

TEXAS STATE BOARD OF WATER ENGINEERS

Prepared in cooperation with the Geological Survey,  
United States Department of the Interior

PROGRESS REPORT ON THE GROUND-WATER RESOURCES OF THE  
HOUSTON DISTRICT, TEXAS

By

Walter N. White

March 1, 1939

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Decline of water levels in wells in the Houston area, in 1937 and 1938

In the pages immediately following, (pages 4 to 12), the record of water level fluctuations in observation wells in and around Houston, given on pages 33 to 54 of the progress report of March 1, 1937, have been brought down to date, and hydrographs which were submitted at the end of that report showing fluctuations in a part of the wells from 1931 to May 1937 have been extended to the end of 1938. The net changes in water level in 21 representative wells during 1937 and 1938 are given in the table on the next page. (The locations of these wells are shown on the sketch map at the end of the March 1, 1937 report.)

All of these wells show a sharp net decline in water levels during the two-year period. One of the observation wells near the center of heavy pumping in the vicinity of Pasadena had a net decline in water level of about 35 feet and another a net decline of about 37 feet. In the five observation wells in east-central and southeastern Houston, the decline during the two years ranged from 7.57 feet to 28.58 feet and averaged 17.26 feet. The five observation wells in northeastern Houston displayed a net decline ranging from 16.30 feet to 26.60 feet and averaging 20.86 feet. In one well, (No. 264), located about 15 miles north of the Houston Post Office and four miles north of Aldine, the net drop amounted to 14.57 feet. The three observation wells in western Houston had a net decline ranging from 8.05 feet to 12.57 feet and averaging 11.12 feet, and the four in southwestern Houston a net decline ranging from 7.43 feet to 9.94 feet and averaging 8.87 feet.

Decline or rise in water levels in Houston and Pasadena wells, Texas—  
early winter measurements

(All measurements except those noted were made in December)

| Well No.               | Depth (feet) | 1936-38 |         |         |
|------------------------|--------------|---------|---------|---------|
|                        |              | 1936-37 | 1937-38 | 1936-38 |
| <u>Western Houston</u> |              |         |         |         |
| 602                    | 1038         | - 4.44  | - 3.61  | - 8.05  |
| 606                    | 575          | - 0.02  | -12.73  | -12.75  |
| 619                    | 900          | + 1.40  | -13.97  | -12.57  |
| Average                | 837          | - 1.02  | -10.10  | -11.12  |

Decline or rise in water levels in Houston and Pasadena wells, Texas -  
 early winter measurements - continued  
 (All measurements except those noted were made in December)

| Well No.                                     | Depth (feet) | 1936-38 |                                 |                  |
|--|--------------|---------|---------------------------------|------------------|
|  |              | 1936-37 | Decline (-) or Rise (+) in feet |                  |
|  |              |         | 1937-38                         | 1936-38          |
| <u>Southwestern Houston</u>                  |              |         |                                 |                  |
| 783  | 350±         | - 2.32  | - 5.11                          | - 7.43           |
| 790  | 606          | + 2.58  | -11.34                          | - 8.76           |
| 804  | 650±         | - 3.10  | - 6.13                          | - 9.23           |
| 809  | 1100±        | - 4.51  | - 5.38                          | - 9.94           |
| Average                                      | 846          | - 1.85  | - 6.99                          | - 8.84           |
| <u>Northern and northeastern Houston</u>     |              |         |                                 |                  |
| 656  | 665          | --      | --                              | -18.36 <u>1/</u> |
| 751  | 540          | -11.67  | - 7.65                          | -19.32           |
| 757  | 676          | -13.35  | - 7.88                          | -21.23 <u>2/</u> |
| 759  | 759          | -16.85  | - 9.75                          | -26.60 <u>3/</u> |
| 662  | 834          | - 7.35  | - 8.95                          | -16.30           |
| Average                                      | 695          | -12.30  | - 8.56                          | -20.86           |
| <u>East-central and southeastern Houston</u> |              |         |                                 |                  |
| 680  | 1350±        | -13.89  | + 0.88                          | -13.01           |
| 853  | 650          | - 5.13  | - 7.61                          | -12.74           |
| 878  | 905          | -23.29  | - 5.29                          | -28.58           |
| 881  | 650 ±        | -16.70  | - 7.69                          | -24.39           |
| 886  | 540          | - 6.64  | - 0.93                          | - 7.57 <u>4/</u> |
| 898a   | 900          | --      | - 5.37                          | --               |
| Average                                      | 685          | 13.13   | - 4.63                          | -17.26           |
| <u>Pasadena area</u>                         |              |         |                                 |                  |
| 1170   | 836          | -41.65  | + 4.5                           | -37.15 <u>5/</u> |
| 1176   | 800±         | -43.28  | + 8.72                          | -34.56           |
| Average                                      | 818          | -42.46  | + 6.60                          | -35.86           |

1/ 1938 measurements made in November; 2/ 1936 measurements made in November;  
3/ 1938 measurements made in November; 4/ 1936 and 1937 measurements made in  
 November. 5/ 1936 measurements made in November.

Decline in water level in Well 264  
 15 miles north of Houston Post Office and  
 20 miles northwest of Pasadena - November 1936 to November 1938

| Well No. | Depth (feet)   | 1936-37 | 1937-38 | 1936-38 |
|----------|----------------|---------|---------|---------|
| 264      | 1610 <u>6/</u> | -12.48  | - 2.09  | -14.57  |

6/ Water is reported to come from sand at depth of 950 feet.

(For location of wells see sketch map at the end of the progress report of  
 March 1, 1937.)

The decline in these wells was largely due to the effect of new pumping amounting to around 19,000,000 gallons a day, which was started near Pasadena in the spring and early summer of 1937. This represented an increase of almost 40 per cent over the average daily draft by all the wells of the Houston-Pasadena area in 1935 and 1936. The following conclusions

were stated at the bottom of page 25 of the Progress Report of March 1, 1937:

"No large increase in pumping over the volume of water pumped in 1936 should be made within the city limits or along the ship channel between the city limits and Baytown. Any large increase in ground-water withdrawals in or near the existing deep depressions in artesian pressure in down-town Houston and in the east Houston-Pasadena district would be especially undesirable. New wells involving heavy withdrawals of ground water should be located at distances of several miles from these depressions."

The water level record in the wells of the Houston-Pasadena area during 1937 and 1938 confirm the above statement. The new pumping has produced a further heavy decline in the artesian pressures near Pasadena. This depression has spread to Houston and is moving out to increasingly greater distances from the center of pumping.

#### Present ground-water investigation

In the fall of 1938 the sum of \$5,000 was allocated by the City of Houston for continuing the cooperative ground-water investigation in the Houston-Pasadena area and surrounding territory, and this sum was matched with an equal amount of Federal funds. Following these allocations, Mr. C. R. Follett, Jr. Engineer, and Mr. Nicholas Rose, Assistant Geologist, were assigned full time to the territory and plans were formulated for making the investigation more complete and more extensive than ever before. Since the beginning of the new work, the observation wells in and around Houston have been nearly doubled in number and include the City-owned wells which are now measured for static levels once a month, and some of the observation wells have been equipped with automatic water stage recorders. The investigation has been extended to areas outside of Houston which heretofore had not been given detailed study. Quality of water studies are being made to determine whether, as the artesian pressures decline, changes in the mineral content of the water, especially the chloride, are occurring anywhere in the territory. Drillers' logs and electrical logs of water wells and oil tests have been collected and compiled to obtain information to guide a program of exploratory drilling which will be started about April 1, 1939.

Water level fluctuations in observation wells in the Houston area, Texas  
(Descriptions of these wells and previous water level measurements  
are given in the Progress Report of March 1, 1937.)

