

DATABASES FOR ZENITH OIL FIELD (STAFFORD AND RENO COUNTIES, KANSAS)

by K. David Newell

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Kansas Geological Survey
1930 Constant Avenue
University of Kansas
Lawrence, Kansas 66047

INTRODUCTION

Accompanying this text is a floppy disk containing spreadsheet data files developed for the Zenith field in central Kansas. These spreadsheets summarize geologic and production data interpreted and compiled by staff of the Kansas Geological Survey. This information was used in mapping and developing reservoir management models of the field. Maps derived from these databases are also presented in Newell and Wong (1991) and Wong and Newell (1991).

The Zenith field in central Kansas was the subject of an intensive study by geologists and engineers at the Kansas Geological Survey and the Tertiary Oil Recovery Project at the University of Kansas during 1990. The geological goals of this study were to 1) describe the five major reservoir zones in the field and their geometry, 2) determine original oil in place, and 3) identify areas within the field where additional producible oil may remain. Results of this study have been released in various publications (i.e., Newell and others, 1990, in press; Schoeling and others, 1990) in addition to a final report prepared in early 1991 by the staffs of both organizations (Kansas Geological Survey and Tertiary Oil Recovery Project, 1991).

The following spreadsheets are on the accompanying disk. The disk is in high-density DOS format, with files duplicated in Lotus 1-2-3 (*.WK1). Four data bases are included: Zenith field master spreadsheet (ZENITH.WK1), Zenith field porosity spreadsheet (ZENPOR.WK1), and strata model data base (SGM.WK1, SGM.WK1), and the Zenith field volumetric data base (ZENVOL.WK1).

The ZENITH and ZENPOR databases contain geologic information on the field. The SGM database contains well log readings in lotus WK1 format for StrataModel, a cellular reservoir characterization model by Stratamodel, Inc. out of Houston, Texas. Contained in this data base are well codes and columns of well information from well logs in the field. The porosity data in ZENPOR and ZENITH represent averages of the data determined for every two feet through the Zenith reservoirs. ZENVOL summarizes calculated volumetric information for each quarter section in the Zenith field using procedures outlined Newell and others (1990), Schoeling and others (1990), and Kansas Geological Survey and Tertiary Oil Recovery Project (1991).

INFORMATION CONTAINED IN THE DATABASES

ZENITH FIELD MASTER SPREADSHEET (ZENITH.WK1) (January, 1991)

by Dave Newell
assisted by Wendell Weatherbie & Kent Adams

(367,985 byte file in Lotus123 comprising 501 wells)

Area covered:

S/2 sec. 31, SW sec. 32; T.23S., R.10W.
S/2 secs. 33, 34, 35, 36; T.23S., R.11W.
W/2 sec. 5, sec. 6, sec. 7, W/2 sec. 8, W/2 sec. 17,
sec. 18, sec. 19, T.24S., R.10W.
secs. 1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15, 16, 21, 22,
23, 24, N/2 secs. 25, 26, 27, 28; T.24S., R.11W.

For each well, the following data are compiled:

OPERATOR

well number and name
Section-Township-Range
spot location

COMPLETION DATE

month, year

DEEPENING DATE

month, year

YEAR OF LAST PRODUCTION

YEARS PRODUCING (through 1989)

START OF INJECTION (year)

YEAR of ABANDONMENT

WELL STATUS

oil - oil well
inj - injection well
dry - dry hole
oil/TA - temporarily abandoned oil well
inj/TA - temporarily abandoned injection well
oil/abd - abandoned oil well
inj/abd - abandoned injection well

WELL DATUM (from Yates Report)

WELL DATUM (scout cards or well logs)

WELL DATUM USED

WELL LOG PICKS

(scout card [s], lith. log [s], E log [I], inferred [d], missing [-5])

Lansing top
Chattanooga top
upper Misener ss top
upper Misener ss base
Misener ls top
Misener ls base
lower Misener ss top
lower Misener ss base
Viola/Maquoketa top
Maquoketa dolomite base
Viola pay1 top
Viola pay1 base
Viola pay2 top
Viola pay2 base - pay3 top
Viola pay3 base
Simpson top

% POROSITY FOR RESERVOIRS (average for entire reservoir, from ZENPOR.WK1)

Misener ls
lower Misener ss

Maquoketa dolomite
Viola pay1
Viola pay2
Viola pay2
Viola pay2&3

DEPTHS - ENGINEERING DATA

pipe set
TD (Total Depth)
new TD from deepening

DEPTH INTERVALS - ENGINEERING DATA

open hole tested
treatment (acid [a], nitrogen frac [n], stress frac [sf], shot [s])
new open hole tested
treatment (acid [a], nitrogen frac [n], stress frac [sf], shot [s])
perfed hole tested
treatment (acid [a], nitrogen frac [n], stress frac [sf], shot [s])

