PERTINENT DRILLING INFORMATION

HORSESHOE GALLUP UNIT, WELL No. 292
Unit J - 2474' f/South & 2463' f/East lines
Sec. 24-31N-17W, San Juan County, New Mexico

1. Surface Casing: 8-5/8" OD 24# J-55 ST&C SH 120'

2. Casing Head: 8-5/8" x 10", Ser. 600 (2000#WP, 4000#T) OCT C-22 or equivalent, w/2 - 2" LP outlets w/1 - 2000#WP valve.

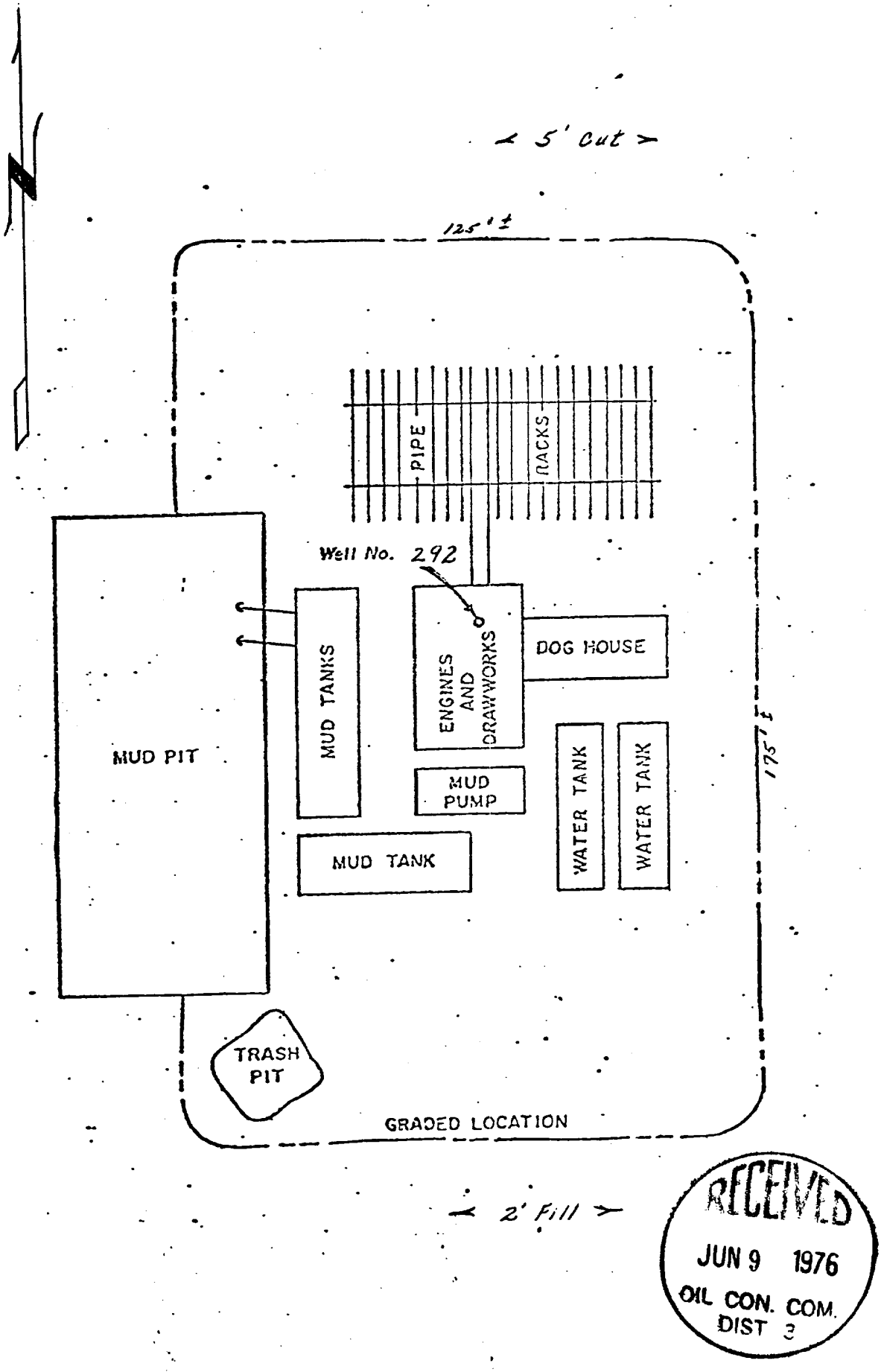
3. Intermediate Casing: None

4. Blowout Preventer:
   - Type - Ram Type
   - Series - Ser. 600 (2000#WP, 4000#T) or greater
   - No. of Rams - Two; one blind ram and one pipe ram for size drill pipe in use.
   - Manufacturer - Cameron or Shaffer, hydraulic operated. Fill, kill and choke line will be 2000#WP or greater, connected below rams on BOP.
   - Blowout Equipment - Will be pressure tested to 800 psi before drilling out of casing and operational checks will be made daily.

5. Auxiliary Equipment: Kelly Cock
   Sub with full opening valve on floor for use when kelly not in hole.

6. Anticipated Bottom Hole or Maximum Expected Pressure: 700 psi

7. Drilling Fluids:
   - Surface - Water & gel w/lime to maintain clean hole for running casing.
   - Below Surface - Water w/necessary gel and chemicals to maintain drillable hole. 9.0± ppg, viscosity as required, 10± water loss, LCM if required. Maintain stock weight material on location.



HORSESHOE GALLUP UNIT, WELL #292

DEVELOPMENT PLAN FOR SURFACE USE

1. Existing Roads: Attached is a portion of the Chimney Rock quadrangle map showing main access from Hwy 550, approximately 3 miles east of Ship Rock, New Mexico. Also attached is a Lease Road map showing the main lease roads in the vicinity of the proposed location.

2. Planned Access Roads: The attached Lease Road Map shows the main lease roads in the vicinity of the proposed location. Access road to be constructed has been marked in "red".

3. Location of Existing Wells: Existing wells in the vicinity of the proposed location are shown on both the attached Lease Road map and Flow Line map.

4. Lateral Roads to Well Locations: Lateral roads to well locations are shown on the Lease Road Map.

5. Location of Tank Batteries and Flow Lines: The attached Flow Line map shows the existing flow line and battery installations. The flow line to be installed, if the well is productive, has been marked in "green".

6. Location and Type of Water Supply: Water supply for drilling will be from Water Supply Well #2-W (NW NW Sec. 32-31N-16W). Water for cementing operations will be from ditch at turnoff of access road from Hwy. 550.

7. Methods for Handling Waste Disposal: Cuttings to be disposed of in reserve pit, a burn pit to be used for disposal of trash, garbage, etc., and both pits to be filled and levelled on cleanup of location.