Well 205

| Date                                  | Depth<br>to water<br>(feet) |
|---------------------------------------|-----------------------------|
| Humble Pipe Line Co. Depth, 700 feet. |                             |
| 1937 - Aug. 14 -                      | 32.52                       |
| Nov. 9 -                              | -- a/                       |
| 1938 - Feb. 2 -                       | 62.01 a/                    |
| Feb. 3 -                              | 32.85                       |
| May 11 -                              | 29.30                       |
| Oct. 24 -                             | 34.84                       |
| Nov. 22 -                             | 35.16                       |
| Dec. 22 -                             | -- a/                       |
| 1939 - Jan. 25 -                      | 32.96                       |

Well 206

|                                 |          |
|---------------------------------|----------|
| R. B. Tucker. Depth, 450± feet. |          |
| 1937 - Aug. 14 -                | 31.00    |
| Nov. 9 -                        | 28.72    |
| 1938 - Feb. 2 -                 | 26.90 a/ |
| May 11 -                        | 26.33 a/ |
| Oct. 24 -                       | 28.94    |
| Nov. 22 -                       | 29.30 b/ |
| Dec. 22 -                       | 29.45    |
| 1939 - Jan. 25 -                | 27.36    |

Well 256

| Date                          | Depth<br>to water<br>(feet) |
|-------------------------------|-----------------------------|
| J. M. Blake. Depth, 189 feet. |                             |
| 1937 - Nov. 10 -              | 31.08                       |
| 1938 - Feb. 6 -               | 31.95                       |
| May 12 -                      | 30.96                       |
| Oct. 26 -                     | 33.13                       |
| Nov. 18 -                     | 33.50                       |
| Dec. 17 -                     | 33.82                       |
| 1939 - Jan. 26 -              | 33.81                       |

Well 264

|                                |       |
|--------------------------------|-------|
| Feary farm. Depth, 1,610 feet. |       |
| 1937 - Nov. 10 -               | 34.54 |
| 1938 - Feb. 6 -                | 34.77 |
| May 12 -                       | 34.21 |
| Oct. 26 -                      | 36.33 |
| Nov. 18 -                      | 36.63 |
| Dec. 17 -                      | 37.03 |

a/ Pump running. b/ Pump running in nearby well.

## Water level fluctuations in observation wells in the Houston area - Continued

| <u>Well 602</u>  |                             | <u>Well 604-cont'd</u>   |                             | <u>Well 619-cont'd</u>   |                             |
|--|-----------------------------|--|-----------------------------|--|-----------------------------|
| Date   | Depth<br>to water<br>(feet) | Date   | Depth<br>to water<br>(feet) | Date   | Depth<br>to water<br>(feet) |
| River Oaks Country Club.<br>Depth, 1038 feet.                    |                             | 1938 - Dec. 20 - 66.70   |                             | 1938 - Mar. 23 - 68.44 <u>b/</u>                                 |                             |
| 1937 - June 21 -   | 51.02                       | 1939 - Jan. 20 - 63.96   |                             | Apr. 28 - 70.75  |                             |
|  | July 19 -                   |  |                             | May 21 - 73.86   |                             |
|  | Aug. 20 -                   |  |                             | June 23 - 80.24  |                             |
|  | Oct. 26 -                   |  |                             | July 20 - 82.82 <u>b/</u>  |                             |
|  | Nov. 19 -                   |  |                             | Aug. 25 - 85.60 <u>b/</u>  |                             |
|  | Dec. 17 -                   |  |                             | Sept. 23 - 85.98   |                             |
| 1938 - Jan. 20 -   | 53.30                       |  |                             | Oct. 21 - 86.62  |                             |
|  | Mar. 1 -                    |  |                             | Nov. 21 - 79.43  |                             |
|  | Mar. 24 -                   |  |                             | Dec. 20 - 77.44  |                             |
|  | Apr. 28 -                   |  |                             | 1939 - Jan. 20 - 72.86   |                             |
|  | May 21 -                    |  |                             | Feb. 20 - 77.52  |                             |
|  | June 20 -                   |  |                             |  |                             |
|  | July 20 -                   |  |                             |  |                             |
|  | Aug. 25 -                   |  |                             |  |                             |
|  | Sept. 23 -                  |  |                             |  |                             |
|  | Oct. 20 -                   |  |                             |  |                             |
|  | Nov. 22 -                   |  |                             |  |                             |
|  | Dec. 21 -                   |  |                             |  |                             |
| 1939 - Jan. 20 -   | 59.22                       |  |                             |  |                             |
|  | Feb. 20 -                   |  |                             |  |                             |
| <u>Well 604</u>  |                             | <u>Well 606</u>  |                             | <u>Well 656</u>  |                             |
| West End Ice Co. Depth,  |                             | Honke and Pillot. Depth,<br>575 feet.                            |                             | Texas Creosoting Co. Depth,<br>665 feet.                         |                             |
| 1937 - June 21 -   | 69.83                       | 1937 - June 21 -   | 69.41                       | 1937 - June 21 -   | -- <u>a/</u>                |
|  | July 22 -                   |  | July 22 - 72.34             | June 22 -  | 70.04                       |
|  | Aug. 20 -                   |  | Aug. 20 - 72.33             | July 20 -  | 57.13                       |
|  | Sept. 23 -                  |  | Sept. 23 - 75.05            | Aug. 20 -  | -- <u>a/</u>                |
|  | Oct. 26 -                   |  | Oct. 26 - 69.90             | Sept. 23 -   | -- <u>a/</u>                |
|  | Nov. 18 -                   |  | Nov. 18 - 69.73             | Oct. 26 -  | -- <u>a/</u>                |
|  | Dec. 17 -                   |  | Dec. 17 - 65.25             | Nov. 18 -  | -- <u>a/</u>                |
| 1938 - Jan. 20 -   | 64.22                       | 1938 - Jan. 20 -   | 67.40                       | Dec. 17 -  | -- <u>a/</u>                |
|  | Mar. 1 -                    |  | Mar. 1 - 66.98              | 1938 - Jan. 19 -   | 75.27                       |
|  | Mar. 23 -                   |  | Mar. 23 - 67.42             | Mar. 1 -   | 73.50                       |
|  | Apr. 22 -                   |  | Apr. 22 - 72.62             | Mar. 23 -  | -- <u>a/</u>                |
|  | May 21 -                    |  | May 20 - 75.10              | Apr. 22 -  | 74.35                       |
|  | June 20 -                   |  | June 20 - 76.13             | May 21 -   | -- <u>a/</u>                |
|  | June 23 -                   |  | July 20 - 79.90             | June 23 -  | -- <u>a/</u>                |
|  | July 20 -                   |  | Aug. 25 - 81.09 <u>b/</u>   | July 20 -  | 79.60                       |
|  | Aug. 25 -                   |  | Sept. 22 - 82.88 <u>b/</u>  | Aug. 25 -  | 83.19                       |
|  | Sept. 22 -                  |  | Oct. 21 - 84.13 <u>b/</u>   | Sept. 22 -   | 83.22                       |
|  | Oct. 21 -                   |  | Nov. 21 - 78.61 <u>b/</u>   | Oct. 21 -  | 83.79                       |
|  | Nov. 21 -                   |  | Dec. 20 - 77.98 <u>b/</u>   | Nov. 21 -  | 83.75                       |
| 1939 - Jan. 13 -   | 75.34                       | 1939 - Jan. 13 -   | 75.34                       | Dec. 20 -  | -- <u>a/</u>                |
|  | Jan. 14 -                   |  | Jan. 14 - 75.73             | 1939 - Jan. 14 -   | 80.47                       |
|  | Feb. 20 -                   |  | Feb. 20 - 74.65             | Jan. 20 -  | 80.65                       |
| <u>Well 619</u>  |                             | <u>Well 619</u>  |                             | <u>Well 619-cont'd</u>   |                             |
| City of Houston. (Lincoln<br>Swimming Pool.) Depth, 900<br>feet. |                             | City of Houston. (Lincoln<br>Swimming Pool.) Depth, 900<br>feet. |                             | City of Houston. (Lincoln<br>Swimming Pool.) Depth, 900<br>feet. |                             |
| 1937 - June 21 -   | 68.98 <u>b/</u>             | 1937 - June 21 -   | 68.98 <u>b/</u>             | 1938 - Mar. 1 -  | 64.15                       |
|  | July 22 -                   |  | July 22 - 74.89 <u>b/</u>   |  |                             |
|  | Aug. 20 -                   |  | Aug. 20 - 73.33 <u>b/</u>   |  |                             |
|  | Sept. 23 -                  |  | Sept. 23 - 77.89 <u>b/</u>  |  |                             |
|  | Oct. 26 -                   |  | Oct. 26 - 69.69 <u>b/</u>   |  |                             |
|  | Nov. 19 -                   |  | Nov. 19 - 69.10             |  |                             |
|  | Dec. 17 -                   |  | Dec. 17 - 63.47             |  |                             |
| 1938 - Jan. 20 -   | 65.54                       | 1938 - Jan. 20 -   | 65.54                       |  |                             |
|  | Mar. 1 -                    |  | Mar. 1 - 64.15              |  |                             |

a/ Pump running.

b/ Pump running in nearby well.

