LEGEND

LITHOLOGY AND SYMBOLS

- LIMESTONE
- ARGILLACEOUS LIMESTONE
- DOLOMITIC LIMESTONE
- CALCITIC DOLOMITE
- DOLOMITE
- LIMESTONE BRECCIA
- ANHYDRITIC DOLOMITE
- ANHYDRITE
- SALT
- SHALE
- QUARTZ SANDSTONE
- QUARTZ SILTSTONE
- CHERT
- OÖLITE
- PISOLITE

DEPOSITIONAL TEXTURE AND STRUCTURE

- GRAINSTONE
- PACKSTONE
- WACKESTONE
- MUDSTONE
- CRYSTALLINE
- LAMINATED
- CROSSBEDDED

GAP IN CORE EXCEEDING 100'

ROBERTSON RESEARCH (U.S.) INC.

R.R.(U.S.) # WA-54. STATE/PROVINCE North Dakota.
OUTCROP or WELL NAME Getty Oil.1 Burton-Graff Et. Al.
COUNTY/MERIDIAN Ward.
LOCATION 157N-86W-3.

STRATIGRAPHY	LOG CHARACTER	DEPTH / ELEV. & SAMPLE POSITION	LITHOLOGY	DEPOSITIONAL TEXTURE	UNIT NUMBER	SCALE
MIDALE-RATCLIFFE						5800
TILSTON - ALIDA - FROBISHER		5830 1/20-53			1	5825
					2	5850
					3	5875
		5892 1/20-54			4	
		5907 1/20-55			5	5900
					6	5925
		5944 1/20-56			7	
		5956 1/20-57			8	5950
						5975
		5986 1/20-58			9	
		5997 1/20-59			10	6000

DESCRIPTION

Core courtesy of:
USGS, Denver, Colorado

TOP OF CORE = 5817'

Unit 1 31.0' Mudstone with rare packstone lenses; pale yellowish brown and dark yellowish brown; sparsely faintly laminated; sparse planolites; rare brachiopods; rare corals; common microstylolites and microstylolite swarms; abundant anhydrite near base; trace pyrite; abundant fine vuggy porosity.

Unit 2 28.0' Barely cryptocrystalline; nodular; very pale gray and light gray; sparsely laminated with gray to grayish orange dolostone; no visible porosity.

Unit 3 6.0' Mudstone; moderate yellowish brown and dark yellowish brown; sparsely laminated; rare medium gray dolomitic limestone; rare anhydrite nodules; no visible porosity.

Unit 4 9.0' Peloid grainstone with rare fenestral mudstone lenses; medium gray and light brownish gray; rare skeletals; sparse oncolites; rare intraclasts; rare anhydrite; grumulose texture has obscured original texture; rare intergranular porosity.

Unit 5 19.0' Oncolite-peloid grainstone with sparse ooid grainstone lenses; dark yellowish brown; common oncolites; sparse stylolites; sparse vertical fractures; trace anhydrite; texture grumulose; sparse moldic and intergranular porosity.

Unit 6 17.0' Peloid-oncolite-ooid packstone with common ooid lenses; texture grumulose; pale yellowish brown and medium gray; rare stylolites; sparse fenestral fabric; common vuggy porosity.

Unit 7 12.0' Fenestral mudstone with sparse lenses of oncolites and ooids; medium gray; trace microstylolites and rare stylolites; sparse moldic and vuggy porosity.

Unit 8 30.0' Oncolite-peloid packstone with trace mudstone lenses; light brownish gray; rare stylolites; rare anhydrite; rare anhydrite filled fractures; fenestral near base; abundant vuggy and intergranular porosity.

Unit 9 14.0' Intraclast grainstone with breccia clasts commonly oncolitic or fenestral, rarely mudstone; light brownish gray and medium gray; common anhydrite nodules; sparse laths of anhydrite; rare vuggy porosity.

Unit 10 4.0' Oncolite packstone with minor fenestral mudstone; light brownish gray and medium gray; common vuggy porosity.

BASE OF CORE = 5997'

WA-54
GETTY OIL, #1 BURTON-GRAFF Et. Al.

3-157N-86W
WARD COUNTY, NORTH DAKOTA

TILSTON-ALIDA-FROBISHER:

Sample 1/20-53 **5830'**

Limestone: Skeletal-peloidal wackestone. Common ostracods, sparse trilobites, brachiopods, calcispheres, rare peloids, crinoids, and fine skeletal (moderately abraded and fragmented), and corals. Sparse organic residue. Common micrite. Rare calcite cement (trace syntaxial rim, blocky spar), and trace dolomite. Low neomorphic grade. Excellent intergranular, moldic, vuggy porosity.

Sample 1/20-54 **5892'**

Limestone: Pisolitic-peloidal wackestone. Common oncolites (0.3-3.3 mm), rare peloids (0.15-0.75 mm). Common micrite and blocky calcite cement, trace pyrite. Low neomorphic grade. Common horizontal calcite-filled fractures; fenestral fabric. Trace intraskeletal porosity.

Sample 1/20-55 **5907'**

Limestone: Pisolitic-peloidal packstone. Common oncolites (less than or equal ton 7 mm) and rare peloids (.09-.15 mm). Trace fine skeletals, ostracods and trilobites. Rare micrite and calcite cement (fibrous aragonite pseudomorphs, blocky spar). Low neomorphic grade. Poor algal intraskeletal porosity.

Sample 1/20-56 **5944-5'**

Limestone: Pisolitic-peloidal wackestone. Common pisoids (0.25-1.75 mm), trace peloids (0.1 mm). Common micrite. Abundant calcite cement (aragonite pseudomorph and blocky spar). Trace dolomite, subrounded detrital quartz and pyrite. Low neomorphic grade. No visible porosity.

Sample 1/20-57 **5956'**

Limestone: Pisolitic wackestone. Common pisoids (0.5-3.5 mm), calcispheres, rare commonly coated skeletals, gastropods, sparse stromatolitic crust, and trace peloids. Trace micrite and microspar. Common neomorphic spar and rare calcite-filled fractures. Fair intergranular porosity, trace moldic porosity, and poor fracture porosity.

Sample 1/20-58 **5986'**

Limestone: Pisolitic packstone. Abundant pisoids (0.5-3.3 mm), rare ostracods, sparse stromaolitic crust and trace peloids (0.1-0.2 mm). Trace micrite and rare microspar. Calcite cement, and void-filling anhydrite cement. Trace pyrite. No visible porosity.

Sample 1/20-59 **5997'**

Limestone: Pisolitic packstone. Abundant pisoids (0.12-2.0 mm), trace micrite and common neomorphic spar. Trace pyrite and anhydrite replacement. Moderate neomorphic grade. Fair intercrystalline porosity.

WA-54
GETTY OIL, BURTON-GRAFF ET AL.

3-157N-86W
WARD CO., NORTH DAKOTA

SAMPLE/DEPTH	FORAMINIFERA	FORAMINIFERA ZONE (MAMET)
1/20-53 5830'	Earlandinita sp. Bisphaera sp. Calcisphaerids	
1/20-55 5907'	Parathurammina sp. (rare) Septatournayella? sp. (rare) Calcisphaerids	Zone 9
1/20-56 5944-5'	Small calcisphaerids	
1/20-57 5956'	Earlandinita sp. Calcisphaerids	