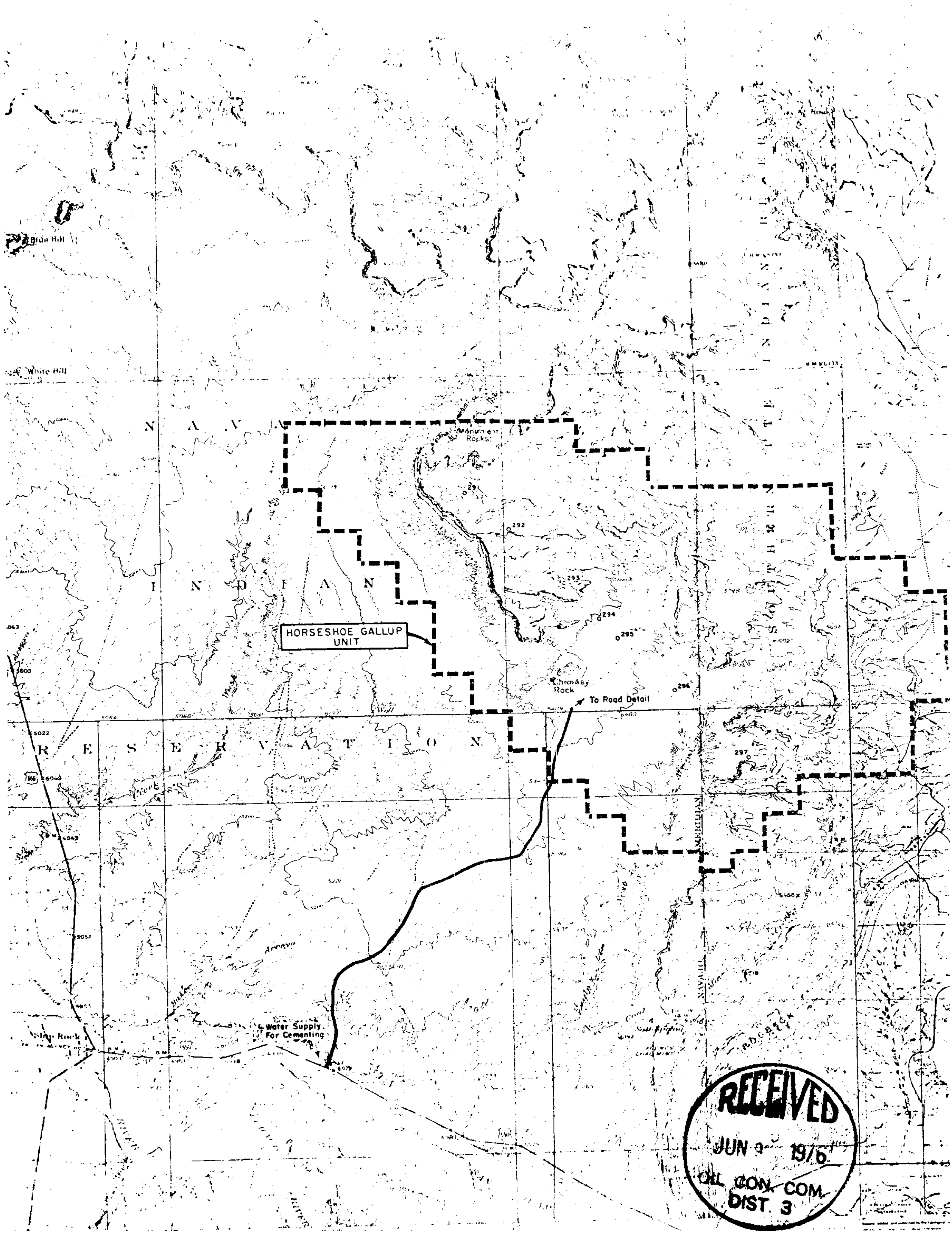
8. Location of Camps: None

9. Location of Airstrips: None

10. Rig Layout: Per the attached drawing.

11. Restoration of Surface: Upon completion of drilling operations, the disturbed surface will be restored as near as practical to its original contours. If sufficient topsoil is encountered, it will be stockpiled for restoration of the surface. Restoration will be to the satisfaction of the United States Geological Survey.

12. This location slopes generally from north to south. It is sandy with rock outcroppings and boulders. There is very little vegetation, a few clumps of of sage brush and isolated clumps of pasture grasses. The northern part of the location will require an approximate 5' cut and a 2' fill will be required on the south side. With restoration of the surface any disturbance to wildlife and local environment will be minimal and of temporary duration.