## Water level fluctuations in observation wells in the Houston area -- Continued

| <u>Well 662</u>  |                             | <u>Well 673-cont'd</u>  |                             | <u>Well 695-cont'd</u>   |                             |
|--|-----------------------------|---|-----------------------------|--|-----------------------------|
| Date   | Depth<br>to water<br>(feet) | Date  | Depth<br>to water<br>(feet) | Date   | Depth<br>to water<br>(feet) |
| South Texas Cotton Oil Co.<br>Depth, 834 feet.   |                             | 1939 - Jan. 20 - 47.20<br>Feb. 20 - 45.17   |                             | 1938 - Sept. 22 - 53.49<br>Oct. 20 - 55.54<br>Nov. 21 - 55.93<br>Dec. 20 - 56.09   |                             |
| 1937 - June 22 - 69.18<br>July 20 - 70.62<br>Aug. 20 - -- a/<br>Sept. 23 - 75.10<br>Oct. 26 - 74.86<br>Nov. 18 - 74.60<br>Dec. 17 - 72.70  |                             | <u>Well 680</u><br>Houston Electric Co. Depth,<br>1,350 feet.   |                             | 1939 - Jan. 20 - 55.92<br>Feb. 20 - 55.90  |                             |
| 1938 - Jan. 19 - --<br>Mar. 1 - 72.53<br>Mar. 23 - -- a/<br>Mar. 30 - 74.44<br>Apr. 22 - 75.50<br>May 21 - 74.55<br>June 23 - 79.45<br>July 20 - 80.70<br>Aug. 25 - -- a/<br>Sept. 22 - -- a/<br>Oct. 21 - 87.10<br>Nov. 21 - 87.76<br>Dec. 20 - 81.65 |                             | 1937 - June 21 - 65.25<br>July 20 - 65.35<br>Aug. 19 - 68.45<br>Sept. 22 - 68.94<br>Oct. 25 - 66.38<br>Nov. 18 - 64.99<br>Dec. 15 - 66.40   |                             | <u>Well 738</u><br>Houston Packing Co. Depth,<br>417 feet.   |                             |
| 1939 - Jan. 20 - 79.74<br>Feb. 20 - -- a/  |                             | 1938 - Jan. 19 - 61.77<br>Mar. 1 - 62.18<br>Apr. 22 - 63.35<br>May 20 - 61.52<br>June 23 - 57.17<br>July 21 - 74.08<br>Aug. 25 - 68.51<br>Sept. 22 - 69.55<br>Oct. 20 - 71.55<br>Nov. 21 - 66.86<br>Dec. 20 - 65.52 |                             | 1937 - June 21 - 65.12<br>July 20 - 65.58 b/<br>Aug. 20 - 66.05 b/<br>Sept. 22 - 66.64 b/<br>Oct. 25 - 67.05<br>Nov. 18 - 67.29<br>Dec. 15 - 67.40   |                             |
| <u>Well 673</u><br>M. K. & T. Railway Co.<br>Depth, 1,638 feet.  |                             | 1939 - Jan. 20 - 63.50<br>Feb. 20 - 60.31   |                             | 1938 - Jan. 19 - 67.39 b/<br>Mar. 1 - 67.39<br>Mar. 24 - 67.35<br>Apr. 22 - 67.30<br>May 20 - 67.30 b/<br>June 23 - 67.36<br>July 21 - 67.48 b/<br>Aug. 25 - 67.54 b/<br>Sept. 22 - 67.65 b/<br>Oct. 20 - 67.76 b/<br>Nov. 20 - 67.82 b/<br>Dec. 20 - 67.79 b/ |                             |
| 1937 - June 21 - 57.87<br>July 22 - 52.13<br>Aug. 20 - 54.82<br>Sept. 22 - 53.37<br>Oct. 26 - 53.33<br>Nov. 18 - 57.23<br>Dec. 17 - 51.54  |                             | <u>Well 695</u><br>Harris County Court House.<br>Depth, .....   |                             | 1939 - Jan. 20 - 67.82 b/<br>Feb. 20 - 67.77 b/  |                             |
| 1938 - Jan. 20 - 48.25<br>Mar. 1 - 47.77<br>Mar. 24 - 48.40<br>Apr. 22 - 49.09<br>May 23 - 50.00<br>June 23 - 50.55<br>July 20 - 50.16<br>Aug. 25 - 55.12<br>Sept. 23 - 53.52<br>Oct. 21 - 53.94<br>Nov. 21 - 51.85<br>Dec. 20 - 48.70                 |                             | 1937 - June 21 - 54.08<br>July 20 - 54.96<br>Aug. 19 - 55.47<br>Sept. 22 - 55.80<br>Oct. 25 - 55.74<br>Nov. 18 - 55.62<br>Dec. 15 - 54.90   |                             | <u>Well 741</u><br>Houston Electric Co. Depth,<br>540 feet.  |                             |
|  |                             | 1938 - Jan. 19 - 53.73<br>Mar. 1 - 53.17<br>Mar. 24 - 54.23<br>Apr. 22 - 54.57<br>May 20 - 49.82<br>June 23 - 51.90<br>July 21 - 52.47<br>Aug. 25 - 52.76   |                             | 1937 - June 21 - 56.37<br>July 20 - 56.47<br>Aug. 20 - 56.49<br>Sept. 22 - 56.54<br>Oct. 25 - 56.57<br>Nov. 18 - 56.53<br>Dec. 15 - 56.58  |                             |
|  |                             |   |                             | 1938 - Jan. 19 - 56.57<br>Mar. 1 - 56.58   |                             |

a/ Pump running.

b/ Pump running in nearby well.

(Continued on next page)

