

Open-File 86-3

**Surficial – Geologic
and Slope Stability Study
of the
Douglas Pass Region**

**By
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Colorado Geological Survey
1985**

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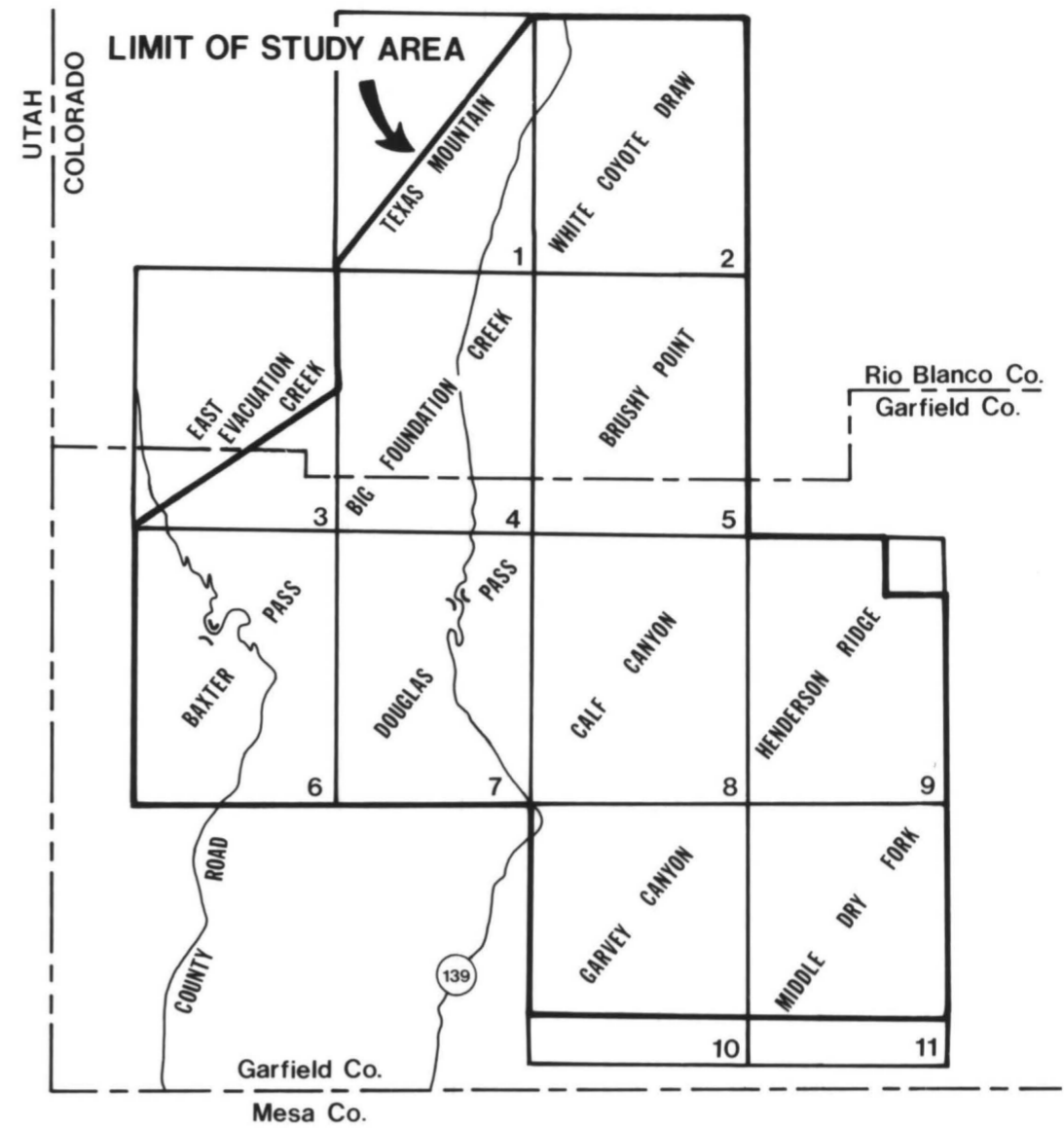
Folio #2 Geologic Hazards

Folio # 2 Geologic Hazards

Location Map



Topographical Location Map



References

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Notes on Use and Limitations of These Maps

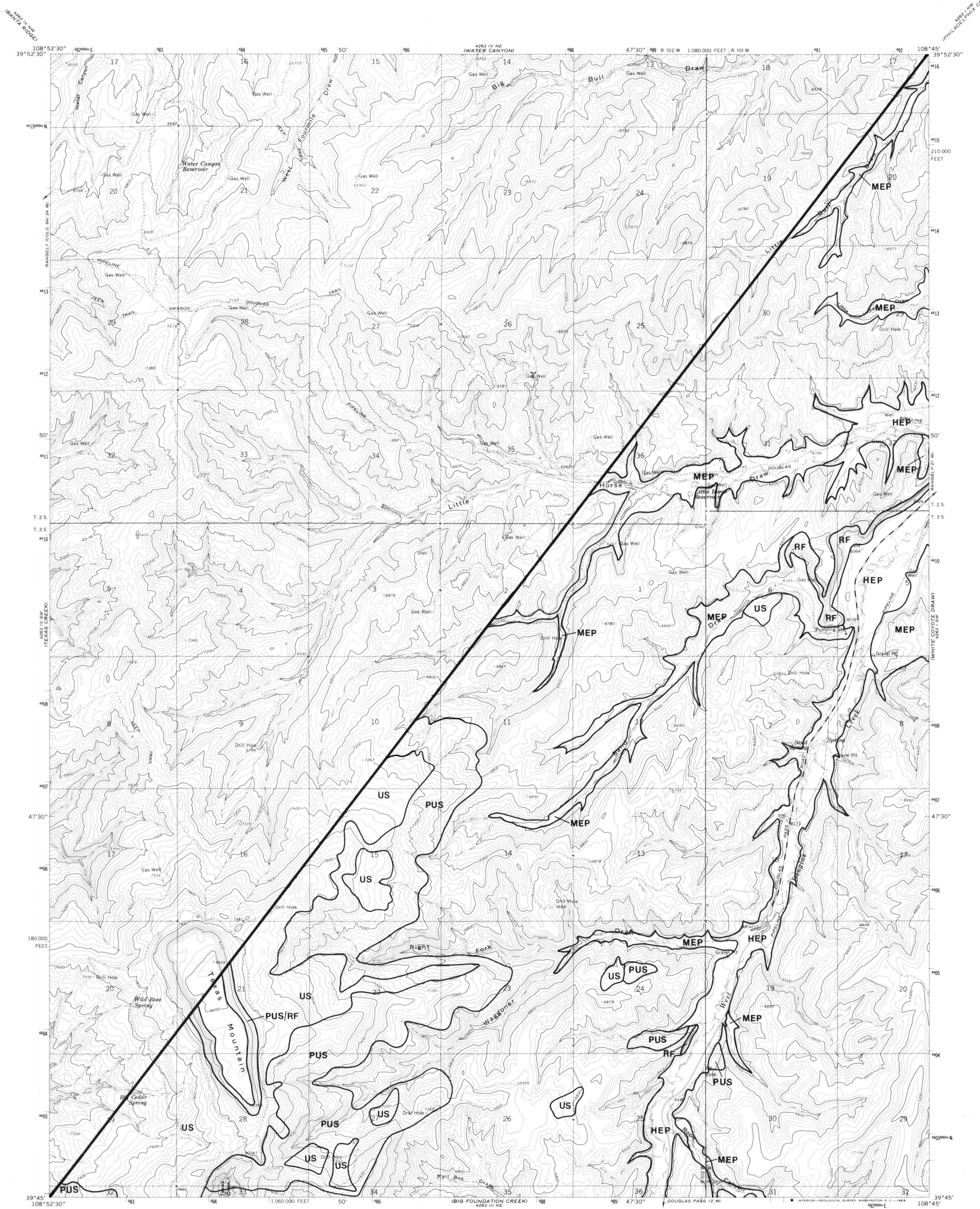
The reconnaissance Geologic Hazards Maps produced within the scope of this project are intended to provide information covering a broad corridor that can be used in planning and evaluating possible future major relocations of highways, pipelines, and related structures. They are not intended to be used in place of detailed site specific studies.