HORSESHOE GALLUP UNIT
Monument Rocks
Chimney Rock
To Road Detail
Water Supply For Cementing
Shiprock
White Hill
NAVAJO INDIAN RESERVATION
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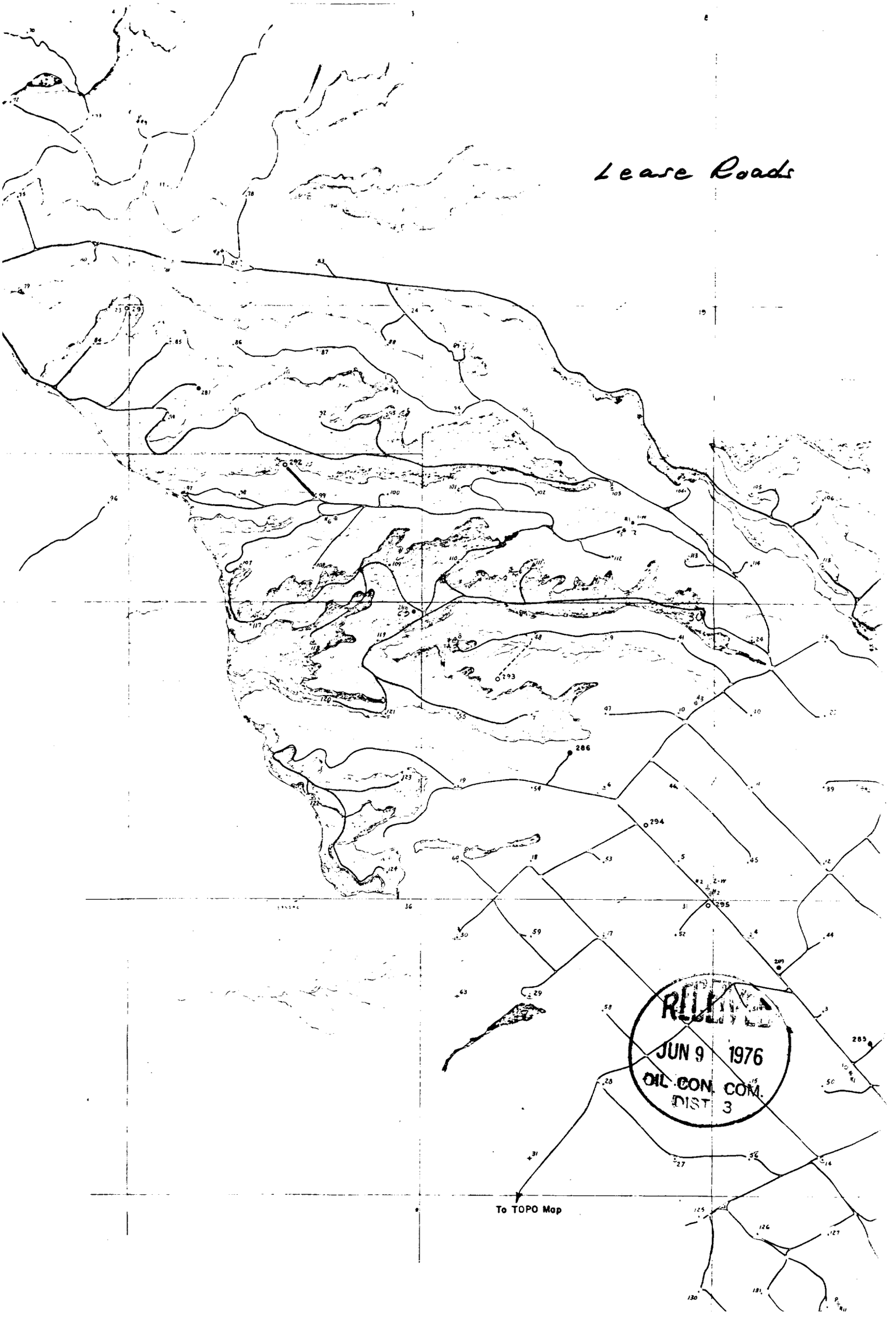
Lease Roads
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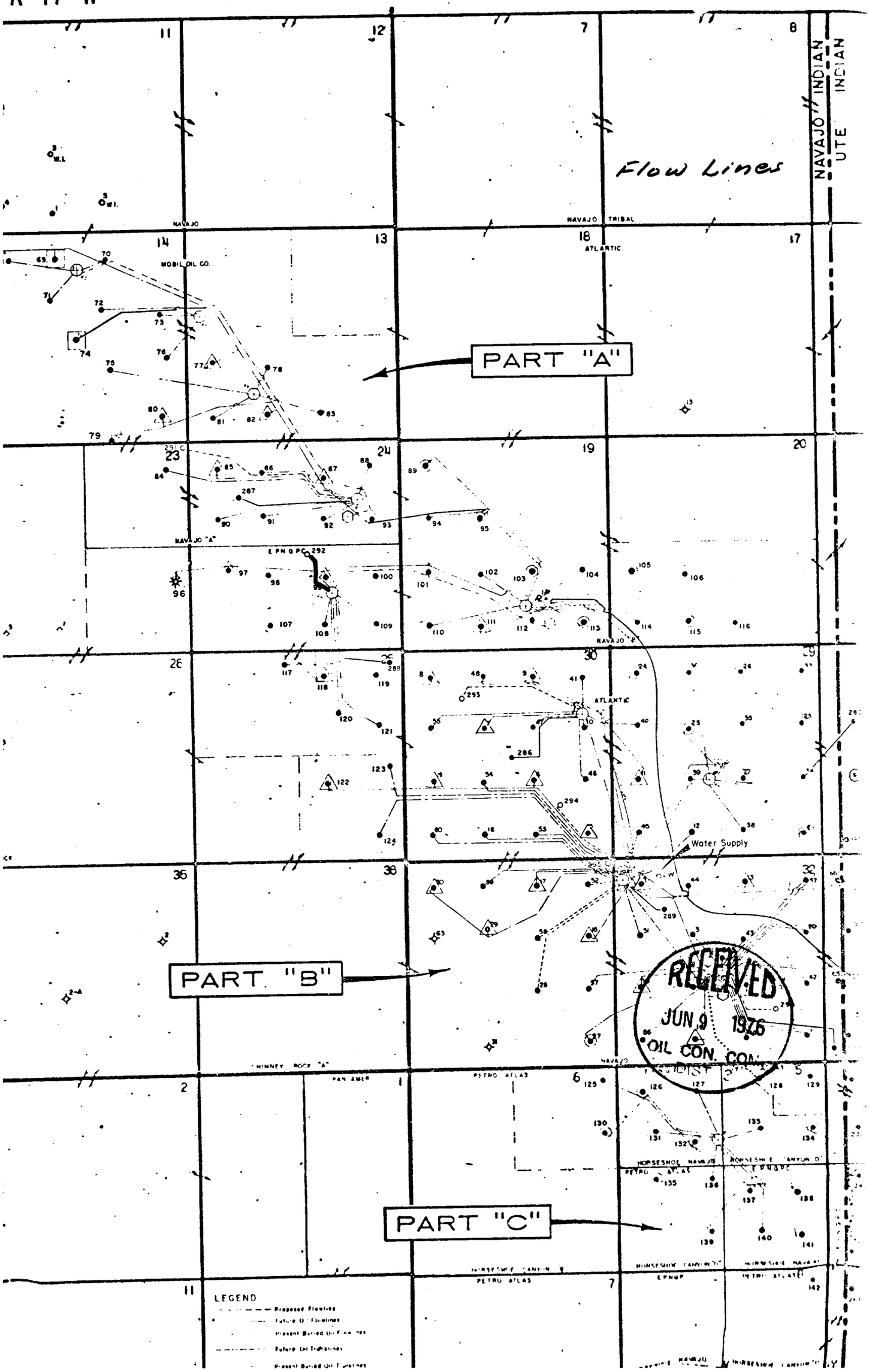
To TOPO Map


