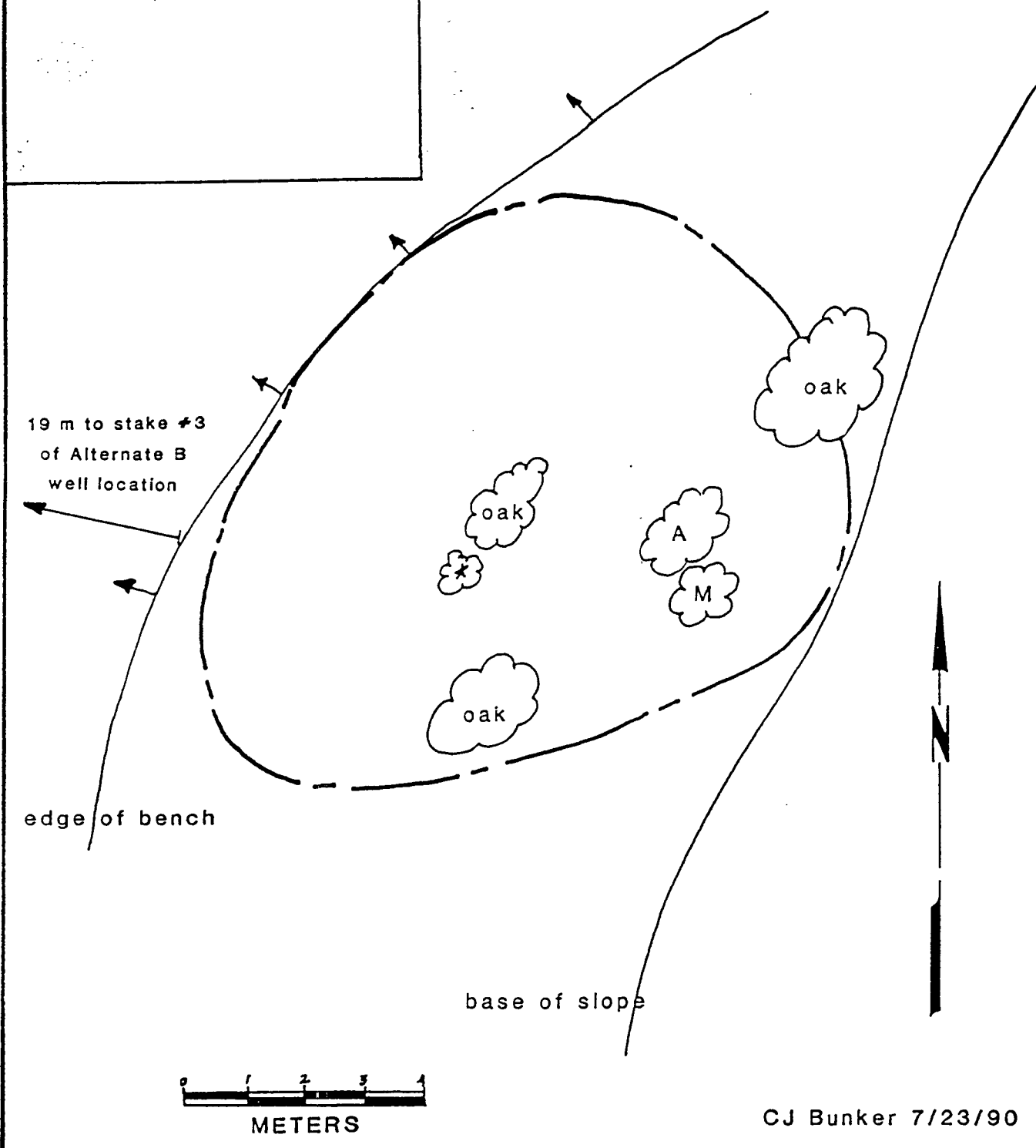






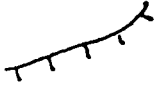


Figure 17. Plan map of Site DCI-0063 (AR-03-02-03-438).