## Water level fluctuations in observation wells in the Houston area -- Continued

| <u>Well 741-cont'd</u>                  |                             |  | <u>Well 757-cont'd</u>                           |                             |  | <u>Well 783-cont'd</u>                      |                             |  |
|---|-----------------------------|--|--|-----------------------------|--|---|-----------------------------|--|
| Date                                    | Depth<br>to water<br>(feet) |  | Date   | Depth<br>to water<br>(feet) |  | Date  | Depth<br>to water<br>(feet) |  |
| 1938 - Mar. 24 -                        | 56.62                       |  | 1937 - Sept. 22 -                                | 75.18                       |  | 1937 - July 19 -                            | 41.63                       |  |
| Apr. 22 -                               | 56.57                       |  | Oct. 26 -  | 75.92                       |  | Aug. 20 -                                   | 42.69                       |  |
| May 20 -                                | 56.58                       |  | Nov. 18 -  | --                          |  | Sept. 24 -                                  | 44.27 <u>b/</u>             |  |
| June 26 -                               | 56.66                       |  | Dec. 17 -  | 75.17                       |  | Oct. 26 -                                   | 43.45                       |  |
| July 21 -                               | 56.69                       |  | 1938 - Jan. 19 -                                 | 75.83                       |  | Nov. 19 -                                   | 43.35                       |  |
| Aug. 25 -                               | 56.72                       |  | Mar. 1 -   | 74.40                       |  | Dec. 17 -                                   | 43.12 <u>b/</u>             |  |
| Sept. 22 -                              | 56.70                       |  | Mar. 23 -  | -- <u>a/</u>                |  | 1938 - Jan. 20 -                            | 42.25                       |  |
| Oct. 20 -                               | 56.78                       |  | Mar. 30 -  | 74.26                       |  | Mar. 1 -                                    | 42.08                       |  |
| Nov. 21 -                               | 56.80                       |  | Apr. 22 -  | 74.86                       |  | Mar. 24 -                                   | 42.25                       |  |
| Dec. 20 -                               | 56.81                       |  | May 21 -   | 75.42                       |  | May 21 -                                    | 43.73                       |  |
| 1939 - Jan. 20 -                        | 56.81                       |  | June 20 -  | 83.35                       |  | June 24 -                                   | 45.80                       |  |
| Feb. 20 -                               | 56.78                       |  | July 20 -  | 83.35                       |  | July 20 -                                   | 46.60                       |  |
| <u>Well 751</u>                         |                             |  | Aug. 25 -  | 84.29                       |  | Aug. 25 -                                   | 47.65                       |  |
| Texas Pipe Line Co. Depth,<br>540 feet. |                             |  | Oct. 21 -  | -- <u>a/</u>                |  | Sept. 23 -                                  | 48.45                       |  |
|   |                             |  | Nov. 21 -  | 85.43                       |  | Oct. 20 -                                   | 48.90                       |  |
| 1937 - June 21 -                        | 64.27                       |  | Dec. 20 -  | 83.05                       |  | Nov. 22 -                                   | 48.53                       |  |
| July 20 -                               | 67.52                       |  | 1939 - Jan. 20 -                                 | 80.83                       |  | Dec. 21 -                                   | 48.22                       |  |
| Aug. 20 -                               | 67.21                       |  | Feb. 20 -  | -- <u>a/</u>                |  | 1939 - Jan. 20 -                            | 47.69 <u>b/</u>             |  |
| Sept. 22 -                              | 69.13                       |  | <u>Well 759</u>                                  |                             |  | <u>Well 790</u>                             |                             |  |
| Oct. 26 -                               | 70.00                       |  | Port City Compress. Depth,<br>396 feet.          |                             |  | Southern United Ice Co.<br>Depth, 606 feet. |                             |  |
| Nov. 18 -                               | 69.65                       |  | 1937 - June 21 -                                 | 71.08                       |  | 1937 - June 21 -                            | 60.37                       |  |
| Dec. 17 -                               | 69.83                       |  | Sept. 22 -                                       | 81.20                       |  | July 19 -                                   | 64.64                       |  |
| 1938 - Jan. 19 -                        | 71.48                       |  | Oct. 26 -  | 81.70                       |  | Aug. 20 -                                   | 65.13                       |  |
| Mar. 1 -                                | 69.20                       |  | Nov. 18 -  | 80.60                       |  | Sept. 23 -                                  | 65.84                       |  |
| Mar. 23 -                               | 68.90                       |  | Dec. 15 -  | 80.64                       |  | Oct. 26 -                                   | 62.40                       |  |
| Apr. 22 -                               | 69.65                       |  | 1938 - Jan. 19 -                                 | 82.17                       |  | Nov. 19 -                                   | 61.70                       |  |
| May 21 -                                | 70.18                       |  | Mar. 1 -   | 80.19                       |  | Dec. 17 -                                   | 58.77                       |  |
| June 23 -                               | 71.25                       |  | Mar. 23 -  | 79.69                       |  | 1938 - Jan. 20 -                            | 58.17                       |  |
| July 20 -                               | 73.60                       |  | Apr. 22 -  | 79.83                       |  | Mar. 1 -                                    | 57.84                       |  |
| Aug. 25 -                               | 77.52                       |  | May 21 -   | 80.93                       |  | Mar. 24 -                                   | 58.92                       |  |
| Sept. 22 -                              | 81.82                       |  | June 23 -  | 83.04                       |  | Apr. 23 -                                   | 64.22                       |  |
| Oct. 21 -                               | 80.10                       |  | July 20 -  | 85.28                       |  | May 21 -                                    | 68.92                       |  |
| Nov. 21 -                               | 79.35                       |  | Aug. 25 -  | 88.45                       |  | June 23 -                                   | 68.92                       |  |
| Dec. 20 -                               | 77.48                       |  | Oct. 21 -  | 91.16                       |  | July 20 -                                   | 72.88                       |  |
| 1939 - Jan. 20 -                        | 75.57                       |  | Nov. 21 -  | 90.39                       |  | Aug. 25 -                                   | 74.18                       |  |
| Feb. 20 -                               | 75.52                       |  | Dec. 20 -  | -- <u>a/</u>                |  | Sept. 23 -                                  | 74.69                       |  |
| <u>Well 757</u>                         |                             |  | 1939 - Jan. 20 -                                 | 86.32                       |  | Oct. 21 -                                   | 73.79                       |  |
| Layne-Texas Co. Depth, 676<br>feet.     |                             |  | Feb. 20 -  | 85.68                       |  | Nov. 22 -                                   | 72.07                       |  |
|   |                             |  | <u>Well 783</u>                                  |                             |  | 1939 - Jan. 20 -                            |                             |  |
| 1937 - June 21 -                        | 67.87                       |  | Houston Riding & Polo Club.<br>Depth, 350± feet. |                             |  | 69.18                                       |                             |  |
| July 20 -                               | -- <u>a/</u>                |  |  |                             |  | Feb. 20 -                                   |                             |  |
| Aug. 4 -                                | 71.74                       |  |  |                             |  | 68.18                                       |                             |  |
| Aug. 20 -                               | 72.91                       |  | 1937 - June 21 -                                 | 42.75                       |  |   |                             |  |

a/ Pump running.b/ Pump running in nearby well.





Water level fluctuations in observation wells in the Houston area -- Continued

| <u>Well 878</u>                       |                       | <u>Well 886</u>                  |                       | <u>Well 1105</u>            |                       |
|---------------------------------------|-----------------------|----------------------------------|-----------------------|-----------------------------|-----------------------|
| Date                                  | Depth to water (feet) | Date                             | Depth to water (feet) | Date                        | Depth to water (feet) |
| Houston Compress Co. Depth, 905 feet. |                       | Bennett Oil Co. Depth, 540 feet. |                       | A. A. Womack. Depth, _____. |                       |
| 1937 - June 21 -                      | -- a/                 | 1937 - June 21                   | -- a/                 | 1937 - June 21 -            | 55.77                 |
| June 22 -                             | -- a/                 | July 19 -                        | -- a/                 | July 20 -                   | 59.54                 |
| July 19 -                             | -- a/                 | Aug. 19 -                        | 73.21                 | Aug. 19 -                   | 60.16                 |
| Aug. 20 -                             | 68.51                 | Oct. 25 -                        | 74.33                 | Sept. 22 -                  | 61.39                 |
| Sept. 22 -                            | 70.03                 | Nov. 18 -                        | 73.34                 | Oct. 25 -                   | 60.92                 |
| Oct. 25 -                             | -- a/                 | 1938 - Mar. 1 -                  | 71.64                 | Nov. 18 -                   | 60.36                 |
| Dec. 15 -                             | 68.56                 | Mar. 23 -                        | -- a/                 | Dec. 15 -                   | 59.87                 |
| 1938 - Mar. 1 -                       | -- a/                 | Mar. 30 -                        | 71.64                 | 1938 - Jan. 19 -            | 59.29                 |
| Apr. 22 -                             | -- a/                 | Apr. 22 -                        | 72.20                 | Mar. 23 -                   | 60.01                 |
| May 20 -                              | 68.40                 | May 20 -                         | -- a/                 | Apr. 22 -                   | 59.77                 |
| June 23 -                             | -- a/                 | June 23 -                        | -- a/                 | May 23 -                    | 59.68                 |
| July 20 -                             | -- a/                 | July 20 -                        | -- a/                 | June 23 -                   | 58.90                 |
| Aug. 25 -                             | 74.44                 | Aug. 25 -                        | -- a/                 | July 20 -                   | 61.72                 |
| Sept. 22 -                            | 76.06                 | Sept. 22 -                       | -- a/                 | Aug. 25 -                   | 62.20                 |
| Oct. 21 -                             | 75.37                 | Oct. 20 -                        | 76.75                 | Sept. 22 -                  | 62.75                 |
| Nov. 25 -                             | -- a/                 | Dec. 20 -                        | 74.27                 | Oct. 21 -                   | 62.19                 |
| Dec. 20 -                             | 73.85                 | 1939 - Jan. 20 -                 | 73.30                 | Nov. 23 -                   | 61.88                 |
| 1939 - Jan. 20 -                      | 71.51                 | Feb. 20 -                        | 72.83                 | Dec. 19 -                   | 61.37                 |
| Feb. 20 -                             | 70.48                 |                                  |                       | 1939 - Jan. 18 -            | 61.07                 |
|                                       |                       |                                  |                       | Feb. 16 -                   | 60.47                 |

| <u>Well 881</u>                         |       | <u>Well 890</u>                       |       | <u>Well 1170</u>                            |       |
|---|-------|---------------------------------------|-------|---|-------|
| Terminal Compress Co. Depth, 650+ feet. |       | Texas Chemical Co. Depth, 1,284 feet. |       | Deepwater Plant of Houston Depth, 836 feet. |       |
| 1937 - June 21 -                        | 64.64 | 1937 - June 21 -                      | -- a/ | 1937 - June 19 -                            | 95.8  |
| July 19 -                               | 67.58 | June 22 -                             | -- a/ | June 26 -                                   | 97.2  |
| Aug. 20 -                               | 71.07 | July 19 -                             | -- a/ | July 3 -                                    | 98.2  |
| Sept. 22 -                              | 73.02 | Aug. 9 -                              | 89.67 | July 10 -                                   | 97.2  |
| Oct. 25 -                               | 72.16 | Aug. 19 -                             | 91.20 | July 17 -                                   | 98.3  |
| Nov. 18 -                               | 70.35 | Sept. 30 -                            | 94.40 | July 24 -                                   | 95.8  |
| Dec. 15 -                               | 69.23 | Oct. 25 -                             | 92.33 | July 31 -                                   | 96.5  |
| 1938 - Jan. 19 -                        | 68.95 | Nov. 18 -                             | 89.61 | Aug. 7 -                                    | 99.7  |
| Mar. 1 -                                | 68.33 | Dec. 15 -                             | 94.13 | Aug. 14 -                                   | 101.1 |
| Mar. 23 -                               | 68.61 | 1938 - Jan. 19 -                      | 87.39 | Aug. 21 -                                   | 96.0  |
| Apr. 22 -                               | 67.73 | Mar. 1 -                              | 86.80 | Aug. 28 -                                   | 99.7  |
| May 20 -                                | 69.30 | Mar. 23 -                             | 87.42 | Sept. 4 -                                   | 97.7  |
| June 23 -                               | 72.24 | Apr. 22 -                             | 85.82 | Sept. 11 -                                  | 97.0  |
| July 20 -                               | 75.00 | May 20 -                              | -- a/ | Sept. 18 -                                  | 101.6 |
| Aug. 25 -                               | 76.64 | June 23 -                             | 89.88 | Sept. 25 -                                  | 102.8 |
| Sept. 22 -                              | 77.40 | July 20 -                             | -- a/ | Oct. 2 -                                    | 103.8 |
| Oct. 20 -                               | 79.48 | Aug. 25 -                             | -- a/ | Oct. 9 -                                    | 101.5 |
| Nov. 21 -                               | 78.74 | Sept. 22 -                            | 94.57 | Oct. 16 -                                   | 98.1  |
| Dec. 20 -                               | 76.92 | Oct. 20 -                             | -- a/ | Oct. 23 -                                   | 95.8  |
| 1939 - Jan. 20 -                        | 75.17 | Nov. 25 -                             | -- a/ | Oct. 30 -                                   | 95.0  |
| Feb. 20 -                               | 74.83 | Dec. 20 -                             | -- a/ |   |       |
|   |       | 1939 - Jan. 20 -                      | -- a/ |   |       |
|   |       | Feb. 20 -                             | -- a/ |   |       |