DEPTH of PERFORATED INTERVAL

top/pay1
bottom/pay1
top/pay2
bottom/pay2
top/pay3
bottom/pay3
top/pay4
bottom/pay4
top/pay5
bottom/pay5

RESERVOIR ZONES TESTED

L (Misener ls)
S (lower Misener ss)
D (Maquoketa dolomite)
V (Viola above Viola1 reservoir)
V1 (Viola1)
V2 (Viola2)

INITIAL PRODUCTION POTENTIALS REPORTED

barrels of oil per day (state test)
barrels of oil per day (scout card or driller's log)
barrels of water per day (scout card or driller's log)
cubic feet of gas per day (scout card or driller's log)
gas-oil ratio
water-oil cut (%)

RESERVOIR ZONES TESTED WITH DEEPENING

L (Misener ls)
S (lower Misener ss)
D (Maquoketa dolomite)
V (Viola above Viola1 reservoir)

V1 (Viola1)
V2 (Viola2)

INITIAL PRODUCTION POTENTIALS REPORTED WITH DEEPENING
barrels of oil per day (scout card or driller's log)
barrels of water per day (scout card or driller's log)
water-oil cut (%)

RESERVOIR ZONES OF PRODUCTION OR INJECTION (PRESENT WELLS)
L (Misener ls)
S (lower Misener ss)
D (Maquoketa dolomite)
V (Viola above Viola1 reservoir)
V1 (Viola1)
V2 (Viola2)

API GRAVITY OF OIL TESTED

SORT KEY (a number to reset well records into their original sort)

LOCATION COORDINATED OF WELL
latitude
longitude
X mapping coordinate
Y mapping coordinate

ZENITH FIELD POROSITY SPREADSHEET (ZENPOR.WK1) (January, 1991)
by K. David Newell and Lanny G. Schoeling

(31,016 byte file in Lotus123 comprising 58 wells)

Area covered: identical to Zenith Field Master Spreadsheet

For each well with a porosity determination, the following data are compiled:

OPERATOR
well number and name
Section-Township-Range
spot location

WELL STATUS (from Zenith Field Master Spreadsheet)
WELL DATUM USED (from Zenith Field Master Spreadsheet)

for **MISENER LIMESTONE**
% porosity (no porosity cutoff)
11% cutoff porosity
11% cutoff porosity multiplier (net-to-gross pay ratio)

for **MISENER SANDSTONE**
% porosity (no porosity cutoff)

5% cutoff porosity
5% cutoff porosity multiplier (net-to-gross pay ratio)

for MAQUOKETA DOLOMITE
% porosity (no porosity cutoff)
8% cutoff porosity
8% cutoff porosity multiplier (net-to-gross pay ratio)
10% cutoff porosity
10% cutoff porosity multiplier (net-to-gross pay ratio)

for VIOLA 1 RESERVOIR
% porosity (no porosity cutoff)
8% cutoff porosity
8% cutoff porosity multiplier (net-to-gross pay ratio)
11% cutoff porosity
11% cutoff porosity multiplier (net-to-gross pay ratio)

for VIOLA 2 RESERVOIR
% porosity (no porosity cutoff)
8% cutoff porosity
8% cutoff porosity multiplier (net-to-gross pay ratio)
15% cutoff porosity
15% cutoff porosity multiplier (net-to-gross pay ratio)

for VIOLA 3 ZONE
% porosity (no porosity cutoff)
8% cutoff porosity
8% cutoff porosity multiplier (net-to-gross pay ratio)
15% cutoff porosity
15% cutoff porosity multiplier (net-to-gross pay ratio)

for Viola 2&3 zones combined (no porosity cutoff)
% porosity (no porosity cutoff)

RESERVOIR ZONES TESTED

L (Misener ls)
S (lower Misener ss)
D (Maquoketa dolomite)
V (Viola above Viola 1 reservoir)
V1 (Viola 1)
V2 (Viola 2)

INITIAL PRODUCTION POTENTIALS REPORTED

barrels of oil per day (scout card or driller's log)
barrels of water per day (scout card or driller's log)
cubic feet of gas per day (scout card or driller's log)

RESERVOIR ZONES TESTED WITH DEEPENING

L (Misener ls)
S (lower Misener ss)
D (Maquoketa dolomite)
V (Viola above Viola 1 reservoir)

V1 (Viola 1)
V2 (Viola 2)

INITIAL PRODUCTION POTENTIALS REPORTED WITH DEEPENING
barrels of oil per day (scout card or driller's log)
barrels of water per day (scout card or driller's log)

SORT KEY (a number to reset well records into their original sort)
latitude
longitude

STRATAMODEL DATABASE (SGM.WK1) (July, 1991)

Each well in the strata model database has a code name that consists of a parenthetical number, designating the section in which the well is located, and an initial which mimic the name of the well. The code name, plus other information is located in a header for each well that contains location and well mapping characteristics. Reference to StrataModel program reference manuals will elucidate these codes, but other information presented in the database can be gleaned and utilized for a variety of other data processing purposes.