R 17 W
Flow Lines
NAVAJO INDIAN
UTE INDIAN
NAVAJO TRIBAL
ATLANTIC
MOBIL OIL CO.
PART "A"
PART "B"
PART "C"
Water Supply
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LEGEND

SAN JUAN COUNTY MUSEUM ASSOCIATION
EASTERN NEW MEXICO UNIVERSITY

DIVISION OF CONSERVATION ARCHAEOLOGY

ROUTE 3 • BOX 169
FARMINGTON, NEW MEXICO 87401

PHONES: 632-2013 • 632-2733 • 632-2777

May 27, 1976

Mr. Ralph Marker
Atlantic Richfield Company
1816 East Mojave
Farmington, New Mexico 87401

Dear Mr. Marker:

Enclosed is a copy of our archaeological clearance report for seven well locations and access roads located on Navajo Reservation lands. As noted in the report, archaeological clearance is recommended for all areas. Also enclosed is our invoice for this service..

It was a pleasure working with you, and if you have any questions about any aspect of our report, please call me.

Sincerely,

Nancy Hewett

Mrs. Nancy Hewett
Division of Conservation
Archaeology

Enclosures

cc: Mr. Philip McGrath, U.S.G.S., Farmington
Mr. Anthony P. Lincoln, BIA, Window Rock
Navajo Tribal Council, Window Rock
Dr. J. Loring Haskell, Portales

Archaeological Clearance Survey Report

for

Atlantic Richfield Company

May 27, 1976

Locations

Horseshoe Gallup Unit #291
Horseshoe Gallup Unit #292
Horseshoe Gallup Unit #293
Horseshoe Gallup Unit #294
Horseshoe Gallup Unit #295
Horseshoe Gallup Unit #296
Horseshoe Gallup Unit #297

Submitted by

Dr. J. Loring Haskell
Operations Director and
Principal Investigator
Agency of Conservation Archaeology

Prepared by

Nancy S. Hewett

Introduction

The Division of Conservation Archaeology of the San Juan County Museum Association and Eastern New Mexico University recently completed an archaeological clearance survey on Navajo Reservation lands to be impacted by the proposed construction of seven wells, four access roads and five flow lines by Atlantic Richfield Company of Farmington, New Mexico.

The survey project was initiated at the request of Mr. Ralph Marker of Atlantic Richfield on May 25, 1976. It was administered by Mr. Marker and Dr. J. Loring Haskell, principal investigator for the Agency of Conservation Archaeology of the San Juan County Museum Association and Eastern New Mexico University.

The field work was conducted by Mrs. Nancy Hewett of the Division of Conservation Archaeology on May 26, 1976 under provisions of Navajo permit #76-NM-032. Representing Atlantic Richfield Company in the field was Mr. Ralph Marker.

Survey

The requested archaeological clearance survey involved seven well pads, four access roads and five flow lines described below and located on lands under the jurisdiction of the Navajo Tribe. For specific details of location, please see the attached copies of maps and the recommendations section of this report.

The general procedure for survey employed was to walk the area of the proposed construction. Visual inspection was made of the ground surface as well as any erosional gullies for evidence of artifactual remains. Floral, faunal and geological observations were made to briefly describe the environmental situation.

H.G. #291

Environment: The terrain of the access road is rugged. The road begins at an existing well pad and runs east and then north downward over large rock outcroppings. The vegetation is quite varied with representations of Juniperus sp., Artemisia tridentata, Eriogonum sp., Ephedra viridis, Atriplex canescens, Gutierrezia sarothrae, Chrysothamnus nauseosus, Purshia tridentata and various herbs and grasses. The soil is unconsolidated sandy clay loam. The proposed flow line will extend further down off the ridge toward an eastern arroyo.

Cultural Resources: No prehistoric artifacts of any kind were noted.

H.G. Unit #292

Environment: The terrain of the access road, well pad and flow line are relatively rugged. The areas are located on an erosional talus slope of a a steep sandstone ridge which runs generally east and west. The vegetation is primarily Chrysothamnus nauseosus, Gutierrezia sarothrae, Salsola kali, Atriplex canescens, Ephedra viridis, sparse Juniperus sp., and various herbs and grasses. The soil is unconsolidated sandy clay loam and very rocky.