DCI-0068

AR-03-02-03-441

LEGEND

-  : oak
-  : dead tree
-  : drainage
-  : sandstone
-  : site boundary
-  : tree w/site tag
-  : edge of ridge with a 20 ft. embankment

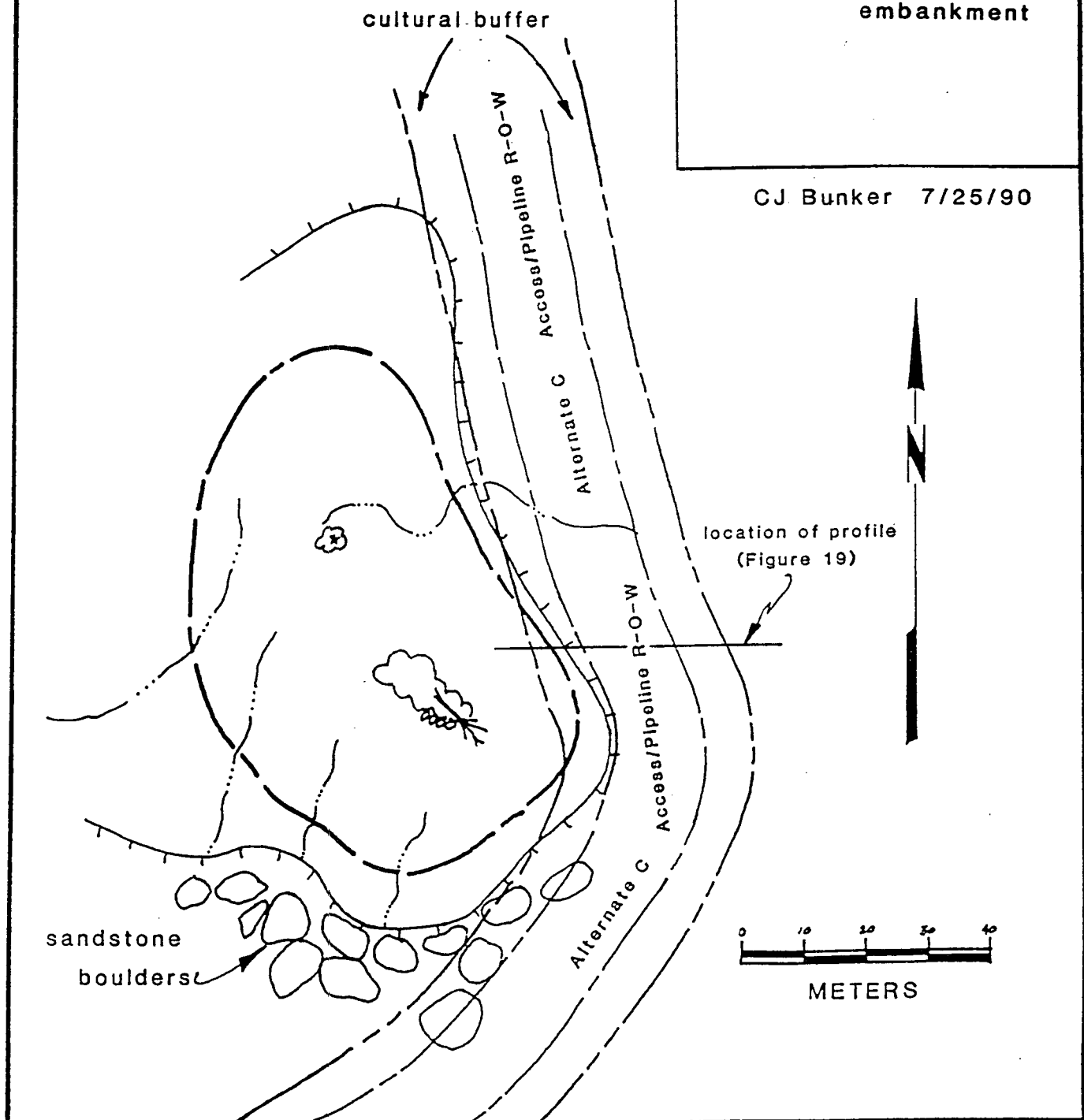
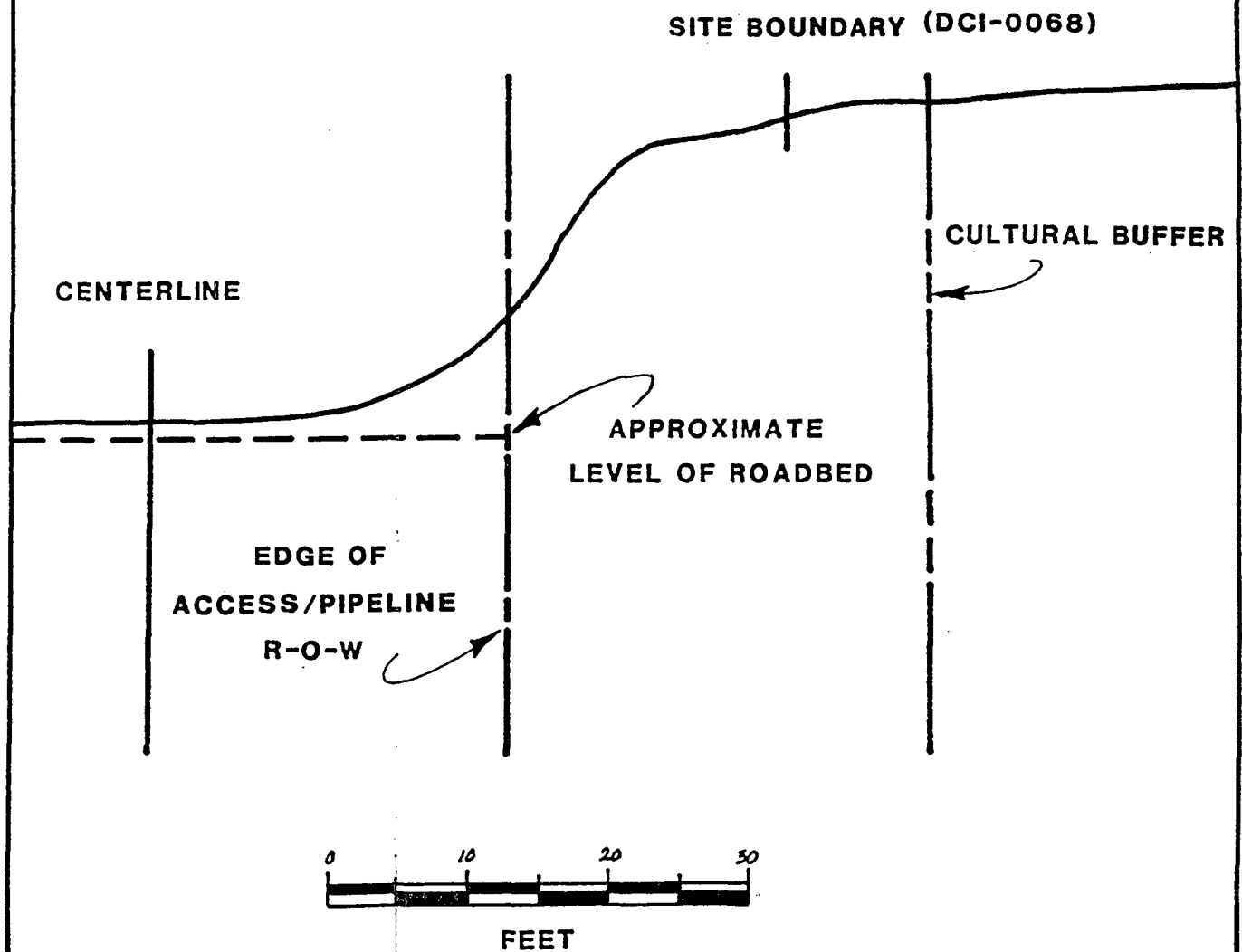


