OIL, CONDENSATE, AND GAS RESERVES RELATED TO ULTIMATE RESERVES OF ASSOCIATED TRAPS

With respect to total hydrocarbons for the average type of trap, the study discloses that for: (1) salt domes, 78.31% of the hydrocarbons will be oil, 5.82% condensate, and 15.87% gas; (2) circular or elongate domes will yield 31.42% oil, 19.54% condensate, and 49.04% gas; (3) anticlinal closures with associated syndepositional regional faults will yield 41.60% oil, 16.22% condensate, and 42.18% gas; (4) fault closures will yield 32.02% oil, 20.99% condensate, and 46.99% gas; (5) closures on regional noses will yield 36.36% oil, 15.94% condensate, and 47.70% gas; and (6) stratigraphic traps on flanks of structural noses or closures will yield 34.59% oil, 17.64% condensate, and 47.77% gas.

DISTRIBUTION OF RESERVES AND FREQUENCY OF SALT DOMES

Of 123 salt domes studied, 23 (18.70%) contain hydrocarbon reserves in the range of 0–5 MM barrels, 24 (19.51%) contain 5–20 MM barrels, 36 (29.27%) contain 20–50 MM barrels, 19 (15.45%) contain 50–100 MM barrels, and 21 (17.07%) contain 100 (+) MM barrels. Of the 146 circular or elongate domes, 56 (38.36%) contain 0–5 MM barrels, 36 (24.63%) contain 5–20 MM barrels, 25 (17.12%) contain 20–55 MM barrels, 17 (11.64%) contain 50–100 MM barrels, and 12 (8.22%) contain 100 (+) MM barrels. Of the 143 anticlinal closures, 67 (46.85%) contain 0–5 MM barrels, 38 (26.57%) contain 5–20 MM barrels, 20 (13.99%) contain 20–50 MM barrels, 12 (8.39%) contain 50–100 MM barrels, and 6 (4.20%) contain 100 (+) MM barrels. Of the 218 fault closures, 162 (74.31%) contain 0–5 MM barrels, 44 (20.18%) contain 5–20 MM barrels, 11 (5.05%) contain 20–50 MM barrels, and 1 (0.46%) contains 50–100 MM barrels. Of the 26 closures on regional noses, 23 (88.46%) contain 0–5 MM barrels, 1 (3.85%) contains 5–20 MM barrels, and 2 (7.69%) contain 20–50 MM barrels. Of the 34 stratigraphic traps on flanks of structural noses or closures, 30 (88.24%) contain 0–5 barrels, and 4 (11.76%) contain 5–20 MM barrels.

DISTRIBUTION OF ULTIMATE RESERVES BY PRODUCING TRENDS

Frio and younger sedimentary units in south Louisiana constitute one of the more prolific petroleum provinces of the world. Industry recognizes that it has one of the best exploration potentials on a per-dollar-invested basis of all domestic producing areas. Seven major producing trends are recognized. They are the Quaternary, Upper Fleming II, Upper Fleming I, Middle Fleming, Lower Fleming, Anahuac, and Frio.

Quaternary.—This is potentially a very good producing trend. As of January 1, 1964, only 18 fields (or 2.61% of the total fields) had been found in this trend and, relative to the more inland-situated trends, was sparsely drilled. Accelerated drilling has found several additional fields which were not included in this study. The trend contains 1.08% (96,040,000 bbls.) of the ultimate oil, 0.26% (5,453,000 bbls.) of ultimate condensate, and 0.54% (456,792 MMCF) of ultimate gas reserves. The average hydrocarbon trap contains 5,336,000 bbls. of oil, 303,000 bbls. of condensate, and 25,377 MMCF of gas.

Upper Fleming II.—This trend has 101 hydrocarbon traps representing 14.64% of the total fields in the area studied. It contains 42.76% (3,808,756,000 bbls.) of the ultimate oil, 21.30% (472,372,000 bbls.) of the ultimate condensate, and 20.92% (17,849,602 MMCF) of the ultimate gas reserves. The average hydrocarbon trap has 37,710,000 bbls. of oil, 4,677,000 bbls. of condensate, and 176,728 MMCF of gas reserves.

Upper Fleming I.—This trend has 124 producing traps representing 17.97% of the total fields. It contains 16.55% (1,474,336,000 bbls.) of ultimate oil, 13.25% (293,944,000 bbls.) of ultimate condensate, and 16.32% (13,920,092 MMCF) of gas and ultimate gas reserves. The average field contains 11,890,000 bbls. of oil, 2,371,000 bbls. of condensate, and 112,258 MMCF of gas.

Middle Fleming.—This trend has 70 producing traps representing 10.15% of the total fields. It contains 8.92% (794,144,000 bbls.) of ultimate oil, 10.88% (241,340,000 bbls.) of ultimate condensate, and 14.06% (11,997,595 MMCF) of ultimate gas reserves. The average field contains 11,345,000 bbls. of oil, 3,448,000 bbls. of condensate, and 171,394 MMCF ultimate gas reserves.

Lower Fleming.—This trend has 116 producing traps representing 16.81% of the total fields in the area. It contains 10.51% (936,365,000 bbls.) of ultimate oil, 25.14% (557,396,000 bbls.) of ultimate condensate, and 23.52% (20,067,689 MMCF) of ultimate gas reserves. The average field contains 8,072,000 bbls. of oil, 4,805,000 bbls. of condensate, and 172,997 MMCF ultimate gas reserves.

Anahuac.—This trend has 84 producing traps representing 12.17% of the total fields in the area. It contains 4.80% (427,113,000 bbls.) of ultimate oil, 5.32% (117,864,000 bbls.) of ultimate condensate, and 5,197,745 MMCF of ultimate gas reserves. The average field contains 5,085,000 bbls. of oil, 1,403,000 bbls. of condensate, and 61,877 MMCF of gas.

Frio.—This trend has 177 producing traps representing 25.65% of the producing fields of the area total. It contains 15.38% (1,370,249,000 bbls.) of ultimate oil, 23.85% (528,876,000 bbls.) of ultimate condensate, and 18.55% (15,830,200 MMCF) of ultimate gas reserves. The average field contains 7,742,000 bbls. of oil, 2,988,000 bbls. of condensate, and 89,436 MMCF of gas.

These data will aid in the future gross evaluation of individual prospects and assist in programming total exploration efforts.

12. WILLIAM F. TANNER, Florida State University, Tallahassee, Florida

ORIGIN OF GULF OF MEXICO

The Gulf of Mexico dates from approximately the Paleozoic-Mesozoic time boundary. From structural considerations, the hypothesis is proposed that the present Gulf is the result of a slowly widening rift, or tension gap, between North America (east of the Rocky Mountains) and Central America and the Caribbean block. Such an hypothesis, if correct, may explain several puzzling questions: (1) How should the southern Appalachians be extended southward from central Alabama? (2) What were the geologic and climatic conditions during deposition of Mesozoic evaporites in the Gulf region? (3) Why is the major delta complex of North America located in the vicinity of the Texas-Louisiana border? (4) What structural deformation is taking place in the area today?

A general program of investigation designed to test, or at least explore, the hypothesis is outlined.

13. C. H. MOORE, JR., Shell Development Company, Houston, Texas, AND K. G. MARTIN, Pan American Petroleum Corporation, New Orleans, Louisiana