Cultural Resources: No prehistoric artifacts of any kind were noted.

H. G. Unit #293

Environment: The terrain of the access road and well pad locations is generally rugged, and follows the contours of talus slope ridges and erosional gullies of a north facing slope of a steep sandstone ridge. The well pad is at the base of the escarpment. The predominant vegetation is Artemisia tridentata, Chrysothamnus nauseosus, Gutierrezia sarothrae, Sarcobatus vermiculatus, Leptodactylon pungens, Purshia tridentata, Ephedra viridis and various herbs and grasses. Sparse evidence of Opuntia sp. was also seen. The soil is quite rocky and is a light brown unconsolidated sandy clay loam.

Cultural Resources: No prehistoric artifacts of any kind were noted. The terrain of this site and #292 is quite unlikely to show habitation.

H. G. Unit #294

Environment: The terrain is generally flat with gently rolling hills to the north. The vegetation is sparse and consists primarily of Opuntia sp., Salsola kali and various herbs and grasses. The area has been disturbed by previous well drilling activity and grazing.

Cultural Resources: No prehistoric artifacts were noted.

H. G. Unit #295

Environment: The location of this well pad is on an existing side road which has been graded. The vegetation is very sparse and dry, and the terrain is flat. The soil is disturbed and is generally unconsolidated sandy clay loam.

Cultural Resources: No prehistoric artifacts were present. There are various clumps of industrial litter and waste material.

H. G. Unit #296

Environment: The terrain of the proposed access road and well pad is very flat. The vegetation is sparse and dry except in a shallow arroyo north of the well pad. Chrysothamnus nauseosus is present in a few clumps, and the vegetation in the arroyo is either a member of the Cruciferae family or is Sisymbrium altissimum . A small stock pond is located south of the proposed well pad which will not be disturbed by construction.

Cultural Resources: No prehistoric artifacts were present.

H. G. Unit #297

Environment: The terrain of the well pad is gently sloping toward the Northwest. Located at the base of a steep talus slope, the well pad is accessible off a refilled slush pit. The vegetation is sparse and consists primarily of

Salsola kali, Atrirlex canescens and various herbs and grasses. Large rocks are present in the area and the soil is unconsolidated sandy clay loam.

Cultural Resources: No prehistoric artifacts were noted.

Recommendations

Due to the lack of cultural materials at any of the locations, immediate archaeological clearance is recommended.

Well	Area	Location	Clearance Status
#291	pad: 125' x 175' road: 800' x 20' flow line: 1000'	50' F/NL, 50' F/EL, NE¼, Sec. 23, T31N, R17W, San Juan County, New Mexico.	Recommended
#292	pad: 125' x 175' road: 650' x 20' flow line: 1000'	2474' F/SL, 2463' F/EL, SE¼, Sec. 24, T31N, R17W, San Juan County, New Mexico	Recommended
#293	pad: 125' x 175' road: 500' x 20' flow line: 7500'	1260' F/NL, 1470' F/WL, NW¼, Sec. 30, T31N, R16W, San Juan County, New Mexico.	Recommended
#294	pad: 125' x 175' road: 40' x 20' flow line: 1500'	1375' F/SL, 1325' F/EL, SE¼, Sec. 30, T31N, R16W, San Juan County, N.M.	Recommended
#295	pad: 125' x 175'	50' F/NL, 50' F/EL, NE¼, Sec. 31, T31N, R16W, San Juan County, N.M.	Recommended
#296	pad: 125' x 175' road: 75' x 20' flow line: 1750'	1350' F/SL, 1250' F/EL, SE¼, Sec. 32, T31N, R16W, San Juan County, N.M.	Recommended
#297	pad: 125' x 175'	1550' F/SL, 1250' F/EL, SE¼, Sec. 4, T30N, R16W, San Juan County, N.M.	Recommended


