

1347  
Large Exhibits

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SEISMOGRAPH APPRAISAL  
ETCHEVERRY RANCH AREA  
TTPS 14 and 15 S, RS 33 and 34 E,  
LEA COUNTY, NEW MEXICO

FOR  
WELMONT OIL CORPORATION

OCTOBER 12, 1957

## SUMMARY AND RECOMMENDATIONS

A dome, based upon reliable seismograph data, has been found, the highest measured point of which is located on the west side of the NW<sub>4</sub> of the NW<sub>4</sub> of Sec. 1, T. 15 S., R. 33 E. This uplift covers the better part of the section and shows an excess of 200' of relief. Another dome is found in Secs. 1 and 12, T. 15 S., R. 33 E. It is recommended that any available acreage on these structures be acquired. It is further recommended that a test be drilled on the former, to the Devonian formation. This should be located as closely as possible to the existing seismograph point. The second feature will require more seismograph work before drilling is initiated.

Leads to two possible structures are found in Secs. 27 and 19, T 14 S, R 34 E. The shooting of these leads is recommended, provided that the land situation makes such a course feasible.

## INTRODUCTION

The greater portion of the area investigated centers on the common boundary between Tps 14 and 15 N., R 34 E., although three lines extend into R 33 E. It is situated four miles east of the Saunders Field, which produces from the Pennsylvanian and Devonian formations north of the Townsend Field, which produces from the Wolfcamp formation, and west of the Caudill and Dean Fields, which produce from the Pennsylvanian and Devonian formations.

United Geological Company, San Francisco, was engaged for the field work. Part of the time two crews were used. One of these employed groups of four men, each with a 100' line, and the other a group of three men with a 100' line. According to traces, the other used groups of eighteen instruments, each with a 100' line. The latter method was not available, as the outputs of the instrument groups were restricted to 100' by rigid and unlinked circuits. The 100' lines were offset by 100' and 100' in the center of the instrument spreads, and the positions of the instruments were marked by a flag on the end of the line, in order to afford up-hole weathering comparisons. The latter method was not used, as this method is not popular with many seismologists, but has proven very successful in this area, as attested by the fact that the 100' line was able to penetrate to a line a mile and a half long, extending across and beyond the San Andreas fault. The 100' line was used in the shooting was tried, but the record quality was far inferior. The 100' line was used in the single hole offset bore holes, even though short first breaks were obtained. Deep holes were used for the vertical records - a device which was not used in the other areas.

TELETYPE CONTROL AND COMPUTATIONAL PROCEDURES

Velocity surveys from the Hunt - #1 State, Sec. 14, T. 15 S., R. 34 E.; the Shell Oil Company - #3 Williams unit, Sec. 8, T. 16 S., R. 34 E.; the Humble Oil and Refining Company - #1 Federal-Elliott, Sec. 1, T. 16 S., R. 34 E. and the Ada Oil Company - #1 Coalsom, Sec. 13, T. 15 S., R. 35 E., were available. The velocity was distributed fairly evenly between the Hunt, Humble and Shell wells, and was projected along the strike as derived checked the experimental data in the Ada-Coalsom well, very closely.