a/ Pump running. b/ Pump running in nearby well.

(Continued on next page.)

Water level fluctuations in observation wells in the Houston area -- Continued

| <u>Well 1170-cont'd</u>           |                             |  | <u>Well 1176-cont'd</u> |                             |  | <u>Well 1187a c/</u>  |                             |  |
|-----------------------------------|-----------------------------|--|-------------------------|-----------------------------|--|---|-----------------------------|--|
| Date                              | Depth<br>to water<br>(feet) |  | Date                    | Depth<br>to water<br>(feet) |  | Date  | Depth<br>to water<br>(feet) |  |
| 1937 - Nov. 8                     | 91.17                       |  | 1937 - June 21          | 69.98                       |  | City of Pasadena, Pasadena City Hall property (North well). Depth, unknown. |                             |  |
| Nov. 27                           | 97.00                       |  | Aug. 4                  | 72.35                       |  | 1937 - Aug. 19  | 112.35                      |  |
| Dec. 4                            | 96.25                       |  | Aug. 19                 | 73.42                       |  | Sept. 22  | 118.63                      |  |
| Dec. 18                           | 100.00                      |  | Sept. 22                | 77.00                       |  | Oct.  | -- a/                       |  |
| Dec. 29                           | 99.00                       |  | Oct. 26                 | 74.55                       |  | Nov. 18   | 106.00                      |  |
| 1938 - Jan. 8                     | 95.08                       |  | Nov. 18                 | 74.45                       |  | Dec. 15   | 109.46                      |  |
| Jan. 22                           | 95.08                       |  | Dec. 15                 | 74.42                       |  | 1938 - Mar. 1   | 101.10                      |  |
| Feb. 5                            | 96.25                       |  | 1938 - Jan. 19          | 74.17                       |  | Mar. 23   | 104.56                      |  |
| Feb. 19                           | 94.25                       |  | Mar. 1                  | 65.58                       |  | Apr. 22   | 105.11                      |  |
| Feb. 26                           | 88.83                       |  | Mar. 23                 | 62.10                       |  | May 23  | 102.96                      |  |
| Mar. 4                            | 90.83                       |  | Apr. 22                 | 63.82                       |  | June 23   | 111.07                      |  |
| Mar. 11                           | 90.08                       |  | May 23                  | 59.36                       |  | July 20   | 114.31                      |  |
| Mar. 13                           | 94.42                       |  | June 23                 | 62.21                       |  | Aug. 25   | 113.65                      |  |
| Mar. 18                           | 90.08                       |  | July 20                 | 60.68                       |  | Sept. 22  | 118.15                      |  |
| Mar. 25                           | 92.17                       |  | Aug. 25                 | 60.93                       |  | Oct. 21   | 112.80                      |  |
| Apr. 4                            | 92.42                       |  | Sept. 22                | 61.89                       |  | Nov. 21   | -- a/                       |  |
| Apr. 11                           | 96.50                       |  | Oct. 21                 | 68.26                       |  | Dec. 20   | -- a/                       |  |
| Apr. 22                           | 90.00                       |  | Nov. 21                 | 64.33                       |  | 1939 - Jan. 18  | 114.87                      |  |
| Apr. 29                           | 93.83                       |  | Dec. 20                 | 65.71                       |  | Jan. 20   | -- a/                       |  |
| May 5                             | 97.00                       |  | 1939 - Jan. 20          | 62.26                       |  | Feb. 20   | -- a/                       |  |
| May 23                            | 95.58                       |  | Feb. 20                 | 62.94                       |  |   |                             |  |
| June 1                            | 96.00                       |  |                         |                             |  | <u>Well 1187 c/</u>   |                             |  |
| June 10                           | 92.83                       |  |                         |                             |  | City of Pasadena, Pasadena City Hall property (South Well). Depth, unknown. |                             |  |
| June 17                           | 96.4                        |  |                         |                             |  | 1937 - Sept. 22   | 114.22                      |  |
| June 24                           | 96.25                       |  |                         |                             |  | Oct. 25   | 114.22 b/                   |  |
| July 1                            | 92.58                       |  |                         |                             |  | Nov. 12   | 106.60                      |  |
| Aug. 26                           | 95.5                        |  |                         |                             |  | Dec. 15   | 110.32                      |  |
| Sept. 2                           | 93.0                        |  |                         |                             |  | 1938 - Jan. 19  | 109.29 b/                   |  |
| Sept. 9                           | 96.5                        |  |                         |                             |  | Mar. 1  | 101.69                      |  |
| Sept. 16                          | 96.5                        |  |                         |                             |  | Mar. 23   | 103.29                      |  |
| Sept. 23                          | 96.5                        |  |                         |                             |  | Apr. 22   | 100.60                      |  |
| Oct. 3                            | 97.5                        |  |                         |                             |  | May 20  | 105.96                      |  |
| Oct. 7                            | 99.5                        |  |                         |                             |  | June 23   | 109.81                      |  |
| Oct. 14                           | 101.0                       |  |                         |                             |  | July 20   | -- a/                       |  |
| Oct. 21                           | 100.5                       |  |                         |                             |  | Sept. 22  | -- a/                       |  |
| Oct. 28                           | 99.5                        |  |                         |                             |  | Oct. 21   | 113.22                      |  |
| Nov. 4                            | 99.5                        |  |                         |                             |  | Nov. 21   | 113.20 b/                   |  |
| Nov. 18                           | 95.5                        |  |                         |                             |  | Dec. 20   | 115.17 b/                   |  |
| Nov. 25                           | 95.0                        |  |                         |                             |  | 1939 - Jan. 20  | 110.72 b/                   |  |
| Dec. 2                            | 95.5                        |  |                         |                             |  | Feb. 20   | 111.39 b/                   |  |
| Dec. 9                            | 95.5                        |  |                         |                             |  |   |                             |  |
| Dec. 30                           | 95.5                        |  |                         |                             |  | <u>Well 1203</u>  |                             |  |
| 1939 - Jan. 6                     | 95.5                        |  |                         |                             |  | Harris County highway well. Depth, 600+ feet.                               |                             |  |
| Jan. 13                           | 96.5                        |  |                         |                             |  | 1938 - Feb. 3   | 30.37                       |  |
|                                   |                             |  |                         |                             |  | Mar. 11   | 36.45                       |  |
| <u>Well 1176</u>                  |                             |  |                         |                             |  | Oct. 25   | 36.39                       |  |
| Texas Co. Refg. Depth, 800+ feet. |                             |  |                         |                             |  | Nov. 23   | 41.18                       |  |
|                                   |                             |  |                         |                             |  | Dec. 19   | 44.29                       |  |
|                                   |                             |  |                         |                             |  | 1939 - Jan. 27  | 44.23                       |  |
|                                   |                             |  |                         |                             |  | <u>Well 1209</u>  |                             |  |
|                                   |                             |  |                         |                             |  | Fireworks Co. Depth, 650+ feet.   |                             |  |
|                                   |                             |  |                         |                             |  | 1937 - Aug. 13  | 48.01                       |  |
|                                   |                             |  |                         |                             |  | Nov. 3  | 50.55                       |  |
|                                   |                             |  |                         |                             |  | 1938 - Feb. 3   | 52.35                       |  |
|                                   |                             |  |                         |                             |  | May 11  | 51.02                       |  |
|                                   |                             |  |                         |                             |  | Oct. 25   | 54.23                       |  |
|                                   |                             |  |                         |                             |  | Nov. 23   | 55.75                       |  |
|                                   |                             |  |                         |                             |  | Dec. 19   | 55.56                       |  |
|                                   |                             |  |                         |                             |  | 1939 - Jan. 27  | 55.24                       |  |

Texas Co. Refg. Depth, 800+ feet.

a/ Pump running. b/ Pump running in nearby well.  
c/ No previous measurements published.