The following are the codes for wells in the data base, together with their location and well number in the ZENITH.WK1 database:

(15)ZU10 -- Braden-Zenith Zenith Unit 10; NE NW NE section 15, T24S-R11W; well 395
(22)RC1 -- A.S. Ritchie et al. #1 Richardson; E2 NE NW section 22, T24S-R11W; well 425
(11)ZU2 -- Braden-Zenith Zenith Unit 2; SW NW SW section 11, T24S-R11W; well 200
(28)MN1 -- Mid-Continent Energy #1 Newell; SW NW SW section 28, T24S-R11W; well 501
(11)ZU33 -- Striker Petroleum Zenith Unit 33; SE NW NE NW section 11, T24S-R11W; well 238
(28)NN1 -- National Oil #1 Newell; SE NW NE section 28, T24S-R11W; well 502
(15)ZU3W -- Braden-Zenith Zenith Unit 3W; SW SW SW NE section 15, T24S-R11W; well 392
(22)RC4 -- Sohio Petroleum #4 Richardson; SE NW NW section 22, T24S-R11W; well 439
(2)ZU37 -- Striker Petroleum Zenith Unit 37; S2 S2 SE section 2, T24S-R11W; well 129
(9)MX5 -- Ron Brooks #5 Maxie G. Figger; E2 SW SE NE section 9, T24S-R11W; well 163
(1)ZU1 -- Braden-Zenith Zenith Unit 1; S2 SW SE SW section 1, T24S-R11W; well 199
(26)ZU26 -- Striker Petroleum Zenith Unit 26; W2 W2 W2 section 26, T24S-R11W; well 190
(9)MX4 -- Ron Brooks #4 Maxie G. Figger; E2 NW NE SE section 9, T24S-R11W; well 162
(15)ZU2W -- Braden-Zenith Zenith Unit 2W; SW SE SE NE section 15, T24S-R11W; well 391
(11)ZU11 -- Striker Petroleum Zenith Unit 11; N2 N2 NW NW section 11, T24S-R11W; well 237
(23)ZU31 -- Striker Petroleum Zenith Unit 31; S2 S2 N2 section 23, T24S-R11W; well 478
(26)MC1 -- Halliburton Oil #1 McComb; SE SW NW section 26 T24S-R11W; well 494
(23)PL1 -- Case Oil and Gas #1 Paulson-L; N2 S2 SW section 23, T24S-R11W; well 443
(27)H1 -- Plains Exploration #1 R. McComb (#1 Hogan); E2 NW NW section 27, T24S-R11W; well 498
(9)SF1 -- Alma #1 Sue Figger; NE NW NE section 9, T24S-R11W; well 149
(11)ZU39 -- Striker Petroleum Zenith Unit 39; SE NE section 11, T24S-R11W; well 239
(11)ZU3 -- Braden-Zenith Zenith Unit 3; E2 SW NW NE section 11, T24S-R11W; well 201
(23)ZU17 -- Striker Petroleum Zenith Unit 17; S2 SW NW section 23, T24S-R11W; well 476
(14)ZU19 -- Striker Petroleum Zenith Unit 19; S2 S2 section 14, T24S-R11W; well 385
(23)ZU15 -- Striker Petroleum Zenith Unit 15; SW SE NW section 23, T24S-R11W; well 474
(6)ZU36 -- Striker Petroleum Zenith Unit 36; W2 NW NW SW section 6, T24S-R10W; well 54

