SELECTED METHODS OF MAPPING SANDSTONES OF THE "CHEROKEE GROUP," TOWNSHIPS 17 AND 18 NORTH, RANGES 8 AND 9 EAST, CREEK COUNTY, OKLAHOMA

By

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CHAPTER 1

INTRODUCTION

Location and General Statement

The area included in this study is located on the Central Oklahoma Platform (Figure 1), and comprises four townships: Townships 17 and 18 North, Ranges 8 and 9 East, Creek County, Oklahoma (Figure 2). Two of Oklahoma's most productive petroleum fields, the Cushing Oil Field and the Glenn Pool, are near the study area (Figure 3). The stratigraphic section of interest is the so-called "Cherokee Group" of Desmoinesian age, composed of marker-beds of thin limestones and coals, of shales, and petroleum reservoirs of sandstone. In descending order, the reservoir rocks are the Prue Sandstone, the Upper Skinner Sandstone, the Lower Skinner Sandstone, the Red Fork Sandstone, and the Bartlesville Sandstone (Figure 4).

Of the strata that compose the Cherokee Group, only the Verdigris Limestone and the Inola Limestone are formal rock-stratigraphic units; other strata bear the informal names of subsurface rock-stratigraphic units, inherited from nomenclature historically used in the petroleum industry (Figure 4). By conventional rules of stratigraphic nomenclature, the lithic terms of only the formal rock-stratigraphic units should be capitalized. However the lithic term of each stratigraphic name is capitalized, in hope of reducing confusion, which tends to arise in this manner: Consider the term "Red Fork sandstone" -- Does the word "sandstone" mean "the mappable rock unit that is called 'Red Fork.'?" Or does it mean "Sandstone that is in the mappable unit called 'Red Fork'.?" In this document, the term "Red Fork Sandstone" (and terms of similar construction) refers to the mappable series of strata (delineated above and below by marker-beds) that is known as the "Red Fork." Conversely, the term "Red Fork sandstone" means specifically "Sandstone within the mappable series of strata that is known as the 'Red Fork'." The rules of stratigraphic nomenclature have been "bent" for the benefit of utility.

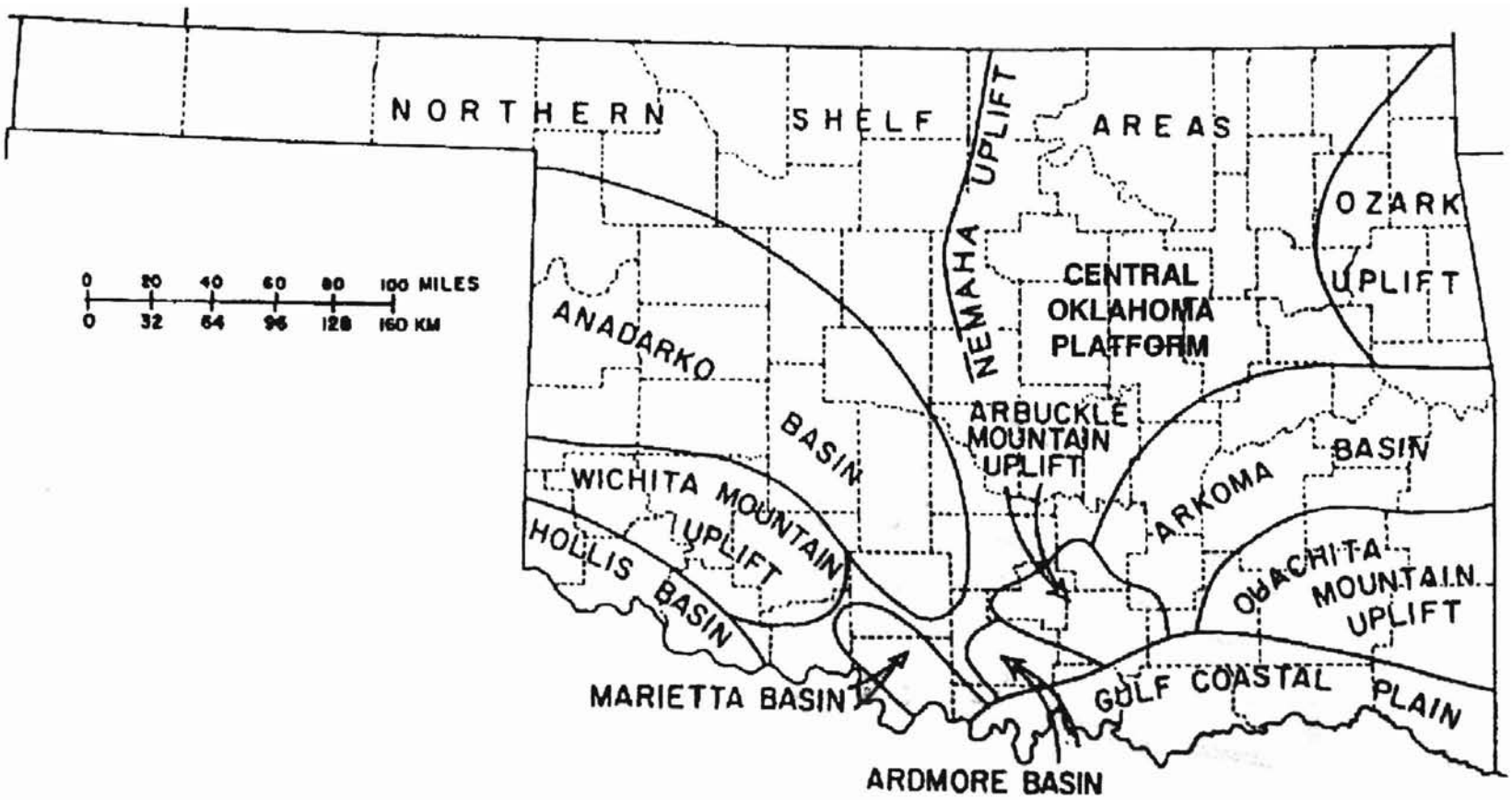


Figure 1. Major geologic provinces of Oklahoma (after Stirling, 1998).

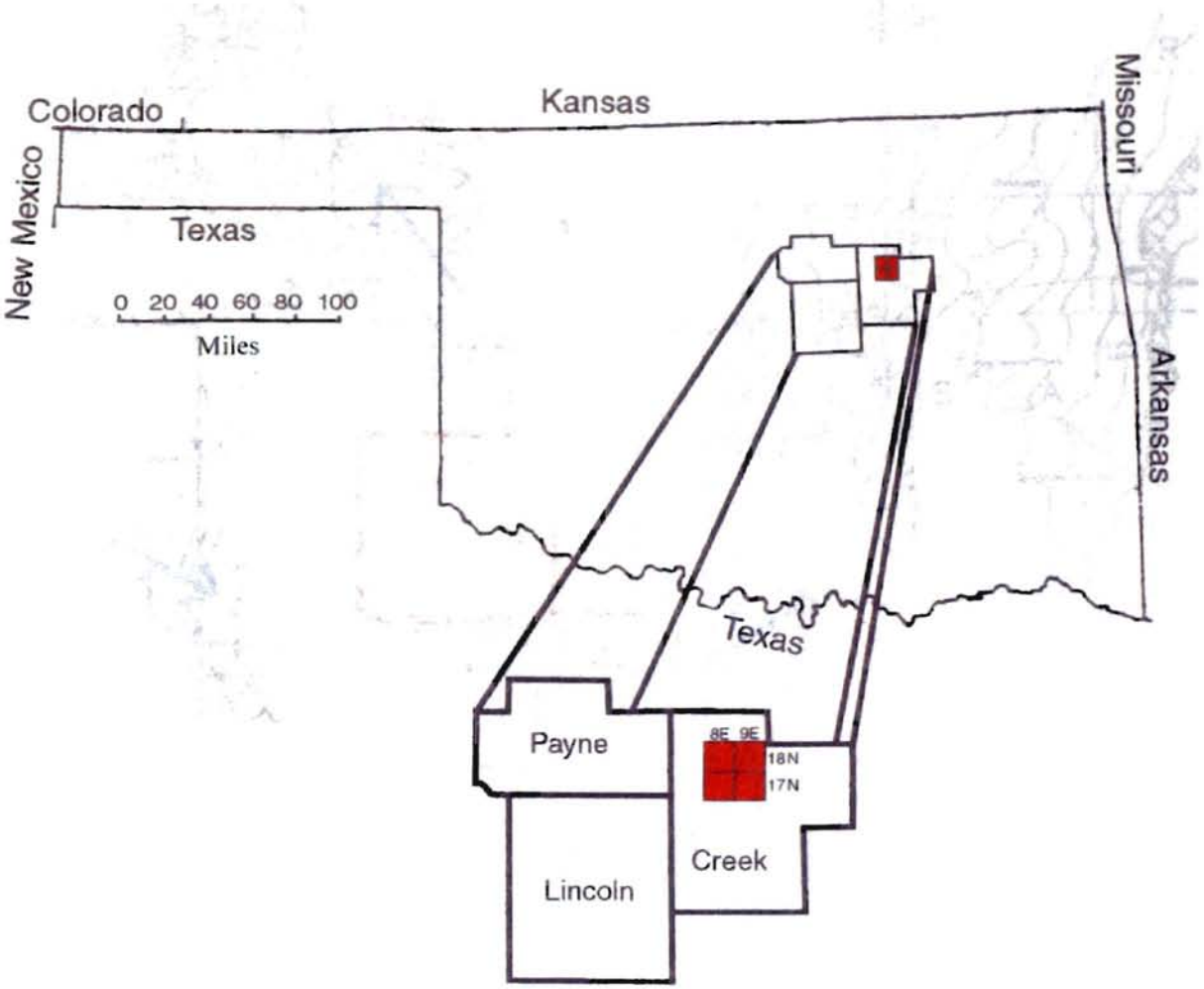


Figure 2. Location of study area.

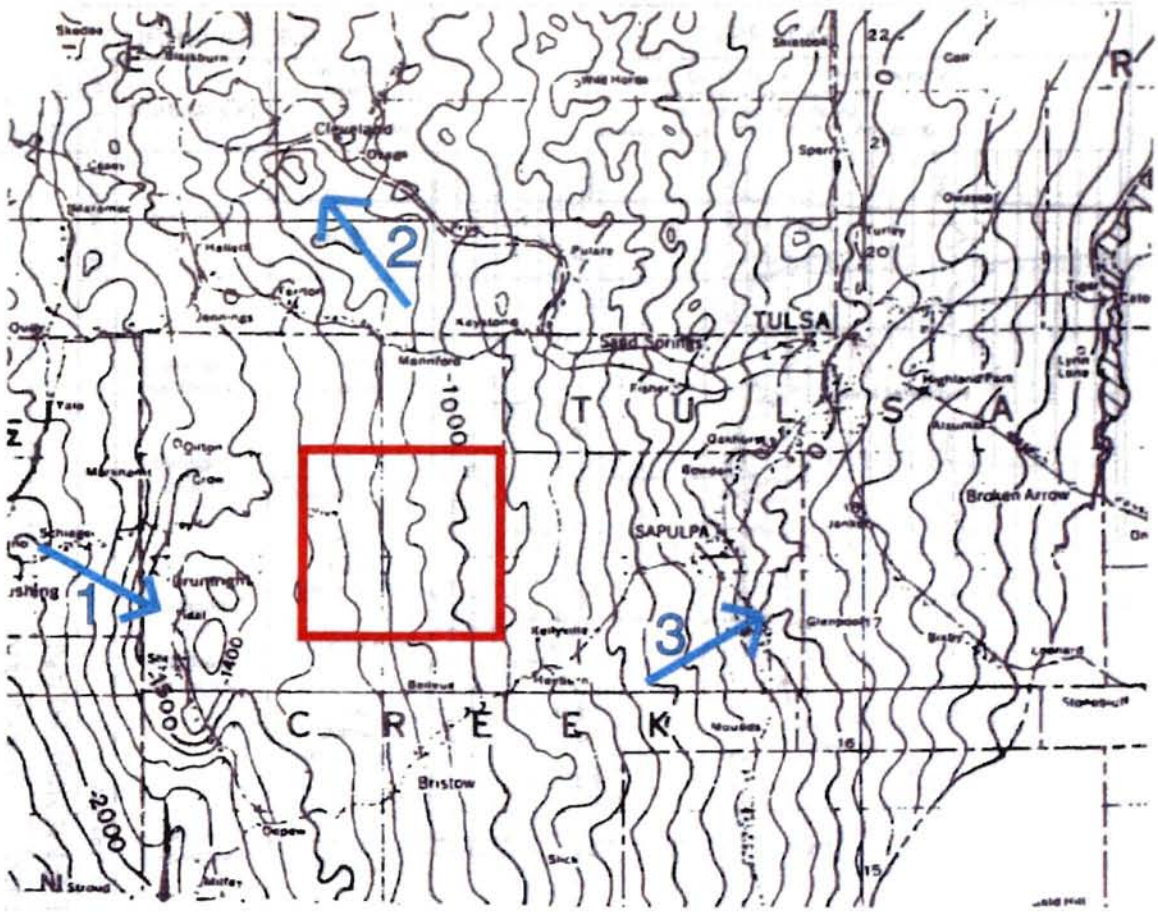


Figure 3. Structural configuration of the Oswego Limestone in the region that includes the study area. Boundaries of study area shown in red. Arrows show locations of Cushing Oil Field (1), Cleveland Pool (2), and Glenn Pool (3). Study area is in region of homoclinal dip, among the three large folds (modified from Fritz, 1978).

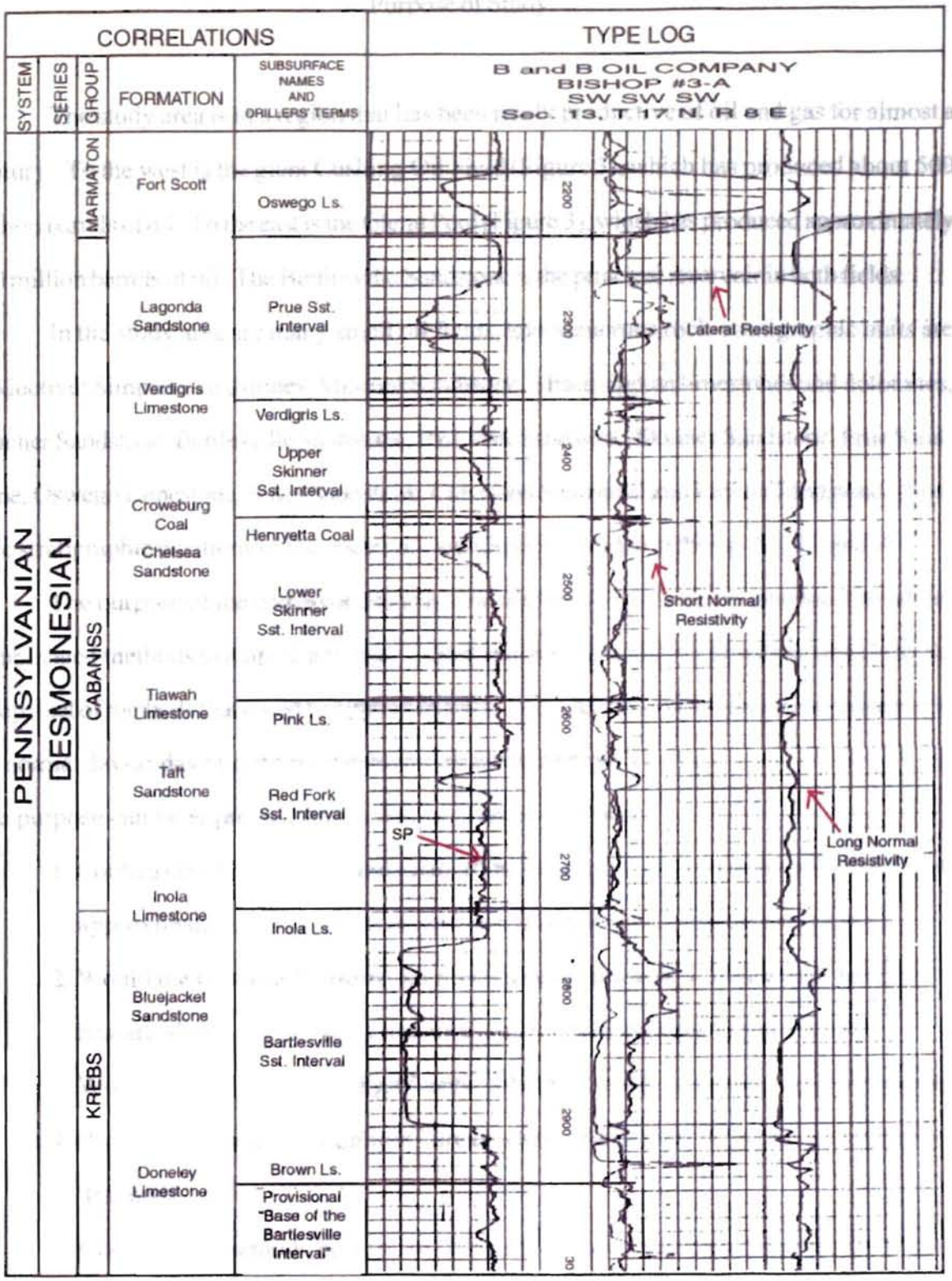


Figure 4. "Type" electric log and stratigraphic section of rocks included in the study. Brown Limestone is about 15 ft. above bed denoted as the Provisional Base of the Bartlesville Interval.

Purpose of Study

The study area is in a region that has been richly productive of oil and gas for almost a century. To the west is the giant Cushing Oil Field (Figure 3), which has produced about 500 million barrels of oil. To the east is the Glenn Pool (Figure 3), which has produced approximately 300 million barrels of oil. The Bartlesville Sandstone is the principal reservoir in both fields.

In the study area are many small oil fields, and numerous rock-stratigraphic units are productive: Simpson sandstones, Misener Sandstone, Mississippian limestones and dolomites, Dutcher Sandstone, Bartlesville Sandstone, Red Fork Sandstone, Skinner Sandstone, Prue Sandstone, Oswego Limestone, Jones Sandstone, Cleveland Sandstone and Layton Sandstone. (Specific stratigraphic positions of the reservoirs are shown by Jordan (1959, p. 81, 87, and 91).)

The purpose of the endeavor described herein was twofold: (1) to develop a set of uncomplicated methods to map "Cherokee" sandstones for subsurface exploration, and (2) to develop a set of methods that could be applied rapidly -- even hastily, a circumstance so common in the normal day-to-day operations of exploration for oil and gas.

The purpose can be expressed differently as a set of questions:

1. Could a set of uncomplicated methods be developed and tested for effective "first-approximation" of distribution and configuration of Cherokee sandstones?
2. Would the methods be suited for practical evaluation of a "drilled-up" area where data are abundant, oil fields are small, and remaining reserves are small?
3. Would the methods "highlight" areas where oil and gas are known to be trapped?
4. Would the methods "highlight" areas where undiscovered oil and gas might be trapped?
5. Could these methods be applied effectively under the normal operational constraints of applied petroleum geology?

Previous Investigations

Desmoinesian rocks of north-central Oklahoma have been studied closely for many years. Oakes (1953) divided the Desmoinesian Series into the Krebs and Cabaniss Groups. Very good accounts of the general stratigraphy and lithic properties of the groups were presented by Jordan (1959) and Moore (1979), among others. Stratigraphy, depositional environments, lithic properties and petroleum geology of sandstone reservoirs in north-central Oklahoma have been reported in illuminating detail by Andrews and others (1997), Astarita (1975), Balke (1984), Clayton (1965), Graves (1955), Hanke (1967), Kuykendall (1985), Lojek (1983), Mason (1982), Northcutt (1997), Roark (1992), Ropp (1991), Shelton (1973), Shipley (1975), Stirling (1998), Tate (1985), and Visher and others (1971).

Petroleum geology of the region and of nearby areas has been described progressively across the span of many years. The petroleum geology of Creek County was set out by Jordan (1959). Chenoweth (1979) and Visher and others (1971) reviewed exploration for and development of petroleum in Pennsylvanian sandstones of Oklahoma. Petroleum geology of Desmoinesian rocks near the study area or moderately distant from it was documented by Astarita (1975), Balke (1984), Clayton (1965), Fath (1925), Furlow (1968), Graves (1955), Kuykendall (1985), Lojek (1983), Mason (1982), Northcutt (1997), Ropp (1991), Shipley (1975), Stirling (1998), and Tate (1985).

Scores of references are omitted here, because the information presented above is sufficient for the purpose of this study; denigration of the work of other geologists is neither intended nor implied.

CHAPTER 2

METHODS OF INVESTIGATION

Correlation of Well Logs

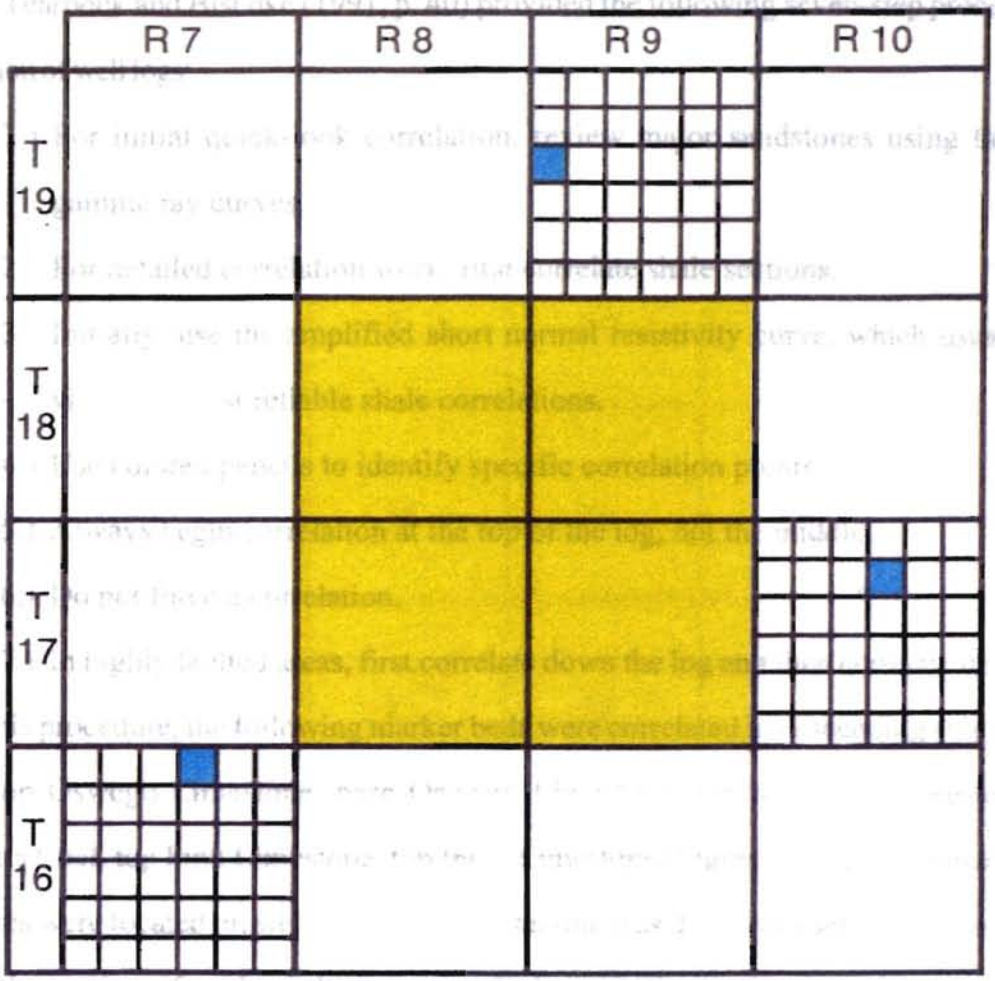
Tearpock and Bischke (1991, p. 37) defined correlation as, "...the determination of structural or stratigraphic units that are equivalent in time, age, or stratigraphic position." Correlating the equivalent stratigraphic positions of several marker beds was vital for preparation of the isolith and structural contour maps of this study.

The first step taken to correlate the well logs of the thesis area was to acquire a type-log. For purposes of this study, the style of type-log required was a correlation type-log. Tearpock and Bischke (1991, p. 42) defined a correlation type-log as a "...log which exhibits a complete stratigraphic section in a field or regional area of study." A reliable source of correlation type-logs for Oklahoma is the Tulsa Geological Society, Inc.

The type-logs are North Central Creek County Mannford Area type-log (Sec. 18, T 19N, R 9E), West Central Creek County Cushing Anticline type-log (Sec. 3, T 16N, R 7E), and Central Creek County West Kellyville Field type-log (Sec. 10, T 17N, R 10E). Of the available type-logs, these are of wells near the thesis area (Figure 5). Three type-logs were used, so that correlation would be based on logs from as many adjoining townships as type-logs were available. This "multiple-reference" approach to correlation tended to minimize inconsistencies.

Of the three type-logs acquired, the West Central Creek County Cushing Anticline type-log is from the well that is closest to the study area. This well is approximately three miles from the southwestern boundary of T 17N, R 8E (Figure 5). The log is the most likely to be similar to well logs of the study area; therefore, correlation was begun from this type-log, toward and into T 17N, R 8E.

For correlation from the West Central Creek County Cushing Anticline type-log into T 17N, R 8E, a set of logs from wells between the chosen type-log well and the southwestern



Study Area

Locations Of Type Logs

Figure 5 Locations of wells illustrated by Tulsa Geological Society type logs, used for correlation of well logs in the study area.

corner of T 17N, R 8E were borrowed from the Oklahoma Well Log Library, in Tulsa.

Tearpock and Bischke (1991, p. 40) provided the following seven-step procedure for correlation of well logs:

1.) For initial quick-look correlation, review major sandstones using the SP or gamma ray curves.

2.) For detailed correlation work, first correlate shale sections.

3.) Initially, use the amplified short normal resistivity curve, which usually provides the most reliable shale correlations.

4.) Use colored pencils to identify specific correlation points.

5.) Always begin correlation at the top of the log, not the middle.

6.) Do not force a correlation.

7.) In highly faulted areas, first correlate down the log and then correlate up the log.

Using this procedure, the following marker beds were correlated in descending stratigraphic order: top Oswego Limestone, base Oswego Limestone, top Verdigris Limestone, top Henryetta Coal, top Pink Limestone, top Inola Limestone (Figure 4). Once the marker-bed signatures were located on well logs, a horizontal line was drawn to signify the corresponding depth-location of each of these marker beds, with the appropriate name assigned to each. Having completed the correlations between the type-log(s) and the southwestern corner of T 17N, R 8E, a "spider-web" pattern of well logs from the southwestern sections of T 17N, R 8E was chosen (Figure 6). In this type of correlation, each well log was compared to several others, which reduced the probability of miscorrelation. All logs that were acquired from T 17N, R 8E were correlated in the same manner.

Well logs from the sections in T 17N, R 8E that border other townships of the study area were used to extend correlation eastward and northward, until logs throughout the study area were correlated. During this process, the well logs were correlated to the type-logs where appropriate.

Well-log signatures of the rock sequences considered are relatively consistent; no major

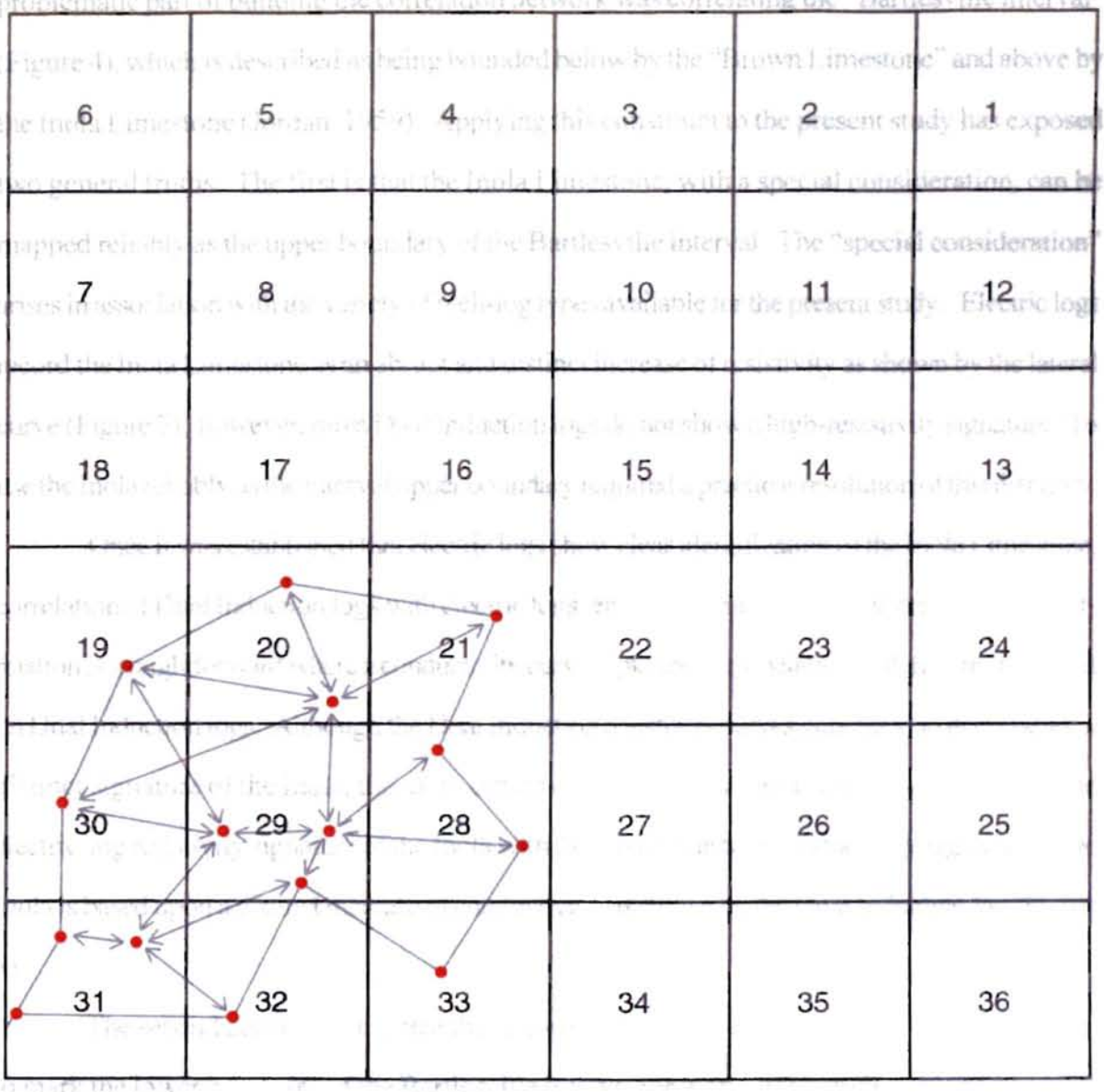


Figure 6. Diagrammatic example of log-correlation network. In this fashion, well-logs were correlated throughout the study area.

structural features, such as large-scale faults or folds, were recognized to be disruptive. The most problematic part of building the correlation network was correlating the "Bartlesville interval" (Figure 4), which is described as being bounded below by the "Brown Limestone" and above by the Inola Limestone (Jordan, 1959). Applying this constraint to the present study has exposed two general truths. The first is that the Inola Limestone, with a special consideration, can be mapped reliably as the upper boundary of the Bartlesville interval. The "special consideration" arises in association with the variety of well-log types available for the present study. Electric logs record the Inola Limestone as an abrupt and distinct increase of resistivity as shown by the lateral curve (Figure 7); however, most Dual Induction logs do not show a high-resistivity signature. To use the Inola reliably as the interval upper boundary required a practical resolution of this disparity.

Once it was established that electric logs show clear identification of the Inola Limestone, correlation of Dual Induction logs with electric logs tended to minimize inconsistencies. This correlation is straightforward where a conductivity curve is plotted in association with resistivity curves on Dual Induction logs. Although the Dual Induction resistivity curves generally do not produce a distinct signature of the Inola, the more sensitive conductivity curve does. Correlation of the electric-log resistivity signature of the Inola with the Dual Induction conductivity signature of the Inola is based upon a distinct increase in conductivity, as shown by the Dual Induction log (Figure 8).

The second general truth is that the "Brown Limestone" (Figure 4) cannot be relied upon to mark the lower boundary of the Bartlesville interval throughout the study area. Many wells penetrated thick Bartlesville channel-fill sandstones. At many locations, these channels were eroded below the Brown Limestone. Of necessity, a provisional "Base of Bartlesville Interval" was correlated. The stratum is about 15 ft. below the Brown Limestone (Figure 4). The log signature is similar from well to well; the marker is dependable in correlation and mapping. This signature was used successfully to correlate the base of the Bartlesville interval for all townships in the study area. However, strata recorded at this stratigraphic position are missing (example shown by Figure 9) at approximately twenty-five locations; probably they were removed by erosion. Most of these

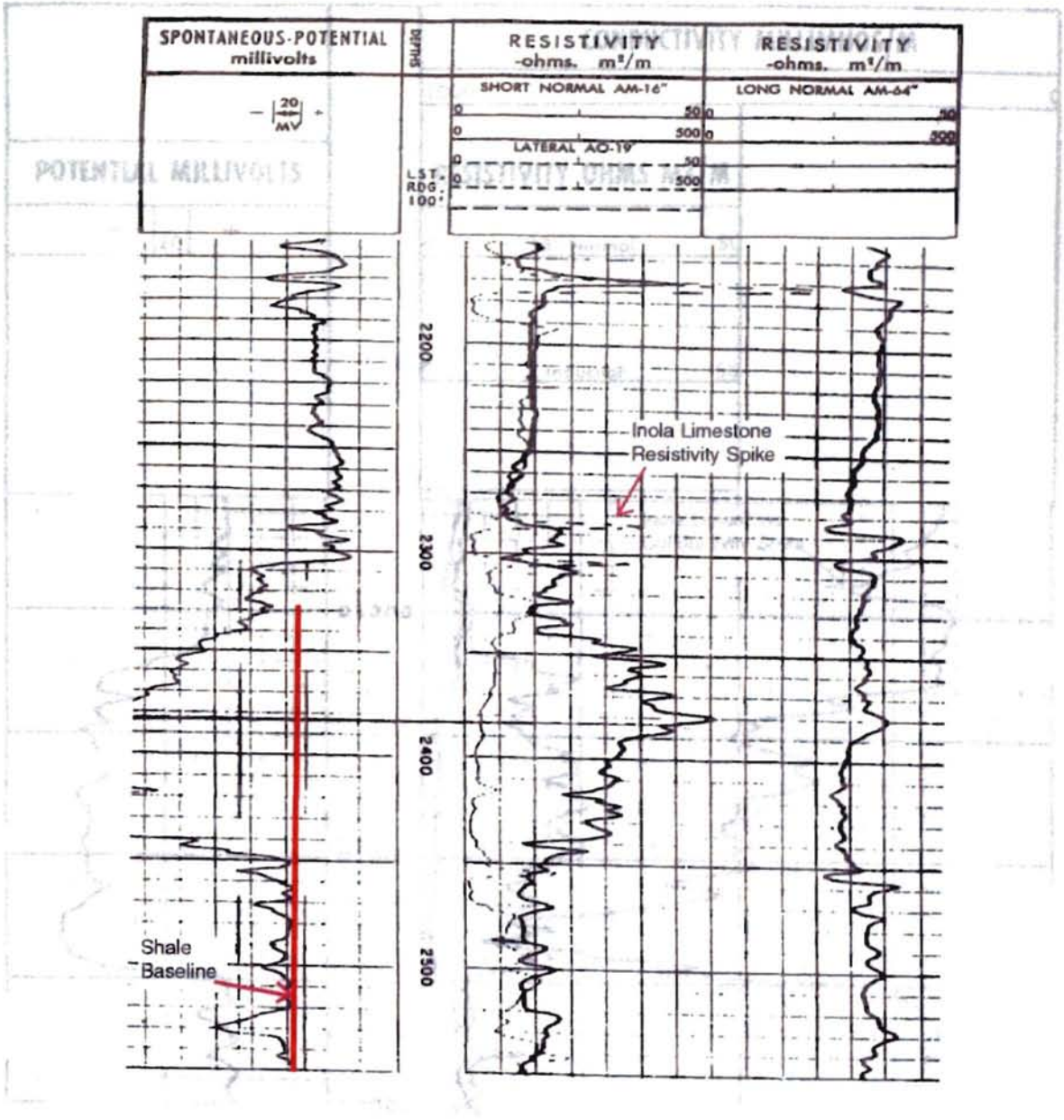


Figure 7. Lateral-curve resistivity spike indicating the position of the Inola Limestone. Note "crater" on long normal curve. The log is an electric log of the St. Anthony Development Co. Marlin No. 1, Sec. 24, T 17N, R 9E, SW SE NE.

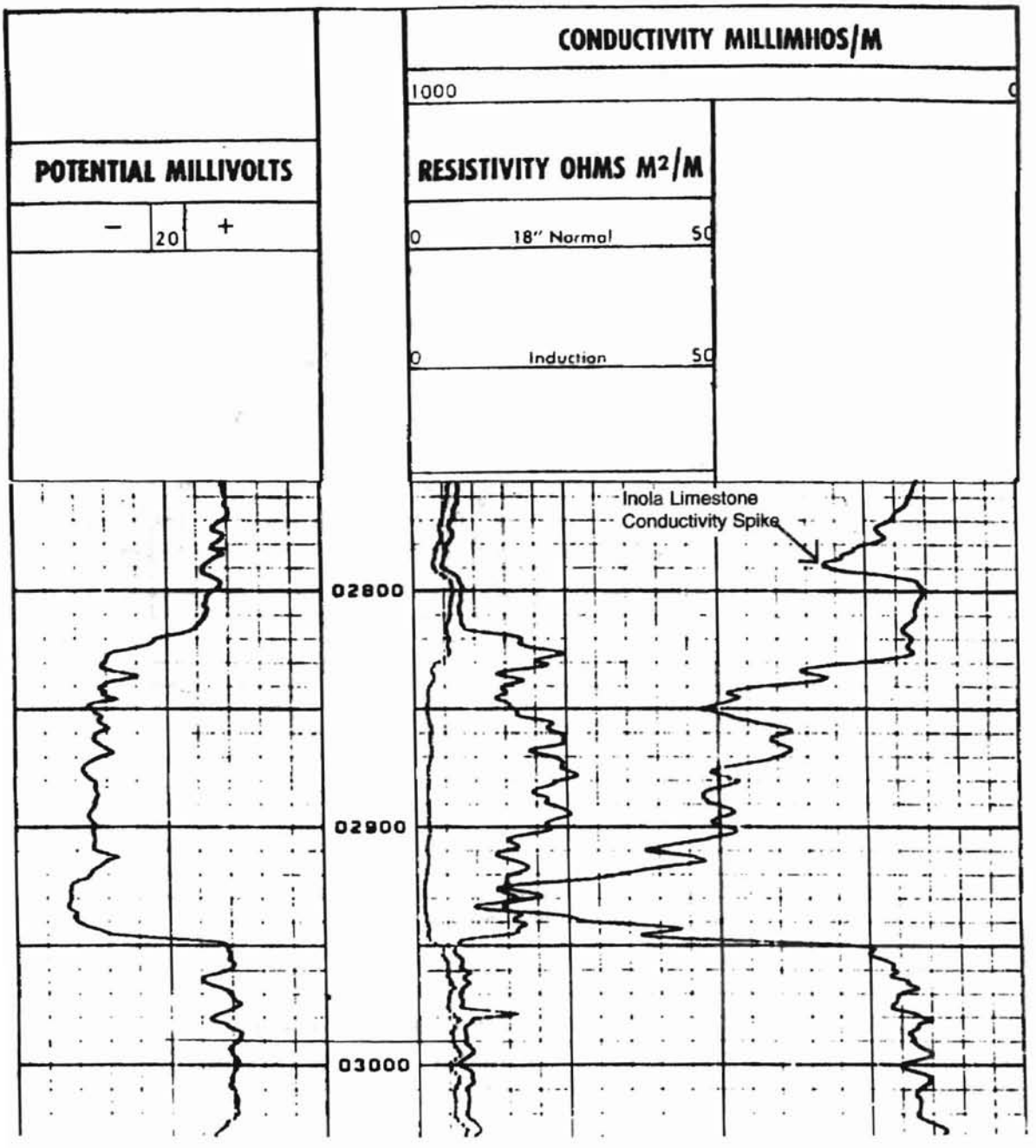


Figure 8. Conductivity spike indicating the position of the Inola Limestone. The base of the conductive bed is coincident with the top of the Inola Limestone.

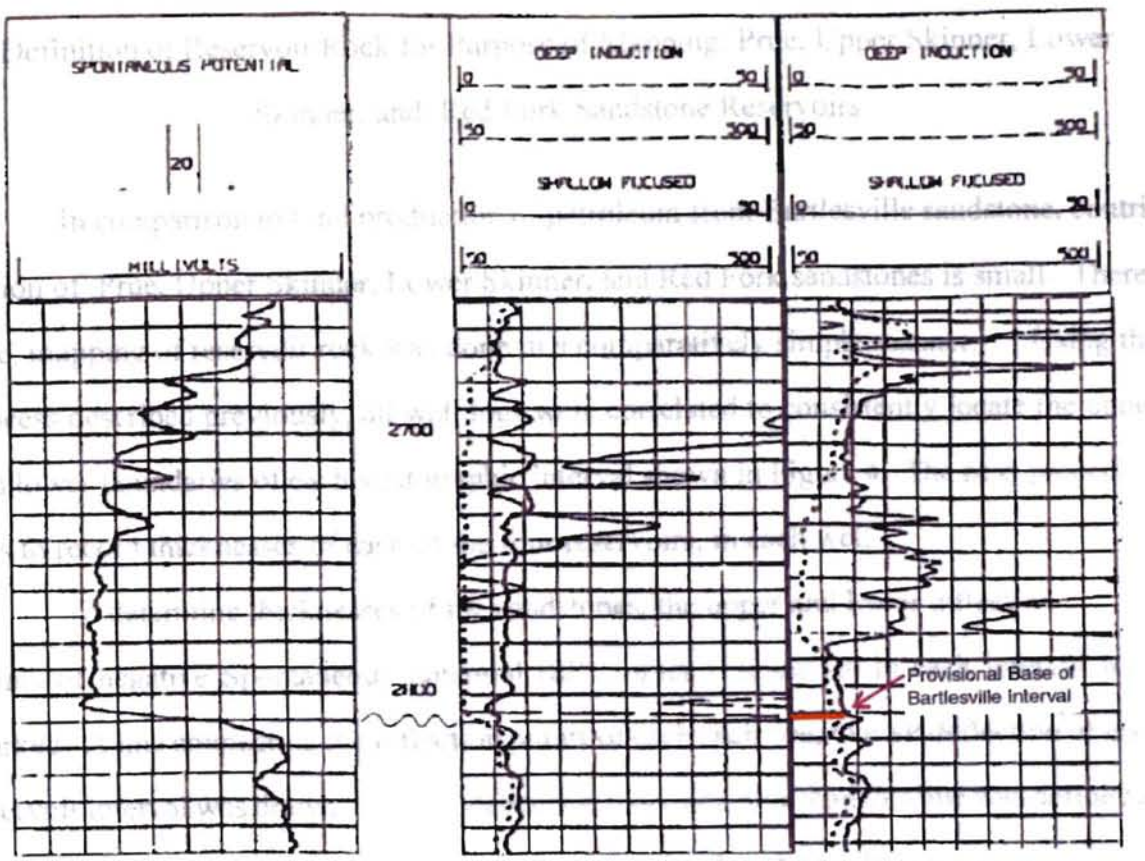


Figure 9. Sample well log illustrating the deep induction and the shallow-focused well-log signatures of the Bartlesville interval, where the provisional marker-bed of the base is shown (right-most column). Central column shows resistivity-signature of a well where the marker-bed is absent. Presumedly the marker-beds were removed by erosion of a channel, in which Bartlesville sandstone was deposited.

locations are in T 18N, R 9E, but a few are in T 18N, R 8E. No stratigraphic sections of this type were found in T 17N, R 8E or T 17N, R 9E.

Definition of Reservoir Rock for Purpose of Mapping: Prue, Upper Skinner, Lower Skinner, and Red Fork Sandstone Reservoirs

In comparison to total production of petroleum from Bartlesville sandstone, contribution of Prue, Upper Skinner, Lower Skinner, and Red Fork sandstones is small. Therefore, mapping of reservoir rock was done in a comparatively simple manner. Using the process described previously, all well logs were correlated to consistently locate the upper and lower boundaries of each stratigraphic interval shown in Figure 4. The next procedure was to record thicknesses of each of the four reservoirs, in each well.

To determine thicknesses of the sandstones, the upper and lower inflection points of negative Spontaneous Potential (SP) curves (Figure 10) in each interval were marked. A line connecting the inflection points of each such negative SP deflection of each reservoir interval was drawn. Any SP deflection more negative than this line was defined as representing reservoir sandstone (Figure 10). To determine the total sandstone in each producing interval, the span between the upper and lower inflection points was measured. Then these multiple span measurements were summed for each producing interval and converted to feet by comparison to the ten-foot scales posted on the well logs. The net-sandstone thickness values for each of the producing intervals were recorded by well location to separate basemaps, one basemap of each producing interval. Lines of equal thickness were drawn to simplify the data.

Definition of Reservoir Rock for Purpose of Mapping: Bartlesville Sandstone Reservoir

In comparison to other Cherokee sandstones of the study area, the widespread, multistoried, multilateral Bartlesville Sandstone is complex. Therefore division and mapping of sandstone in the Bartlesville interval became the primary effort in this study. The generalized approach used to define reservoir rock for the purpose of mapping with respect to the Prue, Skinner and Red Fork

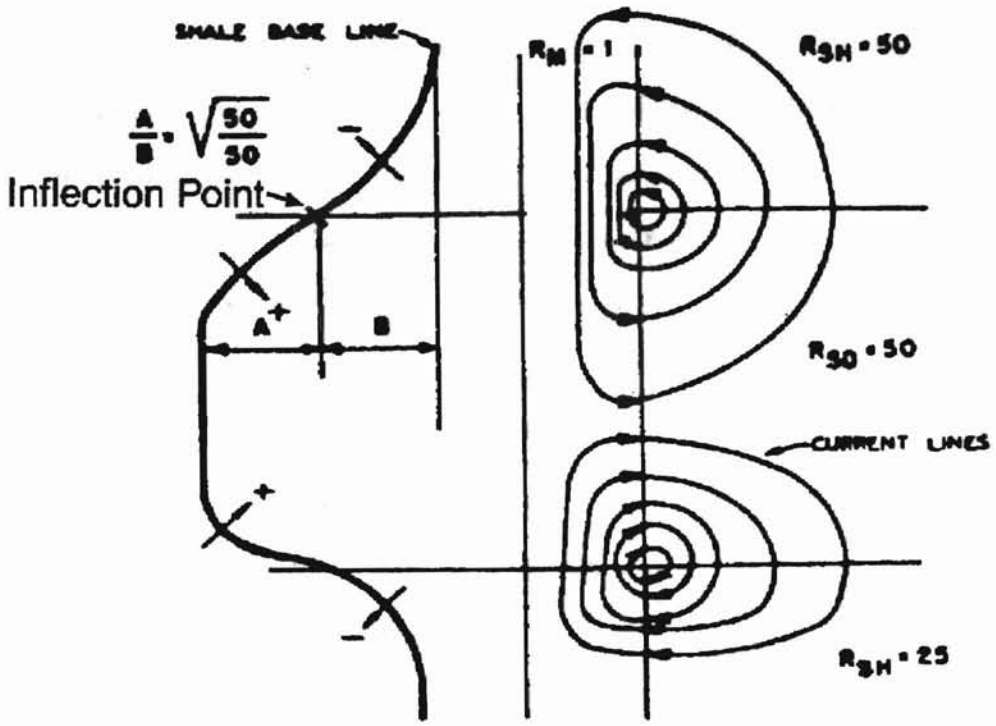


Figure 10. Illustration of the method used to measure the thicknesses of strata of sandstone in the Prue, Skinner, and Red Fork intervals. Inflection points of negative SP signatures were located; a line was drawn connecting the inflection points. Any SP signature left of this line was defined as sandstone of petroleum-reservoir quality. (Modified from Ross and others, 1979, p.24.)

sandstone was not sufficient. With respect to sandstone(s) of the Bartlesville interval, an adequate definition of reservoir rock for the purpose of mapping required estimation of porosity and permeability of the rock.

Well-logging tools used to estimate the amount of porosity in reservoir rock are different from those used to estimate permeability. In the study area, logs of a well commonly include a version of a spontaneous potential/resistivity log (electric-log, DIL, DISFL, DIEL) combined with a porosity log (compensated density, neutron, or sonic) or a microlog -- a "permeability" log -- but generally not both. In the set of approximately 1000 well logs used in this study, only nine included a version of an electric-log/induction log, a porosity log, and a permeability log. Because so few "complete sets" were available, a method was developed to supplement the collection.

Some wells with porosity logs are close by wells with micrologs. If two wells were within the same quarter-section, then they were considered to be close enough to be a matching pair; logs of these pairs were used to supplement the "complete sets." Also, if two wells were in adjacent quarter-sections but were not farther apart than 1320 ft. (the width of a 40-acre tract), and if the log-signatures of the wells showed sections of sandstone of similar thickness and configuration, then these wells were also considered to be matching pairs. For general description of reservoir sandstone, distance between wells of 2640 ft. or less was defined as "acceptably close" because important overall characteristics of the reservoir should not differ appreciably across such a distance. If the definition of "acceptably close" had been more restrictive, then the number of workingpairs compiled to constitute a study group would have been insufficient for statistically stable estimates of porosity and permeability across the study area. Well logs available for each township were divided into three stacks: (1) those well-log suites that contained a version of an electric log and a microlog, (2) sets composed of an induction log and a porosity log, and (3) sets composed only of an electric log or an induction log. Locations of wells in sets 1 and 2 were plotted on the six-inch by six-inch township figures; the two sets were distinguished by color (for example, see Figure 11).

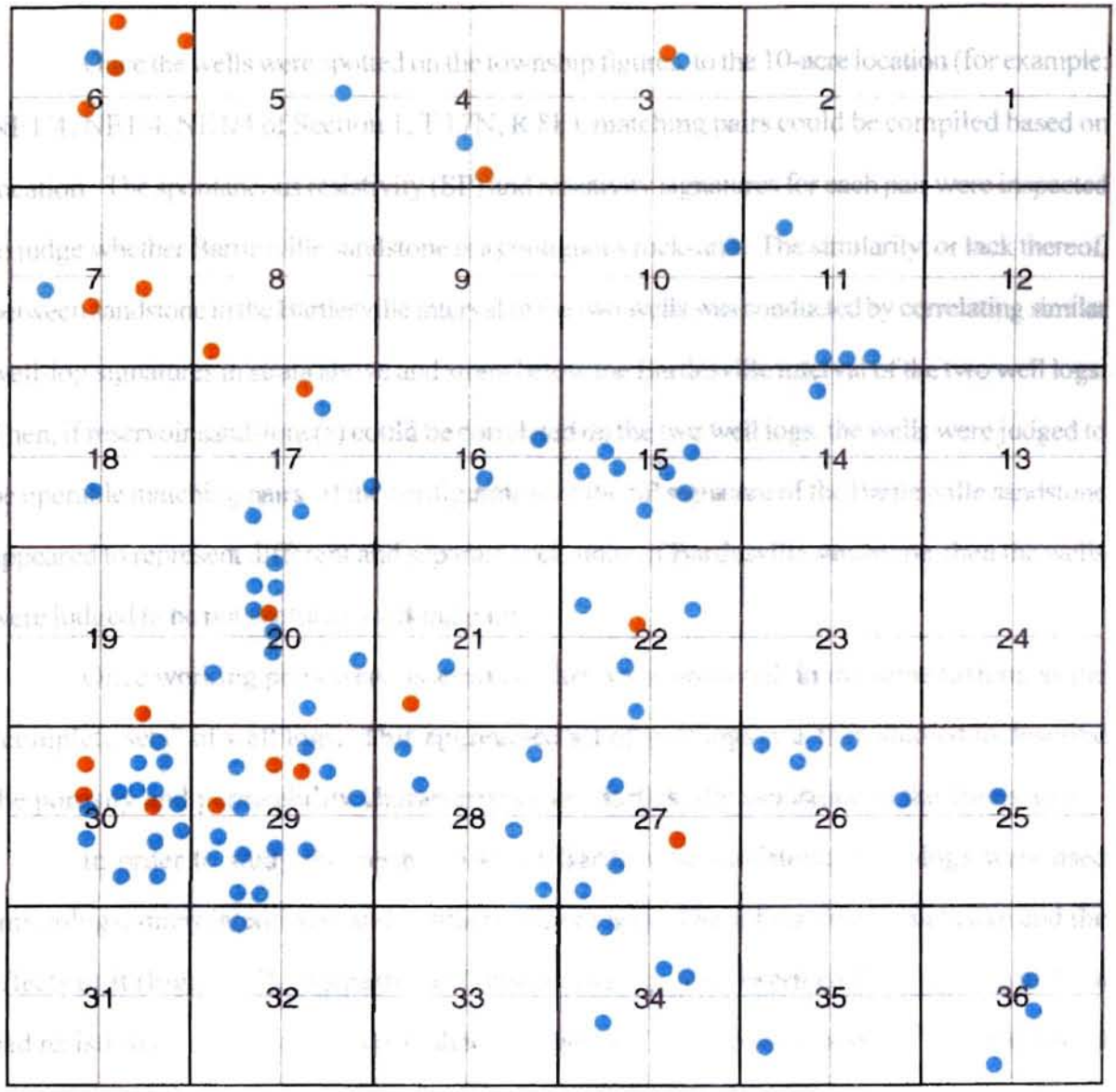


Figure 11. Locations of wells with well-log suites in T 18 N, R 9 E; suites consisted of and electric log and a microlog or an induction and a density-neutron log. Plotting each suite was necessary, so that well log suites that measured both porosity and/or permeability could be compiled.