The Geologic Hazards Maps integrate surficial geology, slope and moisture conditions, and the geologic record of ongoing and past geologic processes. The hazard units classify the type and intensity of geologic hazards and their potential impacts on the works of man. The maps show interpretations of slope stability based upon geologic factors, geomorphic expressions, slope aspect and inclination, proximity to actively failing areas, and experience with the types of failure-prone deposits and mass-wasting processes active in the study area. Laboratory testing of materials and formal slope stability analyses have not been used to define slope stability hazards within the scope of this project.

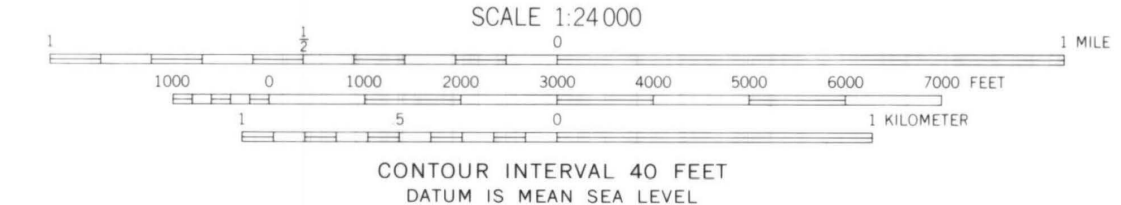
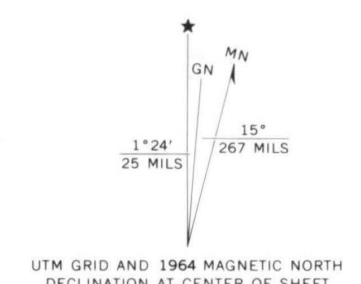
Floodplain delineation and flash flooding hazards were not objectives within the scope of this project. Some degree of flash flood hazard exists along all the steep rocky tributary streams in the study area. Entrenched floodplains exist within the broad alluvial valley floors of all major streams and creeks draining the project area, but have not been investigated or mapped.

Explanation

DMA	Debris-flow/mudflow-Flooding Area Debris fans, alluvial fans, and drainage channels subject to potentially destructive inundation by rapid downslope flowage of wet, commonly fluid-like masses of fine-to-coarse debris and water derived from contiguous side slopes, usually during periods of heavy rainfall and/or snowmelt runoff. Map unit includes only those areas subject to this process in modern times.	RF	Rockfall Area Area subject to free-falling, toppling, bounding, or rolling of rock fragments including large cobbles, boulders, and blocks capable of damaging or destroying most types of structures. Areas so mapped include rock source areas and estimated runout zones below cliffs where mobilized rocks come to rest. The exact extent of the runout zone is typically difficult or impossible to predict or map precisely without site-specific studies because of the varying effects of ground-surface texture, size and shapes of mobile rock fragments, and localized vegetation, ground moisture, and slope variations. Note: Virtually all the steep rocky cliffs and slopes of the Mesa Verde Formation (Kmv) have some potential for rockfall, ranging from minor to severe. It is impractical to map all these areas due to the significant variations of the rockfall hazard in relation to a specific slope or cliff. Only a few more prominent or observed rockfall hazard areas are mapped within the Mesa Verde Formation outcrop.	HEP	High Erosion-Potential Area Alluvial valley floor presently undergoing rapid headward erosion, gully, stream bank caving, and/or sheet erosion exhibiting a high potential for continued erosion (generalized). These areas are generally underlain by fine grained alluvium which is highly susceptible to erosion.
PUS	Potentially Unstable Slope Areas subject to slope failure(s) if natural conditions, especially those related to slope, ground moisture, vegetation cover, and drainage, are disrupted. Areas so mapped include those in proximity to or otherwise associated with areas subject to natural slope movements. Does not include steep stream and gully banks, virtually all of which are subject to localized slope failure during periods of heavy runoff.	PUS/RF	Steep Potentially Unstable Slopes and Rockfall Hazard Areas Combined hazard unit; steep slopes and cliffs in the Green River Formation which are subject to rockfall hazards and potential slope instability hazards as described (in detail) above.	MEP	Moderate Erosion-Potential Area Alluvial valley floor undergoing moderate gully, headward erosion, bank caving and exhibiting a moderate potential for continued erosion (generalized).
US	Unstable Slope Areas subject to natural translational or rotational landslides and/or earthflows. Evidence includes: distinctive landslide and earthflow morphology, proximity to actively failing areas composed of the same or similar geologic units, slope aspect and inclination, vegetation cover conducive to slope failure, and disrupted cultural or structural works.	UA	Mine-Subsidence Area Area overlying abandoned underground coal mine(s) that could be subject to potentially	SAT	Snow Avalanche Tracks Steep chutes on north facing slopes which channel masses of wet or dry snow, ice, and debris rapidly down slope to runout zones below. Avalanches can exert forces great enough to destroy structures and uproot or snap off large trees. Dry powder avalanches may be preceded by a destructive "air blast". Tracks are characterized by a lack of vegetation, or predominance of quick-growing aspen and low shrubs. Actual extents of runout zones have not been delineated due to the scale of reconnaissance mapping, but can be considered to extend at least to valley floors or local base levels.
AFS	Actively Failing Slopes Areas where active landsliding, slumping and earthflows are involving the ground surface. The areas shown are as of fall, 1979. These areas are now probably much larger, and undoubtedly hundreds of additional active slides have occurred in the back country of the Douglas Pass study area since 1979. AFS			Wavy line symbol	Contact between units



Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964
 Polyconic projection. 1927 North American datum
 10,000-foot grid based on Colorado coordinate system, north zone
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

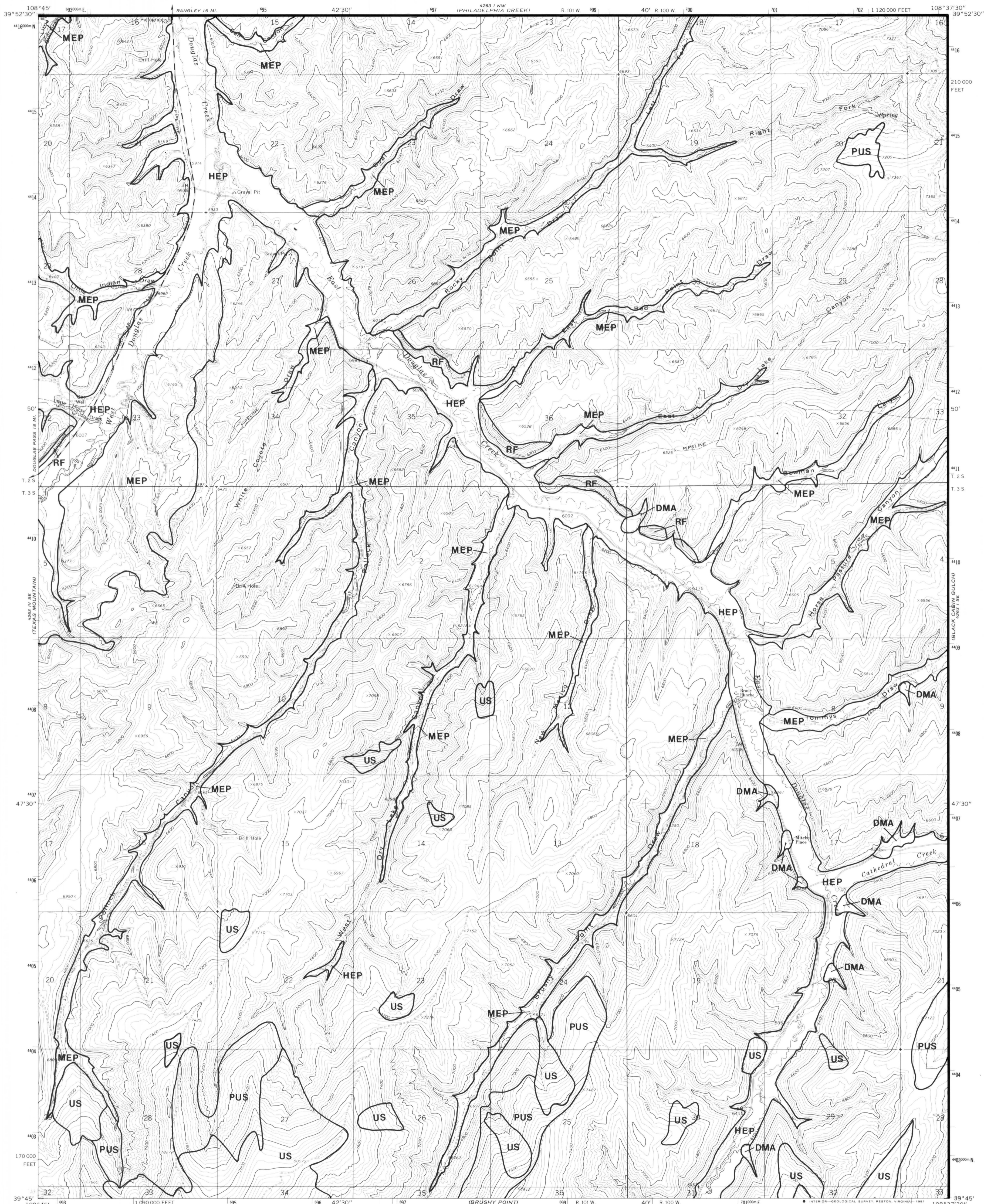


CONTOUR INTERVAL 40 FEET
 DATUM IS MEAN SEA LEVEL



ROAD CLASSIFICATION
 Medium-duty ——— Light-duty - - - - -
 Unimproved dirt - - - - -

TEXAS MOUNTAIN, COLO.



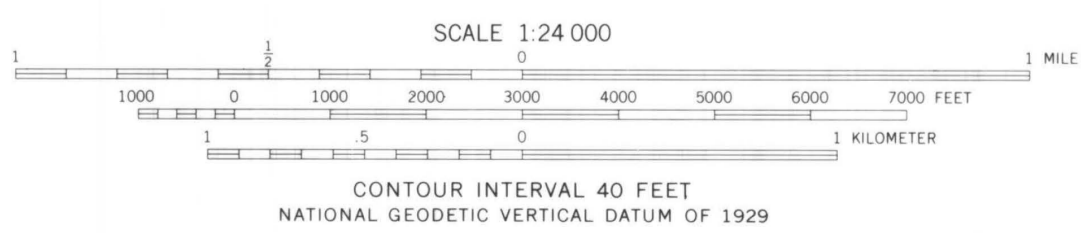
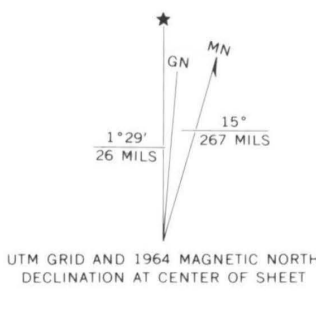
WATER CANYON

SAGEBRUSH HILL

IBIG FOUNDATION
SAGEBRUSH HILL

RAZORBACK RIDGE

photographs taken 1963. Field checked 1964
 Polyconic projection. 1927 North American datum
 10,000-foot grid based on Colorado coordinate system,
 north zone
 1000-meter Universal Transverse Mercator grid ticks,
 zone 12, shown in blue
 To place on the predicted North American Datum 1983
 move the projection lines 7 meters north and
 57 meters east as shown by dashed corner ticks
 Map photoinspected 1973
 No major culture or drainage changes observed