Figure 18. Plan map of Site DCI-0068 (AR-03-02-03-441).

Figure 19. Profile showing topographic relationship of Site DCI-0068 (AR-03-02-03-441) to Alternate C access/pipeline. (90-DCI-030) (USFS 1990-02-132)



history; or
(b) that are associated with the lives of persons significant in our past; or
(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4)

The 50-year guideline is simply that sites less than 50 years in age are not considered eligible for the National Register (36 CFR 60.4). Seven exceptions to the above regulations may be applied, however, these rarely apply to prehistoric cultural resources and are not reproduced here. The most recent listings of the National Register of Historic Places have been consulted and no sites which appear on the Register occur within the project area.

The data potential of the twenty-one isolated occurrences encountered during this project has been exhausted through the recordation techniques implemented during the field work and the documentation presented in this report. Isolated occurrences are not eligible for inclusion in the National Register since, as isolates, they lack integrity.

Six of the nine sites including DCI-0017 (AR-03-02-03-435), DCI-0060 (AR-03-02-03-231, SJC-1118), DCI-0063 (AR-03-02-03-438), DCI-0064 (AR-03-02-03-439), DCI-0065 (AR-03-02-03-440), and DCI-0068 (AR-03-02-03-441) appear to be eligible for inclusion in the National Register because they possess integrity, meet the 50-year guideline, and have research potential as cited under criterion d. The remaining three sites, DCI-0061 (AR-03-02-03-436), DCI-0062 (AR-03-02-03-437), and DCI-0069 (AR-03-02-03-445) are evaluated as not eligible for inclusion on the National Register. These sites lack integrity, in large part as a result of their extremely eroded condition. Moreover, since each of these sites is a small artifact scatter lacking features and each is likely to be in secondary depositional context, their potential to provide information important to local and/or regional prehistory is limited and considered to have been exhausted with field documentation and recordation procedures. None of these three sites are evaluated as eligible under criteria a, b, c, or d, although all meet the 50-year guideline.

Recommendations

Based on the evaluations presented above, no further work focusing on the isolated occurrences or archaeological sites DCI-0061 (AR-03-02-03-436), DCI-0062 (AR-03-02-03-437), and DCI-0069 (AR-03-02-03-445) is recommended. It is recommended that the remaining archaeological sites be preserved in place and that measures be implemented to protect them from direct impacts associated with the proposed undertaking. Potentially

significant resources are located within or in close proximity to each of the alternate well locations and alternate access/pipeline rights-of-way.

Archaeological clearance is not recommended for the proposed land modifications at the Alternate A well location, because a portion of a potentially Register eligible site, DCI-0060 (AR-03-02-03-231; SJC-1118) is located in the construction zone (see Figure 6). Instead, it is recommended that the Alternate B location be utilized since no potentially significant resources are located in the proposed area of effect (see Figure 5). It is further recommended that the access/pipeline be constructed along the first 300 feet of Alternate A Access/Pipeline and the remaining construction occur along the route designated Alternate C Access/Pipeline. Only one potentially Register eligible site, DCI-0068 (AR-03-02-03-441), is located along this route and it is situated in the cultural buffer north and west of the Alternate C Access/Pipeline (see Figures 18, 19). Archaeological clearance is not recommended for access/pipeline construction along Alternate B route or the segment of Alternate A beyond the first 300 feet of the route.

In sum, it is recommended that construction associated with the proposed Rosa Unit No. 306 be limited to Alternate B well location and that the access/pipeline follow Alternate route A for the first 300 feet from the existing road, then proceed into the location using the Alternate C route. Use of the above-described location and access/pipeline can accomplish the recommended avoidance of potentially significant cultural resources, specifically sites DCI-0063 (AR-03-02-03-438) and DCI-0068 (AR-03-02-03-441). Moreover, Sites DCI-0061 (AR-03-02-03-436) and DCI-0062 (AR-03-02-03-437) will be avoided, even though these have been evaluated as not National Register eligible.

While archaeological clearance is recommended for the undertaking as detailed above, because of the complexity of the recommended route and the fact that potentially significant resources are located outside of, but in relatively close proximity to the area of effect, it is recommended that prior to the initiation of construction activities an archaeologist reflag the final proposed access/pipeline route and insure that all stakes indicating the well location are in place. Any flagging that may be left on any of the alternate routes or the alternate well location should be removed. It is further recommended that a representative of the project sponsor accompany the archaeologist during reflagging operations, to insure that the final proposed route and location will be known to the sponsor. If these stipulations are followed it is believed that the project can proceed without an archaeological monitor during construction activities, especially since much of the access/pipeline crossed bedrock outcrops with no potential for subsurface cultural deposits.

Based on field observations during survey and considerations with regard to site location and integrity as related to the proposed project, archaeological clearance is recommended for the Rosa Unit No. 306 well pad and access road/pipeline project. Construction should be allowed to proceed given the stipulations outlined earlier in this report. Final clearance is the prerogative of the Forest Service Archeologist and will be considered after reviewing this report.

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