Once the wells were spotted on the township figures, to the 10-acre location (for example: NE1/4, NE1/4, NE1/4 of Section 1, T 17N, R 8E), matching pairs could be compiled based on location. The spontaneous resistivity (SP) and resistivity signatures for each pair were inspected to judge whether Bartlesville sandstone is a contiguous rock-unit. The similarity, or lack thereof, between sandstone in the Bartlesville interval of the two wells was conducted by correlating similar well-log signatures in strata above and strata below the Bartlesville interval of the two well logs. Then, if reservoir sandstone(s) could be correlated on the two well logs, the wells were judged to be operable matching pairs. If the configuration of the SP signature of the Bartlesville sandstone appeared to represent different and separate rock-units of Bartlesville sandstone, then the wells were judged to be not useful as working pairs.

Once working pairs were assembled, they were analyzed in the same fashion as the "complete sets" of well logs. This aggregated set of well logs was then studied to describe the porosity and permeability characteristics of Bartlesville sandstone in the thesis area.

In order to study the permeability of Bartlesville sandstone, micrologs were used (micrologs, microlaterologs, and contact caliper logs). These logs detect mud cake and the effects of it (Figure 12). Asquith and Gibson (1982, p. 43) described the microlog as "...a pad resistivity device that primarily detects mudcake." The pad consists of three electrodes spaced one inch apart. From the pad, in contact with the borehole-wall, two measurements of resistivity are made; one is called micronormal resistivity and the other is microinverse resistivity. The micronormal device "investigates" three to four inches into the formation (and measures resistivity of the flushed zone) whereas the microinverse device investigates approximately one to two inches deep and measures primarily the resistivity of mud cake. Detection of mud cake (commonly only one-fourth to three-fourths of an inch thick) indicates that the formation is invaded, and therefore that the formation is permeable. Permeable zones are shown on the microlog as "positive separation" whereas micronormal curves record higher resistivity than microinverse curves.

The first step in analyzing micrologs was to mark the top and bottom of the zone of

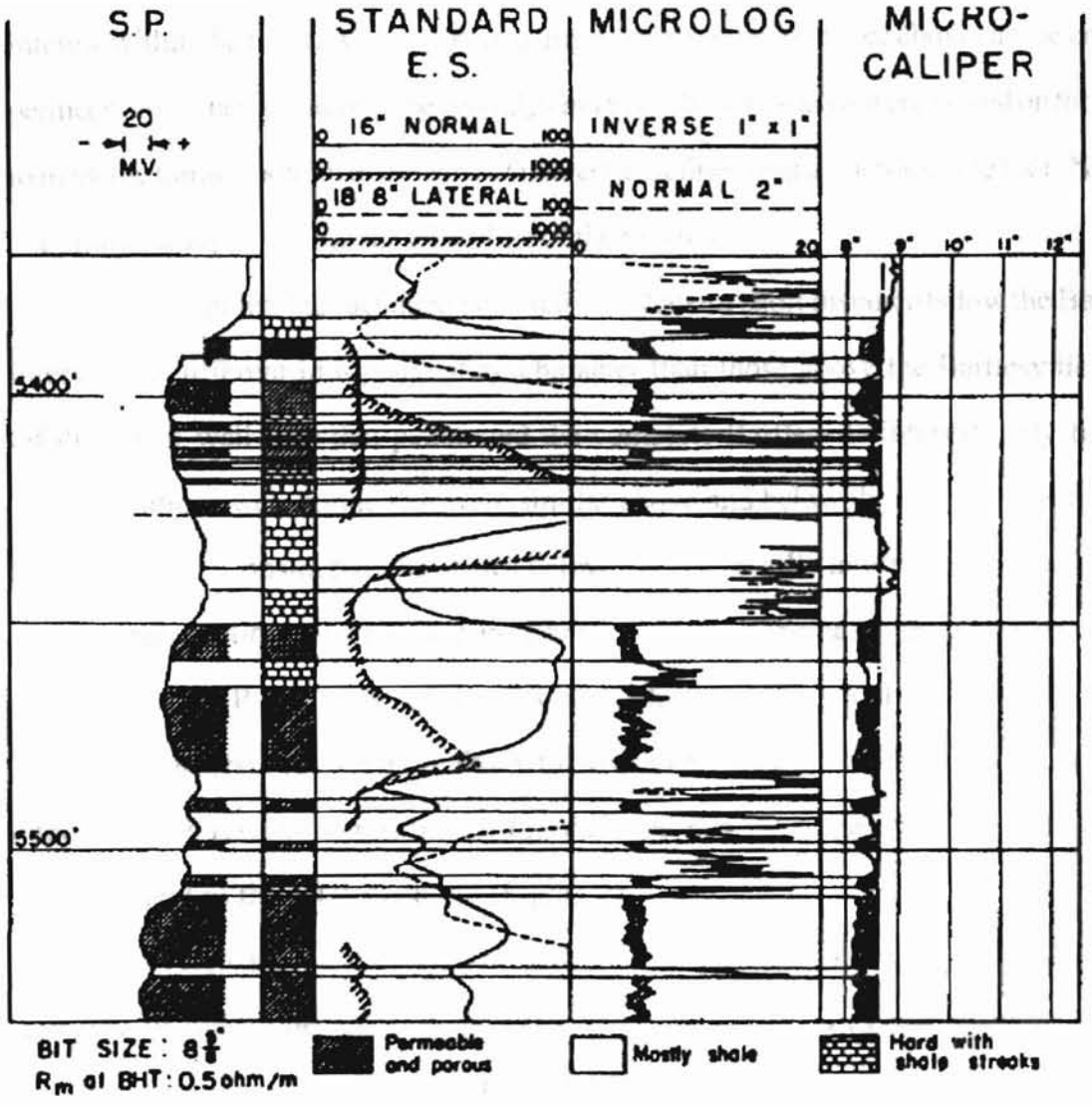


Figure 12. A limestone-and-shale sequence, logged by a Spontane ous Potential (SP) curve, a standard electric-log comprised of a Short Normal (16-in.) curve and a Lateral Curve (18 ft., 8 in.), a Microlog and a Microcaliper log. Leftward convexities of the SP curve indicate rock that is permeable to movement of ions. In the context of this discussion, configurations of resistivity curves are irrelevant. The microlog and microcaliper logs detect mud cake on walls of the borehole, the result of invasion of drilling-mud filtrate and the screening-out of clay. The microinverse log measures chiefly the resistivity of mud cake and secondarily the resistivity of rock charged with mud filtrate. The micronormal curve measures more deeply into the formation, documenting mainly the resistivity of rock charged with mud filtrate, and secondarily the resistivity of mud cake. Separation of the two curves is evidence of per meable limestone. (Figure after Martin, 1955.)

interest within the Bartlesville interval, using positive separation (see above) as the criterion of permeability. Then, relative to the central depth tract, these positions were posted on the SP curve to mark the top and bottom of the zone of interest as defined by the micrologging tool. Next, a line was drawn to represent the shale baseline of the SP curve.

At this point, the fact must be noted that shales a short distance below the Bartlesville interval are different in log-signature character than those above the Bartlesville interval. Of the set of well logs that penetrated the complete Bartlesvile interval, only five to ten shale signatures were found that were similar above and below the interval. As for the rest of the well logs considered, the shales below the Bartlesville interval tend to be "sandier." The greater fraction of sandstone in these shaly zones increases the negative deflection shown by the SP log. The decision was made that shales a short distance below the Bartlesville interval are the more likely to be characteristic of shales within the Bartlesville interval. As a result, the position of the shale baseline was determined and marked using the alignment of these lower shales (Figure 7).

In every case, once the microlog-determined zone of interest was marked on the SP signature of sandstone, the top and bottom marks were in different positions on the SP signature, relative to the shale baseline. To determine which of the two "zone of interest" positions would be used to define permeable rock, each was considered in the context of what it represented. With the purpose of defining sandstone of reservoir quality in mind, the position farther from the shale baseline (more negatively deflected) represents the more conservative estimation of "clean" reservoir-quality rock. This decision to describe reservoir-quality sandstone — based on the "zone of interest" mark that was the farther from the shale base line — isolated sandstone that was the less likely to have porosity occluded and permeability impaired by shale. If this procedure were in error, then the author's opinion is that to underestimate the amount of reservoir-quality rock is more desirable than to overestimate the amount. Having used the "more conservative" value at which the microlog lines intersect the SP line, the next step taken was to draw a vertical line at this position. Any part of the SP curve that was more

negatively deflected than this line was defined as "permeable sandstone."

In the study area, resistivity of shale generally is greater than resistivity of sandstone that is saturated with salt water (for example, see Figures 7, 8 and 9). Shale in sandstone commonly causes porosity recorded by well-logging tools to be overestimated. Therefore, estimation of the percentage of shale in reservoir rock was necessary, to be followed by estimation of its effect on measurement of porosity. Measurement of the percentage of shale in sandstone required using the set of well logs that consists of a version of the electric log and a density-neutron log.

A cross-plot diagram was used to approximate the shale percentage of Bartlesville sandstone; Gamma-ray logs provided the measurements necessary to complete the cross-plots (Figure 13). The first requirement of the shale percentage cross-plot was a gamma-ray deflection that represented shale-free rock (clearly a judgment). Of the rock-stratigraphic units considered in this study, the Oswego Limestone (Figure 4) is presumed ordinarily to contain the least amount of shale (clay), a supposition based on average deflection of the gamma-ray curve from the gamma-ray shale baseline. Therefore, the "clean, shale-free" gamma-ray deflections were recorded from the Oswego Limestone in well logs that were examined for shaliness of Bartlesville sandstone. The average gamma-ray deflection of the Oswego Limestone was calculated; this number was the provisional definition of "clean, shale-free rock" posted on shale-percentage cross-plots (Figure 13).

Because estimated shale-percentage is a relative quantity, gamma-ray deflections of beds of shale within the Bartlesville interval are requisite. A bed of 100% shale is difficult to find on well logs of most Bartlesville stratigraphic sequences. Because of this, the average gamma-ray reading of zones within the Bartlesville interval that seem to be shaly was recorded, and then the well log was scanned for shaly strata short distances above or below the Bartlesville interval. These shaly zones were identified by configurations of the SP and resistivity curves. Where these lines had the appearance of "railroad tracks," relatively close to the central depth tract of the well log, then the zone was treated as being shaly (Figure 4). Gamma-ray measurements in these shales were compared to gamma-ray intensities of thin shaly zones within the Bartlesville interval. These values

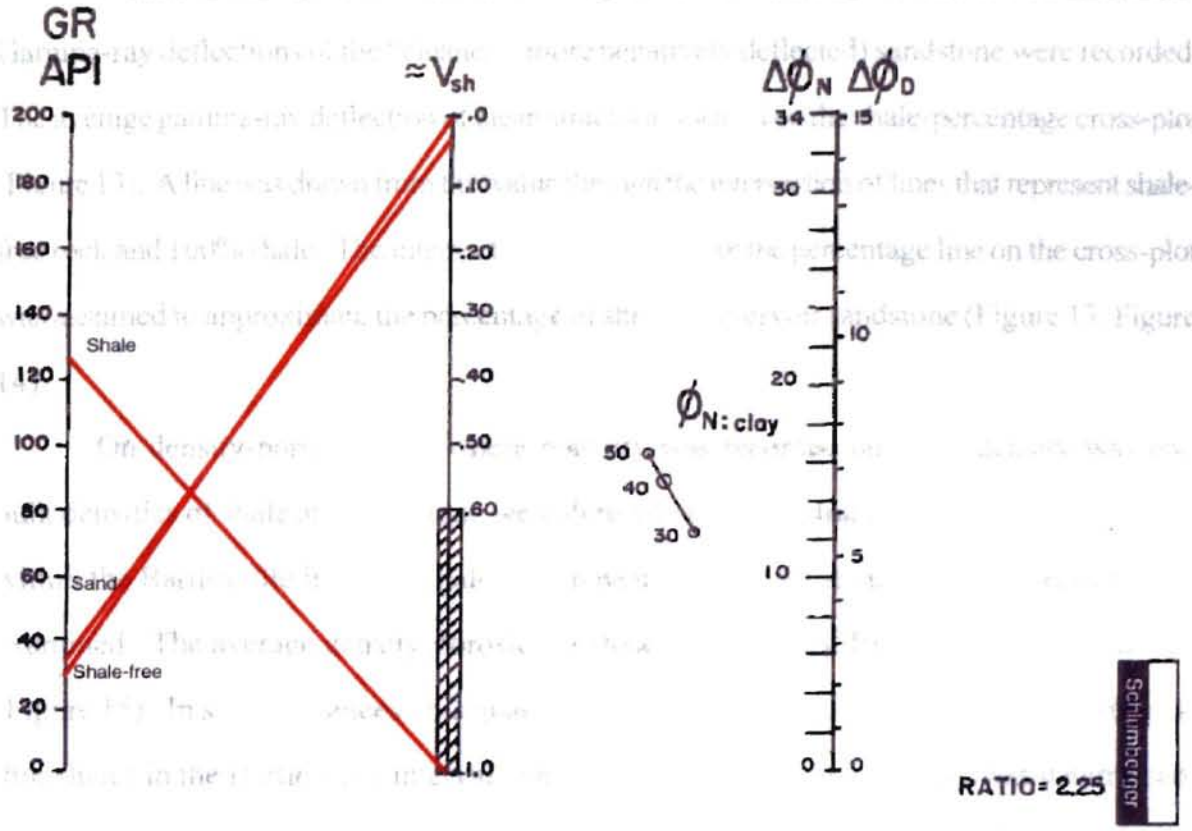


Figure 13. Schlumberger crossplot for shale-correction of neutron-density porosities (from Schlumberger, 1983, p.22). Volume of shale shown for rocks in the Bartlesville stratigraphic interval of the LCB Resources, No. 1 E.B., Sec. 14, T 18N, R 8E. "Shale-free" rock of the Oswego Limestone shows approximately 30 API units of gamma-ray deflection. Shale shows approximately 125 API units of deflection. Gamma-ray deflection of "clean" Bartlesville sandstone is about 35 API units. Volume of shale in Bartlesville sandstone is approximately 4 percent.

were averaged and plotted on the shale percentage cross-plot to represent the 100% shale value.

Next, estimation of shaliness involved gamma-ray intensity of Bartlesville sandstone. Gamma-ray deflections of the "cleaner" (more negatively deflected) sandstone were recorded. The average gamma-ray deflection of clean strata was located on the shale-percentage cross-plot (Figure 13). A line was drawn from this value through the intersection of lines that represent shale-free rock and 100% shale. The intersection of this line with the percentage line on the cross-plot was assumed to approximate the percentage of shale in reservoir sandstone (Figure 13, Figure 14).

On density-porosity logs where porosity was recorded but bulk density was not, bulk densities of shale and sandstone were derived. Because strata entirely of shale are few within the Bartlesville interval, shale within nearby parts of the stratigraphic section were examined. The average density-porosity of shale was recorded from density-neutron logs (Figure 15). In some instances, this quantity could be compared to the density-porosities of thin shales in the Bartlesville interval. Once the average density porosity was determined, it was converted to bulk density by taking into account the standard matrix density of most density-neutron logs (2.71 gm./cu.cm.). This procedure was repeated to determine bulk density of clean sandstone in the Bartlesville interval.

Once the percentage of shale and bulk densities of shale and sandstone were evaluated, entry of these qualities into simple equations (Appendix A) yielded close approximations of porosity of reservoir sandstone and reduced the biasing effects of shale. This process of determining sandstone porosity was completed for each pair of logs. Based on these data, a position of –65 mv from the SP shale baseline was judged to be the best estimate of the baseline for net-reservoir sandstone (Appendix A).

Distinction of Rock-Stratigraphic Units Within the Bartlesville Interval

The Bartlesville Sandstone interval includes the most productive reservoirs in the region. In comparison to other sandstone reservoirs of the study area, Bartlesville sandstone is

Schlumberger

SHALE CORRECTIONS
FOR NEUTRON & DENSITY POROSITIES

USE AND DESCRIPTION

The Gamma Ray Log may be used to estimate the volume fraction of shale (V_{sh}) in a formation. Knowing V_{sh}, approximate corrections to the Neutron and Density porosities can be established for the effects of shale. These corrections are based on the average shale response for these logs in the Gulf Coast Region.

INFORMATION REQUIRED

GR_{sd} – Gamma Ray Log reading in a clean sand – in API units.
GR_{sh} – Gamma Ray Log reading in a nearby 100-percent shale.
$\phi_{N\text{-}clay}$ – average Neutron porosity of clay

PROCEDURE

For finding V_{sh}: Enter nomogram with the appropriate API values of GR_{sd} and GR_{sh}. From GR_{sd} pass a line to 0 on the V_{sh} column and from GR_{sh} pass a line to 1.0 on the V_{sh} column. The intercept of these lines establishes a pivot point, which normalizes the Gamma Ray Log to V_{sh}. To establish the volume of shale (V_{sh}) for a given Gamma Ray reading, a line connecting the reading and the pivot point is extended to the "V_{sh}" scale.

For shale corrections ($\Delta\phi_N$, $\Delta\phi_D$) to the Neutron and Density porosities: From the value V_{sh} established above, pass a line through the average Neutron reading in clay (45% for Pleistocene) to the intercept with the $\Delta\phi_N$ - $\Delta\phi_D$ line. The indicated values from this column are then subtracted from the Neutron and Density porosity readings to provide the equivalent clean-sand responses.

EXAMPLE

GR_{sd} = 20 API
GR_{sh} = 120 API
GR = 40 API
V_{sh} = 20%
$\phi_{N\text{-}clay}$ = 45%
$\Delta\phi_N$ = 5.6%
$\Delta\phi_D$ = 2.5%

Figure 14. Instructions for Schlumberger sale-correction crossplot (see also Figure 13). (From Schlumberger, 1983, p. 21.)

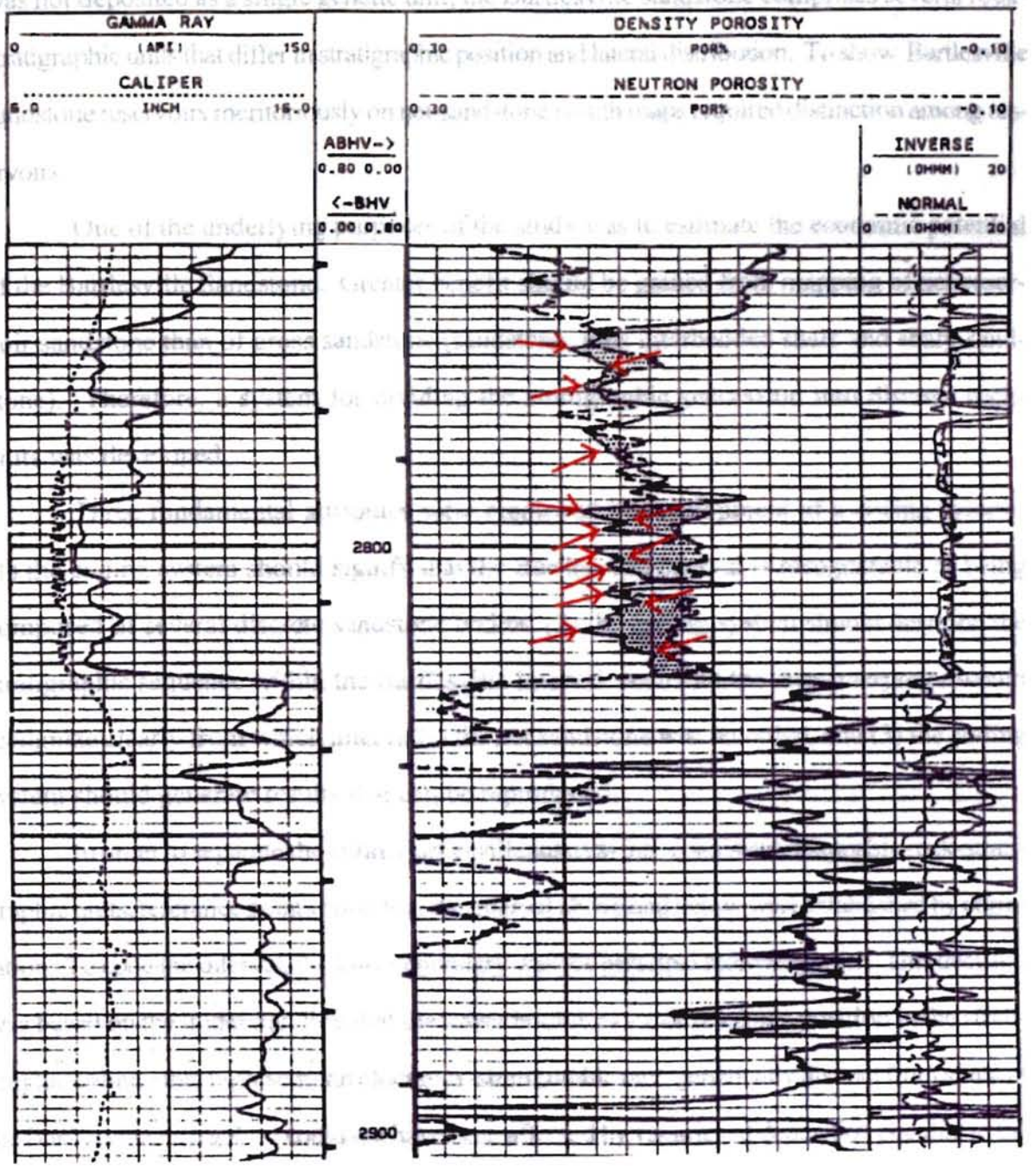


Figure 15. To calculate average density-porosity, "peak" values (see arrows) within the "zone of interest" were summed and averaged. The procedure was the same for shale and sandstone. Bartlesville interval of the LCB Resources No. 1. E.B., Sec. 14, T 18N, R 8E.

thick and extensive. According to Mason (1982, p. 52), sandstone within the Bartlesville interval was not deposited as a single genetic unit; the Bartlesville sandstone comprises several rock-stratigraphic units that differ in stratigraphic position and lateral distribution. To show Bartlesville sandstone reservoirs meritoriously on net-sandstone isolith maps required distinction among reservoirs.

One of the underlying purposes of the study was to estimate the economic potential of the Bartlesville Sandstone. Greater benefit should be gained from mapping of net-reservoir sandstone than of gross sandstone (sandstone, plus interbedded shale and shaly sandstone). Therefore, a system for dividing the stratigraphic succession into discrete rock-units was developed.

Three fundamental attributes were employed in development of a coding system: (1) the coding system should signify that the Bartlesville interval is recognizable as being composed of several discrete sandstone bodies, (2) the coding system should describe the stratigraphic sequence within the Bartlesville interval, such that the map-interpreter would recognize clearly from which interval(s) the net sandstone was recorded, and (3) the coding system should generate results that can be reproduced.

In order to separate the entire Bartlesville interval into consistent, mappable rock-stratigraphic units, reference points bounding the interval above and below were established by correlation. To code the interval, the lower boundary was the principal reference point. This decision was based on the understanding that the lower boundary - - defined at a position in the stratigraphic column that represents an older rock-stratigraphic unit, genetically distinct from strata of the Bartlesville interval - - would not have been affected by vagaries of deposition peculiar to the Bartlesville interval. (The only exceptions to use of the lower boundary were in those locations where the lower-boundary marker bed was missing, almost certainly by incision before deposition of basal strata of the Bartlesville.)

For each well log, total thickness of the Bartlesville interval was calculated within an Excel spreadsheet (Appendix B). In most cases, this value was a number between 185 and

205 feet. In the extreme two instances, thicknesses were as small as 46 ft. and as large as 290 ft. Based on the similarity of interval thickness over much of the study area, the interval was divided in half. A "horizontal" line was drawn on each well log signifying the mathematical center of the Bartlesville interval (Figure 16). Commonly, this line was close to a thick shale "break" in the Bartlesville succession. Sandstones in the upper and lower halves were named based upon relative positions in the upper or lower half of the interval. All logs were coded by this procedure. Due to variation in position among sequences of sandstone, this system proved to be deficient. Because of this failure, a new approach was attempted.

Use of the mathematical center of the interval was re-evaluated, and was regarded as the proper first step in coding the Bartlesville interval. The only sandstone thicknesses that were coded were where the SP curve was deflected beyond the derived value of -65 mv from the shale baseline. Therefore, the application of strictly geological criteria to ranking of these reservoirs was no longer practical. (This circumstance resulted from rejection of parts of the sandstone that are not of "reservoir quality;" consequently, the classification on the basis of inferred depositional processes proved to be somewhat illogical.)

Failure of the first attempt at coding yielded a significant observation. With respect to the mathematical midpoint of the Bartlesville interval, net-reservoir-quality sandstones of the interval tend to be positioned distinctively (a) either in the upper half and lower half with a distinct separation in the middle, (b) in the upper half only, (c) in the lower half only, (d) or in both halves with sandstone distributed across the midpoint. Based on this observation, well logs for Township 17 North, Range 8 East were separated into four stacks: (1) a stack of logs that had distinguishably separate sandstone bodies in the upper and the lower half, (2) a stack of logs that showed sandstone in the upper half only, (3) a stack that showed sandstone in the lower half only, and (4) a stack that showed a sandstone body or bodies that extended across the mathematical midpoint of the Bartlesville interval. Such stacks of logs appeared to represent, acceptably, a classification of the Bartlesville interval into sets of sandstone rock-units; these units seemed to meet the needs of acknowledging the uniqueness of

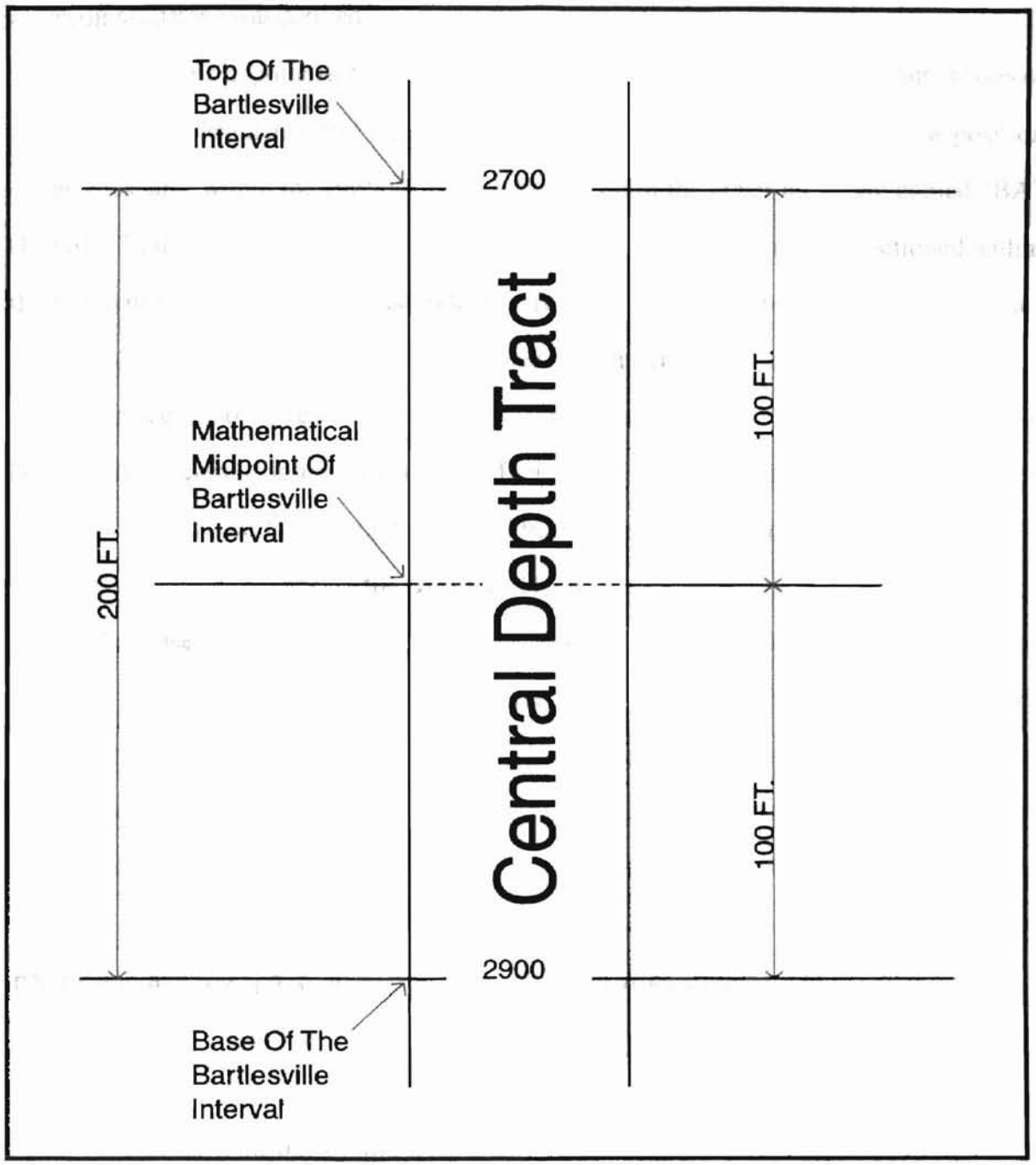


Figure 16. Division of the Bartlesville interval, for coding of sandstone rock-units.

the sandstones in the Bartlesville interval, and of clearly detailing from which interval(s) the net-reservoir sandstone was derived.

To test the hypothesis that this system could be used successfully, the four classes of sandstone were designated by "tag" names that could be used to signify quickly the position of the rock-unit within the Bartlesville interval: those in the upper half were named "BA" (Figure 17), those in the lower half "BB" (Figure 17), and those that were positioned within the two halves were designated as "BA/B", "BC," or "BU" (Figures 18, 19, 20). The categories BA/B, BC, and BU were distinguished by characteristics set out below. The BA/B sandstone seems to represent a complete fining upward, point-bar sequence within the Bartlesville interval (Figure 18). The BA/B shows net-sandstone development in both the halves of the interval; the log-signature is indicative of coarse-grained sandstone in the BB half, and of fining upward into the BA half. The BC sandstones (Figure 19) were classified as such because no other sandstone is either above or below the BC sandstone within the interval, and the mathematical midpoint is "centered" within the BC sandstone; the sandstone can not be distinguished reasonably as belonging exclusively in either the upper BA category or the lower BB category. The BU sandstones (Figure 20) show log signatures that are strongly suggestive of two or more "stacked" channel-fill sandstones, with no distinct "break" of shaly rock anywhere within the interior of the Bartlesville interval. The system of coding described in this paragraph was applied to all well logs considered in the present study.

In order to make classification functional for mapping, two special sets of strata required special consideration. On many well logs, in the uppermost part of the Bartlesville interval and a short distance below the Inola Limestone, is a thin bed of sandstone with a "spiky" SP signature (Figure 21). This sandstone seems to have been deposited independent of other sandstone(s) in the Bartlesville interval. Therefore, it was classified independently, as "BT" for "Bartlesville Top" (Figure 21).

The second exception involved judgment about a set of strata observed from several well logs: (1) The mathematical midpoint-line cut across the very bottom-most portion of a sand-

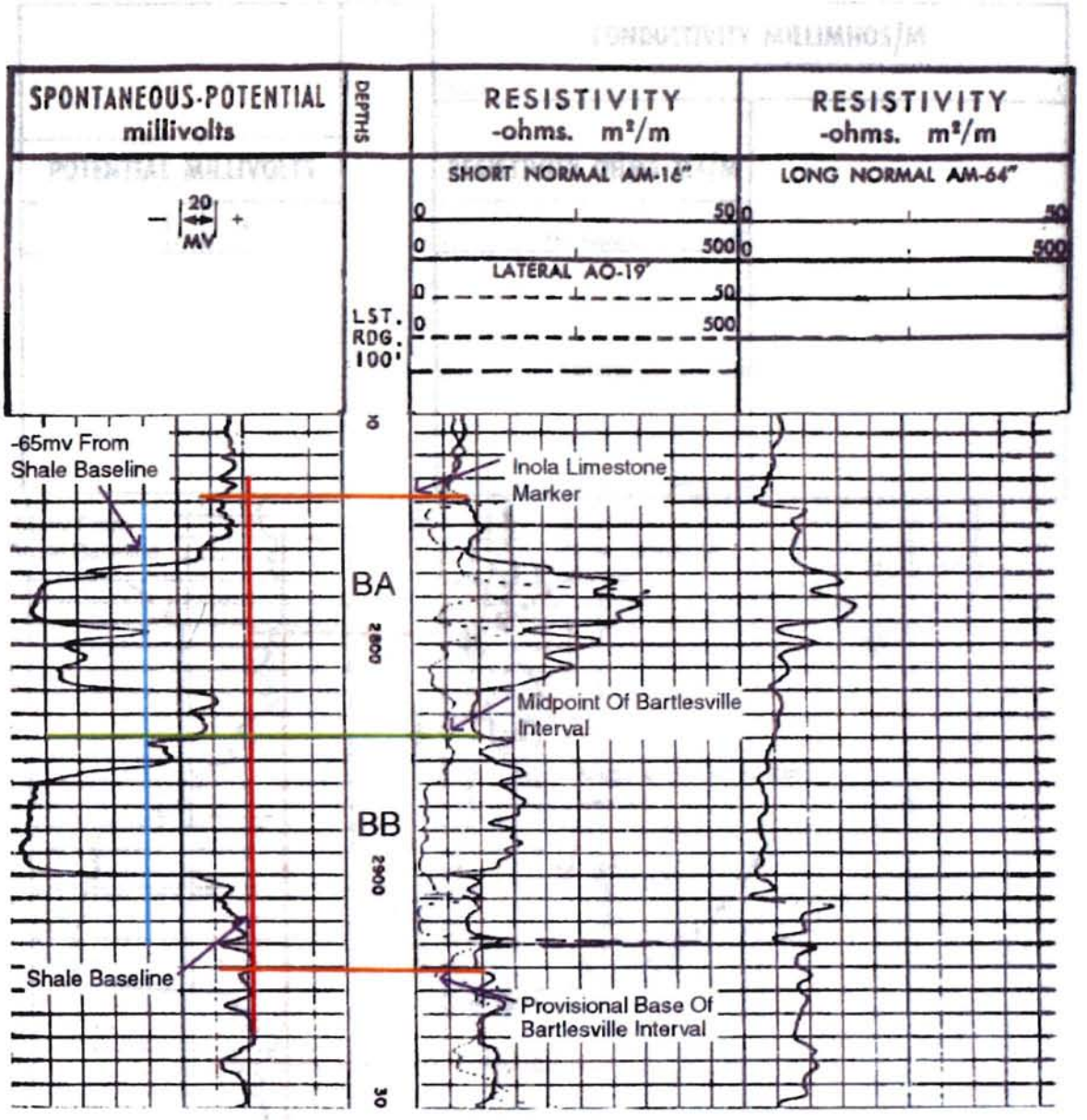


Figure 17. The Bartlesville sandstone interval is composed of several distinct sandstone bodies, interbedded with shale. To code sandstones of the Bartlesville interval, the mathematical midpoint between the Inola Limestone marker and the provisional base of the Bartlesville interval was calculated for each well log. Then, for each well log, a vertical line was drawn, relative to the SP curve, at the position of 65 millivolts from the shale base line. This figure is an example of well logs in which Bartlesville sandstone is in both halves of the interval. Sandstone in the upper half is classified as "BA" sandstone, whereas that in the lower half is "BB" sandstone. The two rock units are separated by shale.

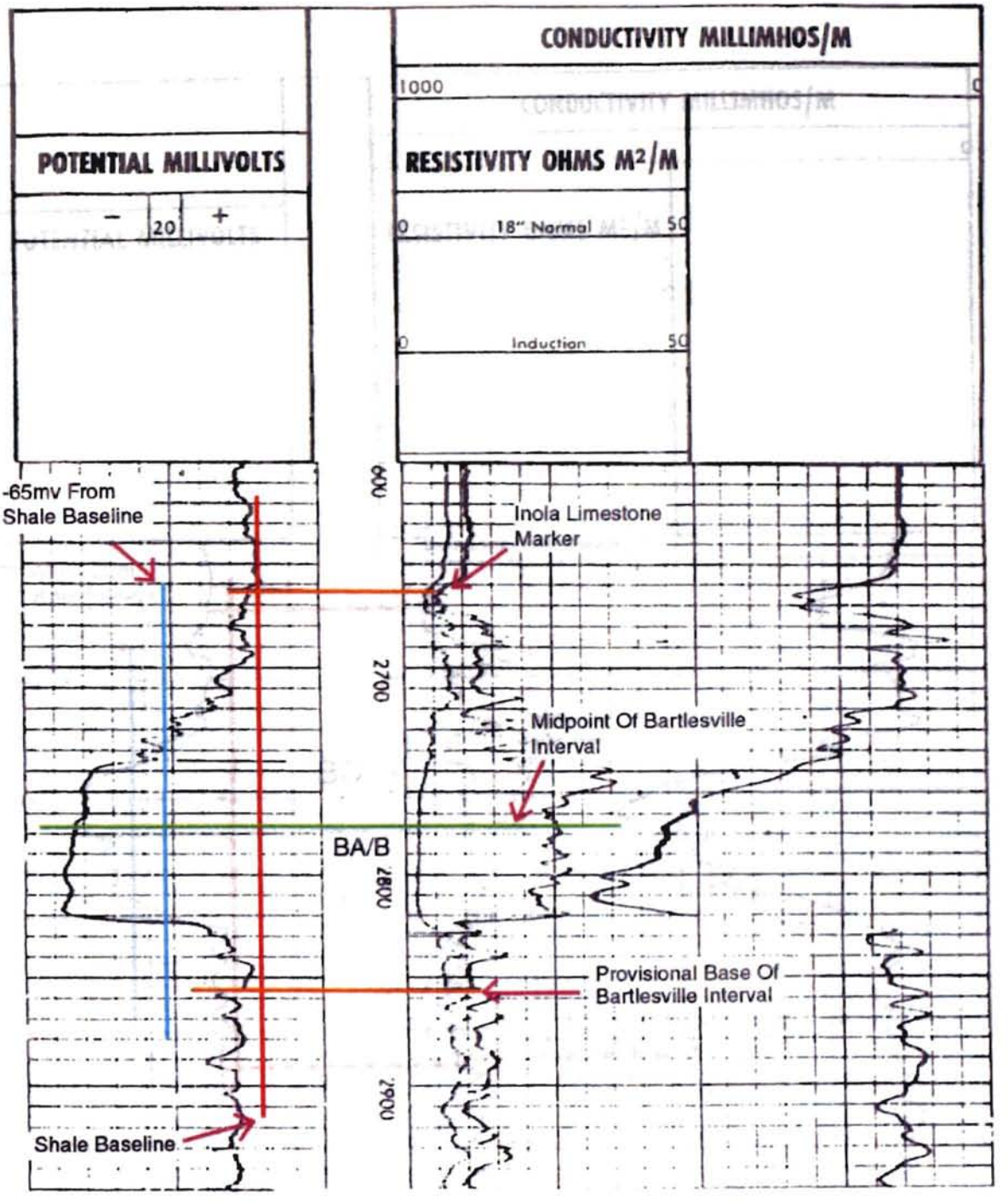


Figure 18. In several wells within the study area, sandstone extends from within the lower half of the Bartlesville interval to the upper half. The log-signature is indicative of coarse-grained sandstone in the lower half, fining upward into the upper half.

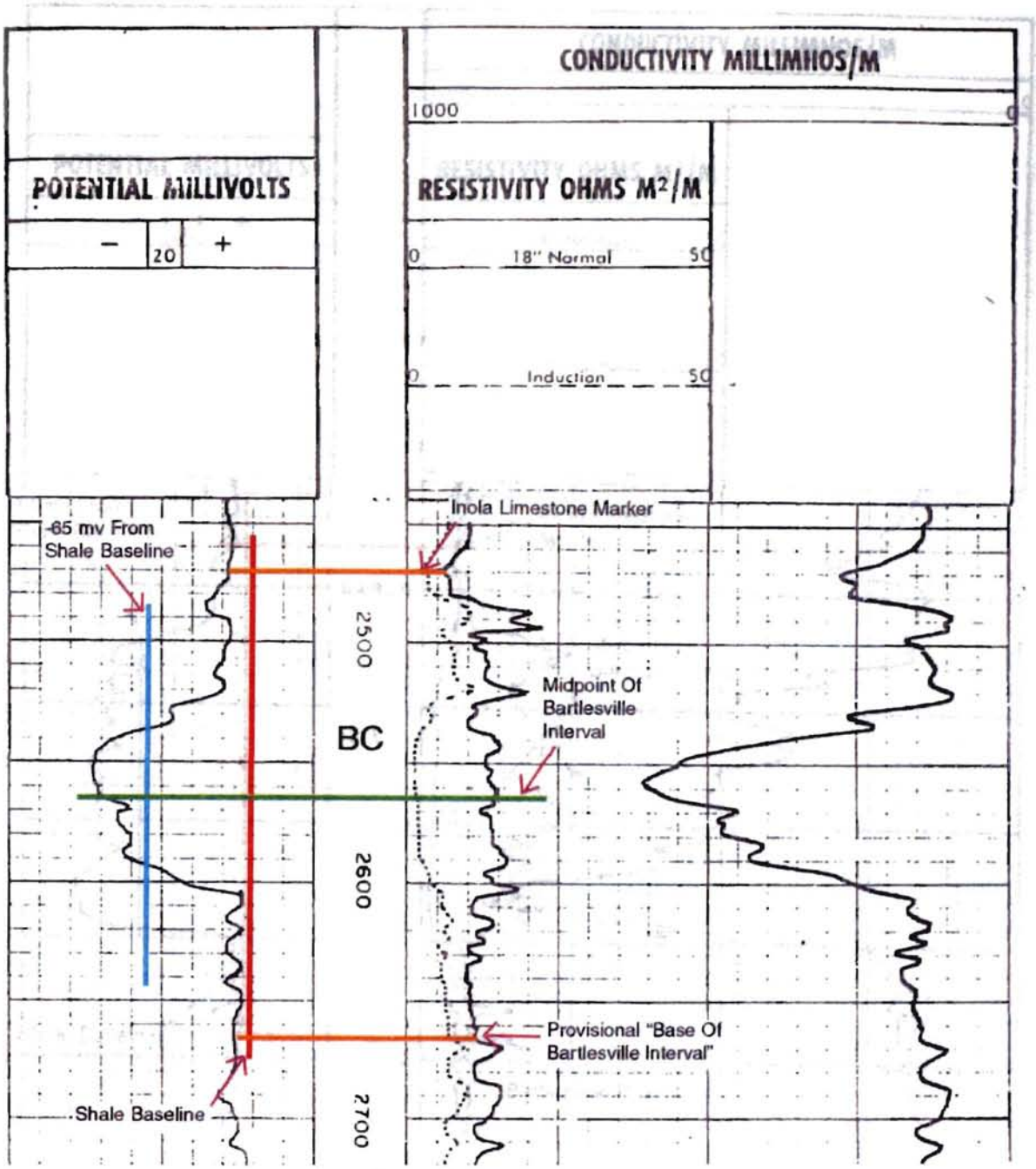


Figure 19. In some wells the principal body of sandstone in the Bartlesville interval is positioned so as to be intersected by the midpoint-line. The sandstone can not be referred entirely and indisputably to the upper half or the lower half of the interval. Sandstone of this kind was classified as "BC" sandstone.

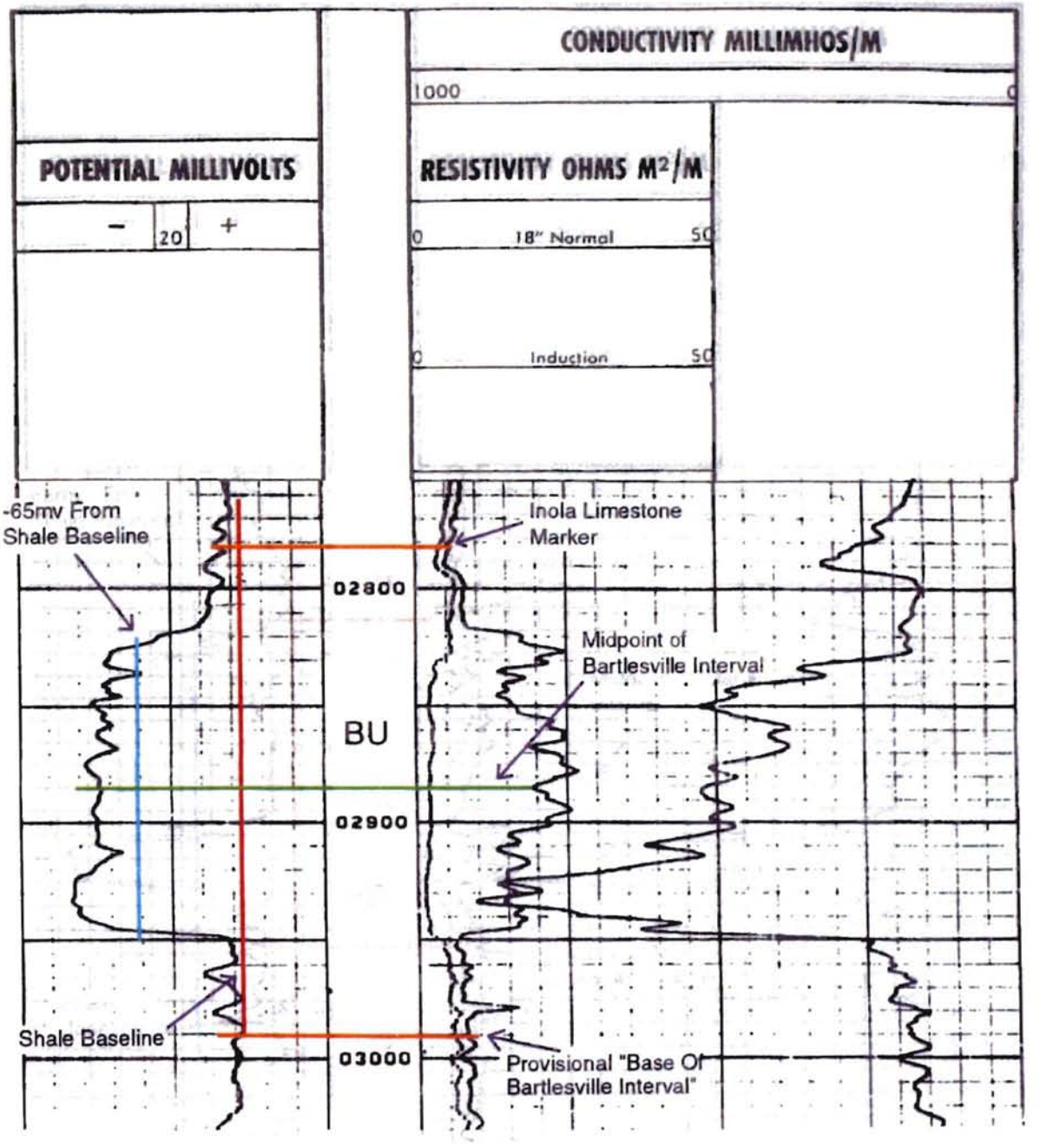


Figure 20. In several wells within the study area, sandstone extends from deep within the lower half of the Bartlesville interval to high in the upper half. Strata of shale are so thin that the sequence is not divisible in a conventional manner. These thick sequences were classified as "BU" sandstone.

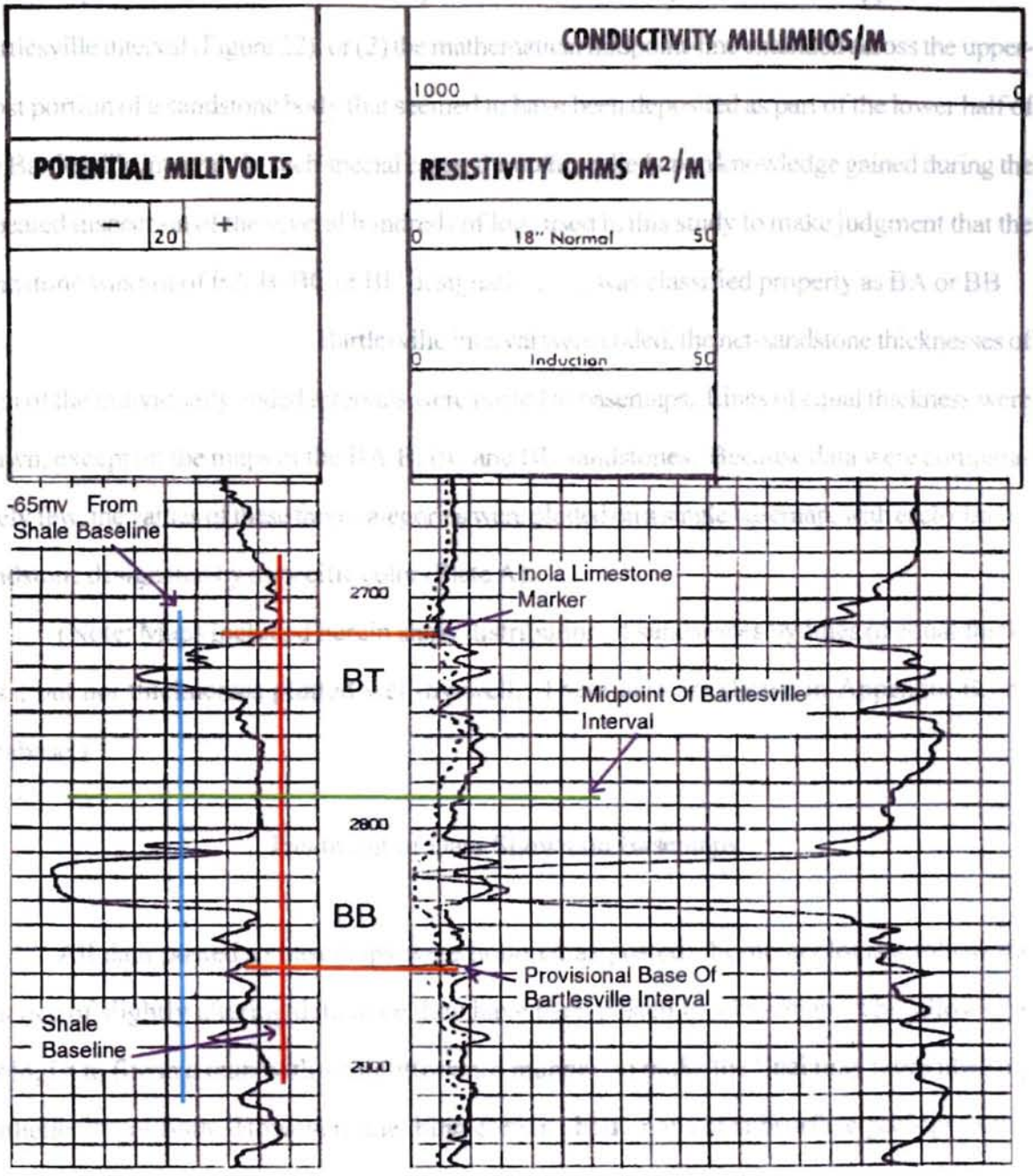


Figure 21. Sandstones of the kinds named "BB" and "BT" are positioned below and above the mid-point marker, separated by shale. The "BB" sandstone also is shown in Figure 17. The "BT" sandstone generally is thin but extensive; it characteristically has a "spiky" SP and resistivity-log signature.

stone body that seemed to have been deposited almost entirely as part of the upper half of the Bartlesville interval (Figure 22), or (2) the mathematical midpoint-line extended across the uppermost portion of a sandstone body that seemed to have been deposited as part of the lower half of the Bartlesville interval. In such special cases, the author relied upon knowledge gained during the repeated inspection of the several hundreds of logs used in this study to make judgment that the sandstone was not of BA/B, BC or BU designation, but was classified properly as BA or BB.