## Water level fluctuations in observation wells in the Houston area -- Continued

| <u>Well 1302</u>                |                             | <u>Well 1324-cont'd</u> |                             | <u>Well 1360</u>               |                             |
|---------------------------------|-----------------------------|-------------------------|-----------------------------|--------------------------------|-----------------------------|
| Date                            | Depth<br>to water<br>(feet) | Date                    | Depth<br>to water<br>(feet) | Date                           | Depth<br>to water<br>(feet) |
| City of Genoa. Depth, 832 feet. |                             | 1937 - Nov. 3 -         | -- a/                       | Mrs. -- Fain. Depth, 659 feet. |                             |
|                                 |                             | 1938 - Feb. 3 -         | 54.32                       |                                |                             |
|                                 |                             | May 11 -                | 55.81                       | 1937 - Nov. 3 -                | -- a/                       |
| 1937 - Aug. 13 -                | 65.18                       | Oct. 25 -               | 59.42                       | 1938 - Feb. 3 -                | 48.34                       |
| 1938 - May 11 -                 | 71.20                       | Nov. 23 -               | 52.98                       | May 11 -                       | 49.59                       |
| Oct. 25 -                       | 74.63                       | Dec. 19 -               | 58.70                       | Oct. 25 -                      | 53.63                       |
| Nov. 23 -                       | -- a/                       | 1939 - Jan. 27 -        | 58.70                       | Nov. 23 -                      | 52.98                       |
| Dec. 19 -                       | 75.56                       |                         |                             | Dec. 19 -                      | 52.84                       |
| 1939 - Jan. 27 -                | -- a/                       |                         |                             | 1939 - Jan. 27 -               | 52.62                       |

Well 1324 c/

J. M. West,  $1\frac{1}{2}$  miles north-west from South Houston.  
Depth, 400± feet.

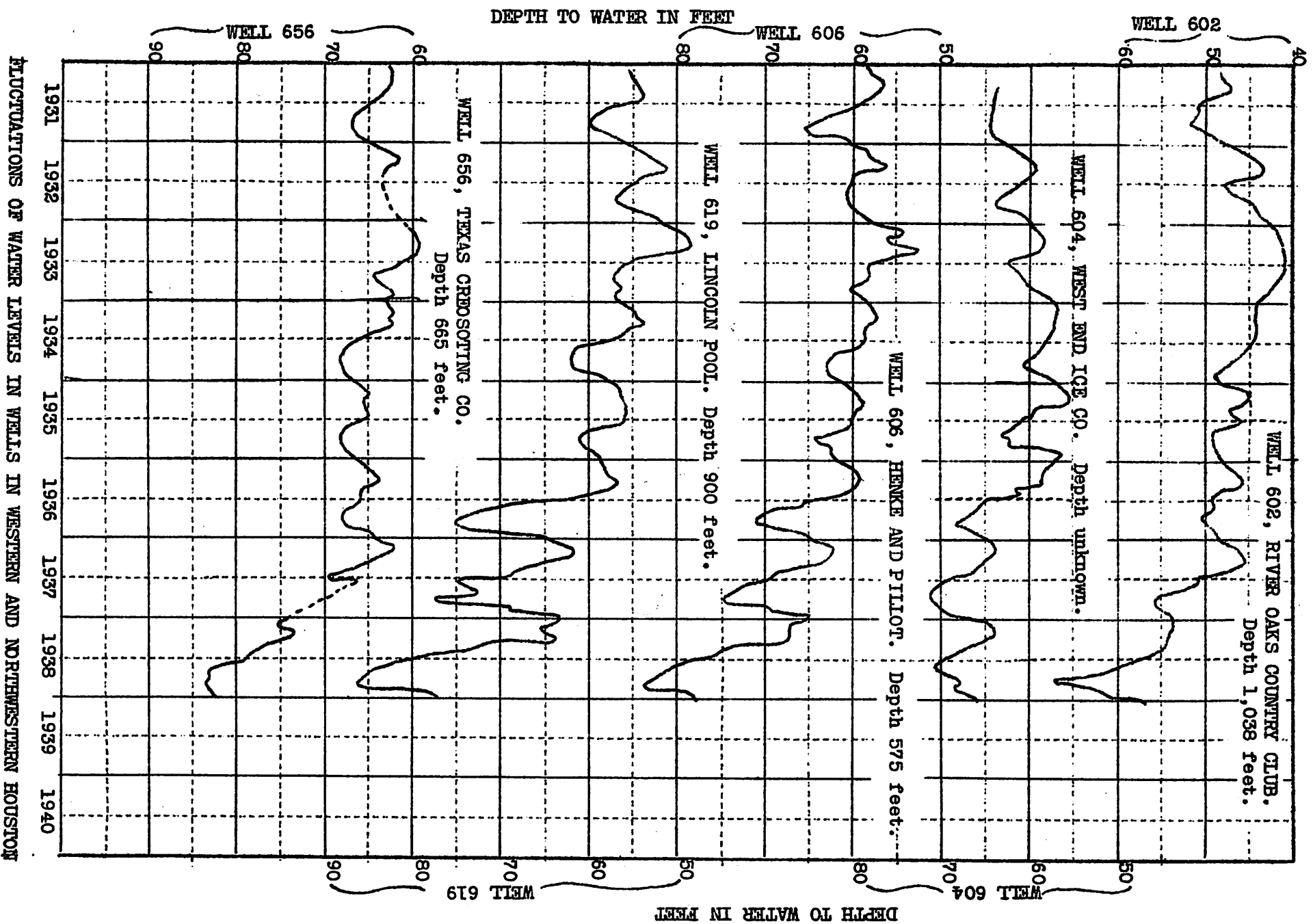
1937 - Aug. 13 - 60.34 b/

a/Pump running. b/Pump running in nearby well. c/No previous measurements published.

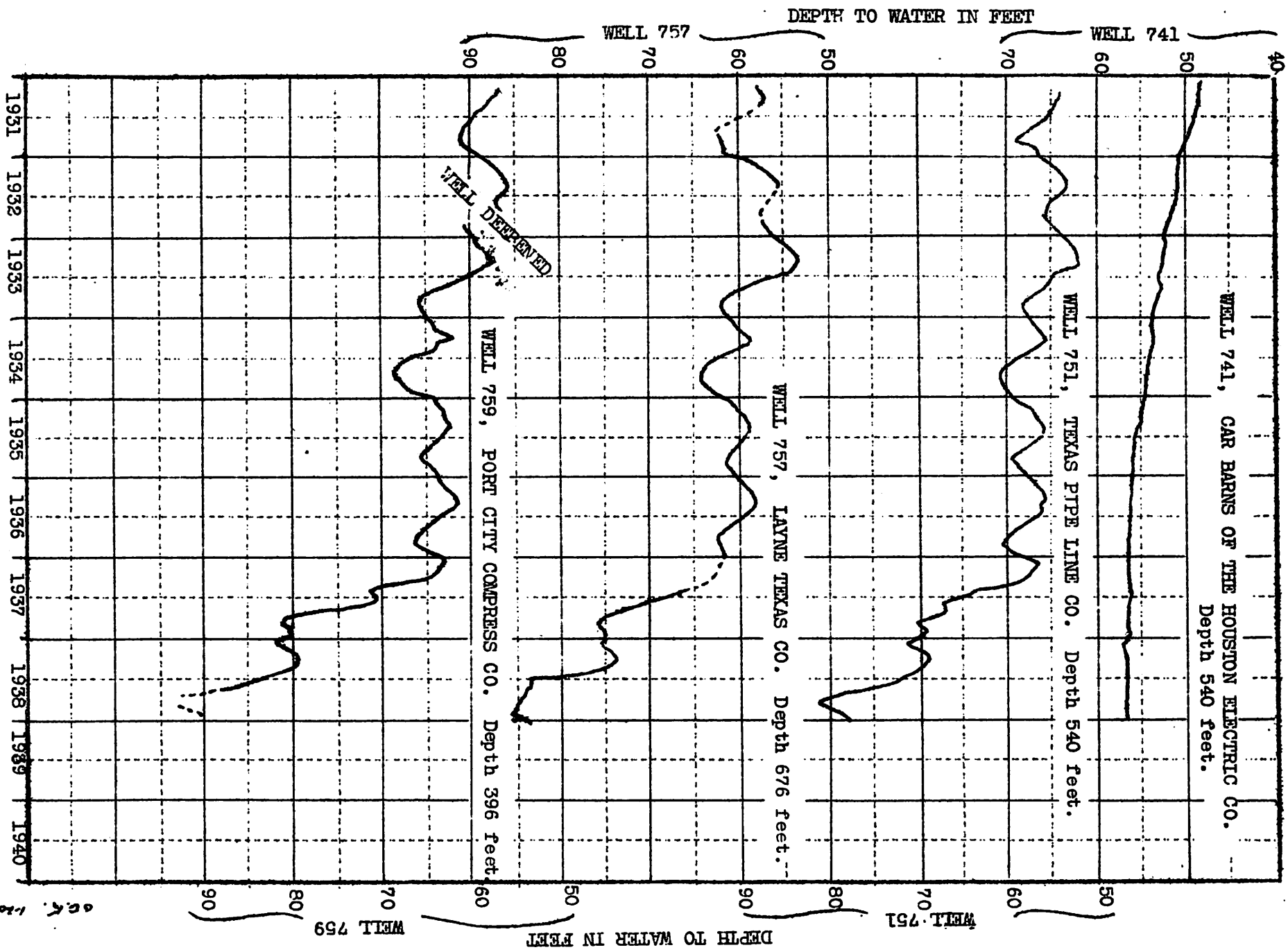
## Water level fluctuations in observation wells in Galveston County, Texas