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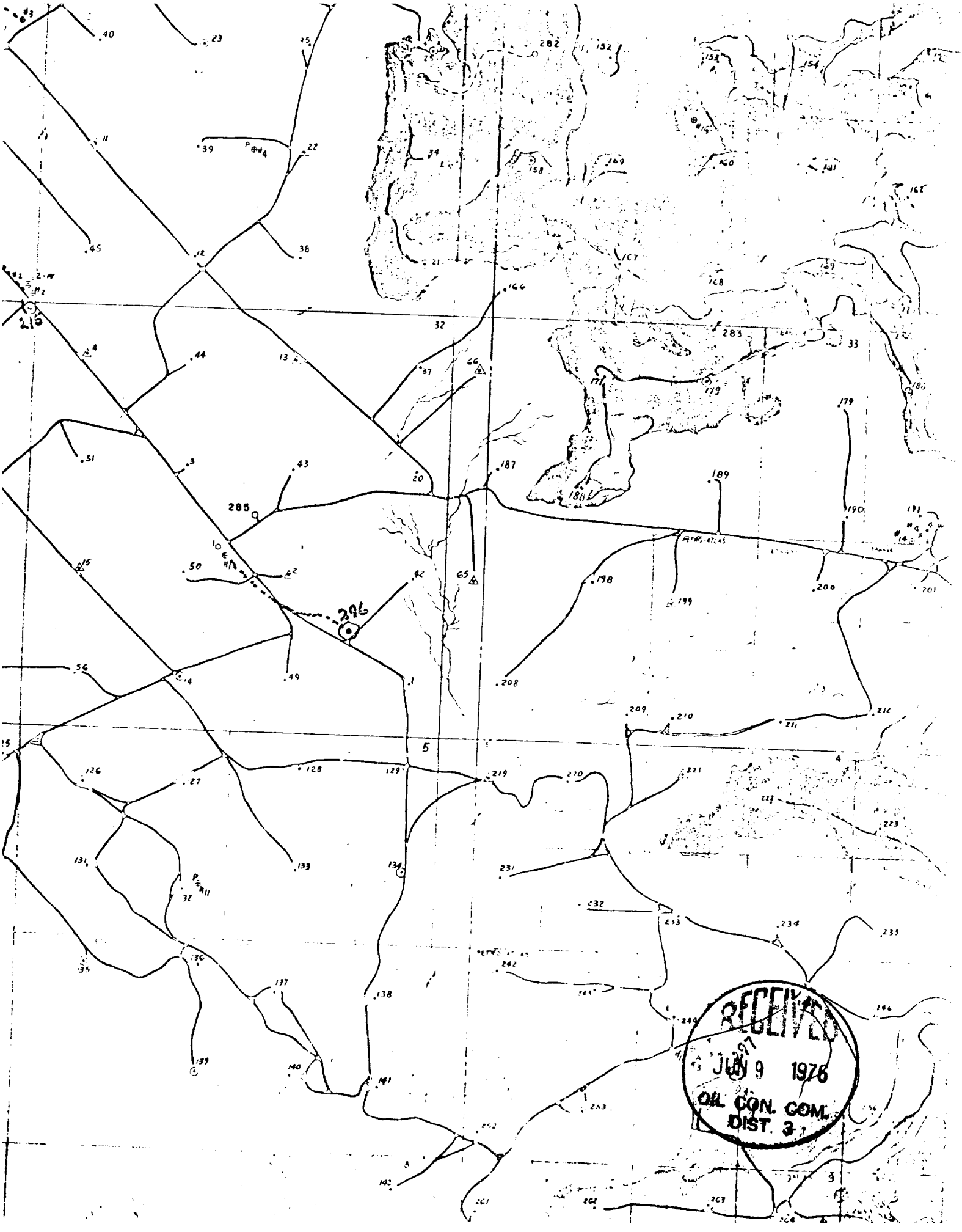
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