After sandstones of the Bartlesville interval were coded, the net-sandstone thicknesses of each of the individually coded intervals were posted to basemaps. Lines of equal thickness were drawn, except on the maps of the BA/B, BC and BU sandstones. Because data were comparatively few, the values of these three categories were plotted on a single basemap, with each class of sandstone designated by a specific color (Plate A).

(Note: Maps included herein show distribution of sandstones by lines of equal thickness, but not thicknesses plotted well-by-well. These data are shown in Appendix B, the database.)

Treatment of Data Shown on Basemaps

All data posted to basemaps were honored as posted. Some geologists follow the practice of slightly altering data once they have been posted to a basemap. This allows the geologist to finish a map with straightforward manner, to make the final map more pleasing aesthetically, or both. However, one thing certain about maps of subsurface geology is that they are incorrect to an unknown extent. In this study, to change the data after they were posted would have removed the consistency exercised when the original data were calculated. Further, altering data to fit to "what is expected" increases the risk of misinterpreting subsurface formations and directly violates scientific method. Therefore, the original data were honored as posted, in order to avoid enhancement of error.

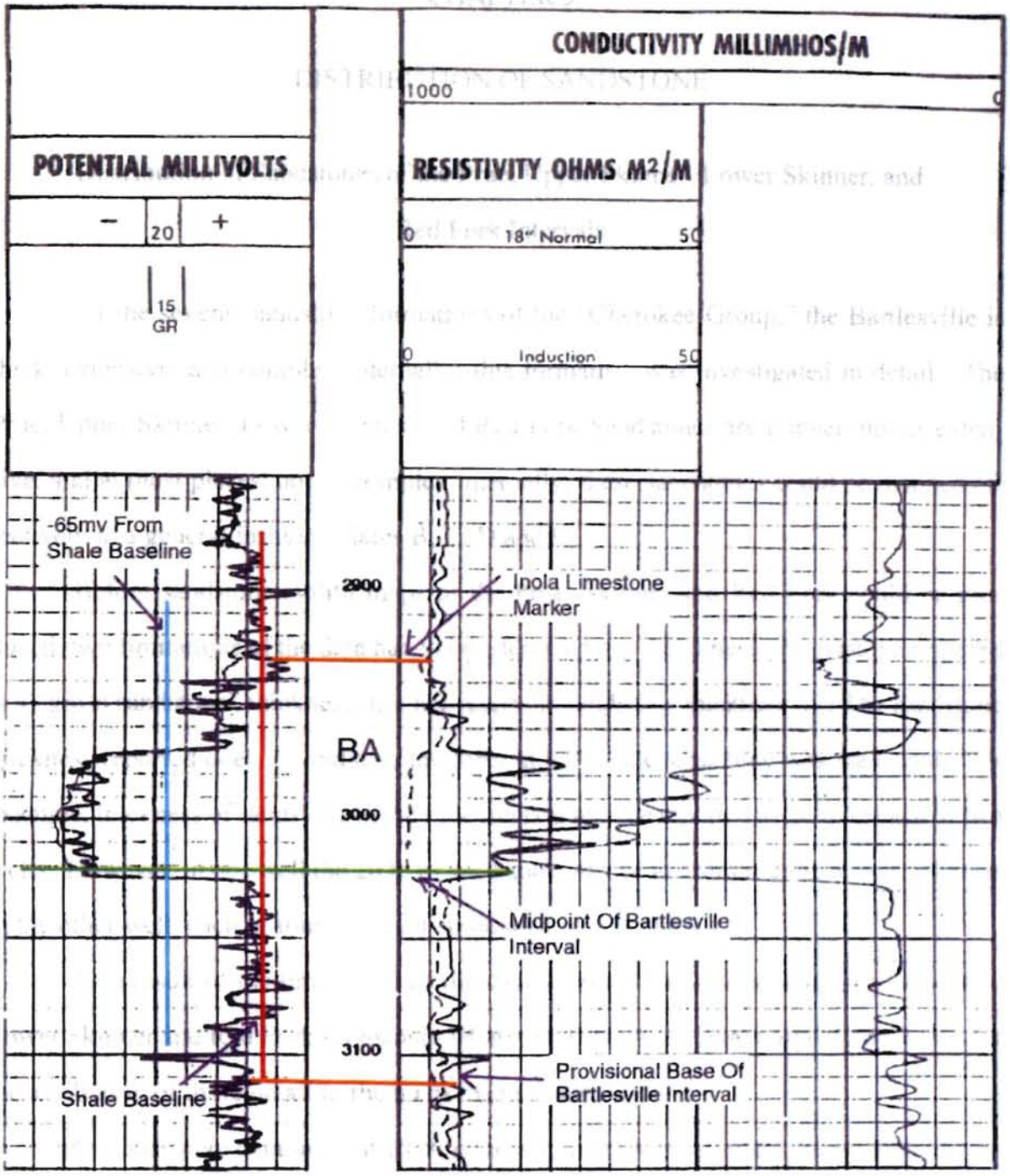


Figure 22. On some well logs, the midpoint-line of the Bartlesville interval extends across the lower parts of log-signatures of sandstone units that seem clearly to have been deposited as part of the upper half of the interval. Conversely, the mid-point line is positioned across upper parts of signatures of sandstone bodies that seem definitely to be genetically part of the lower part of the interval. Rock units of these kinds were classified as "BA" and "BB" sandstones, respectively.

CHAPTER 3

DISTRIBUTION OF SANDSTONE

Distribution of Sandstones of the Prue, Upper Skinner, Lower Skinner, and Red Fork Intervals

Of the several sandstone formations of the "Cherokee Group," the Bartlesville is thick, extensive, and complex internally; this formation was investigated in detail. The Prue, Upper Skinner, Lower Skinner, and Red Fork Sandstones are thinner, not as extensive, and at most places, not as complex internally; these sandstones could be mapped effectively in a general fashion (Plates B, C, D and E).

Before sandstone isolith maps of the Prue, Skinner and Red Fork could be produced, two limitations of the data had to be addressed: (1) Thickness of sandstone reported is a "gross sandstone" thickness, not net-reservoir-sandstone thickness. (2) The sandstone thickness reported does not indicate the form in which the sandstone was measured. For example, thickness of sandstone in the Prue interval may be reported as 20 ft. in each of two wells. However, in one well the 20 ft. of sandstone may be in a single genetic unit, whereas in the other well, each of four different strata may be 5 ft. thick.

As a result of the limitations of the data, construction of isolith maps of the Prue, Lower Skinner and Red Fork sandstones (Plates B, D and E) required guidelines to prevent the attribution of more detail to the maps than the data allow:

1. Data were contoured at 20-ft. intervals, in order to facilitate observation of general trends. In these reservoirs, interval thicknesses greater than 20 ft. are sparse. Contour lines of 20 ft. are believed to cancel most of the spurious error -- which resulted from classification of the data -- but to yield useful maps, nevertheless. This assertion seems highly probable to be true of the interval of 0 ft. to 20 feet.
2. In the spreadsheet (Appendix B) is a column for each of the related reservoirs, entitled "Related Reservoir Wireline Signature Shapes." These columns show

brief descriptions of the types of sandstone well-log signatures observed. These signatures were the bases for reported thicknesses. The columns should allow the reader to discriminate between single, relatively thick sandstones and "thick sandstone" reported as a result of summing thicknesses of two or more thin strata.

3. Data reported about the related reservoirs was honored only to the quarter-section, rather than to the exact locations of wells. In most quarter-sections, all data reported would be in one contour-interval category (0-20 ft., 20-40 ft., and so forth). Where this was not the case, the sandstone thicknesses reported were located to the actual well "spots," and contour lines were drawn accordingly. This allowed using a contour line to properly distinguish the wells with different interval-thickness values of sandstone (for example, Plate E, Sec. 1, T 17N, R 8E).
4. The final guideline addressed the case where a contour line extended toward a quarter-section in which all numbers posted were smaller than the value of the contour line. In most cases, regardless of whether each well-spot in the quarter-section actually showed a thickness-value, the contour line was drawn so as to circumvent all well-spots in the quarter-section (for example, Plate E, Sec. 27, T 17N, R 9E). Two benefits resulted from following this guideline: (a) None of the data in the quarter-section was violated and (b) mapping in this manner was faster than mapping in a fashion that honored each well location.

Maps of the Prue, Skinner and Red Fork Sandstones accomplished four objectives: (1) The maps are reliable first-approximations of distribution of sandstone. (2) The maps are rough approximations of depositional environments. (3) Combination of these maps with data from Herndon maps and from structural geologic maps provides insight into possible trapping circumstances in these reservoirs. (4) The value of the different mapping techniques was discovered after maps were compared to isolith maps of the Bartlesville interval.

Clearly, refinement of maps of the Prue, Skinner and Red Fork Sandstones would be

required for some purposes. Examples of areas that could be subject to refinement are (1) sections where wells have been drilled, but few or no logs were available (for example, Plate E, Sections 14, 22, and 23, T 17N, R 9E of the Red Fork thickness map) and (2) sections where data are relatively abundant, thickness is quite varied, and variation could be taken into account in mapping only if data were plotted well-by-well, as they would be plotted for a "comprehensive" map (for example, Plate E, the southwest quarter of Section 19, T 17N, R 8E). Further, sandstone-thickness maps of the Prue, Lower Skinner, and Red Fork illustrate that these units are similar in overall geometry (Plates B, D, and E). To some degree, the similarity results from the manner in which data were acquired. Different geometries would have arisen if the sandstone had been mapped in detail.

Prue Sandstone

Geographic Location and Trend. The Prue Sandstone is distributed as elongated belts that trend both northward and eastward. The dominant belt trends from Sec. 3 and 4, T 18N, R 9E southward to Sec. 34, T 17N, R 9E (Plate B). Another generally north-trending belt is mapped from Sec. 3 and 4, T 18N, R 8E to Sec. 20, T 17N, R 8E. This belt is not as distinctive and continuous as the belt in Range 9 East, described above. In the southwest one-quarter of the southwest one-quarter of T 18N, R 8E, this belt has only suggestive continuity, but a belt of sandstone is judged to join with it from Sec. 5 and 6, T 17N, R 8E.

Two east-trending belts are also illustrated. One is between Sec.10, T 18N, R 8E and Sec. 17 (and Sec. 20), T 18N, R 9E. This belt connects the northern portions of the two north-trending elongated belts (Plate B). The second east-trending belt connects the southern portion of the north-trending belts, in the area from Sec. 21, T 17N, R 8E to Sec. 20, T 17N, R 9E.

Vertical Position. Sandstones of the Prue interval are below the base of the Oswego Limestone and above the Verdigris Limestone (See Figure 4).

Length. Prue sandstone is distributed locally in one continuous belt from the northern boundary of T 18N, R 9E to the southern boundary of T 17N, R 9E, a distance of 12 miles (Plate B). Other belts, described above, are each less than 12 miles long (Plate B). These secondary belts are of sandstone generally thinner than 20 feet.

Width. Prue sandstone belts generally are 1 to 2 mi. wide, but locally are narrow (Plate B). Belts are shown as being wider where data are sparse, as a consequence of limited control (for example, Plate B, Sec. 12, 13, and 24, T 18N, R 8E), and where belts converge (for example, Plate B, Sec. 1, 2, 3 and 4, T 17N, R 9E). The narrower belts are "branches" of the main belts. These "secondary" belts are as narrow as ¼ mile (Plate B, Sec. 29, T 17N, R 9E), and are suggestive of the lower limit of width of belts of Prue sandstone.

Thickness. The recorded thickness ranges from near 0 to 77 feet (Sec.3, T 17N, R 9E; see Appendix B, well number 358, "Related Reservoir Thicknesses"). The sandstone generally thickens in a manner suggestive of channel-fill deposition.

Depositional Environment. Stirling (1998) described the Prue Sandstone in an area only about 12 mi. distant. According to Stirling (1998, p. 21-22) Prue sandstone was deposited in strata with one of three basic shapes: sheets, elongated belts, and pods (Figure 23). Of the three basic geometries, only elongated belts are shown by Plate B. Similarity between the distribution of belts shown in Plate B and the distribution of elongated belts described by Stirling (1998) strongly suggests that Prue sandstone of both areas was deposited in similar environments. Cross-sections in the study area (Plates F, G, H and I) show that Prue sandstone tends to be developed in rather narrow belts. (See also Plate B.) Most of the Prue seems to have been deposited as a channel-fill complex.

Upper Skinner Sandstone.

Variation in data was insufficient for a useful isolith map of the Upper Skinner interval (Plate C).

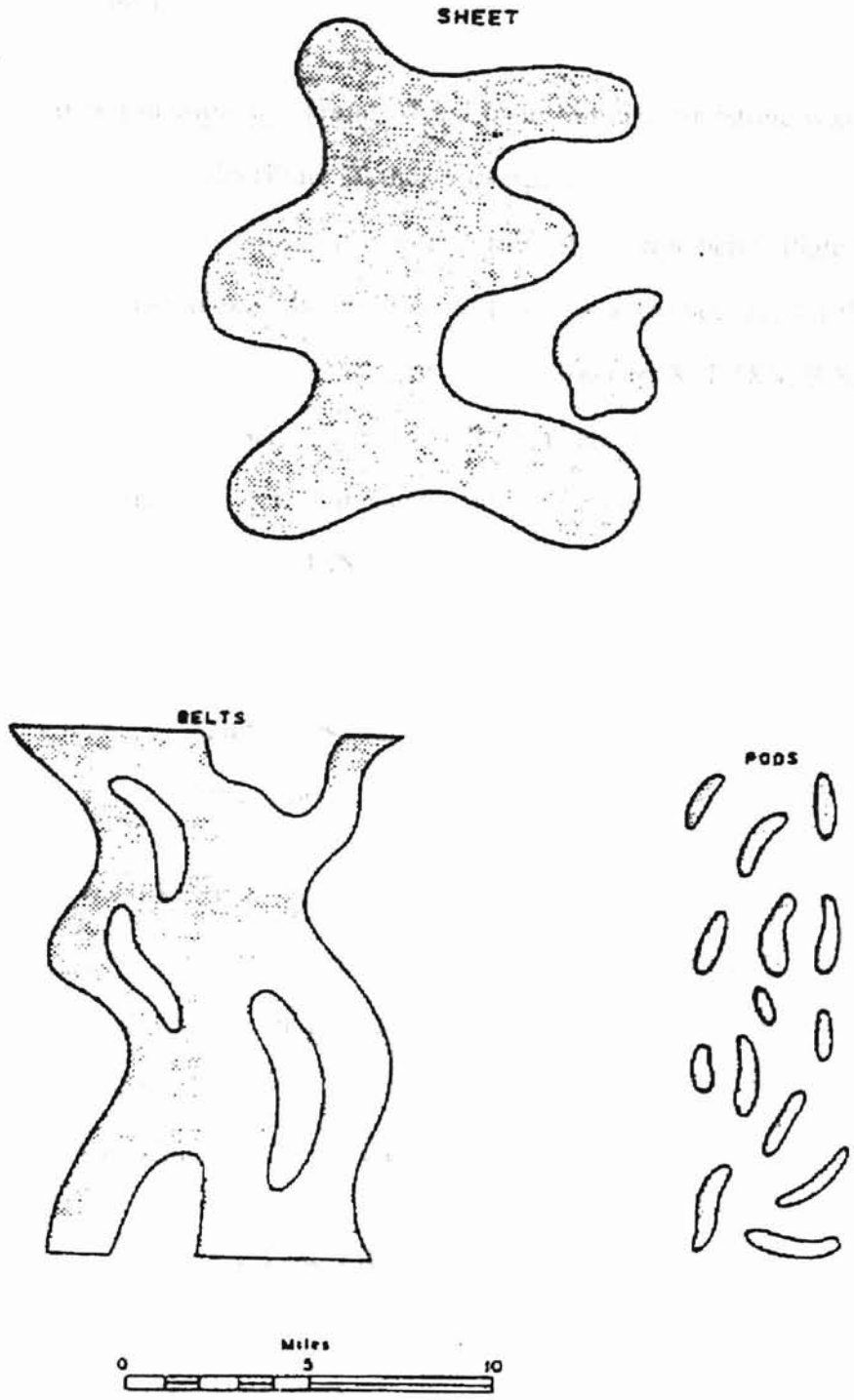


Figure 23. Geometries of Prue sandstones as described by Stirling (after Cole, 1969). Example of general plan-view shapes of sandstone rock-stratigraphic units. (From Stirling (1998) after Cole (1969).)

Lower Skinner Sandstone

Geographic Location and Trend. The Lower Skinner sandstone was distributed in generally north-trending belts (Plate D) that converge in Sec. 7, 8, 17, and 18, T 18N, R 8E (Plate D). Secondary belts commonly extend from the major belts (Plate D). The belt trending nearest northward extends from Sec. 6, T 18N, R 8E to Sec. 22, T 17N, R 8E (Plate D). The remaining belts are dispersed from this trend at Sec. 8, T 18N, R 8E. Branching from Sec. 8, T18N, R8E to Sec. 17, T 18N, R 9E is an east-trending belt. This belt is divided into a north-trending belt in the southern portions of Sec. 10 and 11, T 18N, R 8E (Plate D); however, in Sec. 36, T 18N, R 8E the belt trends southeastward and is divided into a system of north- and east-trending belts (Plate D).

Vertical Position. Sandstones of the Lower Skinner interval are below the Henryetta Coal and above the Pink Limestone (Figure 4).

Length. Lower Skinner sandstone spans the entire diagonal length of the study area. However, the longest individual trend is approximately 10 miles (Plate D). Lengths of belts are controlled by tracts of sandstone thinner than 20 feet. The "belts" of sandstone are suggestive of channel-fill deposition. The 20-ft. contour interval inevitably excludes depiction of channel-form sandstones that are thinner than 20 feet.

Width. Major trends of Lower Skinner sandstone range from approximately ¼ mi. wide in Sec. 22, T 18N, R 8E to approximately 1 ½ mi. wide in Sec. 17 and 18, T 18N, R 8E (Plate D). Much like the distribution of Prue sandstone, the Lower Skinner is shown as being extensive in an area where data are relatively sparse (Plate D, Sec. 5, 6, 7 and 8, T 17N, R 9E). Clearly such tracts are improbably large; they are inversely proportional to the amount of data available. In a given area, the more abundant the data, the more detectable are variations in thickness across short distances.

Thickness. Recorded thickness of Lower Skinner sandstone ranges from almost 0 to 44 feet (Sec.8, T 17N, R8E; See Appendix B, well number 385, "Related Reservoir Thicknesses"). However, no belt of sandstone is shown to be thicker than 40 feet. The spot-location of the well that penetrated 44 ft. of Lower Skinner sandstone was plotted only to the quarter-section (Plate D, Sec. 8, T 17N, R 9E; see also Appendix H, item 4). Thus, the exact distribution of this thick sandstone is not detectable from Plate D (but it is recorded in Appendix B; see well 385, "Related Reservoir Thicknesses"). Lower Skinner sandstone thickens at the expense of the underlying finer-grained material of the Lower Skinner interval.

Depositional Environment. Lojek (1983) made reference to the work by Valderrama (1976), in which he proposed four major sedimentary depositional environments of the Skinner Sandstone: upper deltaic plain, lower deltaic plain, marginal marine terrain, and prodelta terrain. Assuming that these four kinds of terrain are correct, Plates F, G, H, and I show log signatures of coarsening-upward Lower Skinner sequences that seem to indicate probable marginal marine deposition.

Red Fork Sandstone

Geographic Location and Trend. The Red Fork sandstone is distributed as elongated belts that trend generally northward but converge in the central part of T 17N, R 9E (Plate E). Two belts trend from Sec. 1 and 2 and Sec. 5 and 6, T 18N, R 8E to converge in Sec. 25 and 26, T 18N, R 8E (Plate E). From this location, an individual belt extends southward into T 17N, R 9E. A third belt is conjectured to trend from Sec. 1, T18N, R9E to Sec. 12, T 17N, R 9E; however the belt is mapped from sparse data (Plate E). There is some suggestion that a fourth major belt may trend across Sec. 30 and 31, T 17N, R 8E.

In comparison to the Prue and Lower Skinner sandstones, one main apparent difference of the Red Fork is the sheet-like geometry in the central part of T 17N, R 9E. However, this pattern is chiefly the effect of interpretation from sparse control points, a circumstance that prevents detection of local variation in thickness.

Vertical Position. Sandstones of the Red Fork interval are below the Pink Limestone and above the Inola Limestone (Figure 4).

Length. Combining the length of either of the north-trending belts in T 18N, R8E with the portion of the trend that extends from their convergence in Sec. 25, T 18N, R 8E renders a maximal trend-length of the Red Fork sandstone of approximately 8 miles. The only other belt of substantial length is shown in T 18N, R 9E (Plate E).

Width. Width of the Red Fork sandstone pattern ranges from less than ¼ mi. to as much as 3 miles (Plate E). Relative to the Prue and Skinner sandstones, this larger range in width is a result of the sheet-like pattern shown in the central portion of T 17N, R 9E (Plate E). If this part were discounted, then widths of the Red Fork tracts closely resemble widths of Prue and Skinner sandstone bodies.

Thickness. Thickness of Red Fork sandstone ranges from 0 to 38 feet (Sec. 20, T 17N, R 9E; see Appendix B, well number 412, "Related Reservoir Thicknesses"). The sandstone thickens at the expense of the finer-grained material of the Red Fork interval.

Depositional Environment. Log signatures of Red Fork sandstone commonly indicate a coarsening-upward sequence, as suggested by SP and resistivity profiles (for example, Plates F, G, H and I). The log signatures are suggestive of shallow marine to marginal marine settings.

Distribution of the Sandstones of the Bartlesville Interval

As discussed above, methods of compiling data led to description of six units of sandstone in the Bartlesville interval. The data were intended to evaluate sandstone of petroleum-reservoir quality. Isolith maps of sandstones of the Bartlesville interval were created with the expectation that they would serve as the best reasonable approximations of distribution of sandstones in the Bartlesville interval (Plates J, K, L, M, N, O and P).

"BT" Sandstone

Constraints of the Data. A sandstone that is stratigraphically equivalent to the BT sandstone (Figure 21) was described by Mason (1982, p. 56), "Directly underlying the Inola Limestone, this sand is very silty and clayey; it can barely be classified as a sandstone. It being where it is, being silty sandstone and being on the edge of a delta lobe suggests that this sand body is a strandline deposit composed of delta sands reworked by the Cherokee Sea as it transgressed northward." This interpretation is highly probable to be true. The "silty and clayey" nature of this sandstone certainly restricted the number of log-signatures that showed negative deflection of the SP curve in excess of 65 millivolts. Consequently, the isolith map of the BT sandstone (Plate J) shows a contour interval of 5 feet.

Geographic Location and Trend. Plate J illustrates that the BT sandstone was developed in three "patches." In general, these tracts trend northward. Because the BT sandstone is silty and seems to have been a "reworked" sand, it is reasonable that the trend would be difficult to define rigidly. If gross sandstone rather than net sandstone were mapped, the BT sandstone would most likely be depicted as having sheet-like geometry, and would show no definite overall trend.

Vertical Position. The BT sandstone (Figure 21) is next below the Inola Limestone and above the BA sandstone.

Length. A belt of BT sandstone perhaps spans the length of the study area (Plate J), from the northern boundary of T 18N, R 9E to the southern boundary of T 17N, R 9E; however, the longest continuous tract of sandstone is shown as being approximately 9 miles (Plate J).

Width. General width of the BT sandstone ranges from ½ mi. to 4 miles (Plate J).

Thickness. Thickness ranges from near 0 to approximately 20 feet (Plate J).

"BA" Sandstone

Geographic Location and Trend. The BA sandstone (Figure 17) is distributed in belts that trend northward (Plate K). Some belts are discrete for moderately long distances (for example, Plate K, Sec. 5-31, T 17N, R 8E) but the belts intersect locally (for example, Plate K, Sec. 22, 23, and 27, T 17N, R 8E). A trend from the northern boundary of T 18N, R 8E diverges in Sec. 10 and 11, T 18N, R 8E into two major belts that occupy the eastern portion of Range 8 East (Plate K). These belts are separated by a terrain of "probably absent" sandstone, but merge in Sec. 23 and 27, T 17N, R 8E. A third belt branches from these two connected belts in Sec. 25, T 18N, R 8E (Plate K) and extends to Sec. 4 and 5, T 17N, R 9E, where it joins a north-trending belt that crosses T 18N, R 9E. Township 17 North, Range 9 East is characterized by a broad terrain of sandstone that is the product of convergence of belts. This large area of sandstone is separated into two trends that seem to extend southward beyond the boundary of T 17N, R 9E (Plate K).

As mentioned above, maps of Bartlesville sandstones were intended to be reliable approximations of the areal distributions of reservoir rock. Of course, limited spot-samples of such data permit a large number of reasonable interpretations; therefore, four alternative interpretations of a portion of the BA sandstone map were made from an augmented data-base (Plates L, M, N and O). However, in the final consideration, Plate K is judged to be the best approximation of distribution of BA sandstone of the entire study area. The alternate interpretations illustrate that if a specific zone of the study area were of interest to someone, more data should be acquired.

Vertical Position. The BA sandstone is lower in the Bartlesville interval than the BT sandstone and above the mathematical midpoint of the Bartlesville interval (Figures 17 and 21).

Length. The sandstone spans the entire length of the study area in several locations

(Plate K). Distribution of BA sandstone within the study area suggests that the BA rock-stratigraphic unit extends for some distance beyond the study area.

Width. Width of BA sandstone terrain ranges from ½ mi. to almost 5 miles. On the average, belts of BA sandstone are 1 to 2 mi. wide. The wider belts are where two or more trends of BA sandstone converge (for example, Plate K, in Sec. 12 through 20, T 17N, R 9E). The large, north-trending sandstone belts seem to have been deposited in systems much wider than 1 to 2 miles. Some areas where sandstone is shown "probably absent" are localities near where anticlinal folds are mapped (for example, compare the northeastern one-quarter of T 17N, R 8E on Plates K and Q). Anticlinal flexures and high-standing fault-blocks probably deflected sands into structurally (and topographically) low areas.

Thickness. Thickness of BA sandstone ranges from almost 0 to about 80 feet (Plate K).

Depositional Environment. Based on interpretation of well-log signatures, the BA sandstone was classified as a channel-fill sandstone. Further, when the entire well-log signature of the BA interval was considered, the BA sandstone could be correlated with a sandstone body described by Mason (1982, p. 55): "The SP signature...is characteristic of a point bar deposit of a meandering fluvial system." The BA sandstone probably is related to point-bar sequences, as described by Mason.

"BB" Sandstone

Geographic Location and Trend. The BB sandstone (Figure 17) is distributed in several belts that trend generally northward (Plate P). The overall trend is distinguishable; however, defining the locations of individual belts is practically impossible, because the BB sandstone is in almost every section of the study area.

The greatest complication in finishing the BB sandstone map arose when the mapping proceeded from areas of sparse data to areas of abundant data (for example, see Plate

P, Sec. 16, 17, 18, 19, 20 and 21, T 18N, R 9E). Whereas such areas may be mapped in a manner that is not aesthetically pleasing, they do illustrate the types of details that can be expected where well data are locally sparse, and plentiful. (As a result of this observation and of curiosity that arose from it, an experiment on the effect of incremental data was performed (see Appendix C).

Vertical position. The BB sandstone is below the mathematical midpoint of the Bartlesville interval and above the provisional base of the Bartlesville interval (Figure 17).

Length. The BB sandstone spans the length of the study area in several locations (Plate P). Because the BB sandstone is a major part of the Bartlesville depositional system, it undoubtedly extends far beyond the study area (Figure 24).

Width. Widths of tracts of BB sandstone are nearly impossible to define with the present database. If a specific part of the study area were to be of exceptional interest, more data would be required to depict local variation in width of the BB sandstone. For such a purpose, strip logs, drillers' logs, and other kinds of well logs would be required.

Thickness. Thickness of the BB sandstone ranges from near 0 ft. to approximately 140 feet (Plate P). (The thickest BB sandstone observed (127 ft.) is in Sec.12, T 18N, R 8E (Appendix B, well 603).)

Depositional Environment. Based on well-log-signature interpretation, the BB sandstone was classified as a channel-fill sandstone. If the well log signature of the BB sandstone is considered in its entirety, as was done with the BA sandstone, the equivalent sandstone was described by Mason (1982, p. 54): "...well developed; basal and upper contacts are abrupt, suggesting a delta-distributary channel. At places, the channel eroded into or through the Brown Limestone." I agree with the findings of Mason.

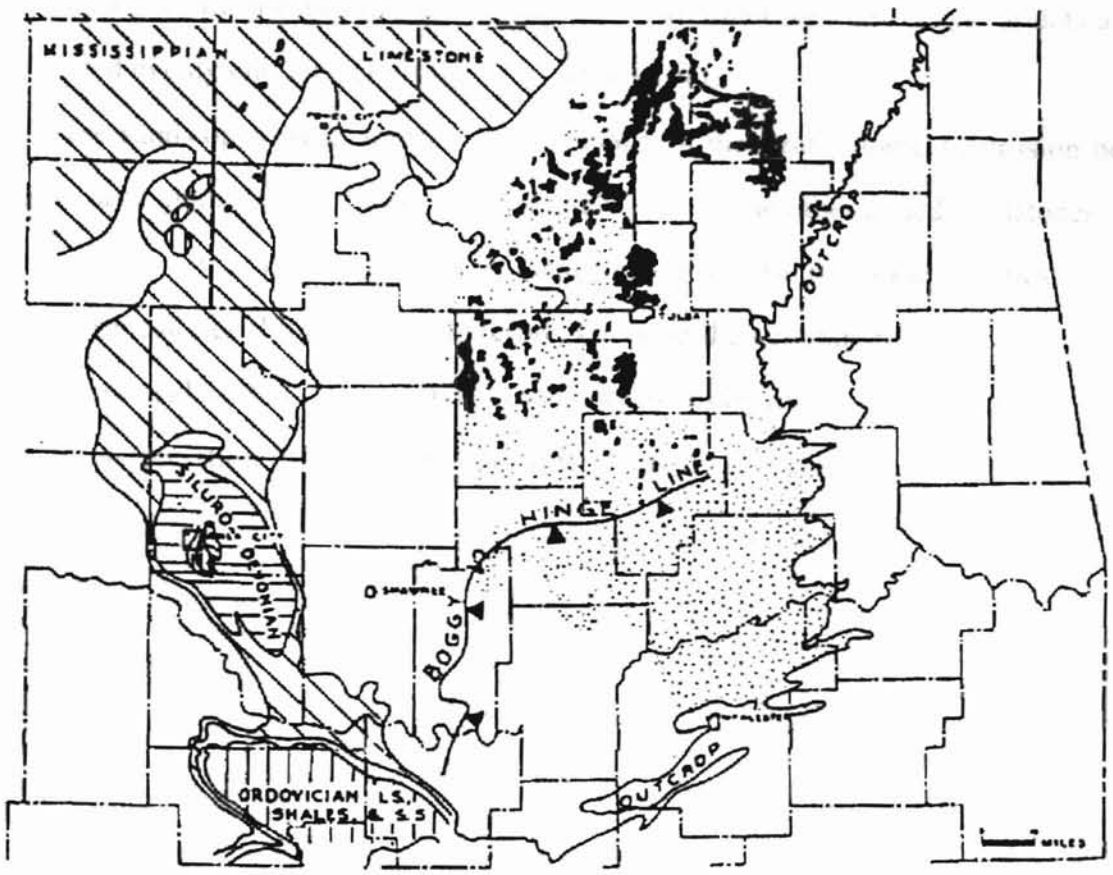


Figure 24. In Oklahoma the Bartlesville depositional system extended from the Kansas border southward past the study area and far into southeastern Oklahoma (after Northcutt, 1997).

"BA/B", "BC", and "BU" Sandstones

Isolith maps of the BA/B, BC and BU sandstones (Figures 18, 19 and 20) were not constructed. Plate A illustrates that either data are insufficient for these maps, or data are not distributed evenly enough across the study area, or both.

These sandstones were described individually in the stratigraphic succession because each has a quality or qualities that distinguish it from the other coded sandstones of the Bartlesville interval. In the case of these sandstones, each also has some qualities of the BA and BB sandstones (Figure 17). Therefore, knowing the geographic spot-locations of these sandstones (Plate A) is informative, because the map-interpreter can be appropriately cautious in interpretation of the BA and BB sandstones in areas close by.

CHAPTER 4

STRUCTURAL CONFIGURATION OF THE INOLA LIMESTONE

Regional structural geology was summarized by Fath (1925, p. 30): " Throughout northeastern Oklahoma, southeastern Kansas, and adjacent regions the rocks that crop out have characteristically a gentle westward to northwestward dip, generally measuring less than 1°. This westward-sloping attitude of the rocks is usually classified as a regional monocline." Fritz (1978, p. 23) described the regional structure in much the same manner: "The general westerly dip is interrupted by numerous noses, saddles, anticlines and faults." These "interruptions" of the regional structure constitute the local structural aspects of the study area.

Fritz (1978, p. 23) stated that " The top of the Oswego Limestone...reflects most of the structure because much of the tectonic activity occurred after Oswego deposition." The Oswego is younger than the Inola Limestone (Figure 4). Therefore, if "much" of the tectonic activity occurred after deposition of the Oswego Limestone, then it also occurred after the deposition of the Inola Limestone.

The Inola Limestone was selected as being representative of the structural fabric in the study area. The persistent thinness and large areal extent of the Inola Limestone lead to the conclusion that it was deposited in a nearly horizontal position; therefore, any relief illustrated on the structural contour map would indicate post-depositional movement. The formation also is known to extend throughout the region, making it mappable throughout the study area. The Inola was deposited a short distance above the Bartlesville sandstone. This allowed for the structural configuration of the Inola Limestone (Plate Q) to be compared to that of the top of permeable Bartlesville sandstone (Plate R).

Local Structural Aspects

Strike

In describing the general structural features of the Bristow quadrangle, Fath (1925) stated that the general strike is about N. 15° E. This corresponds well with a tract of homoclinal dip in the study area (See Plate Q, mid-eastern area).

Dip

According to Fath (1925, p. 30) " The dip averages about 75 feet to the mile." Dip in the part of the study area characterized as a homocline is approximately 70 ft. per mile.

Minimal dip of the study area is not much different from the average dip; minimal dip is approximately 30-40 ft. per mile. Tracts with small amounts of dip are on broad anticlinal noses. As best can determined with evidence available from the database and Plate Q, maximal dip is in the southeast one-quarter of Sec. 26, T 17N, R 8E. If dip measured in this quarter section were approximated across a mile, it would be about 2,000 feet per mile. Obviously, maximal dip of the study area is much more than the average.

Structural Alignment

Plate S shows structural axes of the study area, as mapped from Plate Q. Also shown are positions of prominent closed contour lines; lines with hachures show closed portions of (inferred) synclinal folds. In T17N, the fabric of axes of distinct folds is oriented mostly north-to-south. Transverse elements are concentrated in T 18N, R 8E; eastward-trending axes are in T 17N, R 8E, to a smaller extent.

CHAPTER 5

SOME ASPECTS OF PETROLEUM GEOLOGY

Influence of Structural Geology on Distribution of Sandstone in the Bartlesville Interval

Concurrent inspection of Plates K through P (maps of Bartlesville sandstone) and Plates Q and R (structure of Inola Limestone and Bartlesville sandstone) led to the suspicion that folds and faults strongly influenced the distribution of sandstone in the Bartlesville interval. In general, belts of thick sandstone are near synclines, and tracts of thin sandstone (or no sandstone) are near anticlines or anticlinal noses (for example, see Figure 25).

Because the Bartlesville sandstones are not tabular bodies, and because the Inola Limestone marker-bed is a tabular entity, structural configuration of the Inola Limestone could not be used as a totally reliable guide to the configuration of the uppermost permeable Bartlesville sandstone. Further, the structure contour map of the Inola Limestone (Plate Q) could not be used as a singular line of evidence to explain why wells were productive from Bartlesville sandstone or not.

In order to map the top of permeable Bartlesville sandstone, elevations of the uppermost porous and permeable Bartlesville sandstone (as defined previously) were entered into an Excel spreadsheet (Appendix B). The BT sandstone was not included, because it is thin, shaly, and sporadic. Elevations of the top of permeable sandstone were plotted on a basemap and contoured (Plate R). Although the Inola and top-of-permeable-sandstone maps are not duplicates, the general structural characteristics of the Inola Limestone and of the uppermost permeable Bartlesville sandstone are similar.

Fundamental Structural/Depositional Fabric of the Study Area

Several attributes of the stratigraphic cross-sections (Plates F, G, H and I) are suggestive of the effects of faults (Appendix F). This evidence, combined with localities where

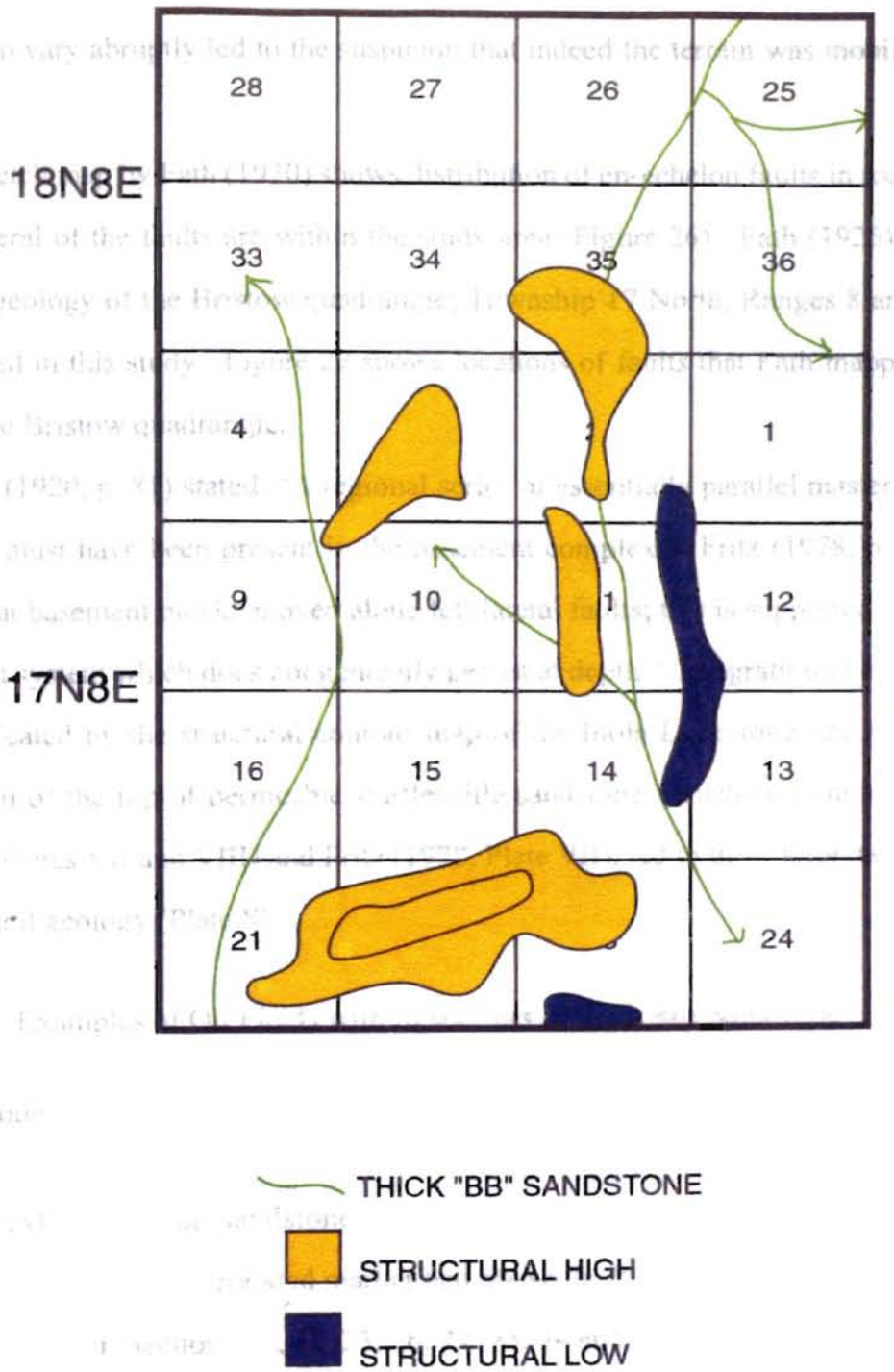


Figure 25. In general, belts of thick Bartlesville sandstone are near synclines (axes of belts shown by lines with "arrows") Tracts of thin sandstone (or no sandstone) are near anticlines or anticlinal noses.

strike and dip vary abruptly led to the suspicion that indeed the terrain was mobile during deposition.

A sketch map by Fath (1920) shows distribution of en-echelon faults in rocks at the surface; several of the faults are within the study area (Figure 26). Fath (1925) also described the geology of the Bristow quadrangle; Township 17 North, Ranges 8 and 9 East were included in this study. Figure 27 shows locations of faults that Fath mapped at the surface in the Bristow quadrangle.

Fath (1920, p. 81) stated, "A regional series of essentially parallel master faults or shear zones must have been present in the basement complex." Fritz (1978, p. 24) suggested "...that basement blocks moved along left lateral faults; this is supported by the en-echelon fault system which does not generally persist at depth." Integration of evidence of faulting indicated by the structural contour map of the Inola Limestone, the map of the configuration of the top of permeable Bartlesville sandstone, structural contour maps of Fath (1925, Plates VII and VIII) and Fritz (1978, Plate VII), led to the interpretation of the local structural geology (Plate S).

Examples of Oil Fields with Reservoirs of Cherokee Sandstone

Prue Sandstone

The extent of Prue sandstone in part of the West Kellyville District and the configuration of an easily correlated marker bed above the Prue are shown in Plate T. The Prue is productive in Sections 21, 22, 23, 26, 27, 33, 34 and 35, T. 18 N., R. 9 E.

A broad anticlinal nose plunges southwestward from Sec. 24 and 25, T. 18 N., R. 9 E. (Plate T); secondary positive flexures superimposed on it are a domal fold, centered in Sec. 22, and a secondary anticlinal nose, in Sec. 33 and 34. Well-log signatures indicate that the Prue is a multistoried, multilateral channel-fill complex. Local depositional strike is northeastward. Sandstone is as thick as 50 ft., in Sec. 22. The axis of the principal belt of

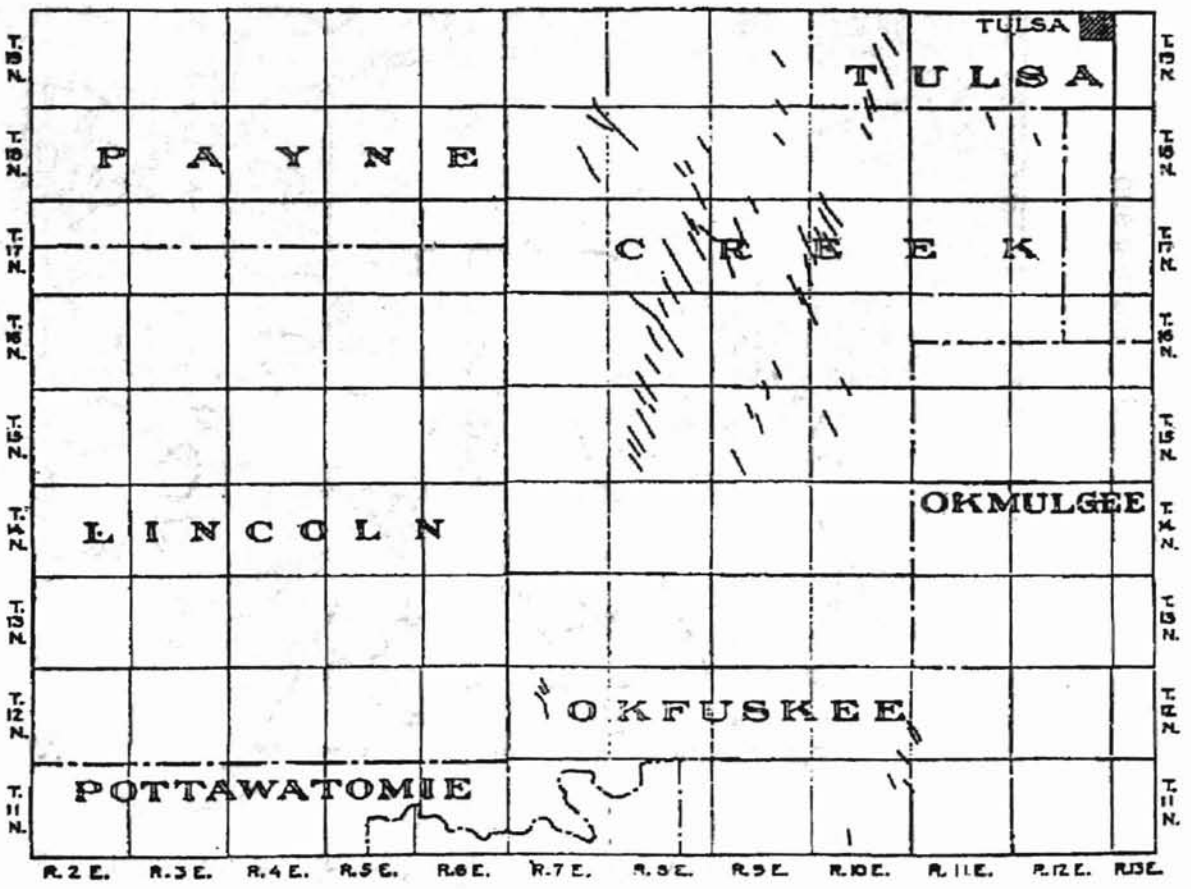


Figure 26. Distibution of en-enchelon faults in Creek County and nearby counties (after Fath, 1920, Plate XII).

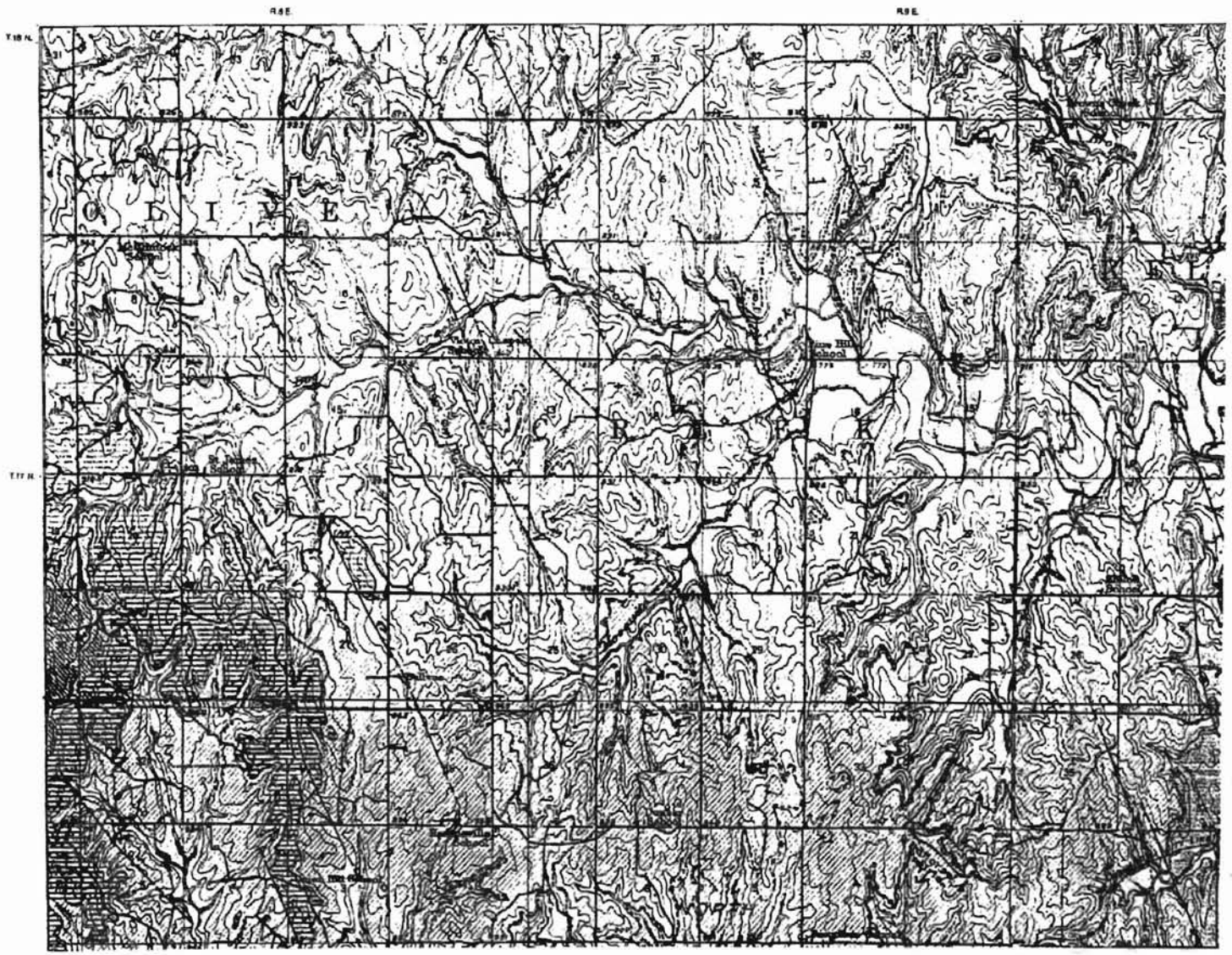


Figure 27. Distribution of en-echelon faults, Township 17 N, Ranges 8 and 9 E (after Fath, 1925, Plate II).

sandstone extends northeastward from the southeast quarter, Sec. 33 toward the southeast quarter of Sec. 22 (Plate T). Inspection of log signatures of the Prue in Sec. 22, 23, and 27 shows that component sandstones of the Prue differ in stratigraphic position and lateral extent. Entrapment of oil and gas within the Prue seems to be due primarily to flexure of the Prue across the broad anticlinal nose and secondarily to local "pinchouts" of secondary belts of channel-fill sandstone within the channel-fill complexes. The small trap in the northeast quarter of Sec. 34 and the northwest quarter of Sec. 35 is interpreted as being in a separate belt of channel-fill sandstone.

Average production of wells is approximately 25,000 barrels of oil (from records of Phillips Petroleum Company).

Lower Skinner Sandstone

Plate U shows distribution of Lower Skinner sandstone (Figure 4) in the eastern part of T 18N, R 8E and the western part of T 18N, R 9E. The sprawling trap is influenced strongly by "pinchout" of the lower unit of the Lower Skinner sandstone, shown by stippled pattern in Sec. 10,11 and 12, T 18N, R 8E. The pinchout seems to extend from near the east line of Sec. 12, T 18N, R 8E, eastward and southward through Sec. 17, 20 and 29, T 18N, R 9E. Structural contours on the Henryetta Coal (Figure 4) show that the pinchout extends along the flank of a southward-plunging anticlinal nose in Sec. 12 and 13, T 18N, R 8E. It probably is subparallel to strike from Sec. 17 to Sec. 20, T 18N, R 9E, and is draped across an anticlinal saddle in Sec. 29 and 30, T 18N, R 9E. The trap primarily is stratigraphic, but structural configuration of the sandstone seems to be of considerable influence.

Statistics about production from the Lower Skinner are sparse, but the superior wells probably produced more than 60,000 bbl. of oil (Petroleum Information Corp., 1984, p.74, 192-193).

Red Fork Sandstone

Plate V shows distribution of Red Fork sandstone (Figure 4) in the Mannford Oil Field, in Sec. 22, 23, 25, 26 and 27, T 18N, R 8E.

Structural contour lines show configuration of a thin bed of limestone, that is approximately 20 ft. above the sandstone. A belt of thin, shaly Red Fork sandstone grades eastward into shaly sandstone of low permeability. Pinchout of Red Fork sandstone is the main factor in entrapment; of secondary influence is flexure of the belt of sandstone across the anticlinal nose that extends southwestward from Sec. 23 across Sec. 28.

Average production of wells seems to be in the range of 10,000 to 30,000 bbl. of oil (Petroleum Information Corp., 1984, p. 74, 192-193).