| <u>Well 26</u>   |                             | <u>Well 113</u>                   |                             | <u>Well 206</u>                        |                             |
|--|-----------------------------|-----------------------------------|-----------------------------|--|-----------------------------|
| Date   | Depth<br>to water<br>(feet) | Date                              | Depth<br>to water<br>(feet) | Date                                   | Depth<br>to water<br>(feet) |
| Galveston, Houston and<br>Henderson Railway. Depth,<br>1,020 feet. |                             | E. Menotti. Depth, 504<br>feet.   |                             | A. J. Biran. Depth, 926<br>feet.       |                             |
| 1937 - Aug. 13 -   | 18.31                       | 1937 - Aug. 13 -                  | 23.75                       | 1937 - Aug. 13 -                       | 39.82                       |
| Nov. 3 -   | 18.14                       | Nov. 3 -                          | -- a/                       | Nov. 3 -                               | 41.52                       |
| 1938 - Jan. 4 -  | 17.18                       | 1938 - Jan. 4 -                   | 24.43                       | 1938 - Feb. 3 -                        | 33.77                       |
| May 11 -   | 15.78                       | May 11 -                          | 25.07                       | May 12 -                               | 40.02                       |
| Oct. 25 -  | 17.66                       | Oct. 25 -                         | 29.91                       | Oct. 25 -                              | 42.93                       |
| Nov. 23 -  | 17.61                       | Nov. 23 -                         | 30.87                       | Nov. 23 -                              | 43.20                       |
| Dec. 19 -  | 17.87                       | Dec. 23 -                         | 33.31 a/                    | Dec. 19 -                              | 39.96                       |
| 1939 - Jan. 27 -   | 16.80                       | 1939 - Jan. 27 -                  | 35.44 a/                    | 1939 - Jan. 27 -                       | 41.51                       |
| <u>Well 112</u>  |                             | <u>Well 115</u>                   |                             | <u>Well 272</u>                        |                             |
| Galveston, Houston and<br>Henderson Railway. Depth,<br>750 feet.   |                             | J. W. Palmer. Depth, 526<br>feet. |                             | City of Galveston. Depth,<br>809 feet. |                             |
| 1937 - Aug. 13 -   | 49.82                       | 1937 - Aug. 13 -                  | 35.34                       | 1937 - Aug. 13 -                       | 60.17                       |
| Nov. 3 -   | 51.08                       | Nov. 3 -                          | 36.06                       | Nov. 3 -                               | 55.81                       |
| 1938 - Jan. 4 -  | 48.41                       | 1938 - Jan. 4 -                   | 50.40 b/                    | 1938 - Feb. 5 -                        | 53.78 b/                    |
| May 12 -   | 54.85                       | May 12 -                          | 42.45                       | May 12 -                               | 61.65                       |
| Oct. 25 -  | 61.79                       | Oct. 25 -                         | 38.34                       | Oct. 25 -                              | 67.12 b/                    |
| Nov. 23 -  | 60.25                       | Nov. 23 -                         | 56.54 b/                    | Nov. 23 -                              | 70.83                       |
| Dec. 19 -  | 58.80                       | Dec. 19 -                         | 42.00                       | Dec. 19 -                              | 66.50                       |
| 1939 - Jan. 27 -   | 56.07                       | 1939 - Jan. 27 -                  | 62.42 b/                    | 1939 - Jan. 27 -                       | 61.33                       |

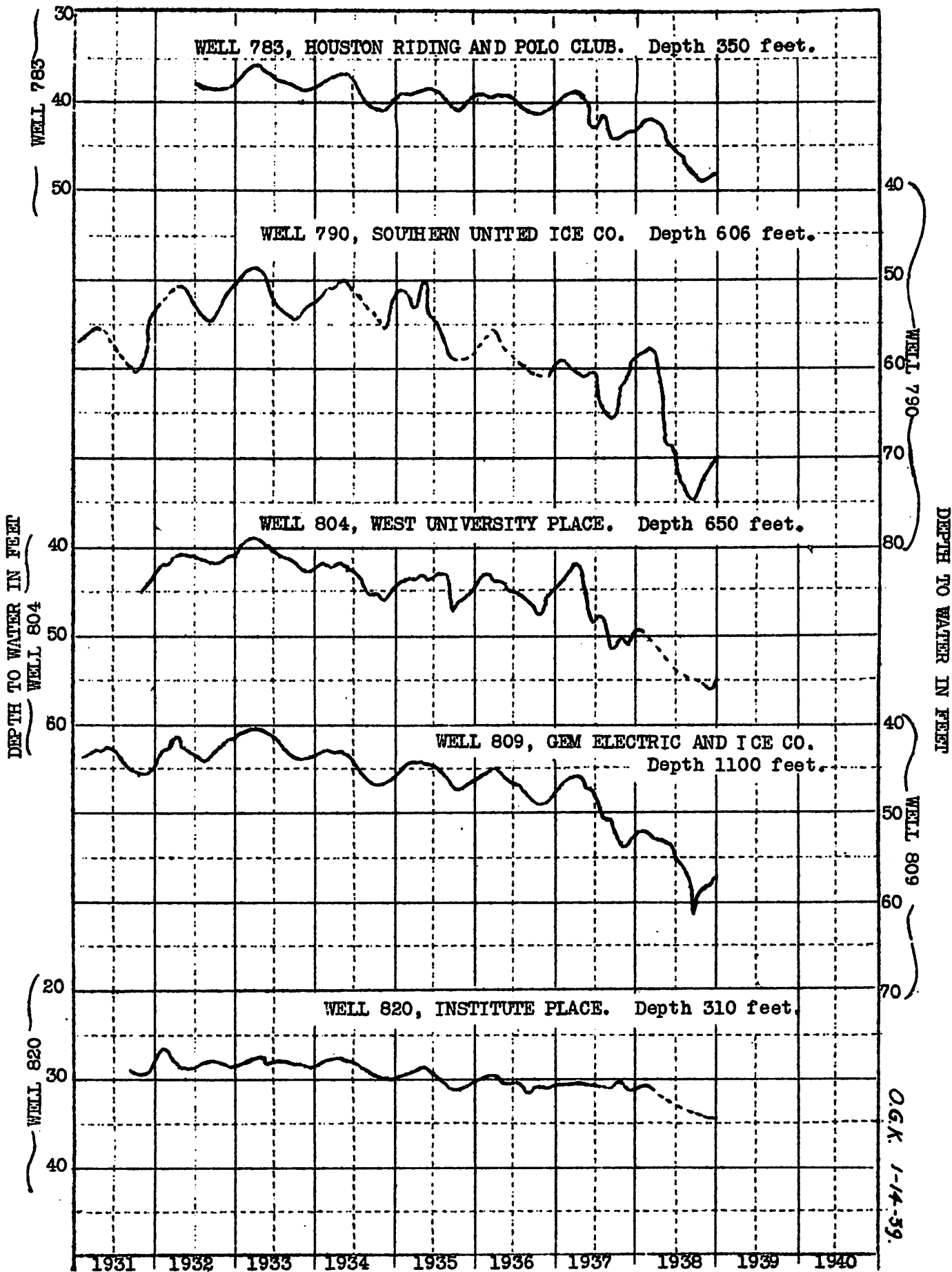
a/Pump running. b/Pump running in nearby well. c/No previous measurements published.