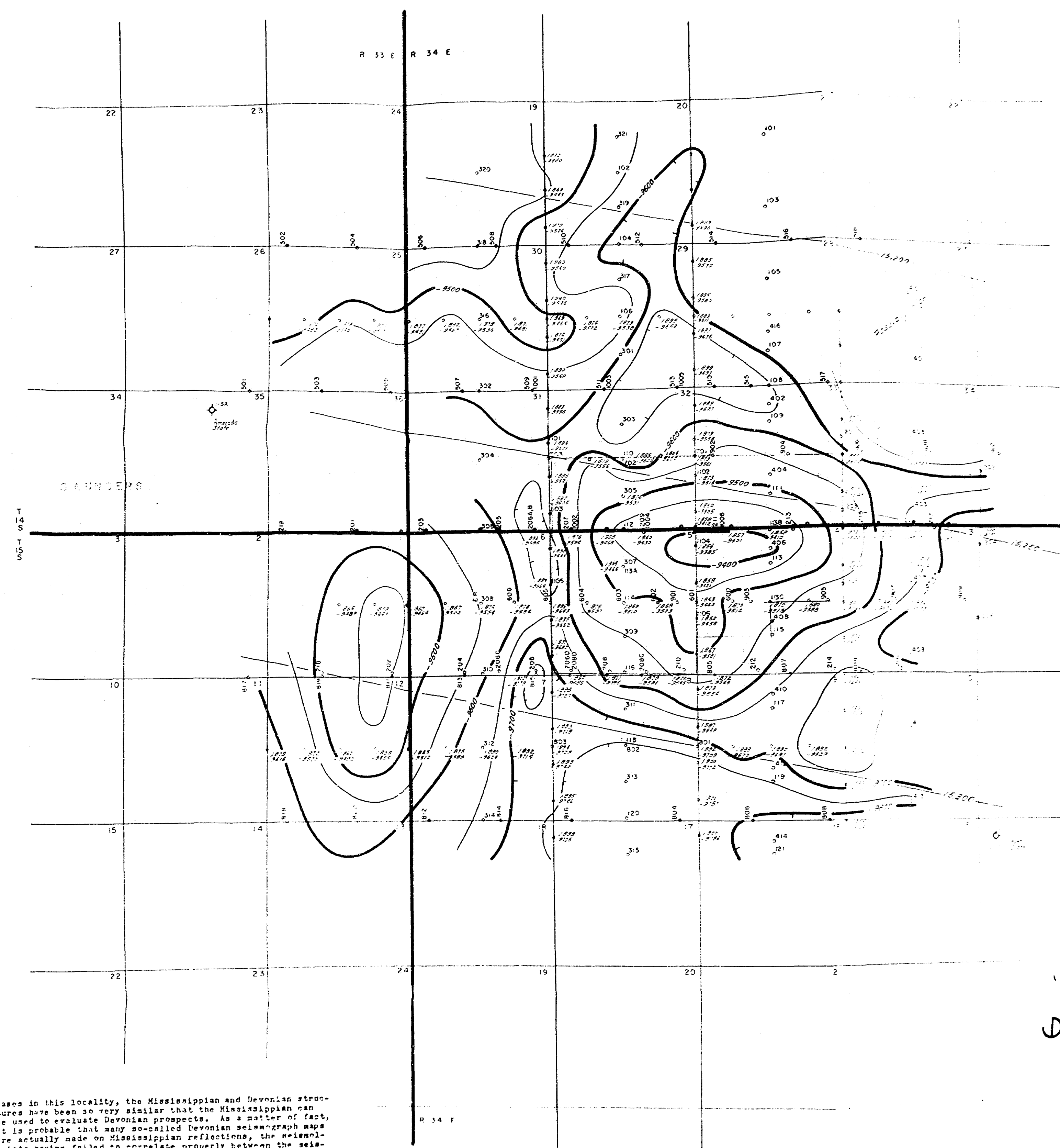
The raw values were converted to depth according to the following procedure: a constant of 0.120 of the value was subtracted from each bath value, this was multiplied by 0.815 for normal movement, 0.817 for instrument lag, and 0.028 for phase. Correction for this latter category was made because it was evident that the trough which was picked was a second phase of the Mississippi reflector. The remaining were multiplied by one-half the velocity of the wave. The bathymetric contours, and the datum of 14,420' was subtracted from the products to yield the surface elevations.

<sup>2</sup>There were many reliable reflections from the hydrogen and ammoniumium ions.

with the same stratigraphic conditions, but there was enough difference in the composition of the formations. It would have been possible to do so by creating small phase differences, but this course was not selected because of the fact that it would have led to a hybridized map; hence the statement as to the Permian and Devonian formations is of only secondary interest, in any event, the principle objective being the Devonian formation. Of a paleogeographic reconstruction, the strongest, and the one of great value, is the Miocenic, and the Miocenic and this is the subject of Enclosure I.

Enclosure 1, Comments on a Reflection from  
the Mesozoic Eruption with  
Velocity Contours

Identification of the subject population with Mississippians formation is based upon two features: (1) morphologically similar but recognizable on some of the beds, and (2) is believed to be the one between the boundary of Mississippians formations. (2) The fact that just west of the "x" is the lower range of the Mississippians formation, as defined by the two of these well, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824,



cases in this locality, the Mississippian and Devonian structures have been so very similar that the Mississippian can be used to evaluate Devonian prospects. As a matter of fact, it is probable that many so-called Devonian seismicograph maps are actually made of Mississippian reflections, the seismologists having failed to correlate properly between the seismicogram and the geological section. On some of the better records, on which the reflection character is well developed, it is evident that the continuous phase which was used in mapping, is the second one.

The structure of principal interest is the *dome*, the highest measured point of which is on the west line of the N42 of the N42, S20, E10, and shows in average 200' of relief. The data which define this "feature" are as follows: *W* 10' along the west line of the N42 line to the N33 line from the center of Sec. 32, T 10 S., R 10 E. to the center of Sec. 3, T 15 S. of a N-W line along the N33 line to the center of Sec. 33, T 10 S., and a N-W line along the west line of Sec. 33, T 10 S., and a N-W line through the center of Sec. 33, T 10 S., and a N-W line through the center of Sec. 9, T 15 S.; will all be within the dome. The *dip* is 10' to the N. There are but dip measurements and dip projection of these former lines to dip with the reliable *barometer*. None of these former

Another one is found in Gees. 1 and 12. T 10 S, R 33 E, but has not been completely delineated by the aeromagnograph. It is possible that Sec. 27, T 10 S, R 30 E, is high, and may be the site of still another dome, but the aeromagnograph data were not diagnostic. Another uplift is indicated in Sec. 29, T 11 S, R 34 E.

Formosa, 1991]  $\gamma = 0.5 \cdot 10^{-4}$

ETCHEVERRY RANCH AREA  
100 14 8 15 31 32 33 34 E.  
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MISSISSIPPIAN FORMATION