Bartlesville Sandstone

An anticlinal-stratigraphic trap is in Sec. 15, 16, 21, 22, 27 and 28, T 17N, R 9E (Plate R and Figure 28). Figure 28 shows configuration of the anticlinal flexure, as expressed by the Inola Limestone. Folding and pinchout of Bartlesville BA sandstone (Figure 17) is shown diagrammatically in Figure 28, and is shown in more detail in Plate W.

Summary

The likelihood of entrapment of petroleum in Cherokee sandstones of the study area seems to be maximized by convergence of facies change or pinchout of belts (Prue, Bartlesville) or sheets (Lower Skinner, Red Fork) of sandstone across anticlines and anticlinal noses. Where the up-dip limits of belts or sheets of sandstone are sub-parallel to regional strike, the probability of entrapment is enhanced. Along the margins of belts or sheets of permeable sandstone, traps formed locally where the sandstone extended up-dip; there the sandstone is sealed both laterally and on the up-dip side.

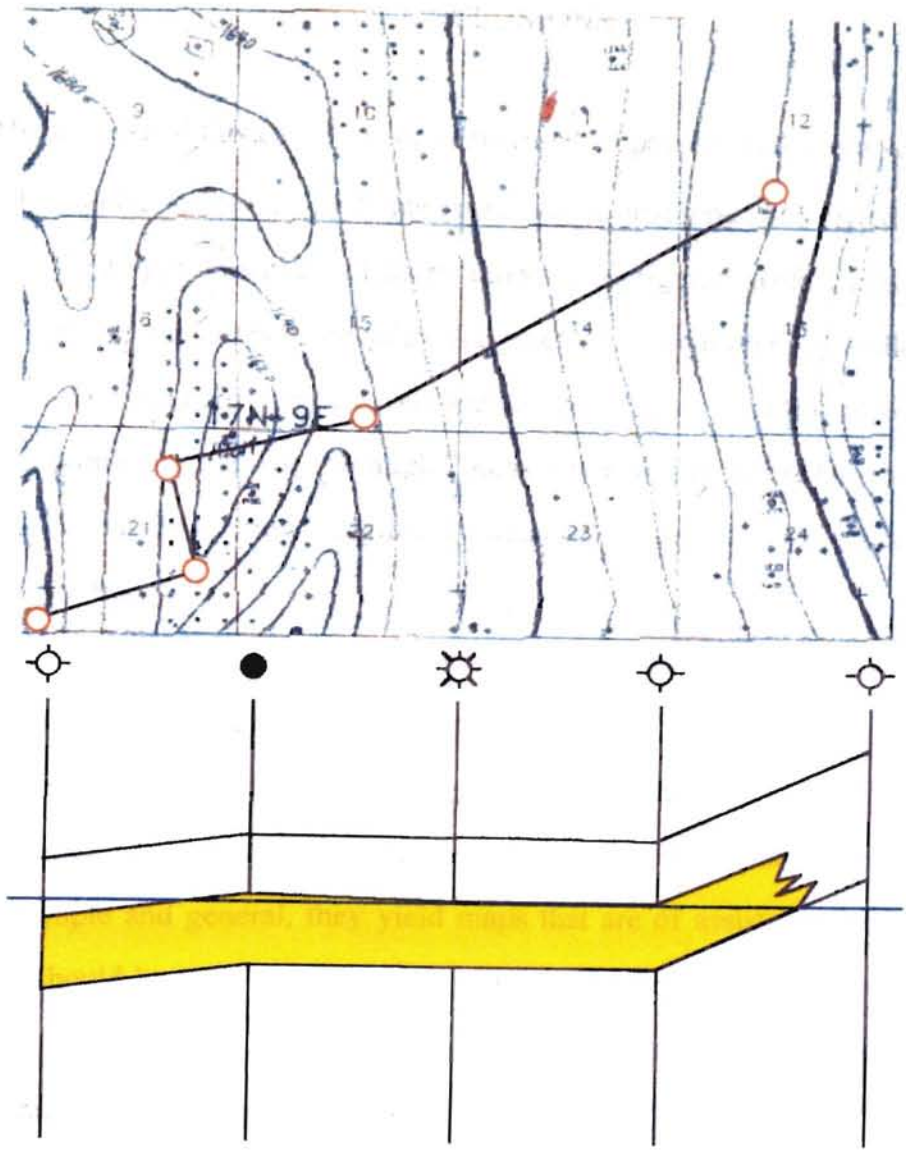


Figure 28. Structural-stratigraphic trap in Bartlesville sandstone, T17N, R9E. Structural contours show configuration of Inola Limestone (contour interval 20 ft.). Cross section is diagrammatic. Horizontal line is at approximate oil-water contact. Pinchout of Bartlesville BA sandstone (in yellow) shown in more detail in Plate W.

CHAPTER 6

CONCLUSIONS

The purpose of this endeavor was expressed on pages 6 and 7 as a set of questions:

1. Could a set of uncomplicated methods be developed and tested for effective "first-approximation" of distribution and configuration of Cherokee sandstones?
2. Would the methods be suited for practical evaluation of a "drilled-up" area where data are abundant, oil fields are small, and remaining reserves are small?
3. Would the methods "highlight" areas where oil and gas are known to be trapped?
4. Would the methods "highlight" areas where undiscovered oil and gas might be trapped?
5. Could these methods be applied effectively under the normal operational constraints of applied petroleum geology?

Evidence described in the preceding text leads to these theses:

1. Although methods of mapping the Prue, Lower Skinner, and Red Fork sandstones are simple and general, they yield maps that are of assistance in deciding where exploration should be concentrated. For example, Plate T shows that the oil field in Prue sandstone is in terrain of thick sandstone in a "belt" that trends subparallel to regional strike. Entrapment of petroleum in Red Fork sandstone is suggested on Plate E; the southeast-trending "belt" of sandstone thicker than 20 ft. is narrowed abruptly in Sec. 22, 26 and 27, T 18N, R 8E — a pattern suggestive of constriction in the up-dip migration pathway. Similar narrowing of a sand-belt is detectable on the generalized map of Skinner sandstone (Plate D); the sand-belt is constricted in Sec. 12, T 18N, R 8E.

Concurrent inspection of these maps and the structural contour map of the Inola Limestone would lead to hypotheses about entrapment of oil at other localities, where limits of sandstone and anticlinal flexures seem to be coincident. (For example, see Plates E and

Q. In Sec. 5, 8, 16 and 21, T 18N, R 8E, compare the 20 ft.-thick sandstone "belt" and the anticlinal axes; the trend of thick sandstone is at a high angle to the anticlinal axes.)

2. The method of classifying sandstones within the Bartlesville interval takes into account the fact that the sandstone is multistoried and multilateral. The method is believed to be reproducible (it should be effective in use by other geologists). Maps that show variation in thickness of divisions of the Bartlesville sandstone should be fruitful in exploration. For example, Plate K, the isolith map of BA sandstone, shows evidence of wedge-out of sandstone against or across the anticline in Sec. 15, 16, 21 and 22, T 17N, R 9E (Plate Q). An example of a rough analogue of this suspected trap is suggested in Sec. 8 and 9, T 17N, R 8E (compare Plates K and Q). Bartlesville BA sandstone probably wedges out eastward toward Sec. 10 and westward toward Sec. 8; if so, locally the wedge-out sandstone could be draped across a southwestward-plunging anticlinal nose, a set of conditions that might account for a stratigraphic-structural trap.

3. Plate R, the map of configuration of the top of permeable Bartlesville sandstone is a useful guide for concentrated effort. For example, in the southern half of Sec. 6, T 17N, R 9E, domal closure of about 20 ft. is indicated.

The five questions set out above, and in the section entitled "Purpose of Study," have been answered "yes." Maps of Prue, Lower Skinner, Red Fork and Bartlesville sandstone are effective first-approximations of distribution and configuration of reservoirs. Traps are "highlighted" and areas of possible entrapment of petroleum are indicated in a rather straightforward fashion. Although the study area is "drilled-up," the maps are useful for prospective extension of oil fields and for discovery of new, small oil fields. The algorithms for construction of maps and cross-sections are simple; application of them leads to quick acquisition of documents.

The methods described in pages above could be used profitably under the normal hurried conditions of exploration.

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APPENDICES

APPENDIX A

ESTIMATION OF THE PROPERTIES OF "RESERVOIR-QUALITY" BARTLESVILLE SANDSTONE, AS SHOWN BY SPONTANEOUS-POTENTIAL CURVES

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ESTIMATION OF THE PROPERTIES OF "RESERVOIR-QUALITY" BARTLESVILLE SANDSTONE, AS SHOWN BY SPONTANEOUS- POTENTIAL CURVES

Most wireline logs of wells in the study area show spontaneous potential (SP) curves, but no curves that permit direct and reliable quantitative estimates about porosity or qualitative estimates about fluid-permeability of the rock. Of the collection of logs used in this study, eighteen sets included logs of spontaneous potential, resistivity and density-porosity. A set of eighteen logs included spontaneous potential curves and micrologs. Logs of only three wells were common to both sets: HLS Resources 2-20 S. Olive, and LCB Resources Nos. 1 E.B. and 1-14 Ruby (pages 73 and 75).

As described in the preceding text (p. 23-25), in instances where data were sufficient to do so, porosity of Bartlesville sandstone was "corrected" for the effects of shale included in the rock. Table 1 shows that on the average, density of shale attributed to Bartlesville sandstone is 2.61 grams per cubic centimeter. Matrix density of Bartlesville sandstone was assumed to be very near 2.68 grams per cubic centimeter. Average "shale-corrected" porosity of Bartlesville sandstone was computed by the algorithm that follows. (The example used here is hypothetical. Porosity is assumed to be filled with mud filtrate; density of mud filtrate is assumed to be 1 gram per cubic centimeter.)

1. Assumed matrix density, sandstone: 2.68 gm./cu.cm.
2. Bulk density of shaly sandstone: 2.4 gm./cu.cm.
3. Estimated percentage of shale in sandstone: 10%
4. Estimated density of shale: 2.60 gm./cu.cm.
5. Matrix density of shaly sandstone: $[(0.9)(2.68 \text{ gm./cu. cm.})] + [(0.1)(2.6)] = 2.672$ gm./cu.cm.
6. Matrix density of sandstone, "corrected" to eliminate effect of shale:

[(2.672 gm./cu.cm. – (2.4 gm./cu.cm.)]/ [(2.672 gm./cu.cm.) – (1.0 gm./cu.cm.)]

= (0.272 gm./cu.cm.) / (1.672 gm./cu.cm.) = 0.163, or 16.3%

Table 1 shows that average porosity of Bartlesville sandstone, "corrected" for effect of shale, is 14.65%.

Bartlesville sandstone that is believed to be permeable was mapped according to evidence compiled from eighteen pairs of spontaneous potential logs and micrologs. Figure 29 shows the spontaneous resistivity, resistivity and microlog curves through Bartlesville sandstones of the Cher Oil Co. No. 2 Greenwood, SW SW SE Sec. 4, T18 N, R 9E. The shale baseline of the SP curve is approximately three chart divisions to the left of the central depth tract. In Table 2, this position was assigned the arbitrary measurement of -60 millivolts (a conditional number, because deflection of the SP curve is meaningful where measured relative to the shale baseline, not relative to zero millivolts). The uppermost and lowermost boundaries of permeable sandstones are indicated by arrows on the SP curve (Figure 29). The leftmost of the two arrows was judged to be the better indicator of sandstone of reservoir-quality. (In Table 2 this measurement is shown as the "Clean Reservoir Sandstone Cutoff" of -82 millivolts from the shale baseline.) Average position of the "clean sandstone cutoff" in the sample of 18 wells was -68 millivolts from the shale baseline. To map Bartlesville reservoir sandstone throughout the study area, from the SP curve, -65 millivolts from the shale baseline was defined as the minimal negative value.

TABLE 1

WELLS WITH SPONTANEOUS-POTENTIAL LOGS, RESISTIVITY LOGS AND DENSITY-POROSITY LOGS

Well Name	Operator	Township	Range	Section	Location	Density, Shale	Matrix Density, Bartlesville Sandstone	% Shale	Matrix Density, Bartlesville Sandstone--Corrected for Shale Percentage	Porosity, Bartlesville Sandstone
Martin #1	Cher Oil Co.	18N	9E	4	SENESW	2.63	2.68	8	2.67	16.17
Robert #1	Rack Oil	18N	9E	6	SENENW	2.64	2.68	14	2.67	15.57
P.B. Jackson #1	Texaco Inc.	18N	9E	7	NWSW	2.63	2.68	10	2.67	12.57
Carroll #4-C	Corn-Okla Producing Co.	18N	9E	20	NWSENW	2.63	2.68	8	2.67	16.17
Carson #1	Creek County Resources	18N	9E	21	SWNWSW	2.62	2.68	25	2.66	11.45
Moore #4	Little River Energy Co.	18N	9E	29	SESWNW	2.65	2.68	7	2.67	16.17
Ruby Cox #1	Boomer Sooner	18N	9E	29	SENWNW	2.64	2.68	8	2.67	14.37
Plumer #7	Blackjack Oil Co.	18N	9E	29	SENWNE	2.60	2.68	5	2.68	17.86
Cox East #1	Little River Energy Co.	18N	9E	30	SESENE	2.62	2.68	15	2.67	16.17
Wheeler #4-C	Cramer Production	18N	9E	30	SESENW	2.62	2.68	14	2.67	13.17
Ruby #1-14	LCB Resources	18N	8E	14	NWSESE	2.55	2.68	9	2.67	14.37
#1 E.B. ***	LCB Resources	18N	8E	14	E/2NESW	2.54	2.68	4	2.66	13.85
S. Olive 2-20	HLS Energy Inc.	18N	8E	20	SESESW	2.64	2.68	19	2.67	12.57
Deer #1-23	Indrex Inc.	18N	8E	23	NESWNE	2.62	2.68	10	2.67	14.97
Rossander #3	Krumme Oil Co.	17N	9E	7	SENWNW	2.65	2.68	19	2.67	13.77
Elias Shoppa #35	Bristow Resources	17N	9E	19	SWSWSE	2.55	2.68	17	2.65	13.93
Rowland Creek #9	Ram Petroleum Co.	17N	9E	26	SESESE	2.60	2.68	8	2.67	14.97
Bethel #1	Petroleum Resources Co.	17N	9E	33	SESWNE	2.58	2.68	10	2.67	15.58
					Average	2.61	N/A		2.67	14.65
					Avg.Deviation	0.03	N/A		0.00	1.31
					Std.Deviation	0.03	N/A		0.01	1.62

*** The density of shale is believed to be 2.54

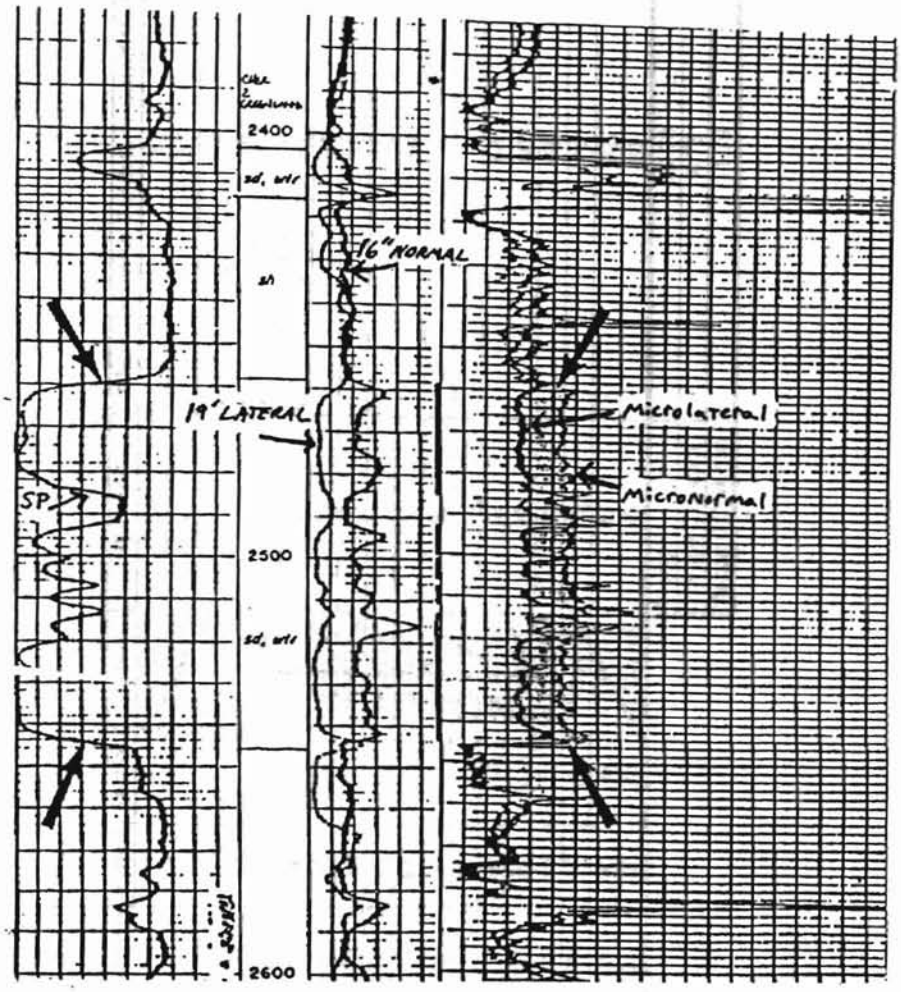


Figure 29. Combined electric log and microlog, Cher No. 2 Greenwood, Sec. 4, T 18N, R 9E. Permeable sandstone is shown by the microlog, by positive separation of microlateral and micronormal curves. The extreme top and base of intervals of porous Bartlesville rock (indicated by arrows) were transposed from the microlog to the SP curve. Approximate position of shale baseline is three chart divisions to the left of the central depth tract.

TABLE 2
WELLS WITH SPONTANEOUS-POTENTIAL LOGS AND MICROLOGS

Well Name	Operator	Township	Range	Section	Location	SBL(-mV)	Clean Reservoir Sandstone Cutoff from Microlog
Greenwood #2	Cher Oil Co.	18N	9E	4	SWSWSE	60	82
Matofsky #2	Big Four Petro. Co.	18N	9E	6	NWSWNE	17	67
Timeley #2	Big Four Petro. Co.	18N	9E	7	SENESW	28	72
Scott #4	Crowder Oil Co.	18N	9E	20	NW	38	84
Carson #2-A	Paul R. Prentice	18N	9E	21	SWSW	37	63
Moore #3	Cobra Oil	18N	9E	29	SWSWNW	27	91
Cox #1	Kidd Williams	18N	9E	29	SENENW	17	64
Stine Franklin #1	Kidd Williams	18N	9E	29	SWNWNE	20	82
Cox #2	Crowder Oil Co.	18N	9E	30	SWSENE	57	62
Wheeler #2-C	Cramer Production	18N	9E	30	SENW	32	60
Ruby #1-14	LCB Resources	18N	8E	14	NWSESE	60	40
#1 E.B.	LCB Resources	18N	8E	14	E/2NESW	30	71
S. Olive #2-20	HLS Energy Inc.	18N	8E	20	SESESW	42	68
Deer #1	Big Four Petro. Co.	18N	8E	23	SWNWNE	10	60
Wilson Bruce #1	Markwell and markwell	17N	9E	7	SWNWNW	30	58
Stone #1	Carter and Mandel	17N	9E	19	SENWSE	33	71
Elias #1	Carter and Mandel	17N	9E	26	NENESE	63	62
Cue #1	L.B. Jackson	17N	9E	33	NENWNE	45	63
						Average	67.78
						Average Deviation	8.75
						Standard Deviation	11.79

APPENDIX B

DATABASE

APPENDIX B

DATABASE

Appendix B is a database. It is organized as a spreadsheet, so as to show important data about wells in the study area. Data are coded according to the system shown in the paragraph below. The database is divided into three parts. (1) Pages 78 through 99 show index numbers of wells, locations of wells, names of operators, names of wells, total depths, kelly-bushing elevations, names of companies that logged the wells, kinds of logs that were available for the study, and bottom-hole temperatures. (2) Pages 100 through 116 show (a) index numbers of wells. (b) depths and elevations of the tops and bottoms of the Bartlesville Sandstone interval, (c) elevation of the top of permeable Bartlesville sandstone, and (d) thicknesses of the Bartlesville interval, of the divisions of Bartlesville sandstone, and of net sandstone. (3) Pages 117 through 145 show index numbers of wells, thicknesses and log-signature shapes of the Oswego Limestone and Prue, Skinner and Red Fork sandstones.

Codes

BA	"BA" sandstone unit of the Bartlesville Sandstone interval.
BA/B	"BA/B" sandstone unit of the Bartlesville Sandstone interval.
BB	"BB" sandstone unit of the Bartlesville Sandstone interval.
BC	"BC" sandstone unit of the Bartlesville Sandstone interval.
BHT	Bottom-hole temperature.
BT	"BT" sandstone unit of the Bartlesville Sandstone interval.
BU	"BU" sandstone unit of the Bartlesville Sandstone interval.
KB	Kelly-bushing elevation.
TD	Total depth of well.

	Well Information								Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
1	17	8	1	NW NE NE	Indrex/Scroggins	Kyser #1	3120	842	Birdwell/84	DIFL	118
2	17	8	1	SE NE NE	Indrex/Scroggins	#3 Kyser	3110	832	Birdwell/84	DIFL/3D Velocity	124
3	17	8	1	NE SW SW	Morton and Pound	Morrow #2	3095	817	Welservice Inc./76	E-log	98
4	17	8	1	NE NE NW	Indrex/Scroggins	Rollestone #3	3506	864	Welservice Inc./84	IEL	103
5	17	8	1	SE NW NE	Indrex/Scroggins	Rollestone #4	3129	853	Gearhart/84	DIL	102
6	17	8	1	NE NE NW	Illinois Exploration Company	Rollestone #1	2625	ND	Schlumberger/54	E-log	96
7	17	8	1	NE SW NW	L.B. Jackson	Mandler #1	3110	872	Welservice Inc/75	E-log/MRL	99
8	17	8	1	NE NW NE	Indrex Scroggins Inc.	Rollestone #2	3165	878	Welservice Inc/84	IEL/CDL	99
9	17	8	1	NW NW NE	Indrex Scroggins Inc.	Rollestone #1	3155	859	Birdwell/84	DIFL	100
10	17	8	1	SW SW SE	Taconic	Collins #1	3675	846	Welservice Inc/80	E-log	107
11	17	8	1	SE NW SE	Morton and Pound	Clarence Morrow #1	3112	ND	Welservice Inc/77	E-log	99
12	17	8	1	NW NW SE	Marion Oil Company	Morrow #1	3056	824	Schlumberger/64	IEL	104
13	17	8	1	NE NE NE	Indrex-Scroggins	Kyser #4	3100	832	Birdwell/84	DIFL	118
14	17	8	1	SW NE NE	Indrex-Scroggins	Kyser #2	3140	832	Birdwell/84	DIFL	107
15	17	8	1	SE NE NW	Indrex-Scroggins	Rollestone #6	3160	866	Birdwell/84	DIFL	122
16	17	8	1	SW NW NE	Indrex-Scroggins	Rollestone #5	3015	840	Welservice Inc./84	E-log	99
17	17	8	1	SE SE SW	Martin Industries	Morrow #1	3055	818	Riley/49	E-log	ND
18	17	8	1	NE SE SE	Newton Barrett	State #1	3056	853	Schlumberger/53	E-log	98
19	17	8	1	NE SW NE	W.T. Sanders	Lee #4	3083	ND	Birdwell/84	DIFL	120
20	17	8	1	SE SE SE	Mickalson Petr. Co.	Harry #1	3416	852	Payne and Payne/84	IEL	107
21	17	8	1	NW SW NE	Stockton Oil and Gas	Lee #3	3094	838	Gearhart/83	DIL	110
22	17	8	1	SW NE NW	Indrex-Scroggins	Rollestone #7	3174	881	Birdwell/84	DIFL	122
23	17	8	1	NE SE SE	Mickalson Petr. Co.	Harry #2	3155	851	Payne and Payne/87	DIL	106
24	17	8	1	NW SW SW	Sooner State Petr. Co.	Morrow #1	2598	827.75	Halliburton/53	E-log	118
25	17	8	1	NW NE NW	Indrex-Scroggins	Rollestone #8	2693	879	Mayfield/85	DIEL	102
26	17	8	2	NW SW SE	Morton Bros.	Owens #1	3082	907	Welservice Inc./83	IEL	99
27	17	8	2	NW NW SE	Morton Bros.	Kirschner #1	3140	895	Welservice Inc./74	E-log	98
28	17	8	2	SE SW SW	Mar-Tay Drilling	Thatcher #1	3531	911	Welservice Inc./84	E-log/ML	103
29	17	8	2	NE NE SE	Morton Bros.	Morrow #2	3410	827	Welservice Inc./78	E-log/MRL	102
30	17	8	2	C SE SE	Morton Bros.	Brock #1	3107	ND	Welservice Inc./76	E-log/MRL	99
31	17	8	2	SE NW SE	Morton Bros.	Kirschner #1A	3588	866	Welservice Inc./75	E-log/MRL	113
32	17	8	2	SE NW SE	Saffa and Brauer	Mandler #1	2637	863	Welex/60	E-log	96
33	17	8	2	SW SE SW	L.B. Jackson	Howard #1-A	3173	881	Welex/81	IEL/CDL	102
34	17	8	2	NW NE NE	Isaac Nolan	Nolan A-5	3499	833.5	Welex/86	DISGL/MLL/SDL-DSN	107
35	17	8	2	NW NE NW	L.B. Jackson	Keener #2	3127	845	Welex/75	IEL/CDL	105
36	17	8	2	SW SW SW	Martay Drilling Co.	Thatcher #2	3196	892	Welservice Inc./81	IEL/MRL	100
37	17	8	2	NE NE SW	L.B. Jackson	Howard #2	3139	871	Welex/74	IEL/CC	100
38	17	8	2	SW NE NW	L.B. Jackson	Keener Shamblin Washdown	3125	836	Welex/76	IEL/CDL	99
39	17	8	2	SE SE SE	Saffa and Brauer	Kelly #2	2633	861	Welex/60	IEL/CC	96
40	17	8	2	SW SW NE	L.B. Jackson	Bear Nolan #6	3225	896	Welex/76	IEL/CDL	100
41	17	8	2	C SE NW	L.B. Jackson	Howard #1	3135	858	Welex/73	IEL/CC	100
42	17	8	2	NE NW NE	L.B. Jackson	Keener #1	3095	832	Welex/73	IEL/CC	100
43	17	8	2	NW SW	Spram	Marrs #1	3487	855	ND /74	E-log	102
44	17	8	2	NW SE NE	L.B. Jackson	Bear Nolan #8	3600	838	Welex/83	DIL/CDL	106
45	17	8	2	SE SW SW	Mar-Tay Drilling Company	Thatcher #1	3531	ND	Welservice Inc/81	E-log	103
46	17	8	3	C NW SE	Producers Oil Company	C. Casey #8	3553	944	Welservice Inc/67	E-log	103

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
47	17	8	3	NW NW	James W. Owens	Kemp #10	3268	961	Welservice Inc./81	E-log/MRL	100
48	17	8	3	NE NE	Ascot Oils Inc.	Gleason #2	3533	872	Schlumberger/69	IEL/ML	104
49	17	8	4	NE NW SW	Lindy Petro. Co.	Abraham 4-1	3663	940	Welex/81	IEL/CDL	105
50	17	8	4	NE SW NE	Fred B. Kroger	H. E. Glimp & C.E. Gragg #1	2902	966	Schlumberger/53	E-log/ML	101
51	17	8	5	NE NE NW	Ric Petroleum	Lisa #1	3309	952	Computalog/85	DISFL/CDL	112
52	17	8	5	NW NE NW	Ric Petroleum	Lisa #2	3609	922	Computalog/85	DISFL/CDL	115
53	17	8	5	SW NE NW	Ric Petroleum	Lisa #3	3640	944	Computalog/85	DISFL/CDL	115
54	17	8	5	NE NE NE	Glenn Gillespie and Sons	Abraham #1	3614	921.2	Schlumberger/55	E-log	108
55	17	8	5	NW SW NE	Sopac Exploration	Rowell #1	3676	932	Schlumberger/88	DISFL	111
56	17	8	5	NW NW NE	Glenn Gillespie and Sons	Abraham #2	3618	917.5	Schlumberger/55	E-log/MRL	ND
57	17	8	5	NE NE NE	Glenn Gillespie and Sons	Abraham #1	3597	921.2	Schlumberger/55	E-log	108
58	17	8	6	SW SW SW	D.H. Cramer	Cramer #1	3105	949	Welservice Inc./71	E-Log	98
59	17	8	6	SW SW SE	Shibley Oil Co.	Carroll #1	2830	910	Halliburton/54	E-log	98
60	17	8	6	NW SW NW	Glimp Oil Co.	Turner #1	3336	969	Welservice Inc./83	IEL/CDL	102
61	17	8	7	SE SE NW	Oak Hill Petroleum company	McKee #1-7	3388	925	Precision/84	DIL/CDL	107
62	17	8	7	NE SW NW	McAdams etal	#1 McKee	2963	947	Schlumberger/52	E-log/ML	107
63	17	8	7	NE SW SE	Monarch Petroleum	Wight #1	3304	970	Gearhart/86	DIL/CDL	105
64	17	8	7	SW SW SE	Monarch Petroleum	Anton #1	3352	994	Gearhart/86	DIL/CDL	106
65	17	8	7	NW SW SE	Monarch Petroleum	Griffin #1	3693	964	Gearhart/85	DIL/CDL	111
66	17	8	7	SW NW SE	Glimp Oil Co.	Nicky #1	3350	939	Welservice Inc./86	IEL/COL	100
67	17	8	7	SE NW SW	C.W. Van Eaton	Jones #1	3415	968	Schlumberger/51	E-log	92
68	17	8	7	SE NW NE	William Shibley	Glimp #1	2810	935	Halliburton/53	E-log	97
69	17	8	7	NW SE SW	R.H. Vise	Catlett #1	2970	967DF	Halliburton/50	E-log	ND
70	17	8	7	SE SE SE	Creek Oil Co.	Catlett #2	2645	1007.5	Halliburton/54	E-log	97
71	17	8	7	SW NW NE	N.B. Gerber	Snell #1	2697	ND	Schlumberger/52	E-log	104
72	17	8	7	NW SW NE	William Shibley	Glimp B #2	2917	931	Halliburton/54	E-log	101
73	17	8	8	NE SW SE	Leonard Seigel	Hedrin #2	3418	ND	Gearhart Owen/78	IEL/CDL	113
74	17	8	8	NW SE SE	Mid Continent Petr. Co.	Mullie #1	3286	954DF	Schlumberger/45	Composite Log	ND
75	17	8	8	NE NW SE	Pawnee Petroleum Co.	Cahill #1	3618	933	Schlumberger/64	IEL	108
76	17	8	9	NE NE SW	Ameri Oil	Sally #1	3292	ND	Mayfield/86	DIEL	107
77	17	8	9	SW NE SE	American First Energy Corp.	Mannford #1	3280	918	Gearhart/83	DIL	107
78	17	8	9	SW SW NW	Mid Continent Petr. Co.	Lasley #1	3293	939DF	Schlumberger/45	Unknown	ND
79	17	8	9	SE SE SW	Illini Oil Co.	Morgan #2	2695	869	Schlumberger/56	E-log	105
80	17	8	9	NW SW SW	Illini Oil Co.	Morgan #3	2788	952	Schlumberger/56	E-log	102
81	17	8	9	NW SE SW	Fred Wewerka	Morgan Estate 1	2708	886	Halliburton/53	E-log	97
82	17	8	10	E/2 SE SE	American First Energy Company	Opal #1	3167	830	Gearhart/83	DIL/CDL	103
83	17	8	10	SE SE NE	Jack Frost	Ashmore #1	2635	867	Schlumberger/51	E-log	100
84	17	8	11	NW NW NE	Texas Crude	Roy Bath #2	2675	875	Schlumberger/53	E-log/ML	96
85	17	8	11	SE NW NE	Texas Crude	Roy Bath #1	2711	883	Schlumberger/53	E-log/ML	97
86	17	8	11	ND	Stockton Oil and Gas	Halford #1	3210	868	Gearhart/83	DIL	103
87	17	8	11	NW NW NW	Morton Brothers	Morrow #3	3187	ND	Welservice Inc/81	E-log	100
88	17	8	11	SW NE SW	Shibley Oil Co.	Betsy Kay #1	2957	ND	Welex/58	E-log/CC	100
89	17	8	11	NW SW SE	William Shibley	Tucker #1	2553	955	Elgen Corp./57	E-log	105
90	17	8	11	SW NE NW	Carl W. Crites	Wagner #1	2600	871.5	Schlumberger/53	E-log	101
91	17	8	11	SW SW SE	Pete Kime	Bath #1	2591	844	Schlumberger/55	E-log	93

	Well Information								Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
92	17	8	11	NE NE NW	Ketchum Whan	Wagner #2	2638	874	Schlumberger/53	E-log/ML	96
93	17	8	11	E/2 SW NW	Morton and Pound	Morrow #1-A	3506	905	Wellservice Inc. 68	E-log/MRL	105
94	17	8	11	SE NE NW	Morton and Pound	Putman #1	3434	ND	Wellservice Inc./78	E-log/MRL	102
95	17	8	11	SW NW NE	Morton Brothers	Bath #1	3481	887	Wellservice Inc./80	E-log/MRL	102
96	17	8	11	C NE SW	American First Energy	Brightwell #1	3128	848	Gearhart/84	DIL/CDL-CDS	110
97	17	8	11	NE SW NW	Albert Brauer	Bath #4	2675	ND	Welex/60	E-log/CC	96
98	17	8	11	NE SW NW	Kenneth Nix	Morrow #1	2778	908	Schlumberger/51	E-log/MRL	100
99	17	8	11	SE SW SW	Rock Hill Oil Company	Josie Wyatt #2	3191	827	Schlumberger/53	E-log	102
100	17	8	11	NW NE SE	Norman A. Smith	Bath #1	3214	ND	Halliburton/50	E-log	ND
101	17	8	11	NW SE NW	Morton Bros.	Pepsis #1	3467	894	Welservice Inc./77	E-log	102
102	17	8	12	SE SE SW	H.S. and W. Company	Sarty Fry #1	3183	ND	Schlumberger/52	E-log	108
103	17	8	12	SW SW NE	George R. Mitchell	Beavers #1	3041	806DB	Halliburton/49	E-log	ND
104	17	8	12	SE NW SE	Brosius and Hall	Whitehill #3	3050	ND	Halliburton/50	E-log	ND
105	17	8	12	NE SE NE	Hammond Production Company	Beaver #2	3052	803	Welservice Inc./85	IEL	98
106	17	8	12	NE NW SE	Brosius and Hall	Whitehill #2	3060	ND	Halliburton/50	E-log	ND
107	17	8	12	SE SE NW	C.L. Brosius	Pickett #1	3066	804RT	Halliburton/ND	E-log	ND
108	17	8	12	NE SE NW	Service Drilling Company	Pickett #3A	3050	816	Schlumberger/54	E-log	107
109	17	8	12	NW NW SE	C.L. Brosius	Whitehill #1	3107	845RT	Halliburton/49	E-log	ND
110	17	8	12	SW SE SE	H.S.and W. Company	Picket Whitehill #4	2755	902	Schlumberger/52	E-log	104
111	17	8	12	NW SW	Lassetter Petro.	Allensworth #1	3132	821	Gearhart/84	DIL/CDL-CNS	102
112	17	8	12	NW	Service Drilling Company	Pickett "A" 4-12	3130	810	Welex/85	DIGL	100
113	17	8	12	NE NE NE	Producers Pipe and Supply Co.	Beavers #4	3059	823	Schlumberger/54	E-log/ML	106
114	17	8	12	NE NE	Hammond Production	Beaver #1	3090	816	Gearhart/82	DIL/CAL	102
115	17	8	12	SE NE NW	Service Drilling Company	Pickett "A" #4-12	3127	ND	Welex/85	DIGL/CDL	100
116	17	8	12	N/2 NE SE	Service Drilling Company	Pickett "B" No. 5-12	3384	830	Gearhart/84	DIL/CDL	104
117	17	8	12	NE SE SE	Indrex Scroggins Inc.	Pickett #1	3123	857	Mayfield/86	DIEL/CDL	105
118	17	8	12	SE SW SW	Lassetter Petroleum Corp.	Sarty Fry 1-B	3194	893	Dresser Atlas/84	DIFL	104
119	17	8	12	NE	Producers Pipe and Supply	Beavers #4	3059	823	Schlumberger/54	E-log/ML	106
120	17	8	12	NE	Hammond Production	Beaver #1	3090	816	Gearhart/82	DIL/CDL	102
121	17	8	13	SW SW NE	Service Drilling Company	Spurgeon #2-A	2298	883GL	Schlumberger/81	E-log/ML	100
122	17	8	13	SW NE NW	MCS Exploration	Sly #1	3240	924	Schlumberger/81	DISFL/CDL	112
123	17	8	13	NE SE NE	William C. Robertson and Assoc.	Tracey #1	3531	838	Great Guns/85	DIL/CDL	115
124	17	8	13	NE SW	L.H. Bracksieck	Harjo #3	2326	924	Schlumberger/60	E-log	102
125	17	8	13	SE SE NW	L.H. Bracksieck	Bath #1	2324	912	Schlumberger/60	E-log	96
126	17	8	13	NW NW SE	L.H. Bracksieck	Kelley #1	2761	ND	Schlumberger/60	E-log	102
127	17	8	13	NE SW	L.H. Bracksieck	Harjo #2	2334	924	Schlumberger/60	E-log	95
128	17	8	13	SE NE SW	L.H. Bracksieck	Harjo #4	2352	947	Welservice Inc./69	E-log	91
129	17	8	13	NW SW	Frisersont Kirchner	Bishop #4	2355	929	Welex/60	E-log	93
130	17	8	13	SE NE NE	Robert Pound	Sly #1-C	3100	847	Welservice Inc./85	IEL/CDL	98
131	17	8	13	SW NE NE	Robert Pound	Sly #2-C	3174	ND	Welservice Inc./85	IEL/CDL	98
132	17	8	13	NW SE SW	L.H. Bracksieck	Harjo #1	2801	932	Schlumberger/59	IEL	102
133	17	8	13	ND	L.H. Bracksieck	Harjo #1-A	2800	ND	ND	ND	ND
134	17	8	13	SW SE NE	W.C. Robertson	Tracy #3	3234	885	Great Guns/84	DIL/CDL	112
135	17	8	13	NW SE NE	W.C. Robertson	Tracy #2	3219	879	Great Guns/85	DIL	112
136	17	8	13	NE NW SW	Robert A. Mason	Bishop I-1	2327	ND	Go Set Services/65	E-log	106
137	17	8	13	SE NW SW	Robert A. Mason	M.C.P.S.U. Bishop I-2	2298	ND	Go Set Services/65	E-log	110

	Well Information								Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
138	17	8	13	NE SW SW	L.H. Bracksieck	Bishop #2-A	2758	907	Schlumberger.59	E-log	102
139	17	8	13	NE NW NE	Brosius and Hall	Spurgeon #1	3160	901DB	Halliburton/50	E-log	ND
140	17	8	13	NE NE NW	Brosius and Hall	Bath #1	3118	843DB	Halliburton/50	E-log	ND
141	17	8	13	SW	B and B Oil Company	Bishop #3-A	4013	938	Welservice Inc./66	E-log	108
142	17	8	13	NE	Brosius and Hall	Spurgeon #3	2755	907DB	Halliburton/50	E-log	ND
143	17	8	14	SE SE NW	Red Eagle Oil Co., Inc.	Ellie Johnston #2-A	3157	847	Lane Wells/59	Electrolog	98
144	17	8	14	C SW SW	Southland Oil Corporation	Lyles #14-1	2905	906	Welservice Inc/84	IEL/CDL	102
145	17	8	14		Lassetter Petroleum Corp.	Sarty Fry 1-XX	3194	ND	Dresser Atlas/83	DIFL	101
146	17	8	14	NE SE NW	Red Eagle Oil Co.	Ellie Johnson #4-A	2655	862	Lane Wells/59	E-log	106
147	17	8	14	NE NE SE	Robert A. Mason	Fry #7	2312	907	Welex/65	E-log	95
148	17	8	14	SE NE NW	Red Eagle Oil Co.	Ellie Johnson #5-A	2638	878	Lane Wells/59	E-log	106
149	17	8	14		Red Eagle Oil Co.	Ellie Johnson #1-A	2631	856.5	Lane Wells/59	E-log	107
150	17	8	14	NW NE NW	Red Eagle Oil Co.	Ellie Johnson #3-A	2615	848	Lane Wells/59	E-log	106
151	17	8	14	SE SE SE	Robert A. Mason	Johnson #8	2370	ND	Welservice Inc./68	E-log	88
152	17	8	14	NW SE SW	Robert A. Mason	M.C.P.S.U. Well I-7	2358	ND	Go Set Services/65	E-log	109
153	17	8	14	SW NE SW	Robert A. Mason	M.C.P.S.U. Well I-8	2355	ND	Go Set Services/65	E-log	105
154	17	8	15	C NE SE	Trinity Production Company	Little Tommy 15-1	3617	847	Payne and Payne/85	DIL	108
155	17	8	15	SE SE NE	James L. Parks	Ashmore Heirs 15-1	3431	ND	Payne and Payne/85	DIL	108
156	17	8	15	SW SW NE	American First Energy Corp.	Thelma #1	3172	890est.	Gearhart/83	DIL	107
157	17	8	15	NE	Alpine Oil and Gas	Robinson #15-1	3198	840	Gearhart/86	DIL/CDL	105
158	17	8	15	NE NE NE	American First Energy Company	Ashmore #1-15	2425	841	Gearhart/84	DIL/CDL	94
159	17	8	15	SW SW NE	Alpine Oil and Gas	Thelma #1-15	3404	ND	BPB/87	Digital Induction/CDL	109
160	17	8	15	NE NE NE	Hanco Oil and Gas	Ashmore #1	3152	833	Schlumberger/53	E-log	106
161	17	8	16	W/2 SW SW	J.A. Sellers	Dressler #1	3446	886	Schlumberger/57	E-log	104
162	17	8	16	NW SE NE	Indrex Scroggins Inc.	Finch #1	3193	868	Mayfield/85	DIEL/CDL	104
163	17	8	16	E/2 SW NE	Indrex Scroggins Inc.	King Trust #1	3549	869	Welex/85	DIGL/CDL	100
164	17	8	16	NW SW SW	C.A. Overstreet	Vick #1	3456	877	Welservices Inc./84	DIEL/CDL	102
165	17	8	16	NW SE SW	St. Anthony Development Co.	Bell #1	2323	867	Schlumberger/53	E-log/ML	100
166	17	8	17	SE SE SE	Waggoner Drilling Company	Wright #1-A	3580	933	Welservice Inc/85	IEL/CDL	104
167	17	8	17	SW NE NW	Rad Oil Corporation	Rad #1	3664	908	Professional/85	DISFL/CDL	109
168	17	8	17	NW NW SW	Shibley Oil Co.	Harjo #1	2947	ND	Welex/58	E-log/CC	99
169	17	8	17	SW NW SW	W.T. Fail Etal	Harjo #1-A	2461	922	Schlumberger/55	E-log/M.L.	103
170	17	8	17	SE	Glenn Gillispie	Wright #1	3571	932	Schlumberger/55	E-log/M.L.	108
171	17	8	17	NE NE SW	Barker and Cowe	Wright #1	3237	933	Schlumberger/53	E-log/MRL	107
172	17	8	17	SW SE NW	Shibley Oil Company	Thompson #1	2918	895	Welex/58	E-log	100
173	17	8	17	NE NE SE	F.W. Cooper	Wright #3-A	3500	870	Schlumberger/56	E-log	100
174	17	8	17	NW SE NW	M.E. Gaskill	Thompson #1-A	2803	ND	Schlumberger/50	E-log	110
175	17	8	17	SE NE NE	St. Anthony Development	Wright #1	2936	931	Schlumberger/51	E-log	105
176	17	8	18	NW SE SW	Jaco Oil Company	Toney #3	3718	ND	Welservice Inc./82	IEL/CDL	105
177	17	8	18	SE NW SE	David T. Winchell	Mary Barnes #3	3647	943	Schlumberger/62	IEL	108
178	17	8	18	NW SE NW	Tilley and Kahan	Land Estate #1	3097	1027	Schlumberger/51	E-log	108
179	17	8	18	SE NE NW	Shibley Oil Company	Estate Land #4	2972	965	Halliburton/58	E-log	99
180	17	8	18	SW NE SW	John Turner	Estate #1-A	2575	999	Welservice Inc. 83	IEL/CDL	94
181	17	8	18	SE NW NW	Berry Oil and Gas	Squito #1	3588	1003	Welservice Inc/83	DIFL	90
182	17	8	18	NW NW SE	Glimp Oil Company	Mary Barnes #1-A	3620	ND	Welservice Inc/66	E-log/MRL	104
183	17	8	18	NE NW NE	Southwest Oil Corporation	Sinclair-Jones #1	2960	ND	Schlumberger/53	E-log/ML	106

	Well Information								Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
184	17	8	18	NE SW SW	Berry Oil and Gas	Owens #1	3755	ND	Welservice Inc/83	DIFL/CDL	105
185	17	8	19	SW SE NW	Curt D.Edgerton	Toney #1	3688	ND	Schlumberger/56	E-log	109
186	17	8	19	C SW SE	Hollex, Inc.	Weaver #1	3316	961	Mayfield/85	DIEL	107
187	17	8	19	SE SE NE	Ramsey Resources	C.B. Hix #1	3247	906	Welservice Inc/85	DIL/CDL	ND
188	17	8	19	NW NW NW	Clyde R. Jacobs	Toney #4	3384	ND	Welservice Inc./83	IEL/CDL	102
189	17	8	19	NE SE SW	W.M. Shibley	Cubbie #1	3191	1062	Welex/59	E-log	100
190	17	8	19	NE SW SW	Sam Cassidy Sr.	Cubby #1	3722	1028	Welservice Inc./67	E-log	102
191	17	8	19	SW SW NW	Simon and Bassett	Estate Land #2	2544	1003.5	Schlumberger/54	E-log/ML	95
192	17	8	19	SW NW SW	Simon and Bassett	Estate Land #3	3049	974.5	Schlumberger/55	E-log/ML	105
193	17	8	19	NE NW NW	Curtis Oil Co.	Toney #4	2875	967	Schlumberger/53	E-log	104
194	17	8	19	SW SW NE	El Dorado Oil Co.	Lewis #1	2978	959	Schlumberger/55	E-log/ML	102
195	17	8	19	SE SE SW	Oak Hill Petroleum Company	Moore #1-??	3252	1053	Precision/86	DIL/CDL	112
196	17	8	19	SE SE SW	Sam Cassidy Jr.	Cubby #2	2904	1043	Welservice Inc./68	E-Log	98
197	17	8	19	SW NE SW	Service Pipeline Company	Sellers #4	2863	1010DF	Schlumberger/44	Unknown	ND
198	17	8	20	NE SE SE	Oklahoma Oilfield Services	Bench #1-A	3608	ND	Gearhart/81	DIL/CDL	107
199	17	8	20	SW NE SE	Thompson and Coffield	Sellers #1	3555	921	Schlumberger/50	E-log	108
200	17	8	20	ND	Thompson and Lee	Sellers #2	3528	912	Schlumberger/53	E-log	111
201	17	8	20	SE SW NE	Johnson and Gill	Wassaff #1	2518	970	Schlumberger/50	E-log	98
202	17	8	20	NW SE SE	Coffield and Thompson	Cox #1	2466	959	Schlumberger/51	E-log	ND
203	17	8	20	SE SE NE	F.R. Billingslea	Turner #1-A	3532	898	Schlumberger/52	E-log	107
204	17	8	20	NW NW SE	Thompson and Raley	Wassaff #4	2472	922	Schlumberger/55	E-log	101
205	17	8	20	NE NW SE	Thompson and Raley	Sellers #3	2471	953	Schlumberger/55	E-log	102
206	17	8	20	NE SW NE	Thompson and Raley	Wassaff #2	2468	939	Schlumberger/55	E-log	103
207	17	8	20	NW NE SE	Thompson and Raley	Sellers #4	2436	996	Schlumberger/55	E-log	92
208	17	8	20	NE SE NW	D.C. Sellers	Estate land #2	2833	930	Schlumberger/54	E-log	100
209	17	8	21	SE SE NW	Frank R. Billingslea	Kano #1	3575	986	Schlumberger/51	E-log	104
210	17	8	21	NW NW SW	Thompson and Lee	Harring #2	3544	949	Schlumberger/52	E-log	110
211	17	8	21	S/2 N/2 S/2	Quinlant Harmon	Anthis #2	3602	988	Schlumberger/54	E-log	100
212	17	8	21	SE SW NW	Coffield and Howard	Kelly-Herring #3	3490	899	Schlumberger/53	E-log	100
213	17	8	21	C SW NE	Robert E. Maxey	Kano B#3	3379	912	Welex/66	E-log/CDL	105
214	17	8	21	NE NW SE	Don E. Brown	Knee #1	3594	925	Welservice Inc./90	DIEL/CDL	104
215	17	8	21	NE NW SW	Thompson and Lee	Tremble #2	2375	906	Schlumberger/52	E-log/ML	100
216	17	8	21	SW SW SW	Thompson Raley	Kelly-Herring B-1	2816	ND	Schlumberger/55	E-log	103
217	17	8	21	NE SE SW	Bert Wheeler	#1 Lee Morrison	2411	942	Schlumberger/52	E-log	103
218	17	8	21	NW NW SW	Toklan and Billingslea	#2 Harring	2440	ND	Schlumberger/52	E-log	93
219	17	8	21	NE NW SW	A.B. Pete Kime	Trimble #1	2407	926	Schlumberger/51	E-log	103
220	17	8	21	SW NE NE	Robert E. Maxey	Anthis #1-A	2833	980.5	Schlumberger/51	E-log	96
221	17	8	21	SW NW SW	Toklan Production	Harring #1	2438	933	Schlumberger/51	E-log	92
222	17	8	21	SW NW SW	Thompson and Lee	Harring #1	3545	931	Schlumberger/53	E-log	110
223	17	8	22	SE NE NE	John Booth Oil Company	Hill #1	3148	880DF	Schlumberger/48	Composite Log	122
224	17	8	22	NE NE NE	Hanlon and Boyle	Hill #2	2322	877	Schlumberger/56	E-log	88
225	17	8	22	C NW SW	Big Four Petroleum Co.	Kelly "A" #14	3548	916	Welex/67	IEL/CC	105
226	17	8	22	SW NW SE	Scat Drilling Co.	Johnson #2	3223	930 DF	Schlumberger/55	IEL/ML	100
227	17	8	22	NW SW SE	Big Four Petroleum Co.	Thompson #1	2356	935	Schlumberger/55	IEL/ML	91
228	17	8	22	NE SW NW	Scat Drilling Co.	Kelly #3	2337	897	Schlumberger/54	E-log	92
229	17	8	22	NE SW SE	Big Four Petroleum Co.	Thompson #2	2375	967	Schlumberger/55	E-log/ML	101