FLUCTUATIONS OF WATER LEVELS IN WELLS IN NORTHEASTERN HOUSTON

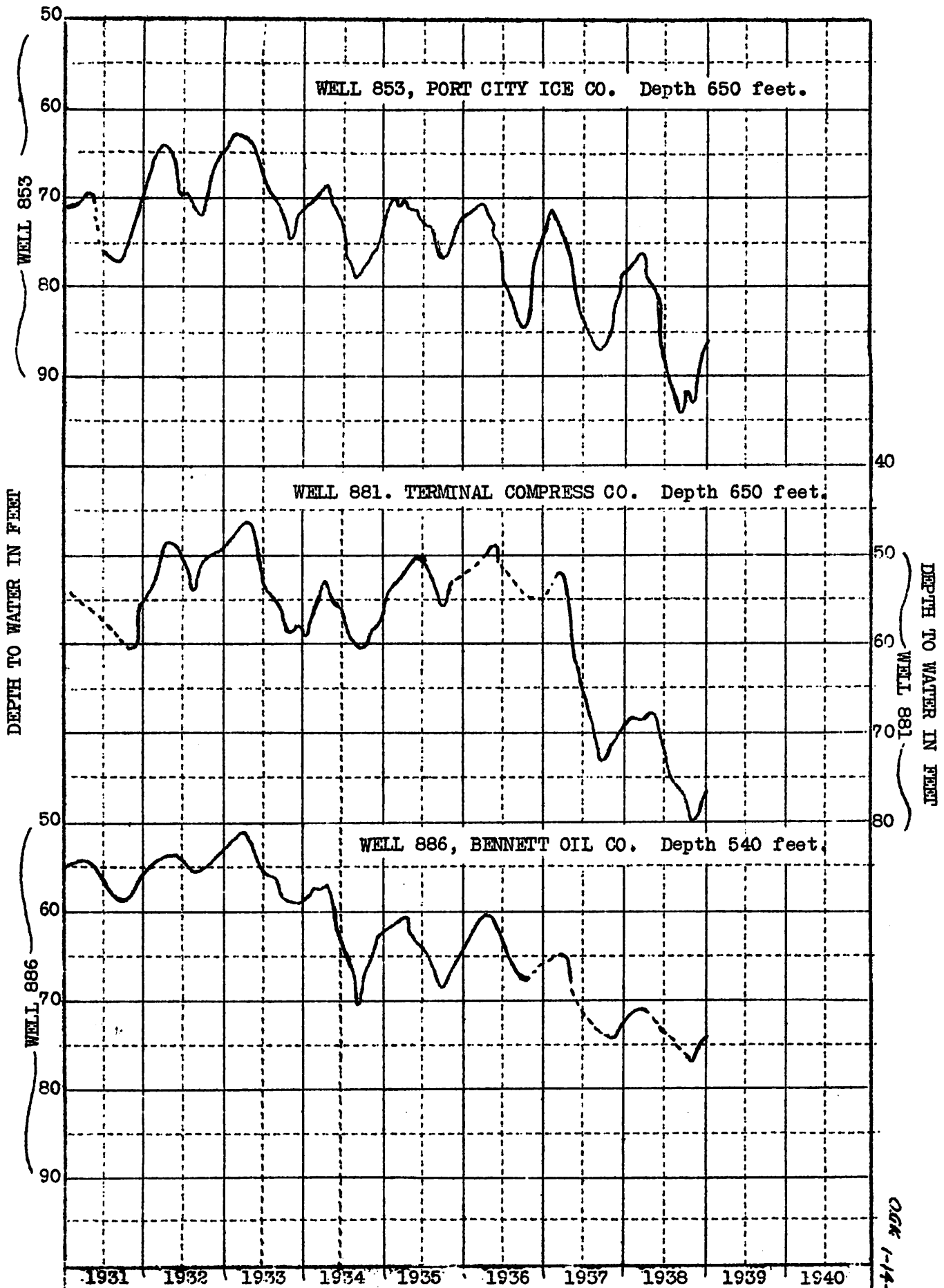


U.S.G.P. 11-2-38



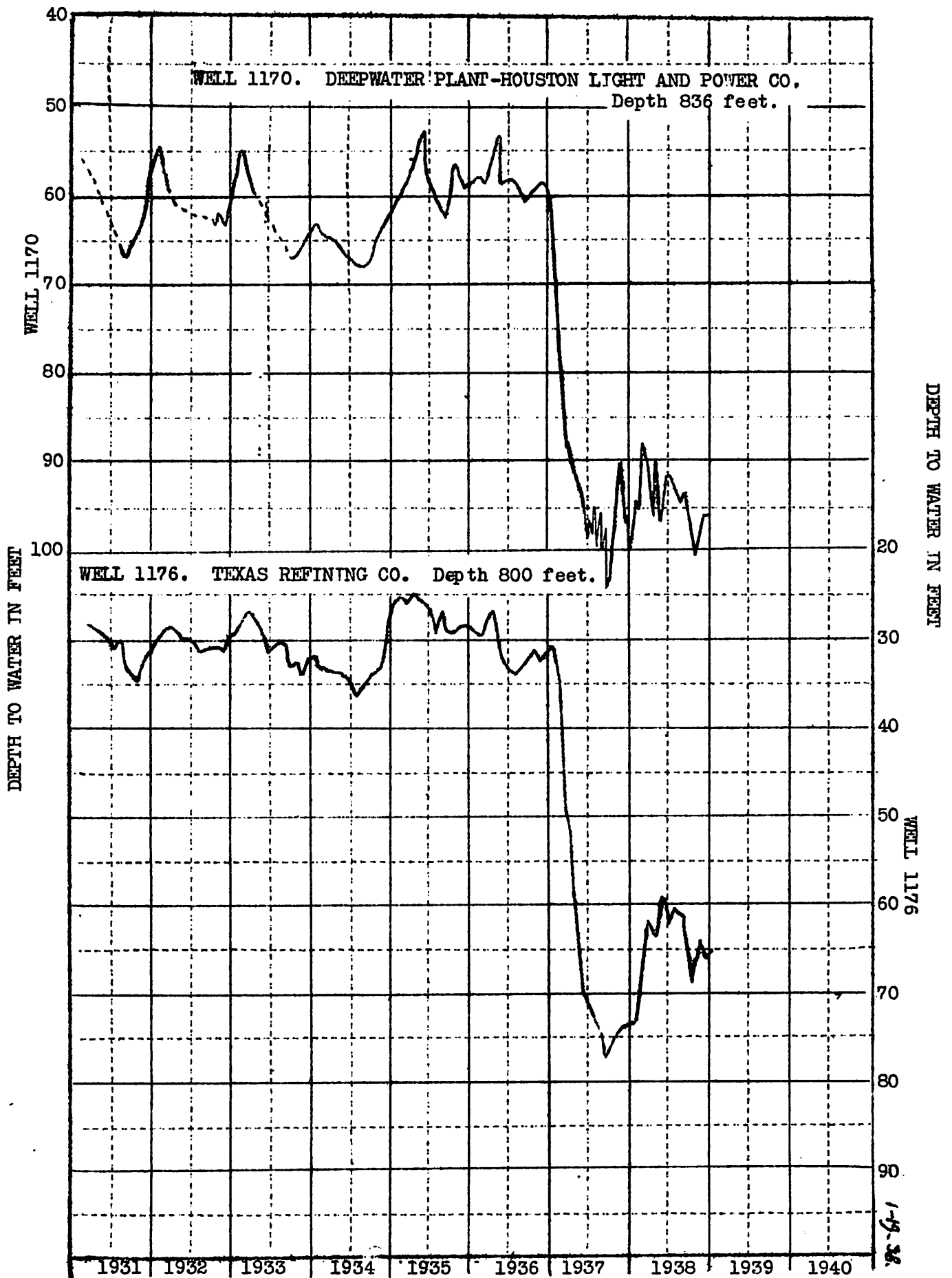
FLUCTUATIONS OF WATER LEVELS IN WELLS IN SOUTHWESTERN HOUSTON





FLUCTUATIONS OF WATER LEVELS IN WELLS IN SOUTHEASTERN HOUSTON

OKK 1-14-39.



FLUCTUATIONS OF WATER LEVELS IN WELLS IN PASADENA AREA