(1)ZU25 -- Striker Petroleum Zenith Unit 25; W2 section 1, T24S-R11W; well 94
 (6)ZU23 -- Striker Petroleum Zenith Unit 23; W2 W2 SW SW section 6, T24S-R10W; well 53
 (12)ZU28 -- Striker Petroleum Zenith Unit 28; S2 S2 N2 section 12, T24S-R11W; well 279
 (7)ZU30 -- Striker Petroleum Zenith Unit 30; E2 E2 W2 section 7, T24S-R10W; well 74
 (1)ZU24 -- Striker Petroleum Zenith Unit 24; E2 section 1, T24S-R11W; well 93
 (12)ST1S -- Striker Petroleum Stewart 1-S; S2 S2 section 12, T24S-R11W; well 273
 (12)ZU20 -- Striker Petroleum Zenith Unit 20; NW SE SE section 12, T24S-R11W; well 278
 (23)ZU16 -- Striker Petroleum Zenith Unit 16; S2 S2 NE section 23, T24S-R11W; well 475
 (12)ZU29 -- Striker Petroleum Zenith Unit 29; S2 S2 NW section 12, T24S-R11W; well 280
 (12)ST2S -- Striker Petroleum Stewart 2-S; N2 S2 section 12, T24S-R11W; well 274
 (12)ZU6W2 -- Braden-Zenith Zenith Unit 6W2; NW NW NE section 12, T24S-R11W; well 240
 (13)H1 -- Time Petroleum #1 Hartnett; N2 N2 NW section 13, T24S-R11W; well 334
 (12)ZU32 -- Striker Petroleum Zenith Unit 32; S2 S2 NE section 12, T24S-R11W; well 281
 (31)KJ31 -- Simasko Production #1 Kery-Johnson; SW section 31, T23S-R10W; well 2
 (18)ZU22 -- Striker Petroleum Zenith Unit 22; NW NE NW NW section 12, T24S-R10W; well 79
 (1)ZU35 -- Striker Petroleum Zenith Unit 55; S2 section 1, T24S-R11W; well 95
 (12)ZU13 -- Striker Petroleum Zenith Unit 13; W2 SW SW section 12, T24S-R11W; well 276
 (13)ZU6W -- Braden-Zenith Zenith Unit 6W; W2 W2 SW NW section 13, T24S-R11W; well 283
 (12)ZU14 -- Striker Petroleum Zenith Unit 14; N2 NW SW NW section 12, T24S-R11W; well 277
 (13)JO1S -- Striker Petroleum Johnson 1-S; N2 N2 NE section 12, T24S-R11W; well 333
 (24)ZU27 -- Striker Petroleum Zenith Unit 27; NE NE NW section 24, T24S-R11W; well 491
 (24)MX3 -- Ron Brooks #3 Maxie/Thompson; NW SW SW section 24, T24S-R11W; well 489
 (23)ZU18 -- Striker Petroleum Zenith Unit 18; SW NW NW section 23, T24S-R11W; well 477
 (1)ZU38 -- Striker Petroleum Zenith Unit 38; W2 W2 W2 section 1, T24S-R11W; well 96
 (2)ZU5 -- Braden-Zenith Zenith Unit 5; NW SE section 2, T24S-R11W; well 110
 (24)MC1 -- Case Oil and Gas #1 Glen McComb; W2 SW NW section 24, T24S-R11W; well 480
 (3)IJ1 -- Getty #1 Ira Johnson; E2 NE SE section 24, T24S-R11W; well 135
 (3)IJ2 -- Getty #2 Ira Johnson; S2 NW SE section 24, T24S-R11W; well 136
 (22)MC1 -- Case Oil and Gas #1 McComb; N2 N2 NE section 22, T24S-R11W; well 427
 (7)ZU21 -- Striker Petroleum Zenith Unit 21; W2 W2 SW NW section 21, T24S-R10W; well 73
 (16)MY1 -- National Petroleum Reserves #1 Meyer; E2 NE NE section 16, T24S-R11W; well 414
 (4)F1 -- Graves Drilling #1 Figger; E2 SW SW section 4, T24S-R11W, well 147

With respect to data, several data columns are presented for each well. They are:

Column 1 -- depth column (data are applicable from the depth designated in this line, down to the depth in the following line); note that the usual interval is two feet, but shaly zones are summarized over their entire thickness

Column 2 -- gamma ray (in API units)

Column 3 -- neutron-density crossplot porosity, corrected for shaliness using equations in Asquith and Gibson (1975, p.103); only corrected neutron or corrected density is listed if either one of these logs is missing; data is fractional porosity

Column 4 -- lithology code, 1=shale, 2=limestone, 3=sandstone; 4=dolomite

Column 5 -- Water saturation (Sw), fractional, assumed to be 0.35 for Misener reservoirs; 0.30 for all other reservoirs above the oil-water contact at -2019 ft. An Sw of 1 is assumed for all strata below the oil-water contact

Column 6 -- Density porosity (percent)

Column 7 -- Neutron porosity (percent)

Column 8 -- Vshale, calculated from equations in Asquith and Gibson (1975, p. 103)

If no data are available, -99999 is inserted in the appropriate location.

ZENITH FIELD VOLUMETRIC SPREADSHEET (ZENVOL.WK1)

This database spreadsheet is self-explanatory with respect to its units and headings.

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