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
230	17	8	22	SW NE SW	Thompson and Raley	Kelly #3	2293	ND	Schlumberger/54	E-log	95
231	17	8	22	C SE SW	Robert E. Maxey	Kelly "B" #8	3551	902	Welex/67	IEL	105
232	17	8	22	SW SE SE	Big Four Petroleum Company	Thompson #4	3228	983	Welservice Inc/68	E-log/MRL	100
233	17	8	22	N/2 SE SE	Grace Petroleum Company	MCDSU P-33	3256	968	Welex/84	DIL/CDL	101
234	17	8	22	E/2 SW SE	Grace Petroleum Company	Mosquito Creek DSUW-31	3200	965	Schlumberger/79	DIL/CDL	120
235	17	8	22	SE NE SE	Grace Petroleum Company	Kirk #1-22	3200	934	Schlumberger/79	DIL/CDL	110
236	17	8	22	SW SW NE	Bill Hale Oil Company	Lester #1	3644	946	Great Guns/80	IEL/CDL	116
237	17	8	23	SW SE NW	Pemberton Production Company	Kelly Bros. #2	ND	926	Dresser Atlas/84	DIFL	96
238	17	8	23	NW NE NW	Drumright Well Service	R. Lester #1	3574	932	Welservice Inc/79	E-log	102
239	17	8	23	NW NE SE	Kingwood Oil Company	Turinsky #1	3188	967	Schlumberger/53	E-log	103
240	17	8	23	NW SW NE	Robert A. Mason	Johnson I-5	2364	905	Go Set Services/65	E-log	105
241	17	8	23	NW NE NW	Pete Kime	Lester #2	2321	930	Schlumberger/55	E-log	106
242	17	8	23	SW	Grace Petr. Co.	Mosquito Creek P-43	3249	945	Gearhart/83	DIL/COL	112
243	17	8	23	SE NE NW	Pete Kime	Lester #1-A	2309	924	Schlumberger/56	E-log	102
244	17	8	23	SE SE SE	Rio Hondo Oil	Turinsky #2	3219	952.5	Schlumberger/56	E-log/ML	106
245	17	8	23	NE SW NW	Pete Kime	Lester #2-B	2844	912	Schlumberger/57	E-log/ML	102
246	17	8	23	W/2 NE NE	Waggoner Drlg. Co.	Hayden #1	2331	938	Schlumberger/55	E-log	95
247	17	8	23	SW NW SE	Echo Production Inc.	Abraham #1-A	2373	926	Drossage Atlas/84	DIFL	96
248	17	8	23	SE SW SW	Waggoner Drlg. Co.	Briggs #1	2391	941	Schlumberger/54	E-log/ML	94
249	17	8	23	SE SE NW	Zephyr Drlg. Co.	Sinclair #1	2875	ND	Schlumberger/41	E-log	ND
250	17	8	23	SE NE SW	Rio Hondo Oil	Abraham #3	2373	943	Schlumberger/56	E-log	100
251	17	8	23	SE NW NW	Pete Kime	Lester #1-B	2292	909	Schlumberger/57	E-log	98
252	17	8	23	NE SE NW	Pete Kime	Lester #3	2328	943	Schlumberger/55	E-log	92
253	17	8	23	NW SW SW	Grace Petroleum Company	Mosq. Creek DSU w-41	3200	935	Schlumberger/79	DIL	121
254	17	8	23	SW SW NW	Dobson Oil Operators	Kelly #1	3170	888	Welex/87	DISGL	99
255	17	8	23	SE NW NE	Keating Drilling Company	Johnson #1	3140	921	Schlumberger/50	E-log	119
256	17	8	23	NE SW SW	Grace Petroleum Company	Mosq. Creek w-44	3241	930	Gearhart/84	DIL/CDL	110
257	17	8	23	SW SW SW	Cleary Petroleum Company	Briggs Estate #1	3204	948	Dresser Atlas/76	IEL/CDL	105
258	17	8	24	NE NW NE	Lindley Hobson Oil	Roberta "J" #1	3615	930.5	Gearhart/82	DIL/CDL	116
259	17	8	24	SE SE NW	Bond Oil Company	#1 Foster	3240	ND	Schlumberger/50	Unknown	122
260	17	8	24	NW SW SW	Lindley-Hobson	Foster #1	3237	958	Gearhart/83	DIL/COL	104
261	17	8	24	SW NE NE	Lindley-Hobson	Lester #1	2895	900	Gearhart/81	DIL/COL	109
262	17	8	24	SW SW SW	Waggoner Drlg. Co.	Foster B #4	3179	935.5	Schlumberger/55	E-log	100
263	17	8	24	NW NE SW	L.G. Broiles	Foster #1	3155	919	Schlumberger/54	E-log/ML	100
264	17	8	24	SW NE NW	Holman Petr. Co.	Wagoner #1-A	3174	ND	Gearhart/81	IL/COL	103
265	17	8	24	SW NW NW	Waggoner Drlg. Co.	Parker #1	3576	938.5	Schlumberger/56	IEL/ML	110
266	17	8	24	NE SW NE	Lindley-Hobson	Frank #1	2350	893.5	Gearhart/82	DIL/CDL	94
267	17	8	25	SW SW SE	Bill Parks Oil Company	Parker #1	3597	882	Davis Company/85	DIL	110
268	17	8	25	NW SW SW	Indrex-Scroggins	Loma #1	1696	907	Mayfield/85	DIEL	94
269	17	8	26	NE NE NE	Waggoner Drilling company	Crain #1	3199	928	Schlumberger/54	E-log	107
270	17	8	26	SW SW NE	Waggoner Drilling company	Crain #2	3197	907	Schlumberger/56	E-log	100
271	17	8	26	NW SW SE	Target Drilling Company	Dumas #2B	3293	ND	Schlumberger/61	IEL	106
272	17	8	26	SW NE SE	L.S. Petro	Nanna Watson #1	3207	930	Shlumberger/56	E-log	103
273	17	8	26	NW SE NE	Little Cypress Exploration	Craine #2	3618	876	DresserAtlas/84	DIFL	100
274	17	8	26	NE NE SW	W.E. Steelman	Dumas #2	3200	922	Schlumberger/56	E-log	96
275	17	8	26	NE SE SE	Enersource Petroleum Inc.	Jewell #2	3340	907	Gearhart/84	DIL	105

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
276	17	8	26	SW SW SE	O.V. York and Associates	Dumas #2	3196	907	Schlumberger/56	E-log/ML	104
277	17	8	26	SW	Cleary Petroleum Corporation	Dumas #4	3318	985	Dresser Atlas/76	IEL/CDL	107
278	17	8	26	NW SE SW	MAC Engineering and Operating	Coastal #1-2	3257	949	Computalog/85	DISFL/CDL	110
279	17	8	26	SW SE SE	Enersource Petroleum Inc.	Jewell #3	3694	892	Gearhart/85	DIL/CDL	110
280	17	8	26	NW NE SE	Enersource Petroleum Inc.	Jewell #4	3250	925	Gearhart/85	DIL/CDL	105
281	17	8	26	NW NW SE	O.V. York and Associates	Dumas #1	3217	926	Schlumberger/55	E-log/ML	100
282	17	8	26	SW NW NW	Magnolia Petroleum Company	Sarhilla #3	3342	933	Schlumberger/55	E-log	104
283	17	8	26	SW SE NW	Seigel Petroleum Company	Sarhilla #1	3193	920	Schlumberger/85	DISFL/CDL	105
284	17	8	26	NW SE NW	Seigel Petroleum Company	Sarhilla #2	3194	924	Gearhart/85	DIL	103
285	17	8	26	ND	Grace Petroleum Company	Mosquito Creek P-123	3239	919	Gearhart/86	DIL	105
286	17	8	26	NW	Seigel Petroleum Company	Sarhilla #2	3194	926	Gearhart/85	DIL	105
287	17	8	27	NE NE NW	Johnson and Gill	Estate Land #1	3270	901	Schlumberger/51	E-log/ML	109
288	17	8	27	SW NE	Grace Petroleum Company	Mosquito Creek WSW #2	2995	908est.	Gearhart/81	DIL	110
289	17	8	27	W/2 NE	Grace Petroleum Company	Dutcher Sand Unit W-81	3195	916	ND/79	ND	116
290	17	8	27	SW SE SE	Grace Petroleum Company	Dutcher Sand Unit "W" 81	3248	ND	Gearhart/81	DIL	104
291	17	8	27	SW NE NE	Grace Petroleum Company	Kelly #1-A	3664	966	Welex/78	DIGL/CDL	105
292	17	8	27	NE SE SW	DMS Investments	Sellers #1	3692	ND	Elite/93	DIL/CDL	106
293	17	8	27	SW NE NE	Grace Petr. Co.	Kelly #1-A	3664	966	Welex/78	DIL/CDL	105
294	17	8	27	SW NE NE	Transcontinental Oil	Kelly #1	3199	972.5	Welservice Inc./69	E-log	102
295	17	8	27	SE NE SE	Grace Petr. Co.	Dutchersand unit P-74	3243	936	Gearhart/81	DIL/CDL	104
296	17	8	27	NE NE NE	Big Four Petroleum Co.	Kelly #2	3633	963	Schlumberger/55	E-log/ML	109
297	17	8	27	SE NE SE	Grace Petr. Co.	Dutchersand unit P-53	3209	955	Gearhart/81	DIL/CDL	112
298	17	8	27	NE SE SE	Grace Petroleum Company	Dutcher Sand Unit P82	3248	945	Gearhart/81	DIL/CDL	112
299	17	8	27	SE	Grace Petroleum Company	Dutcher Sand Unit W71	3226	939	Schlumberger/79	DIL/CDL	118
300	17	8	27	SE NW SE	Grace Petroleum Company	Dutcher Sand Unit W72	3252	ND	Gearhart/81	DIL/CDL	112
301	17	8	27	SW SW SW	Webco Drilling Company	Dumas #1	3277	987.5	Elgen Corp./57	E-log	112
302	17	8	27	E/2 SW NE	Transcontinental Oil Company	Pike #1	3100	ND	Welservice Inc./69	E-log	99
303	17	8	27	C SW SE	Creekmore-Rooney	Scruggs #1	3636	ND	Schlumberger/43	Unknown	ND
304	17	8	27	C SE	Producers Drilling and Service	Crawford #1	3624	935	Lane Wells/50	Radioactivity Log	ND
305	17	8	28	SE SW NE	Pathfinder Petroleum Corporation	Slane #5-28	3347	968	Dresser Atlas/84	DIFL	ND
306	17	8	28	NE	Pathfinder Petroleum Corporation	Slane #6-28	3316	1005	Hayes/84	DIL/CDL	102
307	17	8	28	N/2 N/2 SE	Grace Petr. Co.	Dutchersand unit P-73	3252	931	Gearhart/81	DIL/CDL	112
308	17	8	28	NE SE NW	Echo Production Inc.	John #1	1824	ND	Dresser Atlas/83	DIFL	91
309	17	8	28	SW NW SE	J.A. Sellers	Estateland #1-A	2853	984.5	Shlumberger/55	E-log	105
310	17	8	28	NE SW SW	Southwestern Oil Co.	Campbell #3	2491	ND	Computalog/a82	IEL/CDL	104
311	17	8	28	NW NE NE	Thompson and Lee	Dressler #1	2507	ND	Shlumberger/51	E-log	103
312	17	8	29	SE NW NE	Sopac Exploration Co.	Masius #1	3750	980	Shlumberger/87	DISFL/CDL	113
313	17	8	29	NE NE NW	Douglas Dietz and Dooley	Garrett #1-29	3729	990	Shlumberger/95	DISFL/	110
314	17	8	29	SE SW NE	Wishbone Oil Company	Cramer #1	3641	959	Welservice Inc./74	E-log	110
315	17	8	29	NE NW SW	R.H. Vise	State Land #1	3030	956DF	Schlumberger/50	E-log	109
316	17	8	30	NW SE NW	Ramsey Engineering	Parshall Estate #1	2995	1015	Mayfield Payne/74	IEL	102
317	17	8	30	SE NE NW	Oak Hill Petroleum Company	Johnson #2-30	3235	1011	Mayfield/85	DIEL/CDL	106
318	17	8	30	NW NW NW	Jimmie L. Dunham	Cubbie #3	3235	1049	Welservice Inc./91	IEL/CDL	98
319	17	8	30	SW NW NW	Jimmie L. Dunham	Cubbie #2	2995	1032	Welservice Inc./85	IEL//CDL	98
320	17	8	30	SE NW NW	Simon and Brassett	Cubbie #1	2933	1015	Shlumberger/54	E-log/ML	102
321	17	8	30	SW NW NE	Oak Hill Petroleum Company	Big Four #1-30	3437	1031	Precision/84	DIL	92

	Well Information								Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
322	17	8	30	NW NW SW	Oak Hill petroleum Company	Hall #1-30	3199	991	Mayfield/85	DIEL/CDL	106
323	17	8	31	SW SW NW	Keener Oil Company	Palmer-Stanley #1	3595	935	Schlumberger/55	E-log/ML	104
324	17	8	31	SW SW NW	Monarch Den.	Firefly #1	3737	960	Gearhart/85	DIL/CDL	111
325	17	8	31	NW NW SW	L.B. Jackson	Yarhola #1	3570	918	Haliburton/55	E-log	105
326	17	8	32	NE SW NE	Lee Evans Drlg.	Thompson #1	2838	900	Shlumberger/54	E-log	98
327	17	8	32	SE SW NW	Albert Brauer	Coppinger #1	2373	922.5	Shlumberger/51	E-log/ML	93
328	17	8	32	SE SW NW	Kenneth Nix	Logan and Martin #1	2851	920	Elgen/56	E-log	108
329	17	8	32	SW NW NW	Morton Bros.	Martin #2	3597	957	Welservice Inc./76	E-log/MRL	103
330	17	8	32	NW	Morton Bros.	Martin #3	3622	969	Welservice Inc./76	E-log	105
331	17	8	32	NW	Morton Bros.	Strassell #1	3586	968	Welservice Inc./77	E-log	102
332	17	8	32	SW NW NW	Monarch Petroleum Company	Two Turtles #1	3603	948	Gearhart/84	DIL	107
333	17	8	33	SE SW SE	Morton Bros.	Gates No.1	3750	935	Mayfield/87	DIEL/CNL	110
334	17	8	33	SE NW NE	Cummings and Sherman	Sister Roberts #1	2945	961	Shlumberger/55	E-log	103
335	17	8	34	W/2 NW NE	DMS Investments	Bishop #3	3688	943	Payne and payne/92	DIL/ML	104
336	17	8	34	NW SW NE	Ketchum and Whan/Northern	Bishop #1	3192	927	Schlumberger/53	E-log/ML	103
337	17	8	34	NW SW SE	Sopac Exploration Co.	Bry #1	3350	900	Shlumberger/87	DISFL/CDN	110
338	17	8	34	W/2 SW SW	E.G. Bradley	Oswalt #1	2816	989	Shlumberger/51	E-log	102
339	17	8	34	S/2 N/2 NW	DMS Investments	Sinclair #6	3288	991	Payne and Payne/92	DIEL/CDL	101
340	17	8	34	NW NE SW	Zephys Drlg. Co.	Emarthochlee A-2	2449	963DF	Shlumberger/45	Composite	ND
341	17	8	34	NE SW SW	Mealy Wolfe	Oswalt #1	2761	951DF	Schlumberger/45	Composite Log	ND
342	17	8	34	SE SW NW	Zephyr Oil Company	Sinclair A#3	2781	951	Schlumberger/45	Composite Log	ND
343	17	8	34	NE SW SW	Mcintyre and Cummings	Oswalt #1-A	2838	949.5	Schlumberger/50	Composite Log	108
344	17	8	34	NW NW SE	DMS Investments Inc.	Bishop #5	2849	914GL	Osage/96	DISFL/CDL	ND
345	17	8	35	NE NE NW	O.V. York and Associates	Hendricks #1	3208	932	Schlumberger/56	E-log/MRL	108
346	17	8	35	NW NW NE	Crawford Production Company	Wetmore #1	2575	914	Schlumberger/51	E-log	100
347	17	8	35	SE NW NE	Target Drilling Company	Wetmore #2-B	3195	903GL	Schlumberger/61	IEL	102
348	17	8	35	SE NE NE	Mac Engineering and Operating	Dawson #1	2650	910	Welservice Inc./85	DIEL/CDL	104
349	17	8	35	NW NW NE	O.V. York and Associates	Wetmore #2	3189	916	Schlumberger/55	E-log	103
350	17	8	35	NW NE NE	Crowder Oil Company	Dawson 31	3349	920	Gearhart/81	DIL	105
351	17	8	36	SE NW NW	O.I.L. Petroleum	Alina #1	3248	905	Gearhart/85	DIL	105
352	17	8	36	NW NE NE	McNamar Bailer and Tank Co.	Gordon #1	2752	904	Schlumberger/51	E-log	90
353	17	8	36	E/2 SE NE	Krumme Oil Company	Stewart #1	2739	888	Welservice Inc./80	E-log/MRL	95
354	17	8	36	S/2 NE NE	Krumme Oil Company	Veit #1	2783	922	Welservice Inc./69	E-log/MRL	95
355	17	8	36	SE SE SE	Krumme Oil Co.	Farris #2	2767	906	Welservice Inc./81	E-log	95
356	17	8	36	S/2 NE SE	Krumme Oil Co.	Farris #1	2803	938	Welservice Inc./79	E-log/MRL	96
357	17	9	1	NE SW NE	Waggoner Drilling company	Skaggs #1	3177	839	Welservice Inc/85	IEL/CDL	100
358	17	9	3	SW SW SE	The Texas Company	Simmons #8	3341	885	Schlumberger/53	E-Log	108
359	17	9	3	SW NW SE	Sinclair Oil and Gas Company	Prue Sand Unit Tract 18 #10	2151	933GL	Schlumberger/66	IEL	96
360	17	9	3	SE NW SE	Sinclair Oil and Gas Company	Prue Sand Unit Tract 18 #9-W	2112	927GL	Schlumberger/63	IEL/ML	98
361	17	9	3	NW NW SE	Sinclair Oil and Gas Company	Prue Sand Unit Tract 13 #2-W	2151	941GL	Schlumberger/63	IEL/ML	97
362	17	9	3	NW NE SW	Sinclair Oil and Gas Company	Prue Sand Unit Tract 11 #1-W	2168	929GL	Schlumberger/63	IEL/ML	98
363	17	9	3	SW NW SE	Sinclair Oil and Gas Company	Prue Sand Unit Tract 18#10	2150	933GL	Schlumberger/66	IEL/CDL	96
364	17	9	3	SW	Sinclair Oil and Gas Company	Prue Sand Unit Tract 16 #3-W	2099	867GL	Schlumberger/63	IEL/ML	97
365	17	9	3	NW SW SW	Sinclair Oil and Gas Company	Prue Sand Unit Tract 16 #4-WI	2157	930GL	Schlumberger/64	IEL/ML	97
366	17	9	3	SE SE SW	Sinclair Oil and Gas Company	Prue Sand Unit Tract 17 #5	2077	854GL	Schlumberger/63	IEL/ML	105
367	17	9	3	SW	Sinclair Oil and Gas Company	Prue Sand Unit Tract 17 #6-W	2118	892GL	Schlumberger/63	IEL/ML	97

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
368	17	9	3	SW SE SW	Sinclair Oil and Gas Company	Prue Sand Unit Tract 17 #7	2122	875GL	Schlumberger/65	IEL/ML	100
369	17	9	3	NW SE SE	Sinclair Oil and Gas Company	Prue Sand Unit Tract 13 #3-W	2115	932GL	Schlumberger/64	IEL/ML	97
370	17	9	3	NW NE SE	Novak Drilling Company	Lake Moore #1	3315	918	Schlumberger/55	E-log	103
371	17	9	5	NW NW SE	TXO Production Corporation	Kaufman #1	3028	839	Birdwell/83	DIFL/ML/CDL	122
372	17	9	5	SW SW NE	Carter and Mandel	Bruce #1	3333	826	Schlumberger/55	E-log/ML	103
373	17	9	5	NW NE NW	Krumme Oil Company	Mobil #1	3024	850	Welservice Inc/84	IEL	98
374	17	9	6	SW SW SW	Cobb and King	Stone #1	3092	838.5	Schlumberger/53	E-log/ML	102
375	17	9	6	NW SW NW	Indrex-Scroggins	Kyser B#1	3200	895	Birdwell/84	DIFL/CDL	100
376	17	9	6	SW SW SW	Mitchell and Brown	Stone #1	3040	844DB	Halliburton/50	E-log	ND
377	17	9	6	S/2 SW SW	Enersource Petroleum Inc.	Dorothy Stone #2	3101	873	Gearhart/84	DIL/CDL	102
378	17	9	7	NW NW SE	Denni Enterprises Inc.	Iva #1	3140	800	Welservice Inc/85	IEL/CDL	98
379	17	9	7	SE SW NW	Mickalson Operating	E.Compressor Stn. #2	3324	824	Petro Data Inc/91	DIL	113
380	17	9	7	SE NW NW	Krumme Oil Company	Rossander #3	3345	861 GL	Welservice Inc/90	IEL/CDL	102
381	17	9	7	NW	Krumme Oil Company	Rossander #1	3100	881	Welservice Inc/76	IEL/MRL	99
382	17	9	7	SW NW NW	Markwell and Markwell Prod. Co.	Wilson-Bruce #1	3143	ND	Schlumberger/56	E-log/ML	105
383	17	9	7	NW NW SW	TXO Production Corporation	Henderson "Q" #1	3896	806	Dresser Atlas/85	DIFL/CDL	103
384	17	9	8	SW SE NE	Robert L. Parker	Wilson #1	2693	790	Schlumberger/58	E-log	106
385	17	9	8	NE NE NE	Wes Martgan	Wilson #1	2571	827DF	Schlumberger/50	Unknown	108
386	17	9	9	NE NE NW	Golden Eagle Development	Bussett #3	2760	823	Great Guns/85	DIL/CDL	107
387	17	9	9	SW NE NE	Wilcox Oil Company	No.1 Fanny Davis	2996	864GL	Schlumberger/50	Unknown	118
388	17	9	9	SW NE NE	Cherokee Drilling Company	Davis #2	2095	859	Schlumberger/61	IEL/ML	100
389	17	9	10	NE	Sinclair Oil and Gas Company	Prue Sand Unit Tract 22 #7	2056	856GL	Schlumberger/64	IEL/ML	100
390	17	9	10	NW NE NW	Sinclair Oil and Gas Company	Prue Sand Unit Tract 20 #4-W	2067	839GL	Schlumberger/63	IEL/ML	97
391	17	9	10	SW NE NW	Sinclair Oil and Gas Company	Prue Sand Unit Tract 20 #6	2050	ND	Schlumberger/63	IEL/ML	98
392	17	9	10	NW SE NW	Sam King	Bruce #1	1988	816	Halliburton/55	E-log	94
393	17	9	10	SE NE SW	Wakefiled Oil Company	Bosen #1	2534	841	Schlumberger/56	Induction	94
394	17	9	10	SE SE SE	Tenneco Oil Company	Louis Masterson #1	2100	802.9	Schlumberger/65	IEL/ML	97
395	17	9	10	NE	Sinclair Oil and Gas Company	Bruce Pool Sand Unit 22 #7	2056	856GL	Schlumberger/64	IEL/ML	100
396	17	9	11	SE NW NE	The Link Oil Company	Sawyer #1	2895	944	Gearhart/83	DIL	109
397	17	9	11	SE SW NW	Skelly Oil Company	Della Yaholar #1	2441	903	Schlumberger/57	IEL/ML	98
398	17	9	12	E/2 SE SW	Bristow Resources Inc.	Elias-Shoppa #24	2890	796	Welservice Inc/84	IEL/CDL	98
399	17	9	14	NW SW SE	Autumn Energy Corp.	Greemore #1	2544	760	Great Guns/83	IEL/CDL	106
400	17	9	15	SW SW SE	Elias Oil Company	Elias Bruce #2	2995	784	Welservice Inc/83	IEL/CDL	99
401	17	9	16	NE SW	Swindler Oil Company	Pinehill #1	2555	815	Lane Wells/58	E-Log/ML	107
402	17	9	16	NE NW SW	Swindler Oil Company	Pinehill #3	3002	801DF	Schlumberger/59	IEL	100
403	17	9	17	NE NW NE	Jet Oil Company	Bruce #1	3485	859	Go International/75	IEL/ML/CDL	115
404	17	9	18	N/2 SW SE	Robert C. Brower	Provence #1	3143	917	Gearhart/84	DIL/CDL	93
405	17	9	19	C SE SW	Vaco Oil Company	E. Wheeler #1-19	2725	854	Great Guns/86	DIL/CDL	103
406	17	9	19	NE SE NW	Bristow Resources Inc.	Elias-Shoppa #37	3439	847	Welservice Inc/85	IEL/CDL	102
407	17	9	19	SE NW SE	Carter and Mandel	Stone #1	3353	ND	Schlumberger/59	IEL/ML	105
408	17	9	19	SW SW SE	Bristow Resources Inc.	Elias Shoppa #35	3350	851	Welservice Inc/85	IEL/CDL	98
409	17	9	20	NW SW NW	M.R. Swearingin	Baker #1	2600	ND	Schlumberger/54	E-Log/ML	94
410	17	9	20	NE NE SW	M.R. Swearingin	Baker-Langspecht #1	2550	934	Schlumberger/54	E-Log/ML	94
411	17	9	20	SW NW SE	M.R. Swearingin	Montford #1	2997	851	Schlumberger/54	E-log	108
412	17	9	20	SW SW NW	Anson Petroleum Company	Baker #1	2583	809.5	Halliburton/50	E-log	ND
413	17	9	21	SE NW NW	Elias Oil Company	Elias-Bruce #1	3173	ND	Welservice Inc/84	IEL/CDL	100
414	17	9	21	ND	Sinclair Oil and Gas Company	E.R. Self #8	2460	805GL	Schlumberger/51	E-log	95

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
415	17	9	21	SE NW NE	Bristow Resources Inc.	Elias-Shoppa #17	3008	871	Welservice Inc/83	IEL/CDL	98
416	17	9	21	SW NE SE	C.R. Colpitt	Harjochie #3-A	2943	858.5	Schlumberger/53	E-Log/ML	105
417	17	9	21	SW SW SW	Bristow Resources Inc.	Elias-Shoppa #10	3117	893.5	Welservice Inc/83	IEL	110
418	17	9	22	NW SW NW	Petroleum Management Services	Bruce #1	2450	805	Elgen Corp/56	E-log	105
419	17	9	22	SW SW SW	Sinclair Oil and Gas Company	Self #10	2456	799GL	Schlumberger/51	E-log	101
420	17	9	24	SW SE NE	St. Anthony Development Co.	Marlin #1	2726	794	Schlumberger/52	E-log	97
421	17	9	24	NE SE NW	Pringle, Novak, and Tarr	Miracle #1	2818	834	Schlumberger/53	E-Log/ML	104
422	17	9	24	SE NW SW	McAdams Drilling Company	Abraham #1	2340	868	Schlumberger/55	E-log	95
423	17	9	24	SE NE SW	Golden Eagle Development	Abraham-Golden Eagle #1	2900	842	Gearhart/84	DIL/CDL	100
424	17	9	24	NW NE NE	RGB Corporation	Abraham #1-24	3061	790	Welservice Inc/90	DIEL/CDL	98
425	17	9	24	ND	Ira Rongey	Foley #2-A	2775	ND	Masterlog/84	IEL	108
426	17	9	25	SE NW NE	Biddick Oil	Tuttle #1-A	2925	837.4	Welservice Inc/82	IEL/CDL	98
427	17	9	25	SE NE NW	Bristow Resources Inc.	Elias Pauline #13	2935	873	Welservice Inc/82	IEL/CDL	98
428	17	9	25	NE SW NW	Bristow Resources Inc.	Elias Pauline #14	2950	883GL	Welservice Inc/82	IEL/CDL	97
429	17	9	25	SE NE SE	Elias Oil Company	Tuttle #1	2893	762	Welservice Inc/84	IEL/CDL	96
430	17	9	26	SE SW SE	Ram Petroleum Company	Rowland Creek #8	3070	872	Gearhart/82	DIL/CDL	110
431	17	9	26	NE NE SE	Carter and Mandel	Elias #1	3275	898	Schlumberger/59	E-log/ML	105
432	17	9	26	SE SE SE	Ram Petroleum Corporation	Rowland Creek #9	3018	910	Gearhart/82	DIL/CDL	110
433	17	9	27	NW SE NW	Sopac Exploration	Parks #1	3160	923	Gearhart/86	DIL/CDL/MEL	105
434	17	9	27	NW SW NW	Sopac Exploration Inc.	Estate #1	2894	867	BPB/86	DDI/CDL	103
435	17	9	27	SE NW SW	Sopac Exploration Inc.	Bruce #1	3077	874	BPB/86	DDI/CDL	95
436	17	9	28	NW SW SW	Bristow Resources Inc.	Elias-Shoppa #16	3154	912	Welservice Inc/83	IEL	ND
437	17	9	28	NE NE NE	Sinclair Oil and Gas Company	Self #11	2470	805GL	Schlumberger/52	E-log/ML	102
438	17	9	28	SW SE NW	Bristow Resources Inc.	Elias-Shoppa #1	3074	867GL	Welservice Inc/83	IEL/CDL	98
439	17	9	28	SE SE NW	Bristow Resources Inc.	Elias-Shoppa #5	2996	839	Welservice Inc/83	IEL/CDL	93
440	17	9	28	SE SW NW	Bristow Resources Inc.	Elias-Shoppa #14	3100	887	Welservice Inc/83	IEL/CDL	100
441	17	9	28	SE NW SW	Bristow Resources Inc.	Elias-Shoppa #9	3120	878	Welservice Inc/83	IEL/CDL	105
442	17	9	28	SW NW SW	Bristow Resources Inc.	Elias-Shoppa #11	3165	920	Welservice Inc/83	IEL/CDL	106
443	17	9	28	NW NW SW	Bristow Resources Inc.	Elias-Shoppa #12	3142	914	Welservice Inc/83	IEL/CDL	99
444	17	9	28	NE SW SW	Bristow Resources Inc.	Elias-Shoppa #12A	3100	872	Welservice Inc/83	IEL/CDL	99
445	17	9	28	NW SE NW	Bristow Resources Inc.	Elias-Shoppa #7	3077	886	Welservice Inc/83	IEL/CDL	101
446	17	9	28	NE SW SE	Petroleum Resources	Thompson #1	3110	912	Schlumberger/83	DISFL/CDL	101
447	17	9	28	NW NE NE	Sinclair Oil and Gas Company	Self #9	2470	807GL	Schlumberger/51	E-log	102
448	17	9	28	NW NE SW	Bristow Resources Inc.	Elias-Shoppa #4	3050	873	Welservice/83	IEL	100
449	17	9	28	NE NW SW	Mid-Continent Petroleum Co.	John Toney #1	2753	ND	Schlumberger/53	E-log	98
450	17	9	28	NE NE SW	Bristow Resources Inc.	Elias Shoppa #6	3020	839	Welservice Inc/83	IEL	100
451	17	9	28	NE NW SW	Bristow Resources Inc.	Elias Shoppa #2	2078	877GL	Welservice Inc/83	IEL	100
452	17	9	28	NW NW SE	Bristow Resources Inc.	Elias Shoppa #3	3056	890	Welservice Inc/83	IEL/CDL	98
453	17	9	29	NW NE SE	Bristow Resources Inc.	Elias Shoppa #18	3153	905	Welservice Inc/83	IEL/CDL	98
454	17	9	29	SE SW NW	Bristow Resources Inc.	Elias Shoppa #41	3105	880	Welservice Inc/86	IEL/CDL	98
455	17	9	29	SW SE NE	Bristow Resources Inc.	Elias Shoppa #21	3173	909	Welservice Inc/83	IEL/CDL	97
456	17	9	29	SW NE SE	Bristow Resources Inc.	Elias Shoppa #20	3141	921	Welservice Inc/83	IEL/CDL	99
457	17	9	29	NW NW NE	Carter and Mandel Company	Ware #1	2807	904DF	Schlumberger/55	E-log	95
458	17	9	29	NW SW NW	Bristow Resources Inc.	Elias Shoppa #2	3068	863	PLS/87	IEL	ND
459	17	9	29	NW NW SE	Carter and Mandel Company	Baker #1	2717	861DF	Schlumberger/55	E-log/CDL	95
460	17	9	29	SE SE NE	Bristow Resources Inc.	Elias Shoppa #19	3150	914	Welservice Inc/83	IEL/CDL	95

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
461	17	9	29	NE NE SE	Bristow Resources Inc.	Elias Shoppa #15	3160	927	Welservice Inc/83	IEL/CDL	98
462	17	9	29	SW SW NW	Bristow Resources Inc.	Elias Shoppa #40	3129	897	Welservice Inc/85	IEL/CDL	100
463	17	9	29	NE NW SE	Bristow Resources Inc.	Elias Shoppa #25	3116	877	Welservice Inc/84	IEL/CDL	98
464	17	9	29	NW SW NE	Bristow Resources Inc.	Elias Shoppa #22	3200	900	Welservice Inc/84	IEL/CDL	98
465	17	9	29	SW NW SE	Bristow Resources Inc.	Elias Shoppa #20	3140	921	Welservice Inc/83	IEL/CDL	99
466	17	9	30	NW SE SE	Bristow Resources Inc.	Elias Shoppa #29	3202	928	Welservice Inc/84	IEL/CDL	100
467	17	9	30	SE SE SE	Bristow Resources Inc.	Elias Shoppa #30	3162	945	Welservice Inc/84	IEL/CDL	98
468	17	9	30	SW NW NE	Bristow Resources Inc.	Elias Shoppa #39	3348	822	Welservice Inc/85	IEL/CDL	100
469	17	9	30	NW NW NE	Bristow Resources Inc.	Elias Shoppa #34	3360	822	Welservice Inc/85	IEL/CDL	102
470	17	9	30	SE NE SE	Bristow Resources Inc.	Elias Shoppa #28	3090	890	Welservice Inc/84	IEL/CDL	100
471	17	9	30	SE SE NE	Bristow Resources Inc.	Elias Shoppa #38	3115	889	Welservice Inc/85	IEL/CDL	98
472	17	9	30	NE NW NE	Bristow Resources Inc.	Elias Shoppa #36	2331	830	Welservice Inc/85	IEL	98
473	17	9	30	NW NE SE	Bristow Resources Inc.	Elias Shoppa #27	3122	879	Welservice Inc/84	IEL/CDL	94
474	17	9	30	NW SE NE	Bristow Resources Inc.	Elias Shoppa #23	3119	849	Welservice Inc/84	IEL/CDL	99
475	17	9	30	NE SW NE	Norbla Oil Company	Sellers #1	3401	848	Lonewells/62	E-log	110
476	17	9	31	W/2 SE SW	Krumme Oil Company	Mims #1	2786	938	Welservice Inc/81	E-log/MRL	94
477	17	9	31	NE SW SW	Krumme Oil Company	Horany #1	2785	938	Welservice Inc/81	E-log	95
478	17	9	31	NE NE NE	Bristow Resources Inc.	Elias Shoppa #31	3137	909	Welservice Inc/85	IEL/CDL	98
479	17	9	31	SE SE SE	Bristow Resources Inc.	Miles Devin #11	3190	930GL	Welservice Inc/89	IEL/CDL	98
480	17	9	32	SE SW NW	Bristow Resources Inc.	Miles Devin #18	3178	937GL	Welservice Inc/90	IEL/CDL	98
481	17	9	32	SW SE SW	Bristow Resources Inc.	Miles Devin #5	3208	849GL	Welservice Inc/88	IEL/CDL	98
482	17	9	32	SW SW NE	Bristow Resources Inc.	Miles Devin #17	3110	926GL	Welservice Inc/90	IEL/CDL	98
483	17	9	32	NE SE NW	Bristow Resources Inc.	Elias Kerns #6	2810	821	Welservice Inc/82	IEL/CDL	96
484	17	9	32	SW NE SW	Bristow Resources Inc.	Miles Devin #16	3209	968GL	Welservice Inc/90	IEL/CDL	100
485	17	9	32	SW NW SW	R.K. Dyer	Burris #2	3210	990	Gearhart/88	DIL	101
486	17	9	32	SE SW SW	R.K. Dyer	Burris #1	3268	1001	Davis Co./85	DIL	113
487	17	9	33	NW SE NE	Petroleum Resources	Bethel #2	3180	929	Gearhart/83	DIL/CDL	111
488	17	9	33	NE NW NE	L.B. Jackson	Cue #1	3169	929	Welex/67	IEL/CC	102
489	17	9	33	SE SW NE	Petroleum Resources Company	Bethel #1	3520	902	Schlumberger/83	DISFL/CDL	109
490	17	9	34	NE NE SW	Domestic Resources Corp.	Bethel #1	3029	893	Gearhart/81	DIL/CDL	101
491	17	9	35	E/2 SW SW	R.K.Catlett and Robert W. Anderson	Walters #2	2520	851	Welservice Inc/78	E-log/MRL	93
492	17	9	35	SE NE SW	R.D.T. Properties	Doc #1	2563	869	Welservice Inc/84	IEL/CDL	100
493	17	9	35	NW NW SE	Ram Petroleum Corp.	Rowland Creek #11	3049	898	Gearhart/82	DIL/CDL	110
494	17	9	35	SE NW SW	Carman Oil	Bethel #1	2405	842GL	Saturn/82	IEL	105
495	17	9	35	NW SW SE	R.D.T. Properties	Miller #1-A	2582	901GL	Welservice Inc/82	IEL	ND
496	17	9	35	NE SE SW	R.D.T. Properties	Anderson #3-A	2551	894	Welservice Inc/83	IEL	93
497	17	9	36	NE SW SW	Mikel Drilling Company	Nettie Hill #1	2896	838	Schlumberger/54	E-log	98
498	17	9	36	N/2 SE NE	Bristow Resources Inc.	Elias-Pauline #9	3110	796	Welservice Inc/82	E-log/MRL	98
499	17	9	36	SW NW NW	Bristow Resources Inc.	Elias-Pauline #1	3160	888	Welservice Inc/81	E-log/MRL	100
500	17	9	36	NW NW NW	Bristow Resources Inc.	Elias-Pauline #2	3330	910	Welservice Inc/81	E-log/MRL	101
501	17	9	36	NE NW NW	Bristow Resources Inc.	Elias-Pauline #3	3245	884	Welservice Inc/81	E-log/MRL	102
502	17	9	36	SE NW NW	Bristow Resources Inc.	Elias-Pauline #4	2935	867	Welservice Inc/81	E-log/MRL	99
503	17	9	36	SE SW NW	Bristow Resources Inc.	Elias-Pauline #6	3002	916	Welservice Inc/ 82	E-log/MRL	99
504	17	9	36	NW SW NW	Bristow Resources Inc.	Elias-Pauline #8	3025	911	Welservice Inc/82	E-log/MRL	99
505	17	9	36	SW SW NW	Bristow Resources Inc.	Elias-Pauline #11	2993	891	Welservice Inc/82	E-log/MRL	ND
506	17	9	36	NE SW NE	Bristow Resources Inc.	Elias-Pauline #15	3144	810	Welservice Inc/81	E-log/MRL	100

	Well Information								Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
507	17	9	36	SW SW NE	Bristow Resources Inc.	Elias-Pauline #7	3168	803	Welservice Inc/82	E-log/MRL	100
508	17	9	36	NW SW NE	Bristow Resources Inc.	Elias-Pauline #10	2860	820	Welservice Inc/82	E-log/MRL	97
509	17	9	36	NE SW NW	Conan Oil Company	Hunter #1	2937	899	Welservice Inc/81	E-log/MRL	97
510	18	8	1	NW SE SE	Big Four Petroleum Company	Fixico #7	2880	867	Schlumberger/64	E-Log/ML	103
511	18	8	1	SE SE SW	George Rahal	Nichols #1	2537	845	Schlumberger/55	E-Log/ML	93
512	18	8	1	SW NE SW	Woods-Martin	Nichols #1	2470	862DF	Schlumberger/50	E-log	100
513	18	8	1	SW NW SE	Rahal Oil Company	Fixico #2	2507	838	Schlumberger/57	E-Log/ML	104
514	18	8	1	NW NE SE	Big Four Petroleum Company	Fixico #9	2610	867	Welservice Inc/64	E-log/MRL	ND
515	18	8	1	SW SE NE	S. Laurence Sobel	Julie Nantz #1	2436	ND	Schlumberger/52	E-Log/ML	100
516	18	8	1	NW SW NE	MidStates Pipe and Supply	Nantz #1	2660	840	Schlumberger/53	E-Log/ML	102
517	18	8	1	SE SW SE	George Rahal	Fixico #1	2545	866	Schlumberger/55	E-log	94
518	18	8	1	SE SE SE	Big Four Petroleum Company	Fixico #8	2614	882	Schlumberger/64	E-Log/ML	101
519	18	8	1	NW NW NE	Brady Brothers	Davenport #4	2570	ND	Halliburton/56	E-log	98
520	18	8	2	NW SW SE	Big Four Petroleum Company	Fixico #10	2591	842	Welservice Inc/69	E-log/MRL	ND
521	18	8	2	SE SW SE	Woods Drilling Company	Swart #1	2523	851DF	Schlumberger/50	Unknown	ND
522	18	8	2	NW SW SE	Blackstock, Bradley, and Dietz	Swartz #1	2520	854	Schlumberger/56	E-log	85
523	18	8	2	NE SE SW	Reco Oil Company	Swartz #3	2536	ND	Schlumberger/56	E-log	104
524	18	8	2	NW SW SW	Texkan Oil Company	Cantrell #4	2575	853.5	Schlumberger/55	E-Log/ML	101
525	18	8	2	NE SW SW	Texkan Oil Company	Cantrell #3	2675	976.5	Schlumberger/54	E-log	105
526	18	8	2	CE NW SW	Big Four Petroleum Company	SAAB #22-1	2990	862	Welservice Inc/77	E-log/MRL	96
527	18	8	2	SW SW SW	Big Four Petroleum Company	Cottonwood #21-8	2625	919	Welservice Inc/69	E-log/MRL	94
528	18	8	2	NW NW SW	Tilley Drilling Company	SAAB #1	2550	ND	Schlumberger/54	E-log	100
529	18	8	2	SE NE SW	Claybrook	Kennedy #2	2510	822DF	Schlumberger/56	E-log	102
530	18	8	2	SW NE SW	G.W. Claybrook	Kennedy #1	2625	ND	Schlumberger/54	E-log	95
531	18	8	2	NW NE SW	Big Four Petroleum Company	Cottonwood #23-3	2109	ND	Welservice Inc/69	E-log/MRL	94
532	18	8	2	NW NW SE	Woods-Gilchrist	Swart #3	2468	815DF	Schlumberger/51	E-log	92
533	18	8	2	SW NE SE	Woods-Gilchrist	Woody #4	2500	852	Schlumberger/50	Unknown	85
534	18	8	2	NE SW NE	Woods-Gilchrist	Davenport #1	2456	820	Schlumberger/51	E-log	96
535	18	8	2	NW SE N	Big Four Petroleum Company	Cottonwood #13-12	2520	ND	Welservice Inc/69	E-log/MRL	95
536	18	8	2	NE SE NW	Big Four Petroleum Company	Cottonwood #13-13	2482	803	Welservice Inc/69	E-log/MRL	93
537	18	8	2	SE SW NW	Viking Oil Corporation	Anthis #4	2504	812	Schlumberger/55	E-log	100
538	18	8	2	NW SW NW	Big Four Petroleum Company	Cottonwood #13-14	2550	857	Welservice Inc/69	E-Log/ML	93
539	18	8	2	SE NW NW	Big Four Petroleum Company	Cottonwood #13-9	2636	ND	Welservice Inc/68	E-Log/ML	92
540	18	8	2	SW NW NW	Big Four Petroleum Company	Cottonwood #13-8	2635	908	Welservice Inc/68	E-Log/ML	97
541	18	8	2	SW NE NW	Big Four Petroleum Company	Cottonwood #13-10	2635	916	Welservice Inc/69	E-Log/ML	94
542	18	8	2	NE NE NW	Durex-American Oil Company	Anthis #6	2588	849.8	Schlumberger/56	E-Log/ML	101
543	18	8	2	NW NE NW	Ketchum-Whan Drilling	Anthis #1	2660	909	Halliburton/53	E-log	ND
544	18	8	3	NE SE SE	Big Four Petroleum Company	Cottonwood #21-6	2610	877	Welservice Inc/69	E-log/MRL	ND
545	18	8	3	SE	Yaggas Drilling Company	Piepgrass #2	2546	ND	Schlumberger/54	E-log	95
546	18	8	3	NE NE SE	Texkan Oil Company	Texkan-Cantrell #1	2580	855	Schlumberger/54	E-Log/ML	95
547	18	8	3	NE	Big Four Petroleum Company	Cottonwood #14-7	2575	ND	Welservice Inc/69	E-log/MRL	95
548	18	8	3	E/2 NE NW	Big Four Petroleum Company	Cottonwood #16-6	2690	ND	Welservice Inc/68	E-log/MRL	98
549	18	8	3	SE NE NE	Big Four Petroleum Company	Cottonwood #14-6	2655	933	Welservice Inc/68	E-log/MRL	97
550	18	8	3	NE NE NE	Big Four Petroleum Company	Cottonwood #14-5	2699	954	Welservice Inc/67	E-log/MRL	95
551	18	8	3	SE	Big Four Petroleum Company	Cottonwood #21-7	2586	877	Welservice Inc/69	E-log/MRL	94
552	18	8	4	NW SE SE	Wil-Mc Oil Corp.	Sellers #1	2867	910	Welex/74	IEL/CC	99

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
553	18	8	4	SW NW NW	M.P.And R Production Co.	Keyes #3	3097	823	Mayfield Payne/82	IEL	105
554	18	8	4	SW NW SW	M.P.And R Production Co.	Johnson #2	3240	924	Mayfield Payne/81	IEL	106
555	18	8	4	SW SW NW	M.P.And R Production Co.	Keyes #2	3171	870DF	Mayfield Payne/81	IEL	106
556	18	8	5	SE SE NE	M.P.And R Production Co.	Champlain #1	3143	856	Mayfield Payne/82	DIEL	105
557	18	8	5	SE SE NW	M.P.And R Production Co.	Peterson #1	3448	903	Mayfield Payne/79	IEL	107
558	18	8	5	N/2 SW NW	Special Energy Corporation	Puckett #1	3122	873	Great Guns/89	Digital Log	106
559	18	8	5	NE SW NE	W.M. Petroleum	Hyslop #2	3130	886	Mayfield Payne/85	IEL	105
560	18	8	5	S/2 NE NE	M.P.And R Production Co.	Champlain #2	3376	851	Mayfield Payne/85	IEL	105
561	18	8	5	NW	Robert C. Qinlen	ND	2908	ND	Schlumberger/63	E-log	103
562	18	8	5	NW NE SE	W.M. Petroleum	Jones #1-5	3106	875	Mayfield Payne/84	DIEL	105
563	18	8	5	SW NE NW	Baker Petroleum Company	VanHorn #1	2739	876	Schlumberger/54	E-log	97
564	18	8	6	NE	Jas Oil Company	Tallchief #1	3112	783	Gearhart/83	DIL	102
565	18	8	6	SE SE SW	Mickalson Petroleum Company	Volk #1-A	3215	807	Payne and Payne/85	DIL/CDL	109
566	18	8	7	NE SW NW	Taylor International	Chambers #4	3270	787.5	Gearhart/80	DIL/CDL	104
567	18	8	7	SW SE NW	Taylor International	Chambers #5	3233	847	Gearhart/80	DIL/CDL	112
568	18	8	7	SE SE SE	Baccarat Oil Company	No. 1 Sanders	3493	821	Great Guns/80	IEL/CDL	103
569	18	8	7	E/2 SW NE	Robinowitz Oil Company	Hope #1	3432	815	Computalog/81	IEL/CDL	112
570	18	8	7	NW NW SW	Robinowitz Oil Company	Maggie #1	3207	810.5	Mayfield Payne/80	IEL/CDL	106
571	18	8	8	NE NE NE	HB Oil and Gas Inc.	Jones #1	3251	929	Mayfield Payne/79	IEL/CDL	105
572	18	8	9	NW NW SE	Westwood Energy	Edna Clayton #1	2780	921	Mayfield Payne/87	DIEL/CDL	102
573	18	8	9	SE SE SE	Johnny Mitchell Simon and Bassett	McGuire #1	2784	953	Schlumberger/53	E-Log/ML	97
574	18	8	9	SE NW NW	Wood Enterprises Inc.	Olive #1	3163	910	Presser Atlas/78	DIFL/CDL	105
575	18	8	9	NE NE NW	Autumn Exploration Inc.	Autumn #1	3131	901	Mayfield Payne/86	DIEL/CDL	105
576	18	8	9	NW SW NE	Midwestern Constructors	Biggs #1	2790	951	Halliburton/52	E-log	101
577	18	8	9	SE NE NW	Midwestern Constructors	Davenport #1	2765	922	Schlumberger/53	E-Log/ML	103
578	18	8	9	ND	Sabine Production Company	Caudill #1-9	2756	ND	Birdwell/83	DIFL/CDL	106
579	18	8	9	SE SW NE	Oak Hill Petroleum Company	Kershaw #1-9	3394	1000	Precision/84	DIL	ND
580	18	8	10	NE SW SW	Maggard Oil Company	Bennant #1	3194	956	Precision/78	IEL	119
581	18	8	10	NE NE	H.A.S. Petroleum	Rowell #1	3520	973	Selective Well Service/81	IEL/CDL	110
582	18	8	10	SW SW SE	Simon and Bassett	Marlin #2	2771	ND	Schlumberger/54	E-Log/ML	97
583	18	8	10	SE SW NE	Simon and Bassett	Marlin #1	2843	990	Schlumberger/54	E-Log/ML	98
584	18	8	10	SW SE SW	Johnny Mitchell	Beckham #1	2774	987	Schlumberger/53	E-Log/ML	104
585	18	8	10	NE NW SE	Simon and Bassett	SAAB #3	2713	978	Schlumberger/54	E-Log/ML	97
586	18	8	11	SE	Big Four Petroleum Company	Davis #1	3419	1001	Welservice Inc/81	E-log/MRL	102
587	18	8	11	SW NW NE	Woods Gilchrist	Malloy #3	2575	910DF	Schlumberger/50	E-log	ND
588	18	8	11	NW NW NE	Woods Gilchrist	Malloy #5	2571	908	Schlumberger/50	E-Log/ML	100
589	18	8	11	SW NW SW	G.S. Levine and Carpenter	Davis #3	2796	968.5	Schlumberger/54	E-Log/ML	110
590	18	8	11	NE SW SW	L.B. Jackson	Trent #1	2659	968	Schlumerger/51	E-Log/ML	91
591	18	8	11	SW SW SW	G.S. Levine and Carpenter	Davis #1	2738	991.6	Schlumberger/54	E-Log/ML	100
592	18	8	11	NW SW SW	G.S. Levine and Carpenter	Davis #2	2752	976.6	Schlumberger/54	E-Log/ML	97
593	18	8	11	NE SW SW	G.S. Levine and Carpenter	Davis #4	2686	ND	Schlumberger/54	E-Log/ML	95
594	18	8	12	ND	Ben Stout Jr.	Nichols #2	2495	856	Schlumberger/56	E-log	102
595	18	8	12	NW SE NW	Energy Investments Inc.	Nickles #2	2560	865	Gearhart/83	DIL/CDL	98
596	18	8	12	NE SE NW	Ketchun Whan Drilling	Nichols #1	2545	889	Halligburton/53	E-log	95
597	18	8	12	SE SE NW	Ketchun Whan Drilling	Nichols #2	2566	890	Halliburton/54	E-log	97
598	18	8	12	SW SW NE	Ketchun Whan Drilling	Sidwell #1	2690	942	Halliburton/53	E-log	92