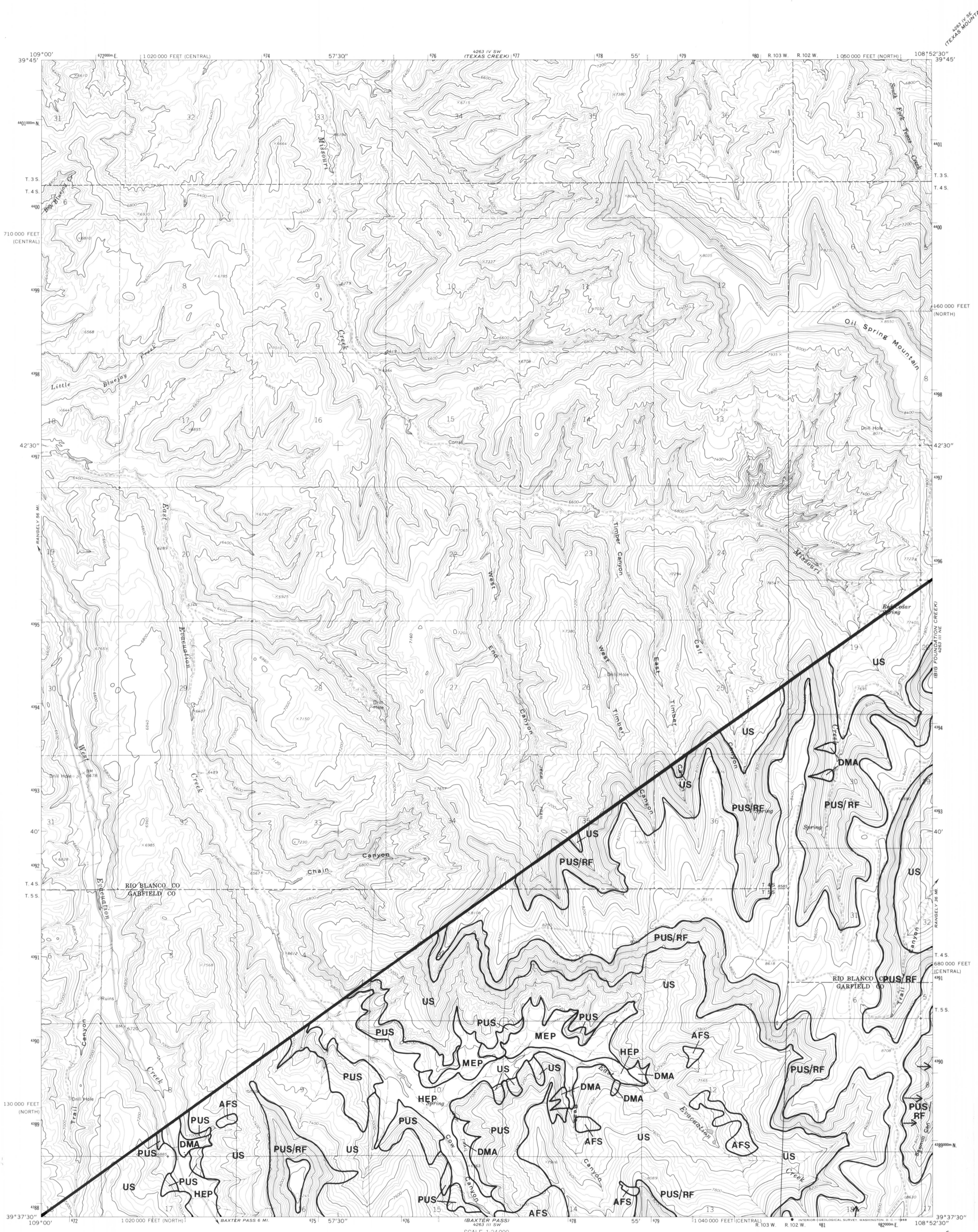


CONTOUR INTERVAL 40 FEET
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

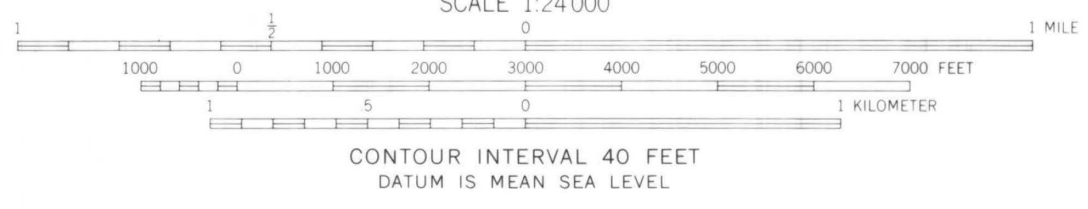
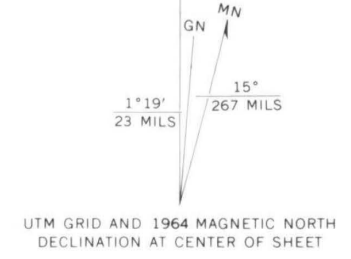


ROAD CLASSIFICATION
 Medium-duty ——— Light-duty ———
 Unimproved dirt - - - - -

WHITE COYOTE DRAW, COLO.