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
599	18	8	12	NW SW NE	Ketchun Whan Drilling	Sidwell #2	2566	ND	Halliburton/53	E-log	94
600	18	8	12	SE SW NE	Viking Oil Company	Sidwell A-3	2553	890	Schlumberger/54	E-Log/ML	95
601	18	8	12	SE SW NW	Energy Investments Inc.	Sidwell #6	3014	930	Gearhart Owen/79	DIL	114
602	18	8	12	SW SE NE	Ketchun Whan Drilling	Sidwell #1-B	2572	880	Halliburton/53	E-Log/ML	104
603	18	8	12	SW NW SW	Gross Production Company	Proctor #1	3121	1009GL	Schlumberger/57	E-log	105
604	18	8	12	NW NE NW	Energy Investments Inc.	Nichols #1	2893	855	Gearhart Owen/70	DIL	101
605	18	8	12	NW NE SE	Ketchun Whan Drilling	King #2	3225	911	Halliburton/53	E-log	102
606	18	8	12	SW NE SE	Ketchun Whan Drilling	King #3	2625	985.5	Halliburton/53	E-Log/ML	96
607	18	8	12	NW NW SE	Ketchun Whan Drilling	Luilla King #1	2617	ND	Halliburton/53	E-log	100
608	18	8	12	NE NE SW	Ketchun Whan Drilling	Proctor #1	2570	ND	Halliburton/53	E-log	98
609	18	8	14	SW SE SW	O.F. Warren	Mann #1	2869	909	Schlumberger/52	E-Log/ML	105
610	18	8	14	NW NW SW	Randerson and Scroggins	Harvel #1	2762	885	Schlumberger/54	E-Log/ML	102
611	18	8	14	SE SE NW	Thomas Exploration Company	Bradstreet #1	3063	917GL	Saturn/86	DIL/CDL	110
612	18	8	14	SW SW NE	Big Four Petroleum Company	Matherly #1	3112	986	Schlumberger/56	E-log	104
613	18	8	14	NW SE SE	LCB Resources	Ruby #1-14	3116	943	Hayes/96	DIL	ND
614	18	8	14	E/2 NE SW	LCB Resources	#1 E.B.	3451	930	Hayes/96	Gamma Ray	ND
615	18	8	15	NW NE NE	Partners Energy Corp.	SAAB #1	3450	981	Gearhart/85	DIL	106
616	18	8	15	SW NE NW	Simon and Bassett	Mundell #1-A	2720	958	Schlumberger/52	E-Log/ML	103
617	18	8	15	NE NE NW	Simon and Bassett	Mundell #3-A	2727	978	Schlumberger/53	E-Log/ML	103
618	18	8	15	NW SW NE	Simon and Bassett	Reynolds #1	2835	972	Halliburton/53	E-Log/ML	94
619	18	8	15	NE NW SW	Clark C. Nye	Hallman #1	2692	912	Schlumberger/50	Unknown	108
620	18	8	15	NE NE SW	Vernon Brown	Reynolds #2	3204	ND	Gearhart/83	DIL/CDL	102
621	18	8	15	SE NW SW	Taylor International Inc.	Hallman #3	3217	910	Gearhart Owen/79	DIL/CDL	115
622	18	8	15	NW SW SW	Vernon Brown	Leader #7	3250	ND	Precision/81	IEL/CDL	114
623	18	8	15	NW SW SE	O'Dell and O'Dell-Falkin	Woods #1A	2750	967	Halliburton/53	E-log	101
624	18	8	15	ND	Simon and Bassett	SAAB #2	2740	994	Schlumberger/53	E-Log/ML	98
625	18	8	16	NE NE NW	Midwestern Constructors	Matherly #1	2902	986	Halliburton/52	E-log	ND
626	18	8	16	NE SE NW	Seigel Production Company	Matherly #1	3198	930	Welservice Inc/84	DIL/CDL	98
627	18	8	16	SW	CN Operating Company	Swartz #3	3294	944	Gearhart Owen/79	DIL/CDL	116
628	18	8	16	NE SE NW	Robert A. Mason Prod. Co.	Matherly #1	3579	931	Rosel/90	DIL/CDL	106
629	18	8	16	SW SW SW	M.P and R Production Co.	Okemah #2	3444	883	Mayfield Payne/79	IEL	106
630	18	8	19	SE SE NE	Roundup Oil Inc.	Keeler #1	2853	898DF	Schlumberger/55	E-log	106
631	18	8	20	NW NW SW	Lindley-Hobson Oil	Spencer #1	2642	939.5	Rileys/81	IEL/CDL	ND
632	18	8	20	NE NE SW	H and B Oil and Gas	Spencer #1	3522	899.6	Mayfield Payne/80	IEL/CDL	110
633	18	8	20	NE SW SW	Lindley Hobson	#1 Edmond	3344	1025.5	Gearhart/82	DIL/CDL	113
634	18	8	20	SE SE SW	HLS Energy Inc.	S. Olive #2-20	3372	999	Mayfield/86	DIL/MRL	107
635	18	8	21	SW NW NW	W.M. Petroleum Corp.	Harris #2	3238	895	Mayfield Payne/84	IEL	106
636	18	8	21	NE SW SW	Flynn Oil Company	Yar-Char-Ney #1	3528	912	Schlumberger/51	E-log	110
637	18	8	21	NW NE SW	C.N. Operating Company	Hallman #2	3350	924	Mayfield Payne/79	IEL/CDL	106
638	18	8	21	SW	C.N. Operating Company	Hallman #3	3348	925	Gearhart/80	DIL/CDL	102
639	18	8	21	SE	C.N. Operating Company	Rollins #1-A	3344	918	Gearhart Owen/79	DIL/CDL	113
640	18	8	21	SE	C.N. Operating Company	Rollins #1	3336	915	Gearhart Owen/79	DIL/CDL	116
641	18	8	22	S/2 SW NW	Chief Well Service	Lacey #4	3220	950	Welservice Inc/83	IEL	105
642	18	8	22	W/2 SE NW	K.D. Emrick	Lacey #2	2726	948	Schlumberger/50	E-log	101
643	18	8	22	SE SE NW	K.D. Emrick	Lacy #3	3143	870	Schlumberger/56	E-log	105
644	18	8	22	NW NW SW	Aladdin Petroleum Company	Catch #11 U-40	2746	959DF	Welex/66	IEL/CC	95

	Well Information								Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
645	18	8	22	SW NW SW	Aladdin Petroleum Company	Catch #12 U-41	2747	940GL	Welex/66	IEL/CC	97
646	18	8	22	SE NW SW	Aladdin Petroleum Company	Catch #10 U-37	2732	ND	Welex/66	IEL/CC	95
647	18	8	22	C NE SE	Aladdin Petroleum Company	Fraley #B-12 U-42	2800	873GL	Welex/66	IEL/CC	98
648	18	8	22	SW NE SE	Aladdin Petroleum Company	Frailey #4-B	3150	893	Schlumberger/56	IEL/ML	105
649	18	8	22	NE NE SE	Ambassador Oil Company	Frailey #7	3145	899	Schlumberger/56	IEL/ML	106
650	18	8	22	SW SE NE	Johnson and Gill	Vicars #1	3032	875	Schlumberger/56	IEL/ML	107
651	18	8	22	NW SE NE	Aladdin Petroleum Company	Vicor #8 U26	3106	881DF	Welex/64	IEL/CC	100
652	18	8	22	NE SE NE	Aladdin Petroleum Company	Vicars #10 U28	3148	875GL	Welex/64	IEL/CC	100
653	18	8	22	SE SW NE	Aladdin Petroleum Company	Vicars #2	3114	874	Schlumberger/58	IEL/ML	105
654	18	8	22	SW NW NE	Aladdin Petroleum Company	Buckles #1	3362	892GL	Welex/63	IEL/CC	105
655	18	8	22	SE NE NE	Ambassador Oil Company	Hazlip #1	3253	876	Schlumberger/56	E-Log/ML	106
656	18	8	22	NE SW SW	Signet Drilling Company	Catch #2	3200	ND	Elgen/58	E-Log/ML	112
657	18	8	22	SE SW SW	Claybrook and Stout	Catch #1	3222	942	Elgen/57	E-Log/ML	112
658	18	8	22	SE SW SE	Aladdin Petroleum Company	Frailey C #6 U31	3022	859DF	Welex/64	IEL/CC	99
659	18	8	22	NE SW SE	Aladdin Petroleum Company	Frailey C #5	3090	864	Welex/63	IEL/CC	99
660	18	8	22	NE SE SW	Aladdin Petroleum Company	Catch #4 U25	3190	ND	Welex/64	IEL/CC	100
661	18	8	22	NE NE SW	Aladdin Petroleum Company	Catch #9 U36	2835	874GL	Welex/66	IEL/CC	100
662	18	8	22	NE NW SW	Aladdin Petroleum Company	Catch #5 U29	2870	924GL	Welex/64	IEL/CC	96
663	18	8	22	SW NW SE	Aladdin Petroleum Company	Frailey D#3	3114	863	Welex/63	IEL/CC	99
664	18	8	22	NW NW SE	Aladdin Petroleum Company	Frailey D4-U30	2813	863DF	Welex/66	IEL/CC	95
665	18	8	22	NE NW SE	Robert L. Kinkaid	Fraley #2	3077	864.5	Schlumberger/57	IEL/ML	106
666	18	8	22	NW NW SE	Aladdin Petroleum Company	Frailey D #2	3820	870	Schlumberger/59	IEL/ML	113
667	18	8	22	SE NE SW	Aladdin Petroleum Company	Catch #3	3195	873	Welex/63	IEL/CC	100
668	18	8	22	SE NW SE	Aladdin Petroleum Company	Frailey C#4	3159	865.5	Welex/63	IEL/CC	100
669	18	8	22	SW NE SW	Aladdin Petroleum Company	Catch #7 U34	2860	884GL	Welex/66	IEL/CC	90
670	18	8	22	NE SE SW	Aladdin Petroleum Company	Catch #4 U25	3192	ND	Welex/64	IEL	100
671	18	8	22	NE SE SW	Aladdin Petroleum Company	Catch #8 U33	2659	887GL	Welex/66	IEL	98
672	18	8	22	SW SE SW	Aladdin Petroleum Company	Catch #8 U35	2715	917	Welex/66	IEL/CC	94
673	18	8	22	SW SE	G.D. King	Frailey #3	2586	ND	Schumberger/55	E-log	103
674	18	8	23	SE SW SE	L.B. Jackson	Replogle #B1	2664	920	Schlumberger/52	E-Log/ML	102
675	18	8	23	NW SW SW	L.B. Jackson	Bertha Jackson #2	2628	911	Welex/60	E-log	96
676	18	8	23	NE SE NW	Big Four Petroleum Company	Castator #1	3214	923	Schlum/berger63	E-Log/ML	106
677	18	8	23	SW NW SW	L.B. Jackson and Aladdin	McLees #1	3086	915	Schlumberger/60	E-Log/ML	96
678	18	8	23	SW	Ambassador Oil Company	Koch #1	3177	ND	Schlumberger/56	E-Log/ML	106
679	18	8	23	NW	L.B. Jackson	Koch #1	2740	990	Elgen/56	E-Log/ML	107
680	18	8	23	NW NW SW	Ashland Oil and Refining Co.	Collie-Koch #1	3070	906DF	Schlumberger/50	E-log	ND
681	18	8	23	NE SW NE	Indrex Inc.	Deer #1-23	3502	1009	Payne and Payne/87	DIL/CDL	108
682	18	8	23	SW NW NE	Big Four Petroleum Company	Deer #1	3468	985	Schlumberger/63	E-log/ML	107
683	18	8	24	NW SE SE	Howard Alexander	Olive #1	3410	968	Welex/77	IEL/CDL	95
684	18	8	24	SW SW SW	Stanton Energy Inc.	South Hampton #1	3461	ND	Welex/82	DIGL	105
685	18	8	24	SE SE NW	Stanton Energy Inc.	North Hampton #1	3323	908	Welex/82	DIGL	104
686	18	8	25	SE SW NW	Helmerich and Payne	Steil #6	2585	876	Schlumberger/52	E-Log/ML	102
687	18	8	25	NW SE NW	Helmerich and Payne	Steil #3	2719	882.5	Schlumberger/52	E-Log/ML	110
688	18	8	25	SE SE NW	Helmerich and Payne	Steil #7	2612	898	Schlumberger/52	E-Log/ML	99
689	18	8	25	NE SW NW	Helmerich and Payne	Steil #4	2757	905	Schlumberger/52	E-Log/ML	110
690	18	8	25	SW SE NW	Helmerich and Payne	Steil #8	2580	881	Schlumberger/52	E-Log/ML	102

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
691	18	8	25	SW SW NE	Helmerich and Payne	Foundation Royalties #1	2635	923	Schlumberger/52	E-log	95
692	18	8	25	NE SE NE	Helmerich and Payne	Foundation Royalties #2	2580	892	Schlumberger/53	E-log	102
693	18	8	25	NW NW SE	Helmerich and Payne	Cora Patrick #1	2639	932	Schlumberger/53	E-Log/ML	102
694	18	8	25	SW NW SE	Roy G. Steele	Ray #1	2672	939.7	Halliburton/57	E-Log/ML	95
695	18	8	25	SW NE SW	L.B. Jackson	E. Olive Unit #6 tract #10	2618	885	Welex/70	E-log/CC	90
696	18	8	25	SW SW NW	Helmerich and Payne	Steil #5	2620	ND	Schlumberger/52	E-Log/ML	104
697	18	8	25	SE NW SW	L.B. Jackson	E. Olive Unit #7 tract #10	2620	869	Welex/70	E-log/CC	95
698	18	8	25	NW NW SW	Russell Maquire	MaQuire Kelly #1	2620	890	Schlumberger/53	E-Log/ML	102
699	18	8	25	SW NW NW	L.B. Jackson	Jackson #1	2745	ND	Schlumberger/52	E-log	102
700	18	8	25	SE NW NW	L.B. Jackson	Jackson #2	2600	890	Schlumberger/53	E-log	102
701	18	8	25	SE NE NW	HLS Energy Co., Inc.	Freedom #2-25	2460	ND	Payne & Payne/84	DIL/CDL	102
702	18	8	25	NW SW NW	Helmerich and Payne	Steil #1	2624	922	Halliburton/52	E-Log/ML	89
703	18	8	25	NE SW NW	Helmerich and Payne	Steil #2	2585	885.5	Schlumberger/52	E-Log/ML	102
704	18	8	25	SW SE SE	EDH Operating Company	Mission #1	3142	957	Welservice Inc/84	DIEL	98
705	18	8	26	SW NE NW	L.B. Jackson	Willis #15	3458	910	Welex/78	IEL/CDL	105
706	18	8	26	SW NE NE	L.B. Jackson	Hall #3	2630	906DF	Schlumberger/52	E-log	94
707	18	8	26	NW NW NW	L.B. Jackson	Willis #12-A	3268	971	Welex/77	IEL/CDL	105
708	18	8	26	NW NW NE	L.B. Jackson	Hall #10	2828	979	Welex/76	IEL/CDL	100
709	18	8	26	SE SE NE	Southern Operating Company	Hall #1-A	3204	898	Welex/85	DIGL/CDL	107
710	18	8	26	NE NE NW	L.B. Jackson	Willis #14	3216	991	Welex/77	IEL/CDL	100
711	18	8	26	SW NE NE	L.B. Jackson	Hall #7	2634	879	Welex/72	IEL/CC	95
712	18	8	26	SE NW NE	L.B. Jackson	Hall #9	2770	908	Welex/75	IEL/CC	97
713	18	8	26	NE SE NE	L.B. Jackson	Hall #4	2645	901.5	Schlumberger/52	E-log	102
714	18	8	26	NW SE NE	L.B. Jackson	Hall #6	2600	872	Schlumberger/54	E-log	84
715	18	8	26	SE SE NE	L.B. Jackson	Hall #5	2635	902	Schlumberger/53	E-log	102
716	18	8	26	NE NE SE	O'Dell and O'Dell-Ketchum and Whan	Kelly #1	2585	898	Halliburton/52	E-log	ND
717	18	8	26	NE SW SE	C and G Drilling Company	Tiger #A-2	2600	877	Schlumberger/54	E-log	100
718	18	8	26	ND	L.B. Jackson	Wills #12	2725	962DB	Halliburton/50	E-log	ND
719	18	8	27	NE NE NE	R.P. Bates	Pine #11	2721	970	Lanewells/61	E-log	107
720	18	8	27	SE NE NW	R.P. Bates	Williams #15	2636	856.5	Welex/66	IEL/CC	106
721	18	8	27	NW NE NE	Bud Marrs Oil Company	Pine #12	2681	ND	Welservice Inc/77	E-log/MRL	94
722	18	8	27	SE NE SE	William H. Pine	Rosa Richards #1A	2663	895	Schlumberger/53	E-Log/ML	102
723	18	8	27	SE NW NE	The Springer Interest	Williams #9	2582	880DF	Schlumberger/49	Unknown	105
724	18	8	27	NW SE NE	The Springer Interest	Pine #10	2605	ND	Schlumberger/51	E-log	101
725	18	8	27	SW NW NE	The Springer Interest	Williams #11	2630	855	Schlumberger/54	E-Log/ML	94
726	18	8	27	NE NE NW	The Springer Interest	Williams #13	2630	ND	Schlumberger/57	E-Log/ML	101
727	18	8	27	C NW SE	Rochwile	Woods #9	3108	ND	Welex/65	IEL/CC	100
728	18	8	27	SW SW SW	L.B. Jackson	Lizzie #1	3210	884	Welex/76	IEL/CDL	100
729	18	8	27	NW SE SW	L.B. Jackson	Lizzie #3	3180	855	Welex/83	DIGL/CDL	102
730	18	8	27	NE NW NW	Johnson and Gill	Marrs #1	3180	938	Schlumberger/55	E-log	107
731	18	8	27	NE	The Springer Interest	#12 Williams	2565	ND	Schlumberger/???	E-Log/ML	ND
732	18	8	29	NE SW NW	CN Operating	Farmer #1	3325	929	Gearhart Owen/80	DIL/CDL	116
733	18	8	29	NE SW NE	Mid-Continent Petroleum Co.	H.E. Glimp #1	2895	913GL	Schlumberger/50	E-log	ND
734	18	8	29	NE	CN Operating	Holman #1	2900	898	Gearhart Owen/80	DIL/CDL	96
735	18	8	29	NW NW NE	CN Operating	Goff #2	3368	952	Mayfield Payne/75	IEL	107
736	18	8	29	SE NW SE	Ketchum-Whan Drilling Company	Gibson #1	2850	895	Halliburton/53	E-log	98

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
737	18	8	29	SE NW NE	Fred B. Kroger and Assoc.	Palmer #1	2883	ND	Schlumberger/54	E-log	94
738	18	8	34	NW SW NE	Power Management Inc.	Wilson #8	3121	ND	Mayfield Payne/75	IEL/CDL	104
739	18	8	34	E/2 SW NE	Power Management Inc.	Wilson #9	3130	838	Mayfield Payne/75	IEL/CDL	105
740	18	8	34	SE SE NE	Power Management Inc.	Wilson #6	3092	838	Mayfield Payne/75	IEL	105
741	18	8	34	NE NE SE	Power Management Inc.	Wilson #4	3100	836	Mayfield Payne/75	IEL	104
742	18	8	34	ND	Power Management Inc.	Wilson #7	3101	841	Welex/75	IEL	92
743	18	8	34	NE NW NW	L.B. Jackson	Mongrall #1	3180	845	Welex/76	IEL/CDL	105
744	18	8	34	SE NW SW	J.W. Owens	Dix #10	3304	901	Welservice Inc/84	IEL/CDL	98
745	18	8	35	NW SW SW	Power Management Inc.	King #2 Lease well #4	3137	847	Welex/75	IEL/CDL	105
746	18	8	35	S/2 NE SE	Tony Cornelius	Whitehead C-1	3093	857GL	Welservice Inc/79	E-log	97
747	18	8	35	NW SE SE	L.B. Jackson	Bear #11	3448	857	Welex/78	IEL	105
748	18	8	35	SW SE SE	L.B. Jackson	Bear #6	2686	847GL	Welex/84	DIGL/CDL	96
749	18	8	35	NW NE NE	C and G Drilling Company	Whitehead #1	2560	850	Schlumberger/53	E-log	95
750	18	8	35	NE NW NE	C and G Drilling Company	Tiger #1	2660	850	Schlumberger/53	E-log	102
751	18	8	35	NW NE SW	Mike Marrs Drilling Company	Daisy King #1	2628	857DF	Schlumberger/55	E-log	94
752	18	8	36	NE NW NW	L.B. Jackson	Gillispy #1	2646	900	Welex/70	IEL	96
753	18	8	36	SW NW SW	C.G. Drilling Company	Whitehead #A-2	2630	878	Schlumberger/53	E-log	102
754	18	8	36	SE SW SW	C.G. Drilling Company	Whitehead #A-3	2608	861	Schlumberger/54	E-Log/ML	94
755	18	8	36	NW SW SW	Tony Cornelius	Whithead #3	3136	863	Welservice Inc/79	E-log	98
756	18	8	36	SW SE SW	Morton Brothers	Whithead #2	3128	886	Welservice Inc/84	IEL	99
757	18	8	36	NE NW NW	L.B. Jackson	Gillispie #1	3127	900	Welex/76	IEL	100
758	18	8	36	SE SE SE	Kent T. Kimball	Bath #1	3090	824	Welservice Inc/70	E-log	99
759	18	8	36	NE SW SE	E.D.H. Operating Company	Pine #2	3170	885	Welservice Inc/84	DIFL	99
760	18	8	36	SE SW SE	E.D.H. Operating Company	Pine #3	3147	885	Welservice Inc/84	DIFL	99
761	18	8	36	NW NW SE	E.D.H. Operating Company	Pine #4	3220	905	Welservice Inc/84	DIEL	102
762	18	8	36	SW SW NE	L.B. Jackson	Gillispie #A-1	3289	ND	Welex/84	DIGL/CDL	ND
763	18	8	36	SW SW NW	L.B. Jackson	Gillispie #A-2	ND	915	Welex/84	DIGL/CDL	102
764	18	8	36	SE SE SW	Morton Brothers	Whitehead #1-A	3107	ND	Welservice Inc/84	IEL/CDL	99
765	18	9	2	SE NW SW	W.B. Moran	Wright #1	2970	845	Schlumberger/54	E-log	100
766	18	9	2	SE SW SE	Big Four Petroleum Company	Irelan #1	2663	805	Welservice Inc/71	E-log	94
767	18	9	2	SE SE NW	D.B.D. Oil and Gas Company	Lena Tiger #1	3352	790	Payne & Payne/86	DIL	109
768	18	9	2	SW SE NW	D.B.D. Oil and Gas Company	Lena Tiger #2	2957	852	Payne & Payne/86	DIL/CDL	109
769	18	9	3	SE NW NE	J.O. Hayes	Stevenson #1	2891	757.5	Schlumberger/54	E-log	94
770	18	9	3	NE NW SE	Stanton Energy Inc.	Martin #1	2768	800	Welex/82	DIGL	97
771	18	9	3	SE NE	Stanton Energy Inc.	Greenwood #1-A	3063	817	Welex/82	DIGL	106
772	18	9	3	SW NW NE	Carter and Mandel	Stevenson #1	2963	811	Schlumberger/59	E-log	103
773	18	9	3	S/2 NW NE	C and S Resources Inc.	Greenwood #1	3004	797	Schlumbeger/80	DISFL	104
774	18	9	4	SW NW SE	Superior Oil Company	Greenwood #1	2809	882	Schlumberger/54	E-log	104
775	18	9	4	NW SW SE	F.C. Harman and Henry Clay	Greenwood #1	3117	869	Schlumberger/53	E-log	105
776	18	9	4	SE NE SW	Cher Oil Company	Martin #1	3096	873	Welservice Inc/82	IEL/CDL	98
777	18	9	4	SW SW SE	Cher Oil Company	Greenwood #2	3048	840	Welservice Inc/81	E-log/MRL	99
778	18	9	5	SW SE NE	Howard Alexander	Bretz #1	3070	824	Schlumbeger/78	DIL/CDL	101
779	18	9	5	SE SW SW	Thomas N. Berry and Company	Kelly #3	2498	820DB	Halliburton/51	E-log	ND
780	18	9	5	NW SE NW	E.D.H. Operating Company	Taylor #1	2822	870	Welservice Inc/84	IEL/CDL	94
781	18	9	6	SE NW NE	Big Four Petroleum Company	Matofsky #3	2599	891	Schlumberger/57	E-log	102
782	18	9	6	NE NW NE	Big Four Petroleum Company	Matofsky #4	2700	890	Schumberger/57	E-log	103

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
783	18	9	6	NE NE NW	Trnas Tex Drilling Company	Delancy #1	2646	891	Schlumberger/54	E-log	102
784	18	9	6	NW NW NE	Big Four Petroleum Company	Matofsky #1	3577	894	Schlumberger/56	E-Log/ML	109
785	18	9	6	SE NE NE	Kidd Williams	Phillips #1	3155	ND	Schlumberger/54	E-Log/ML	100
786	18	9	6	NE NE SW	Big Four Petroleum Company	Beckman #1	2910	927	Schlumberger/57	E-Log/ML	109
787	18	9	6	SW NW NW	Rack Oil Company	Delancey #1	3148	861	Gearhart/81	DIL	110
788	18	9	6	NW SE NW	Vernon Brown	Lloyd #3	2620	ND	Gearhart/82	DIL/CDL	97
789	18	9	6	SW SW NE	Big Four Petroleum Company	Matofsky #5	2630	945	Schlumberger/57	E-Log/ML	103
790	18	9	6	NW NW SE	Big Four Petroleum Company	Matofsky B#1	2629	936	Schlumberger/57	E-Log/ML	101
791	18	9	6	NW NE SW	Big Four Petroleum Company	Beckman #7	2625	ND	Welservice Inc/65	E-log/MRL	ND
792	18	9	6	NW NW SW	Big Four Petroleum Company	Beckman #3	2506	867	Schlumberger/60	E-Log/ML	100
793	18	9	6	NW SW SW	Big Four Petroleum Company	Beckman #4	2550	907	Schlumberger/60	E-Log/ML	105
794	18	9	6	NW SW SE	Big Four Petroleum Company	Matofsky B#2	2576	901	Schlumberger/63	E-Log/ML	100
795	18	9	6	NW SW NE	Big Four Petroleum Company	Matofsky #2	3170	906	Schlumberger/56	E-log/ML	105
796	18	9	6	SE NE NW	Rack Oil	Robert #1	3178	890	Gearhart/82	DIL/CDL	103
797	18	9	7	SE NE SW	Big Four Petroleum Company	Timley #2	3215	938	Welservice Inc/81	E-log/MRL	99
798	18	9	7	NW SW	Texaco, Inc.	P.B. Jackson #1	3210	923	Gearhart/83	DIL/CDL	ND
799	18	9	7	SE NE NE	C.W. Dobson Oil Company	Kelly #1	2529	843	Schlumberger/55	E-Log/ML	104
800	18	9	7	NE NW SE	Big Four Petroleum Company	Timley #1	3302	970	Welservice Inc/80	E-log/MRL	105
801	18	9	7	SW SW SW	Big Four Petroleum Company	Replogle #1	2566	878	Welservice Inc/80	E-log/MRL	99
802	18	9	7	SW NE NE	C.W. Dobson Oil Company	Kelly #2	2698	976	Schlumberger/55	E-log	101
803	18	9	7	SE NE NW	Big Four Petroleum Company	Barnett #1	2572	962	Schlumberger/61	E-Log/ML	ND
804	18	9	7	NW NE NW	Big Four Petroleum Company	Barnett #2	2667	ND	Schlumberger/60	E-Log/ML	103
805	18	9	8	NW NW NW	Big Four Petroleum Company	#3 Barnett	3177	861	Welservice Inc/ND	E-log	ND
806	18	9	8	SE NW NW	Thomas N. Berry and Company	Post Oak #1	2530	852DB	Halliburton/51	E-log	ND
807	18	9	8	NW SW NE	Johnson and Gill	Martin-Marrs #1	2550	929	Schlumberger/52	E-log	103
808	18	9	8	NW SW SW	Wolfe Drilling Company	Reploge B-4	2577	868	Schlumberger/52	E-log	104
809	18	9	8	SE SE SW	H. Waggoner	Airington #1	2611	915	Schlumberger/52	E-Log/ML	102
810	18	9	8	NW SE SW	H. Waggoner	Arrington #2	2610	940	Schlumberger/52	E-log	102
811	18	9	8	SW SE SW	H. Waggoner	Arrington #3	2616	935	Schlumgerger/53	E-log	102
812	18	9	9	NW SE SE	L.B. Jackson	McHannon #1	3120	920DF	Schlumberger/49	Unknown	ND
813	18	9	9	SE SE SE	L.B. Jackson	McHannon #2	2437	915	Elgen/57	E-log	104
814	18	9	9	ND	Isaac Warner	Orr #2	ND	887	Saturn/???	Integrated Data	ND
815	18	9	10	NW NW NE	McAdams Drilling Company	Irelan #1	3042	824	Schlumberger/55	E-log	100
816	18	9	10	SE SW SW	Norbla Oil Company	Lowe #1	2452	867	Schlumberger/56	E-log	92
817	18	9	10	NW SW SW	Norbla Oil Company	Lowe #2	2388	875DF	Schlumberger/56	E-log	101
818	18	9	10	NE SE NE	Big Four Petroleum Company	Wizard #1	3074	ND	Welservice Inc/84	DIEL/CDL	98
819	18	9	11	SW SW SE	Big Four Petroleum Company	Samie #1	3072	885	Welservice Inc/84	DIEL/CDL	98
820	18	9	11	SE NW NW	Dubloon Oil Company	Greenwood Ranch #4	3325	942	Welservice Inc/82	IEL/CDL	108
821	18	9	11	SE SE SW	Big Four Petroleum Company	Tex #1	3032	938	Welservice Inc/84	IEL/CDL	98
822	18	9	11	SE SW SE	Big Four Petroleum Company	Samie #2	3907	884	Welservice Inc/84	DIEL/CDL	106
823	18	9	14	NE NE NW	Big Four Petroleum Company	Wright A-1	3020	912	Welservice Inc/83	DIFL/CDL	101
824	18	9	15	NW NE NW	Globe Oil and Refining Company	Ireland #1	2565	933	Schlumberger/54	E-Log/ML	95
825	18	9	15	S/2 NW NE	Bryan, Mid-Continent...	Lewis #1	3188	964	Schlumberger/48	Unknown	ND
826	18	9	15	SW NW NW	Crawford Producing Company	Howard Trust #3	2403	910	Schlumberger/56	E-log	100
827	18	9	15	SE NW SE	Southland Oil Corporation	Warner #15-3	2920	971	Welservice Inc/83	DIFL/CDL	98
828	18	9	15	NW NW SE	Southland Oil Corporation	Warner #15-1	2917	970	Gearhart/81	DIL/CDL	100

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
829	18	9	15	NW NW SW	Sopac Exploration Inc.	Wagoner #1	2977	934	Welservice Inc/85	DIEL/CDL	100
830	18	9	15	NE NW SW	Sopac Exploration Inc.	Wagoner #2	2954	919	Welservice Inc/85	DIEL/CDL	100
831	18	9	15	SE SW NW	Claremont Corporation	Warner #15-1	3256	947.5	Welex/83	DIGL/CDL	102
832	18	9	15	NE SE SW	Southland Oil Corporation	Warner #15-4	2920	937	Welservice Inc/8	DIFL/CDL	98
833	18	9	15	SE SW NE	RH Energy Development	Lauhon #1	3208	967	Computalog/82	IEL/CDL	111
834	18	9	16	C SE NE	Claremont Corporation	Warner #16-1	3002	930.5	Welex/83	DIGL/CDL	100
835	18	9	16	E/2 NW SE	Claremont Corporation	Spickle #16-2	2970	885	Gearhart/83	DIL/CDL	101
836	18	9	16	SW NE NW	Sloan Oil and Gas Company	Warner B#1	2500	924	Schlumberger/58	E-log	100
837	18	9	16	SW SE NW	Sloan Oil and Gas Company	Isaac Warner #1	2456	898	Schlumberger/50	E-log	104
838	18	9	16	ND	Stan-American Oil Company	Harmon and Clay #1	2452	ND	Schlumberger/58	E-Log/ML	100
839	18	9	17	NW NE NW	Deane Gill	Surber #1	2604	952	Schlumberger/52	E-Log/ML	102
840	18	9	17	SW NE NE	Tibbens Petroleum Company	Surber #2	2614	966	Schlumberger/62	E-Log/ML	101
841	18	9	17	NE NE SE	Blackjack Oil Ltd.	Felton #3	2638	885GL	Great Guns/80	IEL/CDL	106
842	18	9	17	NE SE SE	Baccarat Oil Company	Turner #1	2673	912	Great Guns/81	IEL/CDL	107
843	18	9	17	NE NW NW	Thomas N. Berry and Company	Foundation #1	2578	926	Halliburton/52	E-log	ND
844	18	9	17	SE NW NW	Texas Crude Company	Foundation Royalty #1	2554	904DF	Halliburton/52	E-Log/ML	96
845	18	9	17	SW SE NE	Robert A. Holt	Root #2	2510	902	Schlumberger/56	E-log	102
846	18	9	17	NW SE SW	Big Four Petroleum Company	Vileard #1-17	3245	961	Dresser Atlas/78	DIFL/CDL	105
847	18	9	17	SE NE SE	Blackjack Oil Ltd.	Felton #4	3296	905	Great Guns/80	IEL/CDL	113
848	18	9	17	NW SW SE	Ron and Dan Oil Company	Turner-Root #2	3343	951	Great Guns/82	IEL/CDL	114
849	18	9	17	SE NE SW	Lincoln 77 Inc.	James Leslie #1	3062	944GL	Welservice Inc/84	DIEL/CDL	100
850	18	9	17	SW SW NE	Ketchum-Whan Drilling	Koch #3	2809	997	Halliburton/53	E-log	96
851	18	9	17	NW NW SW	H. Waggoner	Foundation #2	2928	936	Schlumberger/53	E-log	105
852	18	9	17	NW NE NW	Chronister International Energy	Thomas #1	3277	918	Welservice Inc/82	E-log/MRL	100
853	18	9	17	SE NW NE	Chronister International Energy	Thomas #2	3295	907	Welservice Inc/82	IEL/CDL	102
854	18	9	18	NW SW SW	H. Waggoner	Foundation #1	2715	981	Schlumberger/53	E-log	103
855	18	9	18	SW NE NE	Baccarat Oil Company	Arrington #1	3260	890GL	Great Guns/80	IEL	113
856	18	9	18	NE SE NW	Kidd Williams	Turner #2	2757	1004	Schlumberger/53	E-log	103
857	18	9	18	NW SW NE	Ketchum-Whan Drilling	Koch #4	2620	1005	Halliburton/53	E-log/ML	95
858	18	9	18	SW SE NE	Ketchum-Whan Drilling	Koch#2	2611	926	Halliburton/53	E-log	ND
859	18	9	18	SE SE NE	Crites and Gilmore	Koch#1	2675	962	Halliburton/52	E-log	98
860	18	9	18	SE SE NE	Ketchum-Whan Drilling	Bartlett #3	2620	ND	Halliburton/53	E-log	90
861	18	9	18	NE NE SE	Ketchum-Whan Drilling	Bartlett #4	2618	ND	Halliburton/53	E-log	92
862	18	9	18	NW NW SE	Ketchum-Whan Drilling	Bartlett #5	2568	978	Halliburton/53	E-log/ML	96
863	18	9	18	NE NE SW	Kidd Williams	Sharp #1	2736	ND	Schlumberger/53	E-log/ML	97
864	18	9	18	NE SE SW	Simon and Bassett	Dill-Central Commerce #1	2440	947	Schlumberger/53	E-log/ML	101
865	18	9	18	NE SE SE	Ketchum-Whan Drilling	Bartlett #1	2712	ND	Halliburton/52	E-log	ND
866	18	9	18	NW SE SE	Viking Oil Company	Bartlett #7	2728	957	Schlumberger/54	E-log	95
867	18	9	19	NW SE SE	Isaac Warner	Litka #2-A	3016	891.4	Saturn/85	IEL	110
868	18	9	19	SW SE SW	Cramer Production Company	Farmer #1-C	3060	960	Computalog/84	DISFL	106
869	18	9	19	NE NE NW	Simon and Bassett	Fitzhugh #1	2771	ND	Halliburton/52	E-log	102
870	18	9	20	NW NE SE	Paul R. Prentice	McClung #1	2583	934	Elgen/57	E-log	105
871	18	9	20	SE SE NW	Conn-Okla Producing Company	Carroll #2-C	3100	983	Welservice Inc/83	DISFL/CDL	100
872	18	9	20	NE NE SW	Scott Production Company	OU #2	3105	962	Welservice Inc/84	IEL/CDL	98
873	18	9	20	SW NE NW	Conn-Okla Producing Company	Carroll #5-C	3084	1000	Welservice Inc/84	DIEL/CDL	98
874	18	9	20	NE NE NW	Conn-Okla Producing Company	Carroll #6-C	3079	984	Welservice Inc/84	DIEL/CDL	98

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
875	18	9	20	C NE SE	Creek County Resources Corp.	Hart #1	2932	937	Gearhart Owen/79	DIL/CDL	112
876	18	9	20	C SW SE	Scott Production Company	Franklin #1	3288	983	Welservice Inc/84	IEL/CDL	102
877	18	9	20	SE NE NW	Conn-Okla Producing Company	Carroll #3-C	3130	1004	Welservice Inc/83	DIFL/CDL	99
878	18	9	20	SW NW SW	Okie Oil Company	OU #3	3075	ND	Computalog/85	DISFL/CDL	109
879	18	9	20	NE SW NE	Conn-Okla Producing Company	Carroll #2-B	3055	970	Gearhart/83	DIL	102
880	18	9	20	NW	Crowder Oil Company	Scott #4	3025	957GL	Welservice Inc/81	E-log/MRL	99
881	18	9	20	NW SE NW	Conn-Okla Producing Company	Carroll #4-C	3097	1000	Welservice Inc/84	DIEL/CDL	107
882	18	9	21	SW SW	Paul R. Prentice	Carson #2-A	3182	951	Lane Wells/58	E-log/ML	112
883	18	9	21	SW NW SW	Creek County Resources Corp.	Carson #1	2915	955	Gearhart Owen/79	DIL/CDL	109
884	18	9	21	SW	Paul R. Prentice	Carson #2-A	3182	951	Lane Wells/58	E-log	112
885	18	9	21	SE SE NE	Delaney Drilling Company	Beard #1	3175	857	Halliburton/53	E-log	124
886	18	9	21	SW NE SE	Glimp Oil Company	Miller #B-1	3202	889	Welservice Inc/66	E-log	100
887	18	9	21	NW SW NW	Perkins Brothers Producing Co.	Martin #1	2536	ND	Elgen/57	E-log/ML	105
888	18	9	21	NE SE SE	Century Oil Company	Miller #2	2109	918	Schlumberger/56	IEL	101
889	18	9	21	SE SE SE	K.D. Emrick	Miller #1	2099	ND	Schlumberger/55	E-log	92
890	18	9	21	ND	Paul R. Prentice	Carson #1	2685	ND	ND/56	E-log	ND
891	18	9	22	NW SE NW	Century Oil Company	Gona Warner #2	2907	927	Elgen Corp/57	E-log	109
892	18	9	22	NE SW NE	P.A. McGinley	Oda Tiger #1	3118	869	Schlumberger/85	DISFL/CDL	101
893	18	9	22	NW SW NW	Blackjack Oil-Ron and Dan	Warner #2A	3217	898	Great Guns/81	IEL/CDL	112
894	18	9	22	SE SE SW	Blackjack Oil-Ron and Dan	Warner #1A	2904	908GL	Great Guns/81	IEL/CDL	109
895	18	9	22	SE SW NW	Century Oil Company	Gona Warner #1	2877	903	Elgen/57	E-log	109
896	18	9	22	NE SW SW	Carter Mullaly and J.O. Blalack	Hinton #1	2997	836	Schlumberger/60	IEL	ND
897	18	9	22	NE SW SE	P.A. McGinley	Anthis #3	2425	940	Welservice Inc/82	IEL/CDL	92
898	18	9	22	SW SW SE	Mesker Drilling Company	Anthis #2	2101	955	Elgen/56	E-log	101
899	18	9	22	SE SE NW	P.A. McGinley and J.R. McGinley, Jr.	Warner #1	3199	932	Gearhart/81	DIL/CDL/MLL	100
900	18	9	22	SW NE SW	P.A. McGinley and J.R. McGinley, Jr.	Billingslea #1	3196	931	Gearhart/81	DIL/CDL	100
901	18	9	22	SE SE NW	OilWest Drilling Inc.	Warner #1	3376	933	Welservice Inc/81	E-log	102
902	18	9	23	NW SE NW	Doyle Cotton	Coonrod #1	3205	966	Schlumberger/51	E-log	106
903	18	9	25	SE NW NW	L.B. Jackson	Alberta #4	3577	875	Welex/65	IEL	103
904	18	9	25	SE NE	BWAB, Inc.	Anthis 25-42	2790	ND	Mayfield/86	DIFL/CDL	102
905	18	9	25	SW NE SW	Donald B. Gilmore	Jackson Ranch 25-36	2725	822	Welservice Inc/86	IEL/CDL	95
906	18	9	26	NE SE SE	Donald B. Gilmore	Jackson Ranch 26-87	2133	931	Welservice Inc/83	IEL/CDL	90
907	18	9	26	NW NW NW	Paul Sticelber	Coonrod #1	2077	926.5	Elgen/57	E-log	100
908	18	9	26	SE SW SW	McGinley and McGinley	Hinton Holmes #1	2007	834GL	Gearhart/81	DIL/CDL	90
909	18	9	27	SW NE NW	Paul R. Prentice	Coonrod #1-A	2010	851	Elgen/56	E-log	100
910	18	9	27	SW NE NW	Paul R. Prentice	McNeil #2	1978	852.5	Elgen/77	E-log	100
911	18	9	27	NE NE NW	Paul R. Prentice	Coonrod #2A	2090	919.5	Elgen/57	E-log	101
912	18	9	27	SE NW NW	Paul R. Prentice	McNeil #1	1975	821	Schlumberger/56	E-log	96
913	18	9	27	NW SE NW	Striker Drilling Company	Hinton #1	2911	829	Computalog/84	DISFL/CDL	106
914	18	9	27	NE NW NW	Paul R. Prentice	McNeil #3	1965	ND	Elgen/56	E-log	100
915	18	9	27	NW SW NW	Crawford Production Company	Moore #8	2028	899	Schlumberger/56	E-log	98
916	18	9	27	NE SW NW	Crawford Production Company	Moore #7	1950	817	Schlumberger/56	E-log	98
917	18	9	27	N/2 SW NW	Crawford Production Company	Moore #10	2037	913	Schlumberger/56	E-log	100
918	18	9	27	C SW NW	Crawford Production Company	Moore #11	2040	908	Schlumberger/56	E-log	99
919	18	9	28	NE NE NE	Crawford Production Company	Moore #3	1994	867	Schlumberger/55	E-log	90
920	18	9	28	SE NE NE	Crawford Production Company	Moore #4	1976	851	Schlumberger/56	E-log	96

Well Information									Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
921	18	9	28	NW NE NE	Crawford Production Company	Moore #12	2026	870	Schlumberger/57	E-log	100
922	18	9	28	NE NW NE	Crawford Production Company	Stone #2	2024	896	Schlumberger/55	E-log	99
923	18	9	28	SE NW NE	Crawford Production Company	Stone #5	2089	907	Schlumberger/57	E-log	97
924	18	9	28	SW SE NE	Crawford Production Company	Moore #1	2434	914	Schlumberger/54	E-log	102
925	18	9	28	NEW SW NE	Crawford Production Company	Stone #6	2626	921	Schlumberger/57	E-log	101
926	18	9	28	NE SE NE	Crawford Production Company	Moore #5	2023	898	Schlumberger/56	E-log	96
927	18	9	28	NW SE NE	Crawford Production Company	Moore #8	2035	914	Schlumberger/56	E-log	98
928	18	9	28	SE SE NE	Crawford Production Company	Moore #9	2180	920	Schlumberger/56	E-log	98
929	18	9	28	SW NE NE	Crawford Production Company	Moore #2	2826	893	Schlumberger/55	E-log	108
930	18	9	28	SE SE SE	Enersource Petroleum Inc.	Marjorie #1	2899	841	Gearhart/83	DIL/CDL	100
931	18	9	28	NE NW SE	Striker Drilling Company	Rooney #1	2949	903	Computalog/84	DISFL/CDL	97
932	18	9	28	NW NW NW	Creek County Resources Corp.	Anthis #1	3254	919	Gearhart Owen/79	IL/CDL	116
933	18	9	28	NW NW NW	Curt D. Edgerton	Anthis #1	2944	920.5	Schlumberger/59	IEL/CDL	104
934	18	9	28	SW NE NE	Striker Drilling Company	Star #1	2826	877	Computalog/84	DISFL/CDL	104
935	18	9	28	NW NE SE	Striker Drilling Company	Willie #1	2949	903	Computalog/85	DISFL/CDL	107
936	18	9	28	NE SW NW	Striker Drilling Company	Anthis #1	2956	919	Computalog/85	DISFL/CDL	107
937	18	9	28	NW SE SE	T.E. Blackwell and Kent T. Kimball	Fox #1	2445	854	Welservice Inc/69	E-log/MRL	92
938	18	9	29	SW NW SE	T.E. Blackwell and Kent T. Kimball	Ezra #1	3022	947	Welservice Inc/85	IEL/CDL	98
939	18	9	29	NW NW NE	Little River Energy Company	Plumer #6	2950	934	Gearhart Owen/79	IEL/CDL	109
940	18	9	29	SW SE SW	Blackjack Oil Company	Robert Owen #1	3128	936	Welservice Inc/85	IEL/CDL	100
941	18	9	29	SW NE SW	Little River Energy Company	Harry Evans #1	3047	922	Welservice Inc/85	IEL/CDL	98
942	18	9	29	SE NE SW	Little River Energy Company	Sloan #1	2989	904	Welservice Inc/85	IEL/CDL	98
943	18	9	29	SW NW SW	Little River Energy Company	Good #1	3097	926	Welservice Inc/85	IEL/CDL	98
944	18	9	29	SE NW SW	Little River Energy Company	Lynne #1	3107	953	Welservice Inc/84	IEL/CDL	99
945	18	9	29	NW NW SW	Little River Energy Company	Valentino #1	3087	899	Welservice Inc/84	IEL/CDL	98
946	18	9	29	SE SW SW	Little River Energy Company	Grocery #2	3115	961	Welservice Inc/84	IEL	100
947	18	9	29	NE SE NW	Kidd Williams	Lakemoore #1	2730	974.5	Schlumberger/53	E-log/ML/CDL	104
948	18	9	29	NW SW SW	Little River Energy Company	Grocery #3	3100	951	Welservice Inc/84	IEL/CDL	99
949	18	9	29	SW NE SW	T.E. Blackwell and Kent T. Kimball	Whitehead #2	2208	926	Welservice Inc/70	E-log/MRL	84
950	18	9	29	SW NW SW	T.E. Blackwell and Kent T. Kimball	Whitehead #1	2754	925	Welservice Inc/69	E-log/MRL	95
951	18	9	29	SE SW NW	Little River Energy Company	Moore #4	3030	951	Welservice Inc/84	IEL/CDL	100
952	18	9	29	SW SW NW	Cobra Oil Company	Moore #3	3080	949	Welservice Inc/81	E-log/MRL	99
953	18	9	29	SW NW NE	Kidd Williams Drilling Company	Stine Franklin #1	2954	951.5	Schlumberger/54	E-log/ML	105
954	18	9	29	SE NW NE	Blackjack Oil Company	Plumer #7	2940	920GL	Gearhart Owen/79	IEL/CDL	109
955	18	9	29	SE NE NW	Kidd Williams Drilling Company	Cox #1	2940	953.5	Schlumberger/54	E-log/ML	98
956	18	9	29	SE NW NW	Boomer Sooner	Ruby Cox #1	3191	902	Welservice Inc/83	IEL/CDL	100
957	18	9	30	NW	Cramer Production	Wheeler #2-C	3100	943	Welservice Inc/81	E-log/MRL	101
958	18	9	30	NW	Cramer Production	Wheeler #4-C	3098	949	Welservice Inc/83	DIFL/CDL	100
959	18	9	30	SE SE NE	Little River Energy Company	Cox East #1	3062	904	Welservice Inc/84	IEL/CDL	98
960	18	9	30	SW SE NE	Crowder Oil Company	Cox #3	3703	876	Welservice Inc/81	E-log/MRL	104
961	18	9	30	SW NE NW	Ketchum Whan Drilling Company	Wheeler #1	2614	ND	Schlumberger/53	E-log	95
962	18	9	30	NE SE SE	Crawford Production Company	Khair #1	2450	922	Welservice Inc/70	E-log	92
963	18	9	30	NW NE NE	Sopac Exploration Inc.	Manoukian #1	3018	889	Welservice Inc/86	DIEL	98
964	18	9	30	NE NW SE	Southland Oil Corporation	Montgomery #30-3	3031	869	Welservice Inc/83	DIFL	115
965	18	9	30	SW SW NW	Flatt Energy Inc.	Wheeler C-6	3079	907GL	Welservice Inc/85	DIEL	98
966	18	9	30	SE NE SE	Cumberland Operating Company	Rick Montgomery #1	3044	882	Gearhart/84	DIL	108

	Well Information								Wireline Information		
	Township	Range	Section	Quarter Section	Operator	Well Name	TD	KB	Co./Yr.	Logs Available	BHT
967	18	9	30	NE NE SE	Cumberland Operating Company	Rick Montgomery #2	3058	915	Gearhart/84	DIL/CDL	101
968	18	9	30	NW SW SE	Southland Oil Corporation	Gibson #30-2	3335	874	Gearhart/82	DIL/CDL	113
969	18	9	30	SW NE NE	Sopac Exploration Inc.	R.O. #2	3047	889	Welservice Inc/85	DIEL/CDL	98
970	18	9	30	NW SE NE	Sopac Exploration Inc.	R.O. #1	3077	877	Welservice Inc/85	DIEL/CDL	98
971	18	9	30	NE NE SW	Cramer Production Company	Billie Mae #1	3101	920	Welservice Inc/83	IEL/CDL	106
972	18	9	30	SW NE SE	Southland Oil Corporation	Montgomery #30-4	3053	877	Welservice Inc/83	DIFL/CDL	100
973	18	9	30	NW SE SE	Southland Oil Corporation	Page 30-1	3052	888	Welservice Inc/83	DIFL/CDL	101
974	18	9	30	SE NW NE	Sopac Exploration Inc.	Vinson #1	3072	903	Welservice Inc/85	DIEL/CDL	98
975	18	9	30	NE SW NE	Little River Energy Company	Capps #2	3036	915	Welservice Inc/84	IEL/CDL	98
976	18	9	30	NW SW NE	Little River Energy Company	Capps #1	3088	951	Welservice Inc/84	IEL/CDL	97
977	18	9	30	SE NE NW	D.H. Cramer	Wheeler #1-C	3051	935	Welservice Inc/80	E-log/MRL	99
978	18	9	30	SE NW SW	Cramer Production Company	Miller #1	3105	905	Computalog/84	DISFL	107
979	18	9	31	NW NE NE	James W. Owen	Khair #1	3055	901	Welservice Inc/85	IEL	98
980	18	9	31	SW SW SW	Roy G. Oil Company	Burke #2	3107	843	Welservice Inc/84	IEL	100
981	18	9	31	NE SE NW	Roy G. Oil Company	Burke #1	3100	852	Welservice Inc/84	IEL	98
982	18	9	32	NE NW NW	TXO Production Company	Link "C" 1	3198	946	Birdwell/84	DIFL/CDL	120
983	18	9	32	NW SW SE	TXO Production Company	Brown "T" 1	2448	847	Birdwell/83	DIFL/CDL	98
984	18	9	32	NE NE NW	L.B. Jackson	Childers #2	3000	873	Welex/59	E-log/CC	100
985	18	9	33	SE NE SE	Enersource Petroleum Inc.	Stone #2	3033	956	Gearhart/83	DIL/CDL	103
986	18	9	33	ND	Enersource Petroleum Inc.	Mannford #2	3115	898	Gearhart/83	DIL/CDL	102
987	18	9	33	NW SE SE	Enersource Petroleum Inc.	Stone #4	3015	942	Gearhart/84	DIL/CDL	101
988	18	9	33	SW NE SE	Enersource Petroleum Inc.	Stone #3	3018	942	Gearhart/84	DIL/CDL	101
989	18	9	33	SE NW NE	Enersource Petroleum Inc.	Mannford #1	3074	922	Gearhart/83	DIL/CDL	111
990	18	9	33	NE NE SE	Enersource Petroleum Inc.	Stone #1	3030	943	Gearhart/83	DIL/CDL	110
991	18	9	33	SE SW NE	Activated Chemical Company	Stone #1	2927	912	Schlumberger/54	E-log/ML	103
992	18	9	33	NE SE NE	B.B. Blair	Leonard #1	2860	892	Schlumberger/50	E-log	98
993	18	9	33	SE NE NE	JMS Oil Company	Browns Creek #1	2915	831	Welservice Inc/82	IEL/MRL/CDL	97
994	18	9	34	W/2 NE NE	McGinley and McGinley	Jackson #2	2000	817	Gearhart/80	DIL/CDL	90
995	18	9	34	E/2 NE NE	McGinley and McGinley	Jackson #1	2000	807GL	Gearhart Owen/80	DIL/CDL	92
996	18	9	34	NW NW SW	Enersource Petroleum Inc.	Pearl #2	2981	921	Gearhart/83	DIL/CDL	101
997	18	9	34	SW NW SW	Enersource Petroleum Inc.	Pearl #1	3002	935	Gearhart/83	DIL/CDL	101
998	18	9	34	SW SE NW	B.B. Blair	Thompson #1	3227	878	Schlumberger/50	Unknown	110
999	18	9	35	NW NW NW	McGinley and McGinley	Lawson #2-A	2023	825	Gearhart/81	DIL/CDL	90
1000	18	9	35	NE NW NW	P.A. McGinley and J.R. McGinley	Lawson #1-A	2012	840	Gearhart Owen/80	DIL/CDL	88
1001	18	9	35	SE NW SE	L.B. Jackson	Jim Boy #2	3151	865	Welex/72	IEL/CDL	100

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (holla Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
1	2612	2685	2800	1770	1843	1958	188	7	0	0	0	0	76	83
2	2610	2696	2792	1778	1864	1960	182	5	0	51	0	0	0	56
3	2667	2775	2831	1850	1958	2014	164	0	0	12	0	0	0	12
4	2662	2768	2848	1796	1904	1984	186	6	0	32	0	0	0	38
5	2622	2710	2812	1769	1857	1959	190	6	0	50	0	0	0	56
6	ND	ND	ND	NA	NA	NA	NA	0	0	0	0	0	0	0
7	2690	2778	2865	1818	1906	1993	175	0	0	40	0	0	0	40
8	2650	2725	2835	1772	1847	1957	185	7	0	46	0	0	0	53
9	2640	2695	2820	1781	1836	1961	180	8	18	53	0	0	0	79
10	2620	2685	2805	1774	1839	1959	185	0	18	40	0	0	0	58
11	2660	2725	2845	NA	NA	NA	NA	0	0	0	0	0	0	0
12	2610	2685	2795	1788	1861	1971	185	0	0	54	0	0	0	54
13	2607	2690	2791	1775	1858	1959	184	9	0	53	0	0	0	62
14	2612	2650	2797	1780	1818	1985	185	10	4	63	0	0	0	77
15	2652	2737	2840	1788	1871	1974	188	5	4	25	0	0	0	34
16	2625	2690	2805	1785	1850	1965	180	8	0	52	0	0	0	60
17	2605	2690	2782	1787	1872	1964	177	0	0	50	0	0	0	50
18	2612	2665	2808	1759	1812	1955	196	3	0	77	0	0	0	NA
19	2606	2678	2809	NA	NA	NA	NA	6	13	54	0	0	0	73
20	2609	2700	2794	1757	1848	1942	185	0	0	43	0	0	0	43
21	2610	2677	2805	1772	1839	1967	195	5	9	53	0	0	0	67
22	2702	2815	2890	1821	1934	2009	188	5	0	30	0	0	0	35
23	2613	2670	2800	1762	1819	1949	187	0	0	77	0	0	0	77
24	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26	2709	2790	2902	1802	1883	1995	193	0	9	70	0	0	0	79
27	2714	2764	2868	1819	1869	1973	154	0	28	54	0	0	0	82
28	2710	2778	2916	1799	1867	2005	206	0	22	56	0	0	0	78
29	2654	2751	2810	1827	1924	1983	156	0	0	19	0	0	0	19
30	2710	2771	2868	NA	NA	NA	NA	0	6	33	0	0	0	39
31	2710	2789	2868	1844	1923	2002	158	0	0	36	0	0	0	36
32	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
33	2682	2752	2884	1801	1871	2003	202	0	15	50	0	0	0	65
34	2640	2710	2815	1808.5	1878.5	1981.5	175	0	0	61	0	0	0	61
35	2663	2733	2857	1818	1888	2012	194	0	0	88	0	0	0	88
36	2732	2782	2990	1840	1890	2098	258	0	10	70	0	0	0	80
37	2671	2728	2863	1800	1857	1992	192	0	18	72	0	0	0	90
38	2654	2724	2846	1818	1888	2010	192	0	0	88	0	0	0	88
39	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
40	2702	2765	2901	1806	1869	2005	199	0	20	80	0	0	0	100
41	2671	2745	2863	1813	1887	2005	192	0	0	80	0	0	0	80
42	2624	2689	2864	1792	1857	2032	240	0	0	90	0	0	0	90
43	2700	2720	2900	1845	1865	2045	200	0	NA	0	0	0	120	NA
44	2680	2775	2830	1842	1937	1992	150	0	0	12	0	0	0	12
45	ND	ND	ND	NA	NA	NA	NA	0	0	NA	0	0	0	NA
46	2795	2858	2980	1851	1914	2036	185	0	0	80	0	0	0	80
47	2841	2890	3022	1880	1929	2061	181	0	0	93	0	0	0	93
48	2747	2796	2947	1875	1924	2075	200	0	24	75	0	0	0	99
49	2861	2914	3056	1921	1974	2116	195	0	42	74	0	0	0	116
50	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
51	2890	2990	3071	1938	2038	2119	181	4	0	50	0	0	0	54
52	2880	2955	3060	1958	2033	2138	180	0	10	13	0	0	0	23
53	2890	3013	3080	1946	2069	2136	190	0	0	35	0	0	0	35
54	2855	2885	3040	1933.8	1963.8	2118.8	185	0	25	79	0	0	0	104
55	2859	2895	3058	1927	1963	2126	199	3	0	0	0	120	0	123
56	2853	2957	3037	1935.5	2039.5	2119.5	184	5	0	35	0	0	0	40
57	2854	2912	3043	1932.8	1990.8	2121.8	189	3	26	80	0	0	0	109
58	2912	2970	ND	1963	2021	NA	NA	0	16	80	0	0	0	76
59	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
60	2942	3003	3130	1973	2034	2161	188	0	10	60	0	0	0	70
61	2887	2990	3071	1962	2065	2146	184	0	0	28	0	0	0	28
62	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
63	2950	2985	3134	1980	2015	2164	184	0	13	60	0	0	0	73
64	3000	3039	3190	2006	2045	2196	190	0	30	64	0	0	0	94
65	2932	2967	3117	1968	2003	2153	185	0	28	68	0	0	0	96
66	2893	2916	3084	1954	1977	2145	191	0	50	67	0	0	0	117
67	2952	2990	3135	1984	2022	2167	183	5	12	50	0	0	0	67
68	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
69	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
70	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
71	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
72	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
73	2850	2932	2940	NA	NA	NA	NA	0	18	73	0	0	0	91
74	2854	2875	3035	NA	NA	NA	NA	0	0	85	0	0	0	85
75	2850	2930	3048	1917	1997	2115	198	0	6	85	0	0	0	91
76	2785	2835	2985	NA	NA	NA	NA	0	0	0	0	98	0	98
77	2785	2995	2995	1867	2077	2077	210	0	0	37	0	128	0	165
78	2855	2875	3046	NA	NA	NA	NA	0	0	95	0	0	0	95
79	ND	ND	ND	NA	NA	NA	NA	0	0	0	0	0	0	0
80	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
81	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
82	2693	2763	2802	1863	1933	1972	109	0	20	38	0	0	0	58
83	ND	ND	ND	NA	NA	NA	NA	0	0	0	0	0	0	0
84	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
85	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
86	2712	2785	2880	1844	1917	2012	168	0	0	41	0	0	0	41
87	2725	2785	2920	NA	NA	NA	NA	0	7	50	0	0	0	57
88	ND	ND	ND	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
89	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
90	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
91	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
92	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
93	2722	2828	2923	1817	1923	2018	201	0	0	40	0	0	0	40
94	2660	2732	2853	NA	NA	NA	NA	0	0	76	0	0	0	76
95	ND	2775	ND	NA	1888	NA	NA	0	0	73	0	0	0	73
96	2637	2724	2842	1789	1876	1994	205	0	0	70	0	0	0	70
97	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
98	ND	ND	ND	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
99	2633	ND	2832	1806	NA	2005	199	NA	NA	NA	NA	NA	NA	NA
100	2750	2836	2898	NA	NA	NA	NA	0	0	20	0	0	0	20
101	2692	2750	2888	1798	1856	1994	196	ND	18	68	0	0	0	86
102	2714	2788	2870	NA	NA	NA	NA	0	0	35	0	0	0	35
103	2590	2645	2765	NA	NA	NA	NA	0	0	50	0	0	0	50
104	2648	2740	2794	NA	NA	NA	NA	0	0	8	0	0	0	8
105	2564	2628	2748	1761	1825	1945	184	0	30	38	0	0	0	68
106	2610	2694	2778	NA	NA	NA	NA	0	0	25	0	0	0	25
107	2600	2671	2784	NA	NA	NA	NA	0	6	83	0	0	0	89
108	2600	2652	2788	1784	1836	1972	188	0	0	85	0	0	0	85
109	2641	2690	2821	NA	NA	NA	NA	0	20	50	0	0	0	70
110	2708	ND	ND	1806	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
111	2675	2762	2819	1854	1941	1998	144	0	NA	14	0	0	0	NA
112	2594	2645	2783	1784	1835	1973	189	4	33	55	0	0	0	92
113	2580	ND	2763	1757	NA	1940	183	NA	NA	NA	NA	NA	NA	NA
114	2580	ND	2775	1764	NA	1959	195	NA	NA	NA	NA	NA	NA	NA
115	2595	2945	2785	NA	NA	NA	NA	6	32	58	0	0	0	96
116	2620	2714	2785	1790	1884	1955	165	0	0	22	0	0	0	22
117	2650	2707	2823	1793	1850	1966	173	0	0	0	67	0	0	67
118	2730	2787	2895	1837	1894	2002	165	0	0	30	0	0	0	30
119	2578	2630	2785	1755	1807	1942	187	NA	NA	NA	NA	NA	NA	NA
120	2580	2622	2775	1764	1806	1959	195	NA	NA	NA	NA	NA	NA	NA

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
121	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
122	2720	2790	2915	1796	1868	1991	195	NA	NA	NA	NA	NA	NA	NA
123	2608	2685	2810	1770	1827	1972	202	0	0	0	0	0	92	92
124	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
125	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
126	2730	ND	ND	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
127	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
128	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
129	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
130	2610	2688	2810	1763	1841	1963	200	0	0	63	0	0	0	63
131	2692	2764	2880	NA	NA	NA	NA	ND	0	59	0	0	0	59
132	2735	2760	ND	1803	1828	NA	NA	NA	NA	NA	NA	NA	NA	NA
133	2736	2760	ND	ND	NA	NA	NA	ND	ND	ND	ND	NA	NA	NA
134	2873	2714	2658	1988	1829	NA	NA	0	40	64	0	0	0	104
135	2652	2704	2863	1773	1825	1984	211	0	0	0	0	108	0	108
136	ND	ND	ND	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
137	ND	ND	ND	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
138	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
139	2700	2740	2892	NA	NA	NA	NA	0	0	0	0	98	0	98
140	2662	2704	2852	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
141	2736	ND	2944	1798	NA	2006	208	NA	NA	NA	NA	NA	NA	NA
142	2703	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
143	2667	2720	2860	1820	1873	2013	193	0	0	0	0	0	93	93
144	2718	2755	2925	1812	1849	2019	207	0	0	0	0	0	138	138
145	2710	2755	2900	NA	NA	NA	NA	0	34	50	0	0	0	84
146	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
147	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
148	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
149	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
150	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
151	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
152	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
153	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
154	2693	2758	2910	1848	1909	2063	217	0	12	0	0	93	0	105
155	2670	2733	2865	NA	NA	NA	NA	ND	0	0	0	0	0	NA
156	2935	2980	3135	NA	NA	NA	NA	ND	0	0	0	108	0	108
157	2695	2735	2874	1855	1895	2034	179	ND	57	24	0	0	0	81
158	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
159	2892	2970	3136	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
160	2703	2761	2877	1870	1928	2044	174	0	0	68	0	0	0	68
161	2760	2810	2925	1874	1924	2039	165	0	0	0	72	0	0	72
162	2738	2781	2932	1870	1923	2064	194	0	21	87	0	0	0	108
163	2742	2805	2930	1873	1936	2061	188	0	10	70	0	0	0	80
164	2763	2818	2923	1886	1941	2046	160	0	7	0	0	0	0	7
165	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
166	2800	2885	2950	1867	1952	2017	150	0	0	23	0	0	0	23
167	2880	2880	3050	1952	1972	2142	190	6	50	50	0	0	0	106
168	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
169	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
170	2975	ND	3155	2043	NA	2223	180	NA	NA	NA	NA	NA	NA	NA
171	2850	ND	3040	1917	NA	2107	190	NA	NA	NA	NA	NA	NA	NA
172	2863	ND	ND	1968	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
173	2753	2804	2933	1883	1934	2063	180	0	40	40	0	0	0	80
174	ND	ND	ND	NA	NA	NA	NA	0	0	0	0	0	0	0
175	2870	2870	ND	1939	1939	NA	NA	0	23	62	0	0	0	85
176	2970	3085	3153	NA	NA	NA	NA	0	0	20	0	0	0	20
177	2882	3020	3068	1939	2077	2125	186	0	0	10	0	0	0	10
178	2993	ND	ND	1966	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
179	2930	ND	ND	1965	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180	2935	ND	3105	1936	NA	2106	170	NA	NA	NA	NA	NA	NA	NA
181	ND	3065	ND	NA	2062	NA	NA	0	0	55	0	0	0	55

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
182	2905	3015	3075	NA	NA	NA	NA	0	0	14	0	0	0	14
183	2915	2950	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
184	3020	3138	3205	NA	NA	NA	NA	0	0	22	0	0	0	22
185	ND	3005	ND	NA	NA	NA	NA	0	10	20	0	0	0	30
186	2950	ND	3075	1989	-981	2114	125	NA	NA	NA	NA	NA	NA	NA
187	2900	2997	3075	1994	2091	2169	175	0	0	30	0	0	0	30
188	3016	3089	3215	NA	NA	NA	NA	0	25	30	0	0	0	55
189	3012	3067	ND	1950	2005	NA	NA	NA	NA	NA	NA	NA	NA	NA
190	2938	3029	3094	1910	2001	2066	156	0	0	9	0	0	0	9
191	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
192	2920	ND	ND	1945.5	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
193	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
194	2915	ND	ND	1956	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
195	3012	3084	3160	1959	2031	2107	148	NA	NA	NA	NA	NA	NA	NA
196	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
197	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
198	2850	2926	3038	NA	NA	NA	NA	0	0	50	0	0	0	50
199	2790	2830	2973	1869	1909	2052	183	0	0	95	0	0	0	95
200	2755	2785	2952	1843	1873	2040	197	0	0	0	0	0	110	110
201	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
202	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
203	2770	2835	2951	1672	1937	2053	181	0	3	70	0	0	0	73
204	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
205	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
206	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
207	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
208	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
209	2820	2870	3017	1834	1884	2031	197	0	13	85	0	0	0	98
210	2784	2840	2978	1835	1891	2029	194	9	7	80	0	0	0	96
211	2815	2865	3020	1827	1877	2032	205	10	15	83	0	0	0	108
212	2731	2785	2921	1832	1886	2022	190	0	6	81	0	0	0	87
213	2764	2815	2948	1852	1903	2036	184	0	0	71	0	0	0	71
214	2752	2835	2948	1827	1910	2023	196	0	0	67	0	0	0	67
215	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
216	2788	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
217	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
218	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
219	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
220	2804	ND	ND	1823.5	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
221	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
222	2765	ND	2964	1834	NA	2033	199	ND	NA	NA	NA	NA	NA	NA
223	2722	2780	2910	NA	NA	NA	NA	0	0	0	0	0	127	127
224	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
225	2760	2787	2965	1844	1871	2049	205	15	0	0	0	0	80	80
226	2760	2812	2960	NA	NA	NA	NA	0	45	43	0	0	0	88
227	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
228	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
229	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
230	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
231	2750	2777	2951	1848	1875	2049	201	0	45	26	0	0	0	71
232	2830	2860	3020	1847	1877	2037	190	0	0	70	0	0	0	70
233	2795	2850	2995	1827	1882	2027	200	0	37	30	0	0	0	67
234	2790	2842	2990	1825	1877	2025	200	10	43	52	0	0	0	105
235	2758	2817	2960	1824	1883	2026	202	17	15	42	0	0	0	74
236	2750	2778	2945	1804	1832	1999	195	20	10	30	0	0	0	60
237	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
238	2750	2787	ND	1818	1855	NA	NA	ND	19	60	0	0	0	79
239	2810	2831	3010	1843	1864	2043	200	0	72	40	0	0	0	112
240	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
241	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
242	2809	2845	2990	1864	1900	2045	181	0	0	61	0	0	0	61

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
243	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
244	2806	2855	3002	1853.5	1902.5	2049.5	196	0	57	40	0	0	0	97
245	2722	2753	ND	1810	1841	NA	NA	NA	NA	NA	NA	NA	NA	NA
246	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
247	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
248	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
249	2820	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
250	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
251	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
252	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
253	2761	2773	2960	1826	1838	2025	199	ND	10	78	ND	0	0	NA
254	2712	2788	2912	1824	1900	2024	200	0	0	0	0	0	67	67
255	2740	2750	2842	1819	1829	1921	102	0	20	50	0	0	0	70
256	2825	2780	3000	1895	1850	2070	175	0	0	0	0	128	0	128
257	2780	2840	2980	1832	1892	2032	200	15	8	40	0	0	0	63
258	2726	2825	2932	1795.5	1894.5	2001.5	206	0	45	42	0	0	0	87
259	2757	2760	2962	NA	NA	NA	NA	0	0	0	0	125	0	125
260	2787	2875	2992	1829	1917	2034	205	0	25	30	0	0	0	55
261	2789	2727	ND	1889	1827	NA	NA	NA	NA	NA	NA	NA	NA	NA
262	2774	2812	2986	1838.5	1876.5	2050.5	212	0	38	71	0	0	0	109
263	2740	2786	2942	1821	1847	2023	202	0	47	40	0	0	0	87
264	2745	2788	2950	NA	NA	NA	NA	0	32	75	0	0	0	107
265	2745	2780	2942	1806.5	1841.5	2003.5	197	0	28	70	0	0	0	98
266	2810	ND	3005	1916.5	NA	2111.5	195	NA	NA	NA	NA	NA	NA	NA
267	2694	2786	ND	1812	1904	NA	NA	0	44	40	0	0	0	84
268	ND	ND	ND	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
269	2770	ND	2982	1842	-928	2054	212	NA	NA	NA	NA	NA	NA	NA
270	2772	2820	2991	1865	1913	2084	219	2	0	90	0	0	0	92
271	2825	2905	2998	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
272	2860	2918	3012	1930	1988	2082	152	0	5	0	0	0	0	5
273	ND	2755	ND	NA	1879	NA	NA	0	10	0	0	120	0	130
274	2725	2870	2945	1803	1948	2023	220	0	20	27	0	0	0	47
275	2927	3033	3115	2020	2126	2208	188	0	0	37	0	0	0	37
276	2805	2896	3000	1898	1989	2093	195	0	0	48	0	0	0	48
277	2890	3004	3080	1905	2019	2095	190	0	0	28	0	0	0	28
278	2860	2971	3040	1911	2022	2091	180	0	0	24	0	0	0	24
279	2775	2871	2960	1883	1979	2068	185	0	0	41	0	0	0	41
280	2810	2935	2995	1885	2010	2070	185	0	0	18	0	0	0	18
281	2805	2838	3000	1879	1912	2074	195	4	28	30	0	0	0	62
282	2810	2843	3020	1877	1910	2087	210	0	0	0	0	132	0	132
283	2790	2832	3000	1870	1912	2080	210	0	0	0	0	110	0	110
284	2780	2821	3000	1856	1897	2076	220	4	0	0	0	130	0	134
285	2794	2835	3000	1875	1916	2081	206	0	0	0	0	110	0	110
286	2780	ND	3000	1854	NA	2074	220	NA	NA	NA	NA	NA	NA	NA
287	2765	2785	2975	1864	1884	2074	210	15	0	0	0	117	0	132
288	2755	2835	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
289	2750	2790	2955	1834	1874	2039	205	10	0	0	0	120	0	130
290	2810	2855	2980	NA	NA	NA	NA	0	28	0	0	0	0	28
291	2780	2800	2985	1814	1834	2019	205	0	0	0	0	130	0	130
292	2850	2885	3020	NA	NA	NA	NA	0	40	0	0	0	0	40
293	2777	ND	2985	1811	-966	2019	208	NA	NA	NA	NA	NA	NA	NA
294	2778	2800	2984	1805.5	1827.5	2011.5	206	0	0	0	0	127	0	127
295	2828	2884	2984	1892	1948	2048	156	0	6	0	0	0	0	6
296	2795	2840	2994	1832	1877	2031	199	11	0	0	0	0	100	111
297	2790	2823	2992	1835	1868	2037	202	0	0	0	0	122	0	122
298	2858	2938	3031	1913	1991	2086	173	0	10	13	0	0	0	23
299	2792	2940	2980	1853	2001	2041	188	0	0	3	0	0	0	3
300	2802	2831	2981	NA	NA	NA	NA	ND	51	0	0	0	0	51
301	2912	2836	3098	1924.5	1848.5	2110.5	186	NA	NA	NA	NA	NA	NA	NA
302	2763	2804	2975	NA	NA	NA	NA	15	0	0	0	115	0	130
303	2810	2845	2982	NA	NA	NA	NA	0	35	0	0	0	0	35

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
304	2893	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
305	2885	2930	3080	1917	1962	2112	195	0	5	73	0	0	0	78
306	2890	2920	3100	1885	1915	2095	210	0	0	0	0	124	0	124
307	2790	2848	2972	1859	1917	2041	182	0	23	0	0	0	0	23
308	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
309	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
310	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
311	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
312	2910	2970	3080	1930	1990	2100	170	ND	52	0	0	0	0	52
313	2930	ND	3014	1940	NA	2024	84	NA	NA	NA	NA	NA	NA	NA
314	2893	2947	3062	1934	1988	2103	169	ND	47	0	0	0	0	47
315	2953	2931	ND	NA	NA	NA	NA	ND	42	0	0	0	0	42
316	2970	ND	ND	1955	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
317	2970	ND	3120	1959	NA	2109	150	NA	NA	NA	NA	NA	NA	NA
318	3012	3063	3148	1983	2034	2099	138	0	0	25	0	0	0	25
319	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
320	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
321	3010	3045	ND	1979	2014	NA	NA	NA	NA	NA	NA	NA	NA	NA
322	2980	2980	ND	1989	1989	NA	NA	NA	NA	NA	NA	NA	NA	NA
323	2893	2927	3075	1958	1992	2140	182	0	72	0	0	0	0	72
324	2905	2950	3090	1945	1990	2130	185	0	0	55	0	0	0	55
325	2890	2920	3055	1972	2002	2137	165	18	50	0	0	0	0	68
326	2799	ND	ND	1899	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
327	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
328	2772	2817	ND	1852	1897	NA	NA	NA	NA	NA	NA	NA	NA	NA
329	2861	3010	3040	1904	2053	2083	179	0	50	0	0	0	0	50
330	2900	2933	3078	1931	1964	2109	178	0	8	48	0	0	0	56
331	2860	2945	3032	1892	1977	2064	172	0	0	80	0	0	0	80
332	2850	2925	3026	1902	1977	2078	176	0	9	45	0	0	0	54
333	2862	2887	3038	1927	1952	2103	176	0	60	0	0	0	0	60
334	2908	ND	ND	1947	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
335	2820	2840	3000	1877	1897	2057	180	0	50	0	0	0	0	50
336	2815	ND	2995	1888	NA	2068	180	0	0	0	0	0	0	0
337	2831	ND	2993	1931	NA	2093	162	NA	NA	NA	NA	NA	NA	NA
338	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
339	ND	2920	ND	NA	NA	NA	NA	0	47	0	0	0	0	47
340	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
341	ND	2921	ND	NA	NA	NA	NA	0	9	50	0	0	0	59
342	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
343	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
344	2815	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
345	2840	2938	3020	1908	2006	2088	180	0	0	30	0	0	0	30
346	2747	ND	ND	1833	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
347	2804	2900	2987	NA	NA	NA	NA	0	0	39	0	0	0	39
348	2782	2853	2978	1872	1943	2068	196	0	0	49	ND	0	0	NA
349	2812	2910	2995	1898	1994	2079	183	0	0	46	0	0	0	46
350	2800	2895	2985	1880	1975	2065	185	0	0	40	0	0	0	40
351	2747	2808	2950	1842	1903	2045	203	0	40	47	0	0	0	87
352	2690	ND	ND	1786	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
353	2665	ND	ND	1777	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
354	2702	ND	ND	1780	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
355	2690	2745	ND	1784	1839	NA	NA	NA	NA	NA	NA	NA	NA	NA
356	2723	2777	ND	1787	1841	NA	NA	NA	NA	NA	NA	NA	NA	NA
357	2345	2408	2513	1508	1569	1674	168	0	9	33	0	0	0	42
358	2512	2570	2672	1627	1685	1787	160	6	4	30	0	0	0	40
359	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
360	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
361	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
362	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
363	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
364	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
365	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
366	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
367	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
368	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
369	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
370	2520	2628	2700	1602	1710	1782	180	0	0	30	0	0	0	30
371	2522	2555	2712	1683	1716	1873	190	0	18	78	0	0	0	96
372	2529	2625	2720	1703	1799	1894	191	0	0	0	0	120	0	120
373	2555	2651	2750	1705	1801	1900	195	NA	NA	NA	NA	NA	NA	NA
374	2614	2660	2795	1775.5	1821.5	1956.5	181	2	10	65	0	0	0	77
375	2680	2756	2870	1785	1861	1975	190	9	0	73	0	0	0	82
376	2602	2657	2782	NA	NA	NA	NA	3	0	80	0	0	0	83
377	2640	2695	2820	1767	1822	1947	180	0	0	80	0	0	0	80
378	2575	2650	2755	1775	1850	1955	180	0	7	17	0	0	0	24
379	2580	2668	2754	1756	1844	1930	174	0	0	44	0	0	0	44
380	2609	2668	2790	NA	NA	NA	NA	0	14	50	0	0	0	64
381	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
382	2585	2640	2770	NA	NA	NA	NA	2	0	87	0	0	0	89
383	2595	2696	2755	1789	1890	1949	160	0	0	12	0	0	0	12
384	2500	ND	ND	1710	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
385	2528	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
386	2200	2295	2380	1377	1472	1557	180	0	0	23	0	0	0	23
387	2525	2580	2710	NA	NA	NA	NA	8	43	35	0	0	0	86
388	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
389	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
390	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
391	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
392	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
393	2464	ND	ND	1623	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
394	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
395	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
396	2510	2552	2698	1566	1608	1752	186	8	63	32	0	0	0	103
397	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
398	2320	2423	2520	1524	1627	1724	200	0	0	50	0	0	0	50
399	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
400	2432	2460	2638	1548	1676	1854	206	0	60	60	0	0	0	120
401	2480	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
402	2490	2518	2702	NA	NA	NA	NA	0	0	0	0	137	0	137
403	2545	2598	ND	1686	1739	NA	NA	0	71	20	0	0	0	91
404	2651	2670	2858	1734	1753	1941	207	NA	NA	NA	NA	NA	NA	NA
405	2602	ND	ND	1748	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
406	2602	2646	2810	1755	1799	1963	208	0	0	0	0	130	0	130
407	2564	2650	2750	NA	NA	NA	NA	0	6	56	0	0	0	62
408	2565	2640	2750	1714	1789	1899	185	0	8	80	0	0	0	88
409	2542	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
410	2508	ND	ND	1574	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
411	2546	2570	2742	1695	1719	1891	196	0	31	70	0	0	0	101
412	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
413	2580	2617	2791	NA	NA	NA	NA	0	0	0	0	136	0	136
414	2438	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
415	2510	2558	2694	1639	1687	1823	184	0	60	28	0	0	0	88
416	2484	2505	2695	1625.5	1646.5	1836.5	211	0	15	0	0	135	0	150
417	2602	2625	2808	1708.5	1731.5	1912.5	204	0	64	63	0	0	0	127
418	2414	ND	ND	1609	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
419	2434	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
420	2283	2340	2488	1489	1546	1694	205	0	0	0	0	108	0	108
421	2364	2413	2580	1530	1579	1726	196	0	0	0	0	100	0	100
422	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
423	2375	2460	2571	1533	1618	1729	196	0	0	37	0	0	0	37
424	2247	2335	2452	1457	1545	1662	205	0	0	57	0	0	0	57
425	2247	ND	2454	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
426	2373	2510	2576	1535.6	1672.6	1738.6	203	0	0	15	0	0	0	15

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
427	2410	2545	2812	1537	1672	1739	202	0	0	17	0	0	0	17
428	2440	2546	2640	NA	NA	NA	NA	0	0	44	0	0	0	44
429	2276	2353	2457	1514	1591	1695	181	0	0	65	0	0	0	65
430	2420	2460	2638	1548	1588	1766	218	0	16	70	0	0	0	86
431	2435	2435	2645	1537	1537	1747	210	0	10	0	0	140	0	150
432	2435	2508	2640	1525	1598	1730	205	0	4	85	0	0	0	89
433	2584	2630	2785	1661	1707	1862	201	0	0	0	0	0	79	79
434	2570	2693	2762	1703	1826	1895	192	0	0	27	0	0	0	27
435	2545	2600	2750	1671	1726	1876	205	7	8	92	0	0	0	107
436	2604	2658	2781	1692	1746	1869	177	5	0	0	0	120	0	125
437	2448	ND	ND	NA	NA	NA	NA	0	0	0	0	0	0	0
438	2534	2614	2740	NA	NA	NA	NA	0	0	90	0	0	0	90
439	2498	2536	2684	1659	1697	1845	186	0	21	80	0	0	0	101
440	2558	2624	2770	1671	1737	1883	212	0	10	95	0	0	0	105
441	2563	2617	2770	1685	1739	1892	207	0	0	0	0	121	0	121
442	2606	2657	2808	1686	1737	1888	202	0	0	0	0	119	0	119
443	2580	2640	2792	1666	1726	1878	212	0	18	100	0	0	0	118
444	2570	2575	2778	1698	1703	1904	206	0	5	0	0	110	0	115
445	2548	2647	2755	1662	1761	1869	207	0	0	69	0	0	0	69
446	2613	2665	2797	1701	1753	1885	184	0	0	109	0	0	0	109
447	2440	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
448	2530	2610	2740	1657	1737	1867	210	0	0	100	0	0	0	100
449	2552	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
450	2505	2558	2702	1666	1719	1863	197	0	0	104	0	0	0	104
451	2550	2615	2784	NA	NA	NA	NA	0	0	0	0	110	0	110
452	2553	2634	2760	1663	1744	1870	207	7	0	93	0	0	0	100
453	2598	2667	2798	1693	1762	1891	198	0	9	100	0	0	0	109
454	2590	2616	2799	1730	1756	1939	209	0	23	116	0	0	0	139
455	2614	2672	2830	1705	1763	1921	216	0	14	105	0	0	0	119
456	2611	2662	2808	1690	1741	1887	197	0	0	0	0	111	0	111
457	2630	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
458	2604	2675	2792	1741	1812	1929	188	3	0	76	0	0	0	79
459	2580	ND	ND	NA	NA	NA	NA	0	0	0	0	0	0	0
460	2604	2685	2814	1690	1771	1900	210	0	0	100	0	0	0	100
461	2600	2665	2812	1673	1738	1885	212	0	0	117	0	0	0	117
462	2634	2695	2823	1737	1798	1926	189	3	0	89	0	0	0	92
463	2570	2628	2782	1693	1751	1905	212	0	19	107	0	0	0	126
464	2634	2710	2833	1734	1810	1933	199	0	28	65	0	0	0	93
465	2611	2663	2808	1690	1742	1887	197	0	0	115	0	0	0	115
466	2715	2730	2856	1787	1802	1928	141	8	0	30	0	0	0	38
467	2715	2788	2895	1770	1843	1950	180	10	0	78	0	0	0	88
468	2537	2585	2715	1715	1763	1893	178	0	5	65	0	0	0	70
469	2530	2603	2712	1708	1781	1890	182	0	6	45	0	0	0	51
470	2655	2740	2825	1785	1850	1935	170	10	0	43	0	0	0	53
471	2640	2728	2810	1751	1839	1921	170	10	0	40	0	0	0	50
472	2535	2623	2710	1705	1793	1880	175	0	0	50	0	0	0	50
473	2650	2750	2805	1771	1871	1926	155	7	0	16	0	0	0	23
474	2615	2710	2772	1766	1861	1923	157	0	0	17	0	0	0	17
475	2571	2650	2765	1723	1802	1917	194	0	0	64	0	0	0	64
476	2725	ND	ND	1787	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
477	2720	ND	ND	1782	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
478	2684	ND	2844	1775	NA	1935	160	0	0	63	0	0	0	63
479	2730	2770	2905	NA	NA	NA	NA	0	7	95	0	0	0	102
480	2706	2770	2905	NA	NA	NA	NA	0	0	99	0	0	0	99
481	2725	2795	2917	NA	NA	NA	NA	4	0	70	0	0	0	74
482	2656	2730	2844	NA	NA	NA	NA	0	4	95	0	0	0	99
483	2245	2313	2460	1424	1492	1639	215	6	0	105	0	0	0	111
484	2745	2805	2920	NA	NA	NA	NA	9	0	82	0	0	0	91
485	2768	2840	2950	1778	1850	1960	182	0	0	80	0	0	0	80
486	2792	2850	2985	1791	1849	1984	193	6	0	88	0	0	0	94
487	2640	2689	2835	1711	1760	1906	195	8	0	97	0	0	0	105

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permissible Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permissible Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
488	2630	2680	2825	1701	1751	1896	195	0	0	0	0	100	0	100
489	2625	2675	2820	1723	1773	1918	195	9	0	0	0	94	0	103
490	2540	2613	2735	1647	1720	1842	195	0	0	70	0	0	0	70
491	2472	ND	ND	1621	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
492	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
493	2412	2455	2628	1514	1557	1730	216	0	21	70	0	0	0	91
494	2470	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
495	2511	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
496	2510	ND	ND	1616	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
497	2327	2415	2600	1491	1579	1764	273	3	17	80	0	0	0	100
498	2277	2343	2472	1481	1547	1676	195	0	2	55	0	0	0	57
499	2445	2517	2645	1557	1629	1757	200	0	0	70	0	0	0	70
500	2440	2505	2640	1530	1595	1730	200	0	0	70	0	0	0	70
501	2408	2475	2610	1524	1591	1726	202	0	0	75	0	0	0	75
502	2405	2470	2605	1538	1603	1738	200	5	0	73	0	0	0	78
503	2480	2535	2684	1544	1619	1748	204	0	0	62	0	0	0	62
504	2452	2522	2655	1541	1611	1744	203	0	0	68	0	0	0	68
505	2445	2509	2650	1554	1618	1759	205	0	0	84	0	0	0	84
506	2300	2360	2498	1490	1550	1688	198	7	0	95	0	0	0	102
507	2328	2385	2530	1525	1582	1727	202	7	0	90	0	0	0	97
508	2335	2394	2530	1515	1574	1710	195	0	0	88	0	0	0	88
509	2434	2510	2640	1535	1611	1741	206	0	0	73	0	0	0	73
510	2506	ND	2746	1639	NA	1879	240	NA	NA	NA	NA	NA	NA	NA
511	2505	ND	ND	1660	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
512	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
513	2497	ND	ND	1659	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
514	2498	ND	ND	1631	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
515	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
516	2500	ND	ND	1660	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
517	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
518	2520	ND	ND	1638	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
519	2535	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
520	2498	ND	ND	1654	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
521	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
522	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
523	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
524	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
525	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
526	2600	2679	2844	1738	1817	1982	244	0	0	105	0	0	0	105
527	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
528	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
529	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
530	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
531	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
532	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
533	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
534	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
535	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
536	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
537	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
538	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
539	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
540	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
541	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
542	2575	ND	ND	1725.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
543	2640	ND	ND	1731	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
544	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
545	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
546	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
547	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
548	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
549	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
550	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
551	ND		ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
552	2721	ND	ND	1811	NA	NA	NA	0	20	51	0	0	0	71
553	2703	ND	2852	1880	NA	2029	149	NA	NA	NA	NA	NA	NA	NA
554	2795	ND	2855	1871	NA	1931	60	0	0	0	0	0	0	0
555	2740	2770	2903	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
556	2722	ND	2882	1856	NA	2026	160	0	0	0	0	0	0	0
557	2912	ND	2958	2009	NA	2055	46	0	0	0	0	0	0	0
558	2775	ND	2932	1902	NA	2059	157	0	0	0	0	0	0	0
559	2780	ND	2950	1904	NA	2074	170	NA	NA	NA	NA	NA	NA	NA
560	2730	ND	2886	1879	NA	2035	156	0	0	0	0	0	0	0
561	2534	ND	2614	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
562	2758	ND	2910	1883	NA	2035	152	0	0	0	0	0	0	0
563	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
564	2747	2858	2901	1964	2075	2118	154	0	0	10	0	0	0	10
565	2760	ND	2935	1953	NA	2128	175	NA	NA	NA	NA	NA	NA	NA
566	2772	ND	2932	1984.5	NA	2144.5	160	0	0	0	0	0	0	0
567	2835	ND	2995	1988	NA	2148	160	0	0	0	0	0	0	0
568	2805	ND	2962	1984	NA	2141	157	0	0	0	0	0	0	0
569	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
570	2733	ND	2948	1922.5	NA	2137.5	215	0	0	0	0	0	0	0
571	2825	ND	2988	1898	NA	2059	163	0	0	0	0	0	0	0
572	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
573	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
574	2795	ND	2948	1885	NA	2038	153	0	0	0	0	0	0	0
575	2750	ND	2910	1849	NA	2009	160	0	0	0	0	0	0	0
576	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
577	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
578	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
579	2855	ND	3020	1855	NA	2020	165	0	0	0	0	0	0	0
580	2782	2863	2932	1806	1907	1976	170	0	0	37	0	0	0	37
581	2775	ND	3030	1802	NA	2057	255	NA	NA	NA	NA	NA	NA	NA
582	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
583	2784	ND	ND	1794	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
584	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
585	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
586	2711	2780	2988	1710	1779	1987	277	0	63	73	0	0	0	136
587	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
588	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
589	2730	ND	ND	1761.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
590	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
591	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
592	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
593	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
594	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
595	2540	ND	ND	1675	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
596	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
597	2560	ND	ND	1670	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
598	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
599	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
600	2530	ND	ND	1640	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
601	2610	2710	2883	1680	1780	1933	253	0	0	95	0	0	0	95
602	2510	ND	ND	1630	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
603	2710	2780	2970	NA	NA	NA	NA	0	0	127	0	0	0	127
604	2512	2634	2784	1657	1779	1929	272	0	0	89	0	0	0	89
605	2551	2807	2800	1640	1696	1889	249	7	0	122	0	0	0	129
606	2815	ND	ND	1649.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
607	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
608	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
609	2851	ND	ND	1742	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses								
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
610	2680	ND	ND	1795	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
611	2680	2745	2835	NA	NA	NA	NA	0	4	45	0	0	0	49
612	2750	2817	2960**	1764	1831	NA	NA	0	10	70	0	0	0	80
613	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
614	2670	2700	ND	1740	1770	NA	NA	0	0	55	0	0	0	55
615	2754	2814	2995	1773	1833	2014	241	0	55	52	0	0	0	107
616	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
617	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
618	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
619	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
620	2805	2880	2950	NA	NA	NA	NA	0	0	35	0	0	0	35
621	2765	2850	2912	1855	1940	2002	147	0	0	34	0	0	0	34
622	2826	2900	2974	NA	NA	NA	NA	0	0	38	0	0	0	38
623	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
624	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
625	2855	ND	ND	1869	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
626	2805	2885	2980	1875	1935	2050	175	0	37	30	0	0	0	67
627	2800	2858	2980	1858	1914	2038	180	0	27	10	0	0	0	37
628	2805	2866	2982	1874	1935	2051	177	0	37	30	0	0	0	67
629	2805	2887	2953	1922	2004	2070	148	2	0	36	0	0	0	38
630	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
631	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
632	2840	ND	3038	1940.4	NA	2138.4	198	NA	NA	NA	NA	NA	NA	NA	NA
633	2979	3016	3175	1953.5	1990.5	2149.5	196	0	0	100	0	0	0	100
634	2948	3000	3198	1949	2001	2199	250	0	0	0	0	109	0	109
635	2904	2930	2973	1909	2035	2078	169	0	0	9	0	0	0	9
636	2805	2840	3003	1893	1928	2091	198	0	27	75	0	0	0	102
637	2800	2846	3000	1876	1922	2076	200	0	48	66	0	0	0	114
638	2795	2837	3000	1870	1912	2075	205	0	28	67	0	0	0	95
639	2800	2840	3001	1882	1922	2083	201	0	10	100	0	0	0	110
640	2875	ND	3070	1960	NA	2155	195	0	0	0	0	0	0	0
641	2756	2795	2950	1806	1845	2000	194	0	58	53	0	0	0	111
642	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
643	2650	ND	2842	1780	NA	1972	192	NA	NA	NA	NA	NA	NA	NA	NA
644	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
645	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
646	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
647	2630	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
648	2645	2773	2836	1752	1880	1943	191	0	0	20	0	0	0	20
649	2650	2744	2840	1751	1845	1941	190	0	0	56	0	0	0	56
650	2635	2693	2820	1760	1818	1945	185	0	12	46	0	0	0	58
651	2648	2727	2838	ND	ND	ND	ND	0	0	70	0	0	0	70
652	2640	2752	2935	ND	ND	ND	ND	0	0	34	0	0	0	34
653	2625	2720	2811	1751	1846	1937	186	0	0	38	0	0	0	38
654	2670	2720	2865	NA	NA	NA	NA	0	36	47	0	0	0	83
655	2654	2701	2850	1778	1825	1974	196	0	30	72	0	0	0	102
656	2708	2807	2950	NA	NA	NA	NA	0	8	71	0	0	0	79
657	2778	2824	2970	1838	1882	2028	192	0	3	68	0	0	0	71
658	2634	2751	2815	NA	NA	NA	NA	0	0	26	0	0	0	26
659	2645	2771	2833	1781	1907	1969	188	0	0	10	0	0	0	10
660	2685	2770	2880	NA	NA	NA	NA	0	7	46	0	0	0	53
661	2665	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
662	2735	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
663	2652	2767	2847	1789	1904	1984	195	0	0	20	0	0	0	20
664	2640	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
665	2625	2680	2815	1760.5	1815.5	1950.5	190	0	20	50	0	0	0	70
666	2640	2719	2830	1770	1849	1960	190	0	4	50	0	0	0	54
667	2688	2777	2875	1815	1904	2002	187	0	0	45	0	0	0	45
668	2648	2762	2832	1782.5	1898.5	1966.5	184	0	0	32	0	0	0	32
669	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
670	2685	2775	2880	NA	NA	NA	NA	0	0	47	0	0	0	47

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
671	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
672	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
673	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
674	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
675	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
676	2673	2788	2870	1750	1865	1947	197	0	0	56	0	0	0	56
677	2670	ND	2853	1755	NA	1938	183	0	0	0	0	0	0	0
678	2663	ND	2854	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
679	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
680	2665	2768	2847	NA	NA	NA	NA	0	0	33	0	0	0	33
681	2735	2863	2940	1728	1854	1931	205	0	0	43	0	0	0	43
682	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
683	2652	2764	2915	1684	1796	1947	263	NA	NA	NA	NA	NA	NA	NA
684	2682	2758	2875	NA	NA	NA	NA	0	0	103	0	0	0	103
685	2635	2713	2824	1727	1805	1916	189	0	0	90	0	0	0	90
686	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
687	2628	ND	ND	1745.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
688	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
689	2650	ND	ND	1745	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
690	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
691	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
692	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
693	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
694	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
695	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
696	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
697	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
698	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
699	2662	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
700	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
701	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
702	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
703	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
704	2675	2788	2863	1718	1811	1906	188	0	0	70	0	0	0	70
705	2680	2742	2870	1770	1832	1960	190	0	0	83	0	0	0	83
706	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
707	2750	2810	2935	1779	1839	1964	185	0	0	80	0	0	0	80
708	2750	ND	ND	1771	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
709	2654	2712	2871	1768	1816	1975	207	0	3	120	0	0	0	123
710	2760	2807	2937	1769	1816	1946	177	0	18	80	0	0	0	98
711	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
712	2675	ND	ND	1767	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
713	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
714	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
715	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
716	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
717	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
718	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
719	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
720	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
721	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
722	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
723	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
724	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
725	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
726	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
727	2672	2720	2854	NA	NA	NA	NA	0	20	53	0	0	0	73
728	2768	2865	2950	1684	1981	2066	182	0	0	51	0	0	0	51
729	2724	2810	2913	1869	1955	2058	189	0	18	40	0	0	0	58
730	2760	2835	2950	1822	1897	2012	190	0	0	69	0	0	0	69
731	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev. Top Bartlesville Sandstone Interval	Elev. Top Permeable Bartlesville Sandstone	Elev. Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
732	2880	2923	3078	1951	1994	2149	198	0	0	83	0	0	0	83
733	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
734	2812	ND	ND	1914	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
735	2885	2932	3087	1933	1980	2135	202	0	32	70	0	0	0	102
736	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
737	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
738	2688	2799	2870	NA	NA	NA	NA	0	0	22	0	0	0	22
739	2664	2761	2847	1826	1923	2009	183	0	0	38	0	0	0	38
740	2658	2724	2845	1820	1886	2007	187	0	21	33	0	0	0	54
741	2650	2747	2840	1814	1911	2004	190	0	0	50	0	0	0	50
742	2668	2738	2853	1827	1895	2012	185	0	12	40	0	0	0	52
743	2722	2809	2904	1877	1964	2059	182	0	0	32	0	0	0	32
744	2790	2847	2981	1889	1946	2080	191	0	10	90	0	0	0	100
745	2852	2747	2851	1805	1900	2004	199	0	3	62	0	0	0	65
746	2670	2747	2840	NA	NA	NA	NA	0	2	37	0	0	0	39
747	2670	2741	2855	1813	1884	1998	185	0	0	50	0	0	0	50
748	2660	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
749	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
750	2650	ND	ND	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
751	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
752	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
753	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
754	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
755	2700	ND	2846	1837	NA	1983	148	0	0	0	0	0	0	0
756	2695	2796	2870	1799	1910	1984	185	0	0	24	0	0	0	24
757	2690	2786	2850	1790	1886	1950	160	0	48	0	0	0	0	48
758	2595	2680	2785	1771	1836	1961	190	10	6	105	0	0	0	121
759	2675	2754	2860	1790	1869	1975	185	8	5	40	0	0	0	53
760	2655	2754	2838	1770	1869	1953	183	0	0	50	0	0	0	50
761	2715	2818	2910	1810	1913	2005	195	0	0	45	0	0	0	45
762	2745	2867	2950	NA	NA	NA	NA	10	5	62	0	0	0	77
763	2725	ND	2902	1810	NA	1987	177	NA	NA	NA	NA	NA	NA	NA
764	2665	2752	2842	NA	NA	NA	NA	4	0	45	0	0	0	49
765	2320	2409	249077	1475	1564	NA	NA	0	0	35	0	0	0	35
766	2278	2322	241277	1473	1517	NA	NA	0	22	46	0	0	0	68
767	2272	ND	2433	1482	NA	1643	161	0	0	0	0	0	0	0
768	2216	2428	2496	1364	1576	1644	280	0	0	20	0	0	0	20
769	2260	2310	2420	1502.5	1552.5	1662.5	160	0	28	30	0	0	0	58
770	2332	2414	2473	1532	1614	1673	141	0	0	17	0	0	0	17
771	2384	ND	2515	1567	NA	1698	131	NA	NA	NA	NA	NA	NA	NA
772	2315	2384	2474	1504	1573	1663	159	0	4	33	0	0	0	37
773	2300	2398	2470	1503	1599	1673	170	0	0	20	0	0	0	20
774	2453	2487	2620	1571	1605	1738	167	0	6	46	0	0	0	52
775	2435	2495	2605	1566	1626	1736	170	0	32	32	0	0	0	64
776	2440	2532	ND	1587	1659	NA	NA	0	0	40	0	0	0	40
777	2400	2460	ND	1560	1620	NA	NA	4	27	52	0	0	0	83
778	2386	ND	2540	1562	NA	1716	154	NA	NA	NA	NA	NA	NA	NA
779	2420	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
780	2432	ND	ND	1562	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
781	2521	ND	ND	1630	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
782	2505	ND	ND	1615	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
783	2490	ND	ND	1599	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
784	2472	2492	2685	1578	1598	1791	213	NA	NA	NA	NA	NA	NA	NA
785	2520	2604	2655	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
786	2550	2598	2720	1623	1671	1793	170	NA	NA	NA	NA	NA	NA	NA
787	2470	2601	ND	1609	1740	NA	NA	NA	NA	NA	NA	NA	NA	NA
788	2497	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
789	2560	ND	ND	1615	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
790	2574	ND	ND	1638	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
791	2513	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
792	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
793	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
794	2540	ND	ND	1639	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
795	2495	2557	ND	1589	1651	NA	NA	NA	NA	NA	NA	NA	NA	NA
796	2490	2585	ND	1600	1695	NA	NA	0	30	62	0	0	0	92
797	2545	2610	ND	1607	1672	NA	NA	0	0	0	0	140	0	140
798	2545	2615	ND	1622	1692	NA	NA	NA	NA	NA	NA	NA	NA	NA
799	2487	ND	ND	1624	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
800	2560	2617	ND	1590	1647	NA	NA	NA	NA	NA	NA	NA	NA	NA
801	2482	2510	ND	1604	1632	NA	NA	NA	NA	NA	NA	NA	NA	NA
802	2490	ND	ND	1514	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
803	2600	ND	ND	1638	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
804	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
805	2588	ND	ND	1707	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
806	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
807	2553	ND	ND	1624	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
808	2490	ND	ND	1622	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
809	2518	ND	ND	1603	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
810	2550	ND	ND	1610	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
811	2535	ND	ND	1600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
812	2455	2490	2592	NA	NA	NA	NA	0	0	73	0	0	0	73
813	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
814	2470	ND	2630	1583	NA	1743	160	NA	NA	NA	NA	NA	NA	NA
815	2337	2411	2515	1513	1587	1691	178	NA	NA	NA	NA	NA	NA	NA
816	2430	ND	ND	1583	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
817	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
818	2338	2390	2540	NA	NA	NA	NA	0	0	80	0	0	0	80
819	2300	2385	2500	1415	1480	1615	200	0	20	20	0	0	0	40
820	2430	2481	2630	1488	1539	1688	200	0	0	74	0	0	0	74
821	2370	2440	2585	1432	1502	1627	195	0	0	42	0	0	0	42
822	2320	2410	2515	1436	1526	1631	195	0	0	35	0	0	0	35
823	2340	2409	2630	1428	1497	1718	290	NA	NA	NA	NA	NA	NA	NA
824	2485	ND	ND	1552	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
825	2495	2543	2690	1531	1579	1726	195	NA	NA	NA	NA	NA	NA	NA
826	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
827	2502	2560	2700	1531	1589	1729	198	0	14	55	0	0	0	69
828	2495	2561	2685	1525	1591	1715	190	0	0	45	0	0	0	45
829	2493	2560	2690	1559	1626	1756	197	0	32	10	0	0	0	42
830	2455	2523	2685	1538	1604	1746	210	0	24	42	0	0	0	66
831	2505	2572	2705	1557.5	1624.5	1757.5	200	0	0	75	0	0	0	75
832	2474	2536	2680	1537	1599	1743	206	0	0	70	0	0	0	70
833	2482	2541	2673	1515	1574	1706	191	0	10	45	0	0	0	55
834	2507	2569	2710	1576.5	1638.5	1779.5	203	0	0	73	0	0	0	73
835	2468	2537	2674	1583	1652	1789	206	0	0	64	0	0	0	64
836	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
837	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
838	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
839	2523	ND	ND	1571	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
840	2543	ND	ND	1577	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
841	2520	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
842	2552	ND	ND	1640	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
843	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
844	2490	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
845	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
846	2562	2667	2745	1601	1708	1784	183	NA	NA	NA	NA	NA	NA	NA
847	2518	2600	2715	1613	1695	1810	197	NA	NA	NA	NA	NA	NA	NA
848	2580	2656	ND	1629	1705	NA	NA	NA	NA	NA	NA	NA	NA	NA
849	2604	ND	2785	NA	NA	NA	NA	0	0	0	0	0	0	0
850	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
851	2558	2618	2750	1622	1680	1814	192	NA	NA	NA	NA	NA	NA	NA
852	2540	2640	ND	1622	1722	NA	NA	0	0	46	0	0	0	46
853	2530	2635	ND	1623	1728	NA	NA	0	7	38	0	0	0	45