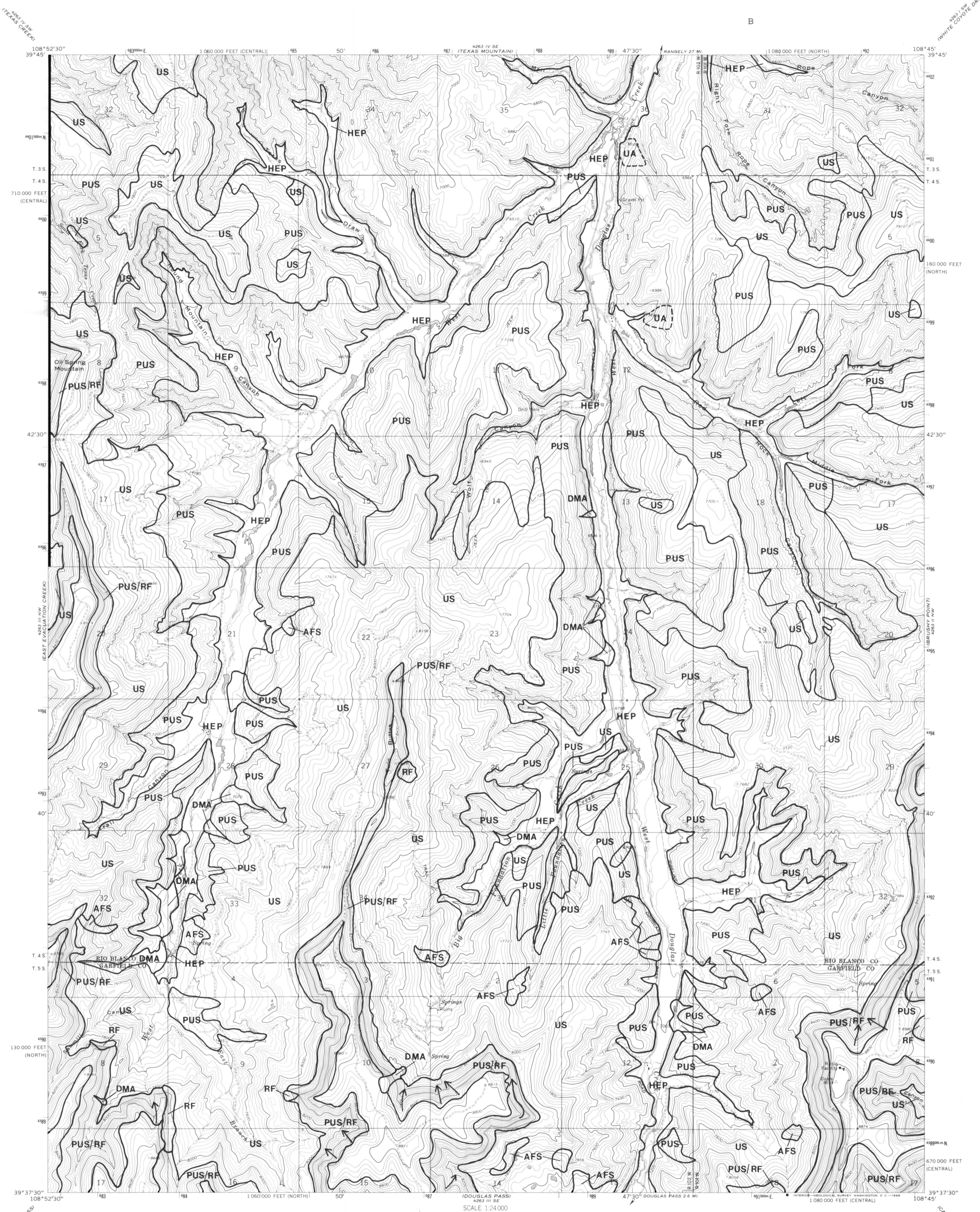


Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964
 Polyconic projection. 1927 North American datum
 10,000-foot grids based on Colorado coordinate system, north and central zones
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

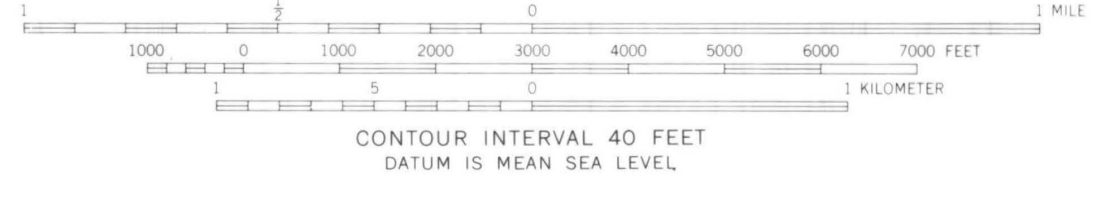
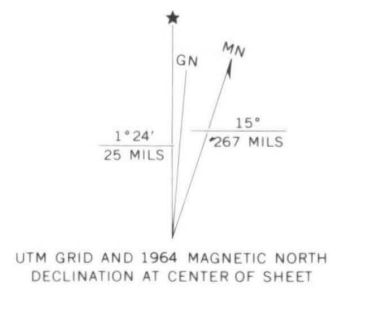


ROAD CLASSIFICATION
 Light duty ———— Unimproved dirt - - - - -

EAST EVACUATION CREEK, COLO.



Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964.
 Polyconic projection, 1927 North American datum
 10,000-foot grids based on Colorado coordinate system, north and central zones.
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue.
 Fine red dashed lines indicate selected fence lines.



ROAD CLASSIFICATION
 Light-duty Unimproved dirt

QUADRANGLE LOCATION
 COLORADO

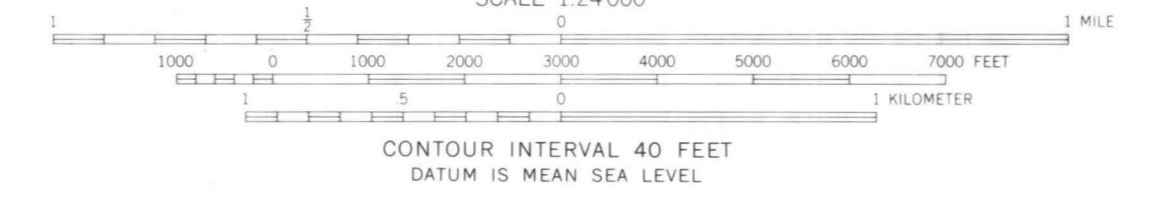
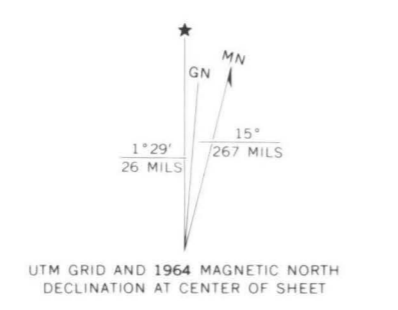
BIG FOUNDATION CREEK, COLO.

TEXAS MOUNTAIN

BLACK CANYON GULCH



Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964
 Polyconic projection. 1927 North American datum
 10,000-foot grids based on Colorado coordinate system, north and central zones
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue
 Fine red dashed lines indicate selected fence lines



CONTOUR INTERVAL 40 FEET
 DATUM IS MEAN SEA LEVEL

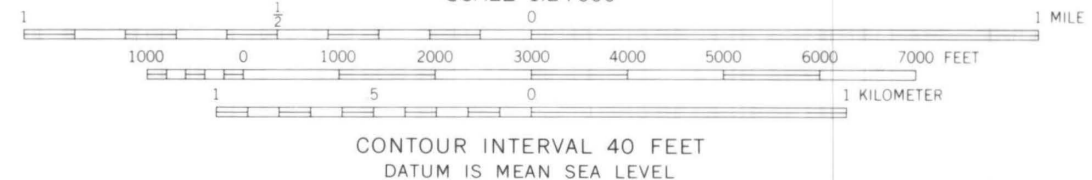
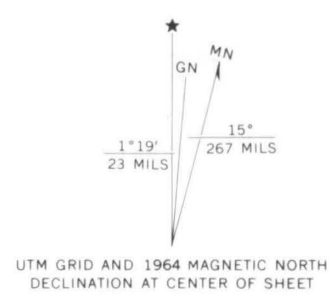


ROAD CLASSIFICATION
 Light-duty ————— Unimproved dirt - - - - -

BRUSHY POINT, COLO.



Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964
 Polyconic projection. 1927 North American datum
 10,000-foot grid based on Colorado coordinate system, central zone
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue
 Fine red dashed lines indicate selected fence lines
 Certain land lines are omitted because of insufficient data



CONTOUR INTERVAL 40 FEET
 DATUM IS MEAN SEA LEVEL



ROAD CLASSIFICATION
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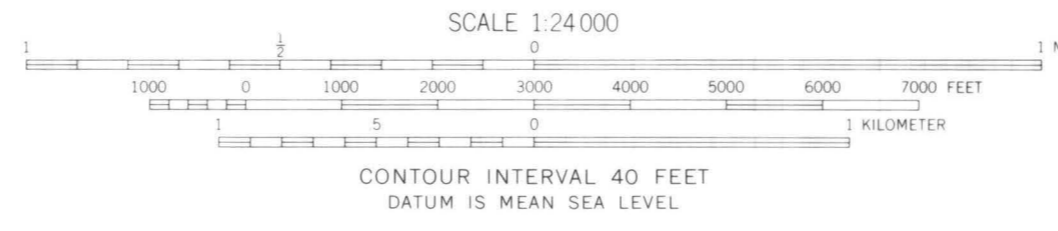
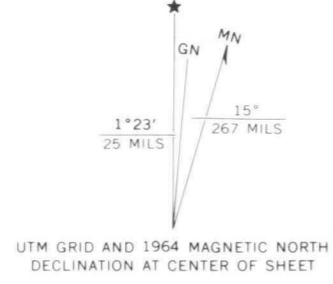
BAXTER PASS, COLO.

250' 11" NW
@ EAST EXCAVATION
(EAST CREEK)

250' 11" NW
@ BRUSH POINT

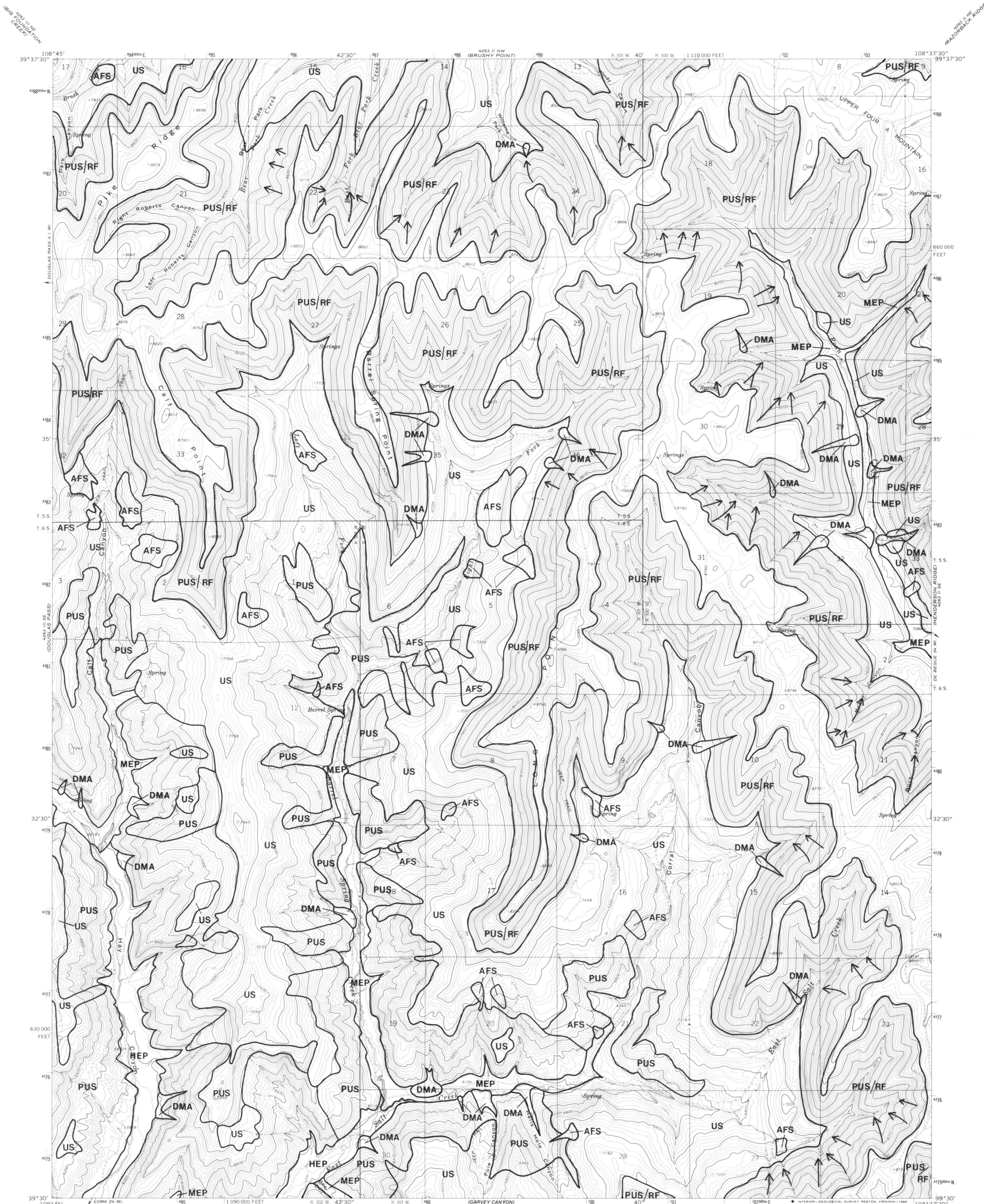


Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964
 Polyconic projection. 1927 North American datum
 10,000-foot grid based on Colorado coordinate system, central zone
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue
 Fine red dashed lines indicate selected fence lines
 Certain land lines are omitted because of insufficient data



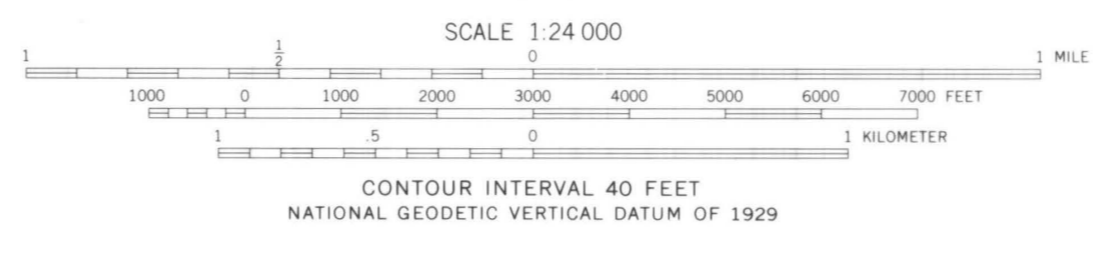
ROAD CLASSIFICATION
 Light-duty ——— Unimproved dirt - - - - -
 State Route ○

DOUGLAS PASS, COLO.
 2-7



Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964
 Polyconic projection. 1927 North American Datum 10,000-foot grid based on Colorado coordinate system, central zone
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue
 Fine red dashed lines indicate selected fence lines
 Certain land lines are omitted because of insufficient data
 To place on the predicted North American Datum 1983 move the projection lines 6 meters north and 57 meters east as shown by dashed corner ticks

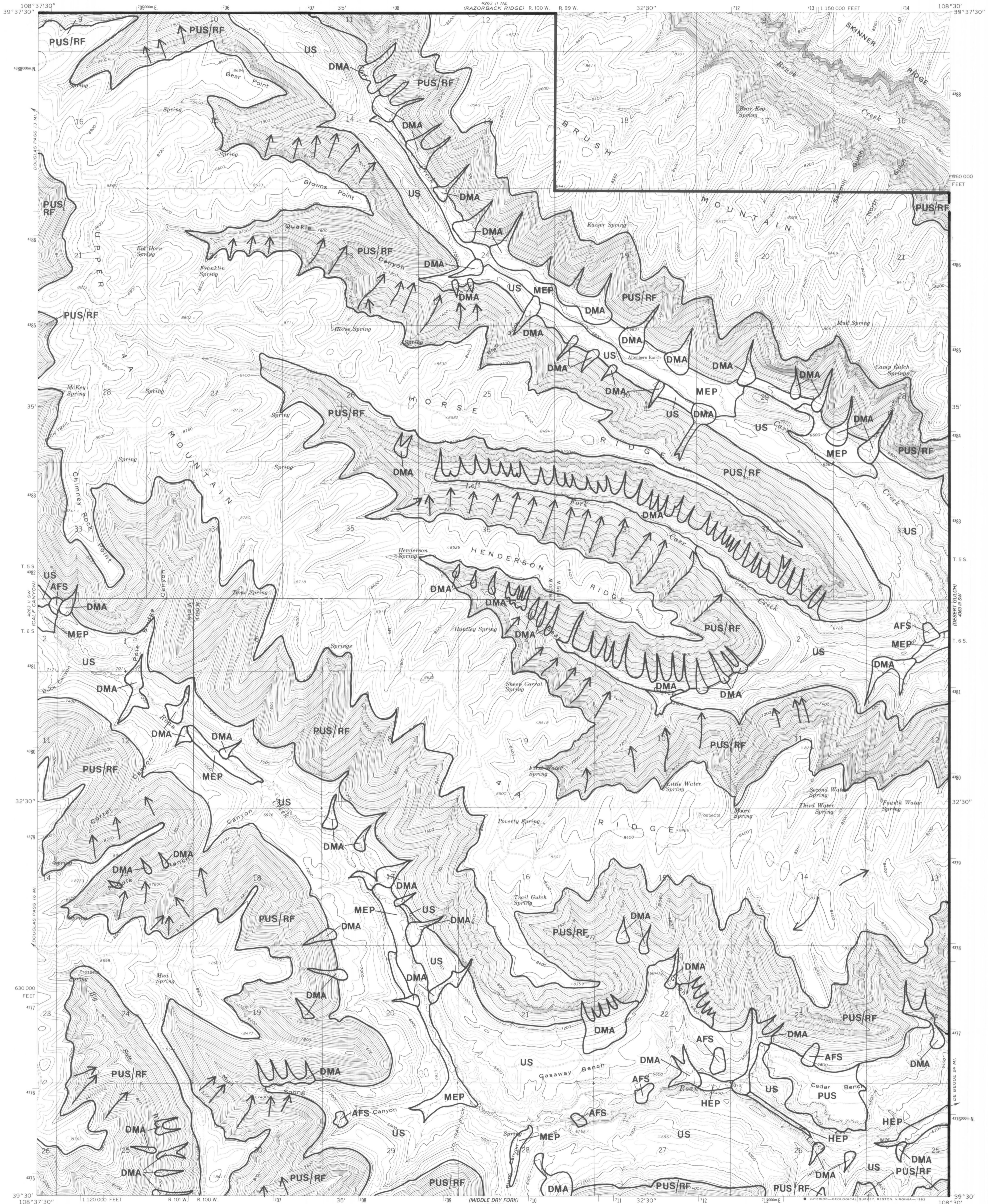
Map photoinspected 1973
 No major culture or drainage changes observed



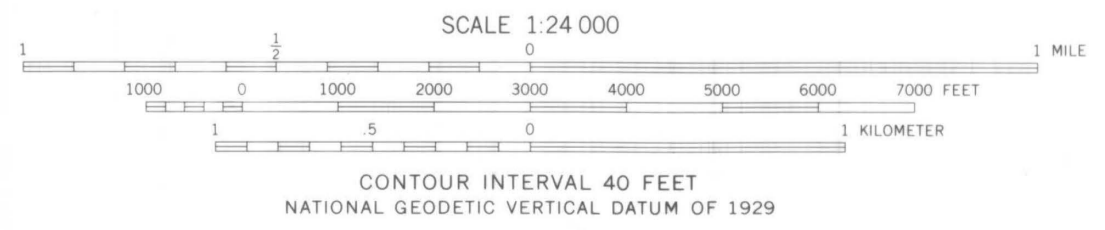
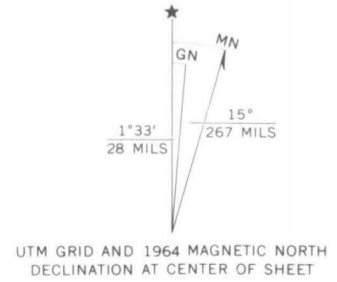
COLORADO
 QUADRANGLE LOCATION

ROAD CLASSIFICATION
 Unimproved dirt

CALF CANYON, COLO.



Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964
 Polyconic projection. 1927 North American datum
 10,000-foot grid based on Colorado coordinate system, central zone
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue
 Fine red dashed lines indicate selected fence lines
 To place on the predicted North American Datum 1983
 move the projection lines 6 meters north and
 57 meters east as shown by dashed corner ticks



ROAD CLASSIFICATION
 Light-duty ——— Unimproved dirt - - - - -

QUADRANGLE LOCATION
 COLORADO

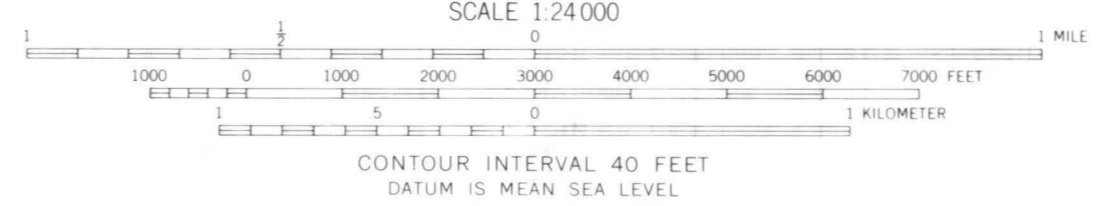
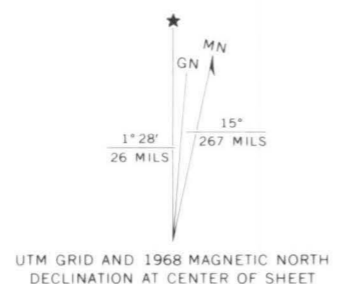
HENDERSON RIDGE, COLO.

Map photoinspected 1973
 No major culture or drainage changes observed

2-9

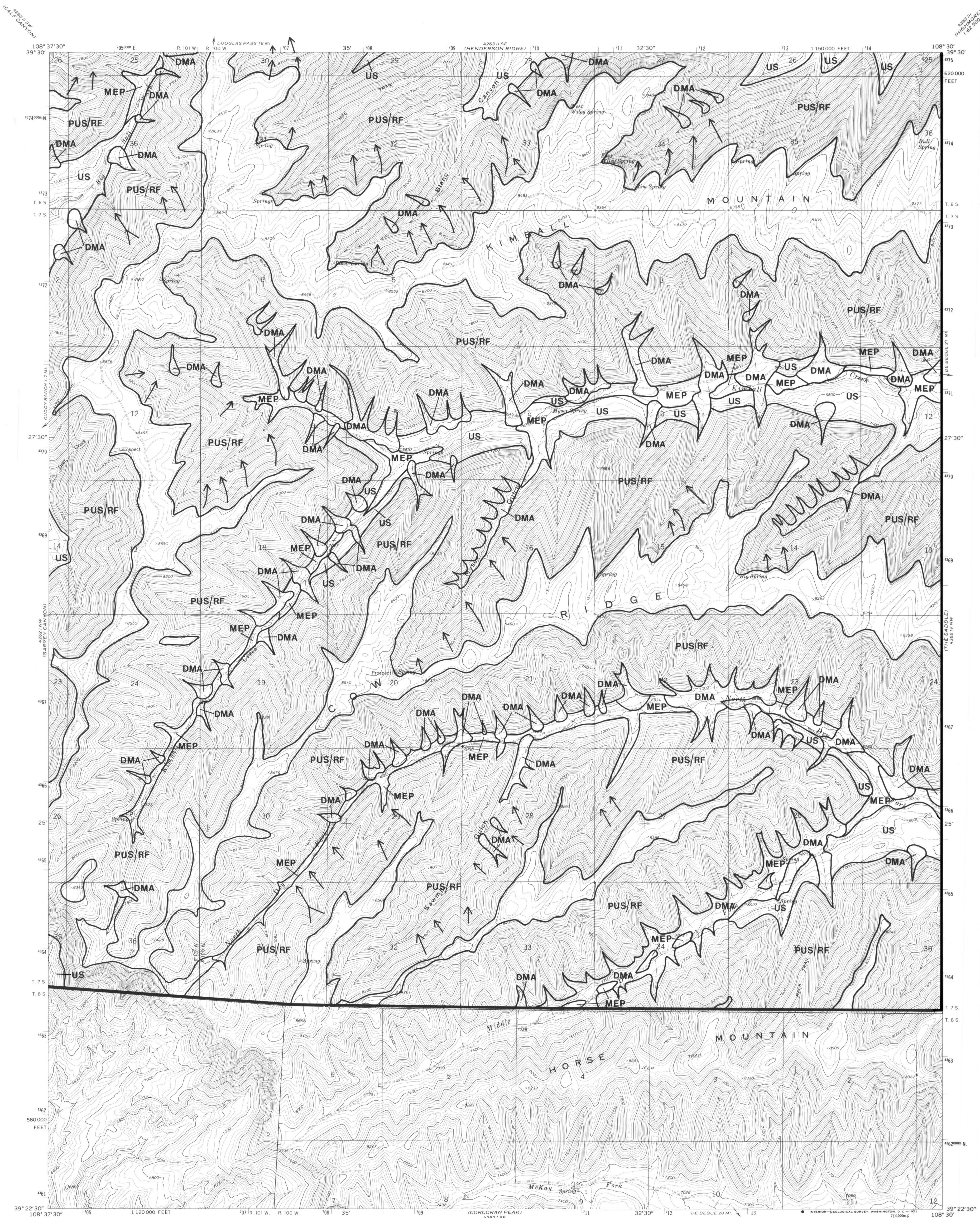


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 Certain land lines are omitted because of insufficient data

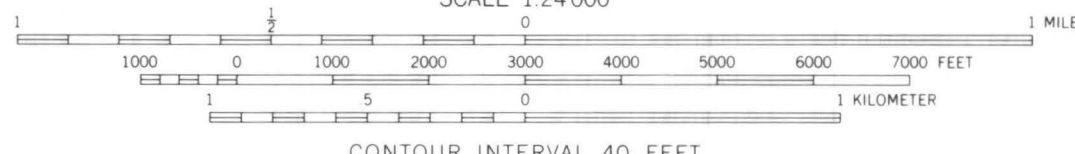
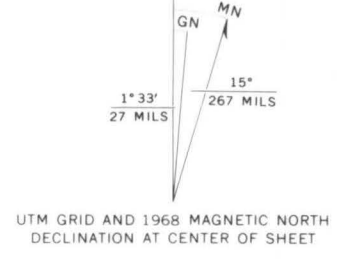


ROAD CLASSIFICATION
 Light-duty road, all weather, improved surface
 Unimproved road, fair or dry weather
 State Route

GARVEY CANYON, COLO.



Topography by photogrammetric methods from aerial photographs taken 1967. Field checked 1968
 Polyconic projection. 1927 North American datum
 10,000-foot grid based on Colorado coordinate system, central zone
 1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue
 Certain land lines are omitted because of insufficient data



CONTOUR INTERVAL 40 FEET
 DATUM IS MEAN SEA LEVEL



ROAD CLASSIFICATION
 Unimproved road, fair or dry weather

MIDDLE DRY FORK, COLO.