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inola Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev, Top Bartlesville Sandstone Interval	Elev, Top Permeable Bartlesville Sandstone	Elev, Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
854	2630	ND	ND	1649	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
855	2525	2623	2715	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
856	2605	ND	ND	1601	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
857	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
858	2560	ND	ND	1634	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
859	2605	ND	ND	1643	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
860	2605	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
861	2610	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
862	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
863	2595	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
864	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
865	2620	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
866	2620	ND	ND	1663	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
867	2545	2684	2730	1653.6	1792.6	1838.6	185	0	0	27	0	0	0	27
868	2620	2723	2800	1660	1763	1840	180	NA	NA	NA	NA	NA	NA	NA
869	2625	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
870	2558	ND	ND	1624	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
871	2630	2719	2795	1647	1736	1812	165	0	0	42	0	0	0	42
872	2594	2678	2780	1632	1716	1818	186	NA	NA	NA	NA	NA	NA	NA
873	2605	2704	2775	1605	1704	1775	170	0	12	40	0	0	0	52
874	2598	2697	2770	1614	1713	1786	172	0	0	45	0	0	0	45
875	2535	2640	2720	1598	1703	1783	185	0	0	61	0	0	0	61
876	2570	2671	2760	1587	1688	1777	190	0	0	70	0	0	0	70
877	2630	2725	2805	1626	1721	1801	175	0	11	50	0	0	0	61
878	2589	2709	2770	NA	NA	NA	NA	0	0	34	0	0	0	34
879	2615	2708	2885	1645	1738	1915	270	0	0	71	0	0	0	71
880	2580	2680	2750	NA	NA	NA	NA	13	0	60	0	0	0	73
881	2608	2718	2785	1608	1718	1785	177	15	0	40	0	0	0	55
882	2500	2540	2670	1549	1589	1719	170	4	12	27	0	0	0	43
883	2520	2715	2700	1565	1760	1745	180	TRACE	0	44	0	0	0	44
884	2500	ND	2670	1549	NA	1719	170	NA	NA	NA	NA	NA	NA	NA
885	2440	2520	2593	1583	1663	1736	153	0	0	29	0	0	0	29
886	2494	ND	ND	1605	NA	NA	NA	0	0	0	0	0	0	0
887	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
888	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
889	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
890	2510	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
891	2475	2529	2640	1548	1602	1713	165	0	0	40	0	0	0	40
892	2400	2470	2590	1531	1601	1721	190	0	20	24	0	0	0	44
893	2470	2526	2665	1572	1628	1767	195	0	0	0	72	0	0	72
894	2445	2514	2620	NA	NA	NA	NA	0	0	30	0	0	0	30
895	2460	2519	ND	1557	1616	NA	NA	NA	NA	NA	NA	NA	NA	NA
896	2358	2436	2550	1522	1600	1714	192	NA	NA	NA	NA	NA	NA	NA
897	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
898	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
899	2455	2524	2640	1523	1592	1708	185	0	25	34	0	0	0	59
900	2445	2510	2620	1514	1579	1689	175	0	0	34	0	0	0	34
901	2465	2530	2630	1532	1597	1697	165	0	20	28	0	0	0	48
902	2485	2548	2670	1519	1582	1704	185	0	30	0	0	0	0	30
903	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
904	2390	2451	2565	NA	NA	NA	NA	0	15	25	0	0	0	40
905	2300	2366	2475	1478	1544	1653	175	0	6	7	0	0	0	13
906	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
907	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
908	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
909	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
910	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
911	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
912	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
913	2410	2534	2596	1581	1705	1787	186	0	0	9	0	0	0	9
914	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Incls Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev, Top Bartlesville Sandstone Interval	Elev, Top Permeable Bartlesville Sandstone	Elev, Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
915	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
916	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
917	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
918	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
919	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
920	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
921	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
922	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
923	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
924	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
925	2505	ND	ND	1584	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
926	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
927	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
928	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
929	2460	2578	2628	1567	1685	1735	168	0	0	2	0	0	0	2
930	2452	2565	2612	1611	1724	1771	160	0	0	21	0	0	0	21
931	2498	2614	ND	1595	1711	NA	NA	0	0	20	0	0	0	20
932	2495	2607	2660	1576	1688	1741	165	0	0	10	0	0	0	10
933	2495	2599	2661	1574.5	1678.5	1740.5	168	0	0	25	0	0	0	25
934	2446	ND	ND	1569	NA	NA	NA	0	0	0	0	0	0	0
935	2488	2601	ND	1585	1698	NA	NA	0	0	22	0	0	0	22
936	2495	2600	2650	1576	1681	1731	155	0	0	24	0	0	0	24
937	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
938	2585	2717	2775	1638	1770	1828	190	0	0	40	0	0	0	40
939	2528	2640	2712	1594	1706	1778	184	0	0	50	0	0	0	50
940	2611	2700	2802	1675	1764	1866	191	4	0	40	0	0	0	44
941	2578	2680	2768	1656	1758	1846	190	0	2	53	0	0	0	55
942	2560	2693	2755	1656	1789	1851	195	NA	NA	NA	NA	NA	NA	NA
943	2585	2685	2775	1659	1739	1849	190	0	15	26	0	0	0	41
944	2600	2729	2795	1647	1776	1842	195	NA	NA	NA	NA	NA	NA	NA
945	2547	2672	2735	1648	1773	1836	188	0	0	39	0	0	0	39
946	2635	2731	2822	1674	1770	1861	187	0	0	35	0	0	0	35
947	2600	ND	ND	1625.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
948	2612	2708	2800	1661	1757	1849	188	0	0	30	0	0	0	30
949	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
950	2590	ND	ND	1665	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
951	2585	2720	ND	1634	1769	NA	NA	0	0	50	0	0	0	50
952	2600	2675	2785	1651	1726	1836	185	6	0	75	0	0	0	81
953	2550	2675	ND	1598.5	1723.5	NA	NA	0	0	53	0	0	0	53
954	2530	2667	ND	NA	NA	NA	NA	0	0	60	0	0	0	60
955	2580	2652	2735	1606.5	1698.5	1781.5	175	0	0	33	0	0	0	33
956	2525	2697	2705	1623	1795	1803	180	3	3	81	0	0	0	87
957	2625	2735	2815	1682	1792	1872	190	0	0	50	0	0	0	50
958	2630	2693	2830	1681	1744	1881	200	0	0	40	0	0	0	40
959	2560	2635	2745	1656	1731	1841	185	0	0	48	0	0	0	48
960	2550	2645	2730	1674	1969	1854	180	0	48	0	0	0	0	48
961	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
962	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
963	2530	2560	2725	1641	1671	1836	195	8	30	50	0	0	0	88
964	2550	2635	2740	1681	1766	1871	190	5	8	50	0	0	0	63
965	2600	2689	ND	NA	NA	NA	NA	0	0	0	0	0	0	0
966	2560	2654	2750	1678	1772	1868	190	0	0	42	0	0	0	42
967	2575	2660	2765	1660	1745	1850	190	0	0	40	0	0	0	40
968	2585	2647	2762	1691	1773	1888	197	0	20	60	0	0	0	80
969	2535	2680	ND	1646	1791	NA	NA	NA	NA	NA	NA	NA	NA	NA
970	2545	2650	2730	1688	1773	1853	185	0	0	40	0	0	0	40
971	2614	2684	2810	1694	1744	1890	196	4	10	85	0	0	0	99
972	2550	2639	2743	1673	1762	1866	193	0	0	50	0	0	0	50
973	2470	ND	2762	1582	NA	1874	292	0	16	40	0	0	0	56
974	2563	2707	2753	1660	1804	1850	190	0	10	38	0	0	0	48
975	2570	2655	2757	1655	1740	1842	187	11	0	45	0	0	0	56

	Wireline Log Tops		Wireline Log Bases	Subsea (Datum)			Format Thicknesses							
	Top, Bartlesville Sandstone Interval (Inole Limestone)	Top, Permeable Bartlesville Sandstone	Base, Bartlesville Sandstone Interval	Elev., Top Bartlesville Sandstone Interval	Elev., Top Permeable Bartlesville Sandstone	Elev., Base Bartlesville Sandstone Interval	Bartlesville Sandstone Interval	BT	BA	BB	BC	BU	BA/B	Total Net Bartlesville Sandstone
976	2625	2722	2810	1674	1771	1859	185	9	0	21	0	0	0	30
977	2620	2701	2825	1685	1766	1890	205	3	0	63	0	0	0	66
978	2605	2722	ND	1700	1817	NA	NA	0	0	70	0	0	0	70
979	2585	2620	2780	1684	1719	1879	195	0	20	66	0	0	0	86
980	2600	2688	2800	1757	1825	1957	200	12	0	0	0	0	93	105
981	2575	2650	ND	1723	1798	NA	NA	NA	NA	NA	NA	NA	NA	NA
982	2635	2740	2828	1689	1794	1882	193	0	0	40	0	0	0	40
983	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
984	2550	2680	2730	1677	1807	1857	180	0	0	20	0	0	0	20
985	2562	ND	2730	1606	NA	1774	168	NA	NA	NA	NA	NA	NA	NA
986	2530	ND	2700	1632	NA	1802	170	0	0	0	0	0	0	0
987	2561	2664	2735	1619	1722	1793	174	0	0	19	0	0	0	19
988	2552	2668	2735	1610	1726	1793	183	0	0	10	0	0	0	10
989	2545	2552	2715	1623	1630	1793	170	10	0	0	0	0	0	10
990	2555	2657	2720	1612	1714	1777	165	0	0	11	0	0	0	11
991	2580	2703	2782	1668	1791	1850	182	0	0	24	0	0	0	24
992	2525	2617	2670	1633	1725	1778	145	0	0	8	0	0	0	8
993	2485	2588	ND	1634	1757	NA	NA	0	0	4	0	0	0	4
994	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
995	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
996	2520	2582	2700	1599	1641	1779	180	0	22	19	0	0	0	41
997	2534	2643	2703	1599	1708	1768	169	0	0	14	0	0	0	14
998	2480	2501	2634	1582	1623	1756	174	4	4	0	0	0	0	8
999	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1000	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1001	2400	2512	2560	1535	1647	1695	160	11	0	4	0	0	0	15

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
1	20	ND	ND	18	Funnel	Block	Funnel	Funnel	Funnel
2	11	ND	9	20	Funnel	Double Spike	Funnel	Funnel	Funnel
3	2	ND	ND	10	Funnel	Funnel	Funnel	Funnel	Spike
4	4	27	4	3	Funnel	Spike	Block	Funnel	Spike
5	4	7	6	2	Funnel	Double Spike	Spike	Spike	Spike
6	5	6	8	ND	Double Spike	Double Spike	Double Spike	Triple Spike	ND
7	10	4	8	5	Double Spike	Double Spike	Double Spike	Triple Spike	Triple Spike
8	10	7	14	14	Double Spike	Double Spike	Triple Spike	Triple Spike	Five Spikes
9	5	12	12	6	Double Spike	Spike	Triple Spike	Triple Spike	Double Spike
10	10	5	15	7	Double Spike	Double Spike	Spike	Triple Spike	Triple Spike
11	5	6	18	6	Double Spike	Spike	Double Spike	Five Spikes	Triple Spike
12	7	5	21	3	Double Spike	Double Spike	Spike	Five Spikes	Double Spike
13	4	3	6	7	Funnel	Spike	Spike	Double Spike	Spike
14	19	12	13	3	Funnel	Spike/Block	Block	Spike/Block	Spike
15	7	14	9	10	Funnel	Spike	Spike/Block	Double Spike	Spike
16	8	9	14	3	Funnel	Double Spike	Double Spike	Block	Spike
17	5	12	27	10	Funnel	Spike	Funnel	Double Spike	Double Spike
18	14	5	24	4	Funnel	Spike/Block	Spike	Block/Funnel	Funnel
19	10	4	11	3	Funnel	Spike/Funnel	Spike	Double Spike	Funnel
20	11	3	3	3	Funnel	Double Spike	Spike	Triple Spike	Double Spike
21	10	9	20	3	Funnel	Double Spike	Double Spike	Spike/Block	Spike
22	4	11	5	12	Funnel	Double Spike	Spike/Funnel	Double Spike	Funnel
23	10	6	8	2	Funnel	Double Spike	Spike	Double Spike	Spike
24	6	8	12	9	Funnel/Spike	Triple Spike	Funnel	Spike/Bell	Spike
25	3	4	16	6	Funnel	Spike	Funnel	Block/Spike	Funnel
26	7	4	14	7	Funnel	Spike	Spike	Double Spike	Spike
27	8	18	5	5	Block	Triple Spike	Spike/Block	Double Spike	Triple Spike
28	6	10	12	8	Funnel	Double Spike	Spike	Triple Spike	Triple Spike
29	4	15	9	9	Funnel	Spike	Spike/Block	Triple Spike	Triple Spike
30	7	29	9	12	Funnel	Double Spike	Dbl. Block	Triple Spike	Block
31	ND	ND	ND	ND	ND	ND	ND	ND	ND
32	5	7	8	ND	Funnel	Triple Spike	Dbl. Spike	Triple Spike	ND
33	6	5	ND	8	Funnel	Funnel	Spike	Funnel	Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
34	4	14	ND	14	Funnel	Spike	Block	Spike	Block
35	4	ND	15	4	Funnel	Spike	Funnel	Double Spike	Spike
36	4	ND	12	5	Funnel	Spike	Funnel	Triple Spike	Spike
37	7	18	5	5	Funnel	Funnel	Block	Double Spike	Spike
38	4	13	8	4	Funnel	Spike	Funnel	Funnel	Spike
39	3	14	15	17	Funnel	Spike	Block	Funnel	ND
40	2	3	4	ND	Funnel	Funnel	Spike	Block	ND
41	5	12	5	0	Funnel	Spike	Spike	Funnel	ND
42	5	2	10	10	Funnel	Spike	Spike	Funnel	Dbl. Spike
43	2	18	6	4	Funnel	Spike	Block	Funnel	Spike
44	5	16	5	5	Funnel	Spike	Block	Double Spike	Double Spike
45	ND	ND	ND	ND	ND	ND	ND	ND	ND
46	6	17	8	16	Double Spike	Double Spike	Block	Double Spike	Triple Spike
47	0	8	4	2	Funnel	ND	Block	ND	ND
48	0	8	6	15	Funnel	ND	Block	Spike	Block
49	8	8	ND	ND	Funnel	Spike	Spike	ND	ND
50	5	7	6	ND	Funnel	Spike	Funnel	ND	ND
51	5	3	10	4	Double Spike	Spike	Spike	Triple Spike	Triple Spike
52	6	5	10	0	Double Spike	Double Spike	Spike	Double Spike	ND
53	6	5	13	4	Double Spike	Spike	Spike	Block/Spike	Double Spike
54	7	8	12	11	Double Spike	Triple Spike	Double Spike	Triple Spike	Five Spikes
55	2	ND	20	7	Funnel	Spike	ND	Block	Spike
56	7	8	18	7	Double Spike	Spike	Double Spike	Block/Spike	Triple Spike
57	24	6	17	5	Double Spike	Spike/Block	Funnel/Spike	Block/Spike	Triple Spike
58	14	5	18	5	ND	Dbl. Spike/Block	Spike	Block/Spike	Double Spike
59	8	2	11	ND	Block	Spike	Spike	Double Spike	ND
60	58	10	18	5	Block	Block	Spike	Double Spike	Spike
61	7	6	11	15	Block	Double Spike	Triple Spike	Triple Spike	Block
62	6	6	5	ND	Double Spike	Triple Spike	Double Spike	Double Spike	ND
63	20	7	8	10	Double Spike	Block	Double Spike	Double Spike	Spike
64	24	5	15	6	Double Spike	Block	Spike	Four Spikes	Triple Spike
65	14	4	15	6	Double Spike	Double Spike	Spike	Triple Spike	Spike
66	8	7	14	5	Block	Spike	Double Spike	Block/Spike	Spike
67	9	12	11	4	Block/Spike	Double Spike	Double Spike	Dbl. Funnel/Spike	Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
68	28	6	8	ND	Block	Block	Double Spike	Triple Spike	ND
69	43	8	8	7	Block	Block	Funnel	Double Spike	Double Spike
70	52	ND	ND	ND	Block	Block	ND	ND	ND
71	10	10	10	ND	Block	Triple Spike	Double Spike	Five Spikes	ND
72	10	9	7	15	Block	Triple Spike	Double Spike	Four Spikes	Block
73	40	6	6	3	Double Spike	Block	Double Spike	Double Spike	Double Spike
74	43	22	10	12	Block/Spike	Block	Spike/Block	Triple Spike	Double Spike
75	39	18	12	11	Block	Block	Dbl. Spike/Block	Triple Spike	Double Spike
76	5	4	6	6	Block	Five Spikes	Double Spike	Spike	Double Spike
77	ND	5	11	5	Double Spike	ND	Spike	Triple Spike	Double Spike
78	19	8	16	11	Block	Double Spike	Double Spike	Triple Spike	Four Spikes
79	6	12	12	ND	Block/Spike	Spike	Double Spike	Four Spikes	ND
80	15	11	12	ND	Block	Triple Spike	Double Spike	Triple Spike	ND
81	10	7	13	ND	Block	Double Spike	Double Spike	Triple Spike	ND
82	16	8	10	19	Block	Block/Spike	Spike	Triple Spike	Four Spikes
83	7	7	12	15	Block	Double Spike	Double Spike	Triple Spike	Double Spike
84	9	9	9	ND	Double Spike	Triple Spike	Triple Spike	ND	ND
85	5	5	9	ND	ND	Triple Spike	Spike	Triple Spike	ND
86	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
87	6	3	12	12	Double Spike	Triple Spike	Double Spike	Triple Spike	Double Spike
88	25	16	24	4	Block	Block/Spike	Double Spike	Block/Spike	Spike
89	ND	ND	ND	ND	Block	ND	ND	ND	ND
90	11	8	15	ND	Block	Triple Spike	Double Spike	Dbl.Spike/Funnel	ND
91	12	16	7	3	Funnel	Triple Spike	Funnel	Double Spike	Spike
92	10	7	11	32	Block	Triple Spike	Double Spike	Triple Spike	Block
93	7	3	10	22	Funnel	Double Spike	Double Spike	Triple Spike	Block
94	9	11	9	18	Funnel	Double Spike	Double Spike	ND	Block
95	7	10	13	14	Funnel	Double Spike	Spike	Triple Spike	Block
96	11	8	8	17	Funnel	Double Spike	Spike	Double Spike	Block
97	7	13	18	4	Block	Double Spike	Block	ND	Block
98	11	8	9	14	Funnel	Double Spike	Double Spike	Double Spike	Triple Spike
99	12	3	12	15	Funnel	Triple Spike	Spike	Triple Spike	Triple Spike
100	10	10	16	13	Funnel	Triple Spike	Double Spike	Triple Spike	Triple Spike
101	15	7	11	16	Funnel	Double Spike	Double Spike	Triple Spike	Triple Spike
102	6	9	7	10	Funnel	Double Spike	Funnel	Double Spike	Triple Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
103	7	13	12	11	Funnel	Triple Spike	Funnel	Triple Spike	Triple Spike
104	2	12	24	9	Funnel	Spike	Block	Block/Spike	Double Spike
105	3	8	12	4	Funnel	Spike	Spike	Triple Spike	Double Spike
106	3	13	22	4	Funnel	Spike	Funnel	Dbl. Spike/Funnel	Spike
107	7	8	13	7	Funnel	Double Spike	Spike	Double Spike	Double Spike
108	6	13	15	13	Funnel	Double Spike	Funnel	Five Spikes	Funnel
109	4	16	13	3	Funnel	Spike	Funnel	Triple Spike	Spike
110	8	9	16	2	Funnel	Spike	Spike	Triple Spike	Spike
111	6	8	6	10	Funnel	Spike	Spike	Double Spike	Spike
112	6	5	21	10	Triple Spike	Double Spike	Double Spike	Six Spikes	Five Spikes
113	12	6	12	6	Double Spike	Triple Spike	Double Spike	Four Spikes	Four Spikes
114	4	5	12	3	Double Spike	Double Spike	Spike	Triple Spike	Double Spike
115	ND	ND	ND	ND	Triple Spike	ND	ND	ND	ND
116	4	4	12	13	Block	Spike	Spike	Five Spikes	Four Spikes
117	8	8	8	10	Block	Double Spike	Spike	Double Spike	Double Spike
118	14	14	8	14	Funnel	Triple Spike	Double Spike	Double Spike	Block
119	12	6	12	6	Double Spike	Triple Spike	Double Spike	Four Spikes	Four Spikes
120	4	5	12	3	Double Spike	Double Spike	Spike	Triple Spike	Double Spike
121	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
122	10	3	10	10	Double Spike	Triple Spike	Spike	ND	Four Spikes
123	ND	ND	ND	ND	Double Spike	ND	ND	ND	ND
124	34	ND	ND	ND	Dbl. Block	Double Block	ND	ND	ND
125	15	ND	ND	ND	Block/Spike	Block	ND	ND	ND
126	24	10	11	26	Dbl. Block	Triple Spike	Spike	Double Spike	Four Spikes
127	28	ND	ND	ND	Dbl. Block	Triple Spike	ND	ND	ND
128	6	ND	ND	ND	Dbl. Block	Spike	ND	ND	ND
129	21	ND	ND	ND	Dbl. Block	Spike/Block	ND	ND	ND
130	14	11	20	5	Funnel	Spike	Funnel	Double Spike	Triple Spike
131	10	12	23	9	Funnel	Funnel	Funnel	Block	Four Spikes
132	3	6	14	17	Dbl. Block	Spike	Funnel	ND	Four Spikes
133	4	3	12	17	Dbl. Block	Spike	Spike	ND	Four Spikes
134	22	3	6	4	Dbl. Block	Double Spike	Double Spike	Spike	Double Spike
135	16	4	21	6	Block/Spike	Spike	Spike	Block	Triple Spike
136	38	ND	ND	ND	Funnel	Block	ND	ND	ND
137	38	ND	ND	ND	Funnel/Spike	Block	ND	ND	ND

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
138	34	7	9	3	Funnel/Spike	Block	Funnel	Spike	Spike
139	9	12	18	4	Funnel	Triple Spike	Funnel	Block	Double Spike
140	8	10	23	24	Funnel	Triple Spike	Funnel	Block	Block
141	36	6	22	13	Funnel/Spike	Block	Double Spike	Bell	Block
142	6	17	17	5	Funnel/Spike	Double Spike	Funnel	Bell	Double Spike
143	10	8	13	13	Double Spike	Double Spike	Double Spike	Triple Spike	Triple Spike
144	16	7	5	10	Double Spike	Block/Spike	Double Spike	Double Spike	Spike
145	11	10	10	7	Double Spike	Four Spikes	Spike	Double Spike	Triple Spike
146	6	3	6	7	Block/Spike	Spike	Double Spike	Spike	Spike
147	17	ND	ND	ND	Funnel	Funnel/Spike	ND	ND	ND
148	9	3	4	9	Block	Funnel/Spike	Spike	ND	Spike
149	6	10	7	9	Block	Double Spike	Spike	ND	Spike
150	6	8	6	12	Funnel	Double Spike	Spike	Double Spike	Block
151	21	ND	ND	ND	Funnel/Spike	Spike/Block	ND	ND	ND
152	18	ND	ND	ND	Funnel/Spike	Spike/Block	ND	ND	ND
153	10	ND	ND	ND	Funnel	Double Spike	ND	ND	ND
154	4	6	6	12	Block	Double Spike	Spike	Double Spike	Triple Spike
155	15	4	7	11	Block	Double Spike	Spike	Spike	Triple Spike
156	ND	ND	ND	ND	Double Spike	ND	ND	ND	ND
157	17	6	9	6	Double Spike	Block/Spike	Double Spike	Double Spike	Triple Spike
158	5	ND	ND	ND	Block	Spike	ND	ND	ND
159	6	10	6	3	Funnel	Double Spike	Funnel	Double Spike	Spike
160	13	17	15	40*	Funnel/Spike	Funnel/Spike	Funnel	Double Spike	Dbl. Spike/Block
161	18	20	15	13	Funnel	Dbl. Spike/Funnel	Triple Spike	Triple Spike	Triple Spike
162	20	6	7	8	Block	Block	Spike	Double Spike	Double Spike
163	13	9	8	12	Block	Triple Spike	Spike	Double Spike	Double Spike
164	8	3	3	4	Funnel	Double Spike	Spike	ND	Spike
165	ND	ND	ND	ND	Block	ND	ND	ND	ND
166	6	7	9	9	Triple Spike	Spike	Double Spike	Spike	Five Spikes
167	50	4	6	7	Funnel	Block	Spike	Spike	Spike
168	6	6	4	ND	Block	Spike	Spike	Spike	ND
169	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
170	26	4	11	13	Triple Spike	Block	Double Spike	Four Spikes	Five Spikes
171	37	19	13	14	Block	Block	Triple Spike	Triple Spike	Double Spike
172	39	13	19	6	Block	Block	Funnel	Block/Spike	Double Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
173	28	19	34	20	Block	Dbl. Spike/Funnel	Funnel/Spike	Block/Spike	5-6 Spikes
174	47	20	16		Block	Block	Spike/Funnel	Triple Spike	ND
175	17	17	19	17	Block/Spike	Spike/Block	Double Spike	Dbl. Spike/Funnel	Four Spikes
176	14	19	16	4	Block/Spike	Block/Spike	Triple Spike	Triple Spike	Double Spike
177	15	10	11	6	Block/Spike	Block/Spike	Triple Spike	Triple Spike	Triple Spike
178	27	18	12	10	Block	Bell	Double Spike	Triple Spike	Double Spike
179	24	14	13	10	Block	Spike/Block	Spike/Funnel	Triple Spike	Double Spike
180	15	10	10	12	Double Spike	Four Spikes	Four Spikes	Five Spikes	Five Spikes
181	5	3	3	3	Block	Spike	Spike	Spike	Spike
182	ND	6	11	6	Double Spike	ND	Double Spike	Triple Spike	Triple Spike
183	12	8	16	3	Double Spike	Four Spikes	Spike	Four Spikes	Double Spike
184	10	13	12	9	Triple Spike	Spike	Block	ND	Four Spikes
185	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
186	8	4	8	14	Triple Spike	Triple Spike	Spike	Double Spike	Triple Spike
187	9	4	5	5	Triple Spike	Triple Spike	Spike	Double Spike	Double Spike
188	4	3	7	3	Block	Spike	Spike	Double Spike	Spike
189	8	3	3	17	Block	Double Spike	Spike	Spike	Block
190	16	2	3	15	Block	Triple Spike	Spike	Spike	Block
191	ND	ND	ND	ND	Block	ND	ND	ND	ND
192	15	3	2	4	Block	Double Spike	Spike	Spike	Spike
193	6	9	10	ND	Block	Double Spike	Double Spike	Double Spike	ND
194	4	4	7	4	Block	Spike	Spike	Spike	Spike
195	10	7	5	27	Funnel/Spike	Triple Spike	Spike	Double Spike	Block
196	15	7	7	31	Block/Spike	Four Spikes	Spike	Triple Spike	Block
197	19	ND	ND	ND	Funnel	Spike/Block	ND	ND	ND
198	20	0	0	4	Block/Spike	Spike/Block	ND	ND	Spike
199	12	2	10	6	Block/Spike	Spike/Funnel	Spike	Double Spike	Double Spike
200	7	12	9	8	Block/Spike	Double Spike	Double Spike	Triple Spike	Four Spikes
201	9	ND	ND	ND	Block/Spike	Double Spike	ND	ND	ND
202	7	ND	ND	ND	Block/Spike	Double Spike	ND	ND	ND
203	5	8	7	7	Triple Spike	Double Spike	Double Spike	Triple Spike	Four Spikes
204	ND	ND	ND	ND	Block	ND	ND	ND	ND
205	ND	ND	ND	ND	Block	ND	ND	ND	ND
206	ND	ND	ND	ND	Block	ND	ND	ND	ND
207	ND	ND	ND	ND	Block	ND	ND	ND	ND

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
208	6	4	5	7	Block	Double Spike	Double Spike	ND	Spike
209	16	4	5	9	Block	Block/Spike	Spike	Double Spike	Four Spikes
210	ND	ND	4	6	ND	ND	ND	ND	Spike
211	23	6	12	4	Funnel	Block	Spike	Spike	Double Spike
212	28	11	10	4	Funnel	Block	Double Spike	Spike	Four Spikes
213	27	6	13	0	Funnel	Spike/Bell	Spike	Block	NA
214	22	9	19	4	Funnel	Bell	Spike	Block	Triple Spike
215	15	ND	ND	ND	Funnel	Double Spike	ND	ND	ND
216	12	5	4	4	Block	Double Spike	Double Spike	Spike	Spike
217	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
218	10	ND	ND	ND	Funnel	Triple Spike	ND	ND	ND
219	16	ND	ND	ND	Funnel	Spike/Block	ND	ND	ND
220	16	3	15	4	Funnel/Spike	Block	Spike	Block	Spike
221	13	ND	ND	ND	Block/Spike	Block	ND	ND	ND
222	10	8	22	14	Block/Spike	Triple Spike	Triple Spike	Four Spikes	Four Spikes
223	33	6	21	16	Block/Spike	Block	Triple Spike	Block	Block
224	40	ND	ND	ND	Funnel	Block	ND	ND	ND
225	32	11	12	13	Funnel/Spike	Block	Block	Block	Block
226	33	7	16	6	Funnel/Spike	Block	Double Spike	ND	Spike
227	ND	ND	ND	ND	Funnel/Spike	ND	ND	ND	ND
228	ND	ND	ND	ND	Funnel/Spike	ND	ND	ND	ND
229	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
230	ND	ND	ND	ND	Funnel/Spike	ND	ND	ND	ND
231	22	9	14	7	Triple Spike	Four Spikes	Triple Spike	Block/Spike	Triple Spike
232	11	7	13	4	Triple Spike	Triple Spike	Double Spike	Block/Spike	Double Spike
233	10	17	12	7	Triple Spike	Spike	Block/Spike	Block	Double Spike
234	8	5	10	6	Triple Spike	Spike	Triple Spike	Double Spike	Double Spike
235	14	8	16	7	Triple Spike	Block/Spike	Double Spike	Block	Double Spike
236	38	5	9	5	Double Spike	Block	Spike	Double Spike	Spike
237	37	ND	ND	ND	Triple Spike	Block	ND	ND	ND
238	17	6	3	5	Triple Spike	Triple Spike	Double Spike	Spike	Triple Spike
239	6	12	10	6	Triple Spike	Triple Spike	Triple Spike	Double Spike	Four Spikes
240	29	ND	ND	ND	Block/Spike	Block	ND	ND	ND
241	ND	ND	ND	ND	Funnel/Spike	ND	ND	ND	ND
242	8	6	6	9	Funnel/Spike	Double Spike	Spike	Double Spike	Triple Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline S ND				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
243	ND	ND	ND	ND	Funnel/Spike	ND	ND	ND	ND
244	8	6	13	2	Funnel/Spike	Double Spike	Double Spike	Funnel	Spike
245	27	3	21	2	Funnel/Spike	Block	Spike	Bell	Spike
246	ND	ND	ND	ND	Funnel/Spike	ND	ND	ND	ND
247	ND	ND	ND	ND	Funnel/Spike	ND	ND	ND	ND
248	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
249	20	7	7	12	Block/Spike	Block/Spike	Spike	Spike	Double Spike
250	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
251	ND	ND	ND	ND	Funnel/Spike	ND	ND	ND	ND
252	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
253	13	12	10	8	Funnel	Double Spike	Double Spike	Spike	Triple Spike
254	31	9	18	10	Funnel/Spike	Double Block	Double Spike	Block	Double Spike
255	31	5	8	10	Funnel/Spike	Double Block	Double Spike	Double Spike	Spike
256	13	8	9	2	Funnel/Spike	Double Spike	Funnel	ND	Spike
257	11	4	12	0	Funnel/Spike	Double Spike	Double Spike	Block	ND
258	10	6	9	4	Funnel/Spike	Double Spike	Spike	Triple Spike	Double Spike
259	23	5	6	5	Block	Block	Double Spike	Double Spike	Double Spike
260	6	9	8	5	Block	Double Spike	Spike	Double Spike	Double Spike
261	8	4	5	4	Block	Double Spike	Double Spike	Spike	Double Spike
262	10	5	7	3	Block	Triple Spike	Double Spike	Spike	Spike
263	20	8	5	4	Block	Block	Spike	Spike	Double Spike
264	20	5	23	6	Block/Spike	Block	Spike	Block	Spike
265	12	5	10	3	Block/Spike	Block/Spike	Spike	Spike	Spike
266	9	8	8	20	Double Spike	Triple Spike	Triple Spike	Triple Spike	Six Spikes
267	10	6	16	16	Block/Spike	Double Spike	Spike	Block/Dbl. Spike	Four Spikes
268	ND	ND	ND	ND	ND	ND	ND	ND	ND
269	12	20	13	15	Block/Spike	Dbl. Spike/Funnel	Funnel/Spike	Double Spike	Triple Spike
270	9	19	14	16	Block/Spike	Spike/Funnel	Spike/Funnel	Block	Spike/Block
271	24	10	10	21	Block/Spike	Four Spikes	Triple Spike	Spike	Block/Spike
272	9	9	9	9	Block/Spike	Double Spike	Spike	Double Spike	Double Spike
273	ND	ND	ND	ND	Block	ND	ND	ND	ND
274	ND	ND	ND	ND	Double Spike	ND	ND	ND	ND
275	ND	ND	ND	ND	Suppressed	ND	ND	ND	ND
276	4	7	6	14	Suppressed	Triple Spike	Four Spikes	Triple Spike	Five Spikes
277	7	7	3	8	lock/Dbl. Spik	Triple Spike	Triple Spike	Spike	Double Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
278	8	3	3	8	Triple Spike	Triple Spike	Spike	Spike	Five Spikes
279	ND	ND	ND	ND	Double Spike	ND	ND	ND	ND
280	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
281	7	4	6	10	Triple Spike	Double Spike	Double Spike	Triple Spike	Four Spikes
282	15	9	8	16	Triple Spike	Triple Spike	Four Spikes	Spike	Seven Spikes
283	9	6	10	20	Block	Triple Spike	Double Spike	Double Spike	Four Spikes
284	10	7	8	ND	Double Spike	Double Spike	Double Spike	ND	ND
285	7	11	8	ND	Double Spike	Double Spike	Triple Spike	Double Spike	ND
286	9	8	9	ND	Double Spike	Triple Spike	Triple Spike	Double Spike	ND
287	13	8	9	11	Triple Spike	Triple Spike	Triple Spike	Four Spikes	Triple Spike
288	13	16	7	7	Triple Spike	Double Spike	Triple Spike	Triple Spike	Double Spike
289	6	15	9	9	Triple Spike	Double Spike	Triple Spike	Five Spikes	Four Spikes
290	12	12	9	12	Triple Spike	Triple Spike	Double Spike	Double Spike	Double Spike
291	8	10	0	7	Block	Double Spike	Double Spike	NA	Double Spike
292	9	8	6	25	Block	Double Spike	Spike	Double Spike	Double Spike
293	24	6	5	7	Block	Block/Spike	Spike	Spike	Double Spike
294	11	5	30	5	Block/Spike	Double Spike	Spike	Block	Funnel
295	7	8	6	13	Block/Spike	Double Spike	Double Spike	Double Spike	Block
296	10	10	5	3	Block/Spike	Funnel/Spike	Double Spike	Spike	Spike
297	11	5	3	6	Block	Double Spike	Spike	Spike	Spike
298	12	15	10	14	Block/Spike	Triple Spike	Triple Spike	Spike	Triple Spike
299	9	14	18	15	Block	Double Spike	Triple Spike	Triple Spike	Four Spikes
300	13	6	14	12	Block/Spike	Triple Spike	Double Spike	ND	Double Spike
301	17	24	8	15	Block/Spike	Triple Spike	Spike/Block	Double Spike	Double Spike
302	32	25	15	9	Block	Double Block	Dbl. Block/Spike	ND	Triple Spike
303	12	12	20	24	ND	Block	Block	ND	Block
304	ND	ND	ND	ND	ND	ND	ND	ND	ND
305	10	6	5	6	Triple Spike	Triple Spike	Double Spike	Spike	Triple Spike
306	17	10	12	5	Triple Spike	Double Spike	Spike	Block	Spike
307	13	5	5	4	Block	Double Spike	Spike	Spike	Spike
308	ND	ND	ND	ND	ND	ND	ND	ND	ND
309	10	7	4	4	Block/Spike	Spike	Spike	Spike	Spike
310	8	ND	ND	ND	Block/Spike	Spike	ND	ND	ND
311	17	ND	ND	ND	Block/Spike	Block	ND	ND	ND
312	5	4	11	5	Block/Spike	Double Spike	Spike	Spike	Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
313	5	3	10	4	Block/Spike	Double Spike	Spike	Double Spike	Spike
314	14	13	11	9	Block/Spike	Four Spikes	Triple Spike	Four Spikes	Triple Spike
315	10	4	18	13	Block/Spike	Triple Spike	Double Spike	Five Spikes	Double Spike
316	19	15	16	36	Block/Spike	Double Spike	Double Spike	Triple Spike	DBl. Block/Spike
317	19	16	13	20	Block/Spike	Triple Spike	Four Spikes	Four Spikes	Block
318	7	4	4	33	Block/Spike	Double Spike	Spike	Double Spike	Block
319	5	4	12	32	Block/Spike	Double Spike	Spike	Block	Block
320	5	4	12	35	Block/Spike	Double Spike	Spike	Block	Block/Spike
321	8	8	9	19	Block/Spike	Spike	Double Spike	Double Spike	Block/Spike
322	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
323	9	10	15	11	Triple Spike	Double Spike	Double Spike	Block	Triple Spike
324	12	10	12	10	Block/Spike	Double Spike	Spike	Block	Double Spike
325	10	9	7	13	Block/Spike	Double Spike	Spike	Spike	Double Spike
326	10	10	4	7	Block/Spike	Spike	Spike	Spike	Double Spike
327	8	ND	ND	ND	Funnel/Spike	Spike	ND	ND	ND
328	7	4	3	7	Funnel/Spike	Spike	Spike	Spike	Spike
329	17	7	8	7	Block/Spike	Dbl. Spike/Block	Triple Spike	Spike	Triple Spike
330	16	6	10	7	Block/Spike	Dbl. Spike/Block	Spike/Funnel	Double Spike	Triple Spike
331	13	8	11	7	Block/Spike	Double Spike	Double Spike	Triple Spike	Double Spike
332	13	6	6	8	Block/Spike	Double Spike	Double Spike	Double Spike	Triple Spike
333	14	4	8	6	Block/Spike	Block	Spike	Spike	Spike
334	9	11	5	4	Block/Spike	Spike	Block	Double Spike	Spike
335	7	5	7	8	Triple Spike	Spike	Double Spike	Spike	Triple Spike
336	9	6	7	11	Block/Spike	Double Spike	Double Spike	Double Spike	Five Spikes
337	7	8	4	8	Block/Spike	Spike	Double Spike	Spike	Spike
338	13	4	6	ND	Block/Spike	Block	Double Spike	Spike	ND
339	12	13	3	ND	Block/Spike	Block	Block	Spike	ND
340	ND	ND	ND	ND	Block/Spike	ND	ND	ND	ND
341	20	6	10		Block/Spike	Spike/Block	Spike	Spike	ND
342	27	14	12	20	Block/Spike	Spike/Block	Triple Spike	Four Spikes	Double Spike
343	24	17	12	12	Block/Spike	Dbl. Spike/Block	Triple Spike	Double Spike	Double Spike
344	22	9	8	15	Block/Spike	Block/Spike	Double Spike	Spike	Double Spike
345	21	16	13	29	Block/Spike	Four Spikes	Four Spikes	Triple Spike	Dbl. Spike/ Block
346	20	19	15	ND	Block/Spike	Four Spikes	Four Spikes	Triple Spike	ND
347	15	16	10	18	Block/Spike	Triple Spike	Double Spike	Double Spike	Spike/Block

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
348	3	11	5	10	Spike/Spike	Spike	Double Spike	Spike	Double Spike
349	8	8	7	14	Double Spike	Triple Spike	Double Spike	Double Spike	Four Spikes
350	7	7	6	13	Double Spike	Four Spikes	Double Spike	Spike	Triple Spike
351	10	8	14	10	Double Spike	Triple Spike	Double Spike	Block	Spike
352	13	8	14	23	Double Spike	Triple Spike	Double Spike	Double Spike	Seven Spikes
353	22	16	18	27	Double Spike	Six Spikes	Triple Spike	Triple Spike	Seven Spikes
354	21	13	6	25	Double Spike	Five Spikes	Double Spike	Double Spike	Seven Spikes
355	6	8	9	7	Spike/Spike	Double Spike	Funnel	Double Spike	Double Spike
356	5	6	8	5	Spike/Spike	Spike	Funnel	Double Spike	Double Spike
357	37	11	32	32	Funnel	Block/Spike	Double Spike	Funnel/Spike	Dbl. Block/Spike
358	77	10	40	20	Funnel	Block	Double Spike	Block/Spike	Double Spike
359	44	ND	ND	ND	Funnel	Block	ND	ND	ND
360	15	ND	ND	ND	Funnel/Spike	Block/Spike	ND	ND	ND
361	29	ND	ND	ND	Funnel/Spike	Block/Spike	ND	ND	ND
362	61	ND	ND	ND	Funnel	Double Block	ND	ND	ND
363	68	ND	ND	ND	Funnel	Block	ND	ND	ND
364	40	ND	ND	ND	Funnel	Block	ND	ND	ND
365	46	ND	ND	ND	Funnel	Block/Spike	ND	ND	ND
366	64	ND	ND	ND	Funnel/Spike	Block	ND	ND	ND
367	40	ND	ND	ND	Funnel	Block	ND	ND	ND
368	60	ND	ND	ND	Funnel	Block	ND	ND	ND
369	47	ND	ND	ND	Funnel	Dbl. Spike/Block	ND	ND	ND
370	29	30	36	11	Funnel	Triple Spike/Block	Block/Spike	Block/Spike	Double Spike
371	ND	ND	ND	ND	Double Spike	ND	ND	ND	ND
372	12	7	15	7	Funnel	Spike	Spike	Block	Spike
373	10	3	4	9	Funnel	Double Spike	Spike	Spike	Double Spike
374	17	20	37	9	Funnel	Triple Spike	Block	Block/Four Spikes	Four Spikes
375	11	7	36	10	Funnel	Triple Spike	Spike	Block/Dbl. Spike	Double Spike
376	13	16	30	10	Funnel	Double Spike	Block	Block/Triple Spike	Four Spikes
377	3	8	3	5	Double Spike	Spike	Spike	Spike	Spike
378	9	13	34	18	Funnel/Spike	Triple Spike	Block	Block/Triple Spike	Four Spikes
379	10	14	36	15	Funnel	Spike	Funnel	Block/Funnel	Five Spikes
380	3	4	5	8	Double Spike	Spike	Spike	Triple Spike	Four Spikes
381	ND	ND	ND	ND	ND	ND	ND	ND	ND
382	8	8	14	6	Double Spike	Double Spike	Spike	Four Spikes	Double Spike
383	ND	ND	ND	ND	Funnel	ND	ND	ND	ND

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
384	19	13	25	19	Funnel	Block/Spike	Triple Spike	Five Spikes	Six Spikes
385	21	15	44	34	Funnel	Four Spikes	Four Spikes	Funnel	Block/Four Spikes
386	26	12	25	25	Funnel	Four Spikes	Double Spike	Block	Block/Triple Spike
387	34	12	36	21	Funnel	Bell	Four Spikes	Block/Five Spikes	Block/Four Spikes
388	34	ND	ND	ND	Funnel	Triple Spike/Block	ND	ND	ND
389	37	ND	ND	ND	Funnel	Block/Spike	ND	ND	ND
390	44	ND	ND	ND	Funnel	Block	ND	ND	ND
391	40	ND	ND	ND	Funnel	Block	ND	ND	ND
392	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
393	22	8	25	20	Funnel/Spike	Block/Spike	Four Spikes	Block/Triple Spike	Five Spikes
394	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
395	30	ND	ND	ND	Funnel	Block/Spike	ND	ND	ND
396	14	11	20	5	Funnel	Double Spike	Funnel	Block	Spike
397	20	15	34	19	Funnel/Spike	Five Spikes	Triple Spike	Block/Four Spikes	Five Spikes
398	17	15	23	23	Funnel	Triple Spike	Funnel	Block	Four Spikes
399	ND	ND	ND	ND	ND	ND	ND	ND	ND
400	19	9	14	23	Funnel/Spike	Triple Spike	Four Spikes	Triple Spike	Five Spikes
401	70	9	12	33	Funnel	Block	Triple Spike	Triple Spike	Block/Five Spikes
402	10	9	21	24	Funnel	Triple Spike	Four Spikes	Five Spikes	Seven Spikes
403	8	3	9	8	Double Spike	Triple Spike	Double Spike	Triple Spike	Triple Spike
404	23	8	21	15	Block/Spike	Six Spikes	Four Spikes	Seven Spikes	Triple Spike
405	9	16	20	18	Block/Spike	Triple Spike	Block	Block	Triple Spike
406	26	14	14	25	Block/Spike	Block/Dbl.Spike	Double Spike	Four Spikes	Six Spikes
407	5	4	7	7	Block/Spike	Double Spike	Double Spike	Double Spike	Triple Spike
408	7	3	7	7	Triple Spike	Triple Spike	Spike	Double Spike	Triple Spike
409	27	15	19	24	Block/Spike	Block/Spike	Block	Six Spikes	Six Spikes
410	16	11	15	21	Block/Spike	Four Spikes	Double Spike	Four Spikes	Seven Spikes
411	33	10	30	21	Block/Spike	Triple Spike	Spike	Block	Six Spikes
412	23	10	17	38	Funnel	Block/Spike	Double Spike	Six Spikes	Nine Spikes
413	15	7	17	26	Block/Spike	Triple Spike	Spike	Block/Dbl. Spike	Block/Triple Spike
414	19	9	15	16	Funnel/Spike	Four Spikes	Triple Spike	Five Spikes	Seven Spikes
415	15	14	11	21	Funnel/Spike	Triple Spike	Double Spike	Triple Spike	Seven Spikes
416	22	15	17	16	Funnel/Spike	Block/Spike	Block/Spike	Four Spikes	Four Spikes
417	20	12	10	19	Funnel/Spike	Block/Dbl.Spike	Block	Four Spikes	Five Spikes/Funnel
418	15	11	14	23	Funnel/Spike	Block/Spike	Double Spike	Triple Spike	Six Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
419	19	13	27	14	Funnel/Spike	Block/Spike	Double Spike	Six Spikes	Six Spikes
420	22	13	27	22	Funnel/Spike	Four Spikes	Five Spikes	Block/Dbl. Spike	Five Spikes
421	22	16	15	18	Funnel/Spike	Block/Dbl.Spike	Five Spikes	Block	Six Spikes
422	22	18	26	14	Funnel/Spike	Triple Spike	Block/Dbl. Spike	Block/Four Spikes	Four Spikes
423	17	13	16	15	Funnel/Spike	Four Spikes	Triple Spike	Triple Spike	Four Spikes
424	17	16	23	25	Funnel/Spike	Four Spikes	Block	Block/Spike	Six Spikes/Block
425	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
426	21	15	25	21	Triple Spike	Triple Spike	Five Spikes	Block/Triple Spike	Seven Spikes
427	26	15	22	28	Triple Spike	Dbl. Block/Spike	Five Spikes	Four Spikes	Five Spikes/Block
428	17	15	20	35	Triple Spike	Double Spike	Four Spikes	Triple Spike	Seven Spikes
429	15	12	16	27	Triple Spike	Double Spike	Four Spikes	Triple Spike	Six Spikes
430	18	14	37	32	Triple Spike	Double Spike	Triple Spike	Block/Dbl. Spike	Five Spikes/Block
431	5	5	21	6	Four Spikes	Double Spike	Double Spike	Block/Dbl. Spike	Double Spike
432	3	6	8	18	ND	Spike	Double Spike	Double Spike	Block/Dbl. Spike
433	9	7	ND	ND	Suppressed	Double Spike	Spike	ND	ND
434	20	13	17	13	Triple Spike	Block/Spike	Double Spike	Triple Spike	Triple Spike
435	20	18	14	16	Triple Spike	Triple Spike	Block/Triple Spike	Triple Spike	Seven Spikes
436	ND	ND	ND	18	Triple Spike	ND	ND	ND	Five Spikes
437	10	13	22	17	Funnel/Spike	Triple Spike	Double Spike	Five Spikes	Six Spikes
438	24	17	14	14	Funnel/Spike	Block/Spike	Block	Funnel	Five Spikes
439	21	15	14	12	Funnel/Spike	Block/Spike	Block/Spike	Triple Spike	Five Spikes
440	23	14	16	18	Funnel/Spike	Block/Spike	Block	Triple Spike	Five Spikes
441	20	15	16	22	Funnel/Spike	Double Spike	Block	Block/Spike	Seven Spikes
442	15	12	12	18	Triple Spike	Triple Spike	Block	Double Spike	Six Spikes
443	16	14	15	14	Triple Spike	Double Spike	Block	Double Spike	Five Spikes
444	15	15	18	21	Triple Spike	Triple Spike	Block	Triple Spike	Seven Spikes
445	21	11	12	15	Triple Spike	ND	Triple Spike	Triple Spike	Five Spikes
446	17	15	22	19	Triple Spike	ND	Block	Block/Spike	Eight Spikes
447	17	12	22	20	Funnel/Spike	ND	Double Spike	Eight Spikes	Six Spikes
448	20	15	17	10	Triple Spike	ND	Block/Spike	Triple Spike	Four Spikes
449	23	15	15	13	Triple Spike	ND	Block/Spike	Four Spikes	Six Spikes
450	15	14	13	14	Triple Spike	ND	Block/Spike	Triple Spike	Six Spikes
451	19	13	12	16	Triple Spike	ND	Block	Triple Spike	Triple Spike
452	22	13	11	11	Triple Spike	ND	Block	Triple Spike	Triple Spike
453	15	10	19	11	Triple Spike	Triple Spike	Double Spike	Four Spikes	Triple Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
454	13	6	10	23	Triple Spike	Triple Spike	Triple Spike	Four Spikes	Seven Spikes
455	19	14	11	14	Triple Spike	Triple Spike	Triple Spike	Four Spikes	Six Spikes
456	14	12	16	11	Triple Spike	Triple Spike	Block/Spike	Double Spike	Four Spikes
457	17	10	11	20	Funnel/Spike	Triple Spike	Spike	Five Spikes	Five Spikes
458	15	13	14	17	Triple Spike	ND	Five Spikes	Five Spikes	Eight Spikes
459	40	8	15	14	Triple Spike	ND	Triple Spike	Six Spikes	Six Spikes
460	15	14	9	15	Triple Spike	Triple Spike	Block/Spike	Triple Spike	Four Spikes
461	16	13	16	10	Triple Spike	ND	Block	Triple Spike	Four Spikes
462	14	8	12	15	Triple Spike	Triple Spike	Four Spikes	Five Spikes	Seven Spikes
463	15	12	15	14	Triple Spike	Triple Spike	Double Spike	Triple Spike	Five Spikes
464	19	10	11	15	Triple Spike	Triple Spike	Spike	Triple Spike	Five Spikes
465	18	10	17	12	Triple Spike	Triple Spike	Spike	Block/Spike	Five Spikes
466	12	14	15	15	Triple Spike	ND	Block	Triple Spike	Seven Spikes
467	12	8	11	17	Triple Spike	ND	Triple Spike	Four Spikes	Eight Spikes
468	16	13	12	15	Triple Spike	ND	Block	Four Spikes	Seven Spikes
469	11	15	10	14	Triple Spike	Triple Spike	Block	Four Spikes	Five Spikes
470	13	8	15	15	Triple Spike	Triple Spike	Triple Spike	Triple Spike	Five Spikes
471	16	9	12	25	Triple Spike	Triple Spike	Triple Spike	Four Spikes	Five Spikes/Block
472	16	8	11	19	Triple Spike	ND	Triple Spike	Four Spikes	Five Spikes
473	10	18	9	17	Triple Spike	ND	Block	Triple Spike	Six Spikes
474	14	14	7	19	Triple Spike	Triple Spike	Block	Triple Spike	Eight Spikes
475	10	17	9	17	Triple Spike	Triple Spike	Block	Spike	Seven Spikes
476	18	12	9	12	Double Spike	ND	Triple Spike	Double Spike	Four Spikes
477	16	8	10	9	Double Spike	ND	Four Spikes	Triple Spike	Four Spikes
478	7	10	7	14	Double Spike	Triple Spike	Four Spikes	Triple Spike	Eight Spikes
479	13	6	7	13	Double Spike	ND	Four Spikes	Triple Spike	Five Spikes
480	12	6	12	12	Triple Spike	Triple Spike	Triple Spike	Triple Spike	Four Spikes
481	11	6	16	17	Double Spike	ND	Triple Spike	Triple Spike	Block/Dbl. Spike
482	9	6	6	17	Triple Spike	Triple Spike	Triple Spike	Triple Spike	Eleven Spikes
483	6	6	7	17	Double Spike	Triple Spike	Triple Spike	Triple Spike	Four Spikes
484	7	9	9	21	Double Spike	Triple Spike	Triple Spike	Triple Spike	Block/Spike
485	9	7	6	12	Double Spike	Double Spike	Double Spike	Triple Spike	Four Spikes
486	12	10	8	14	Double Spike	Four Spikes	Double Spike	Triple Spike	Block/Spike
487	12	7	6	14	Double Spike	Four Spikes	Triple Spike	Triple Spike	Four Spikes
488	12	5	5	10	Suppressed	Triple Spike	Spike	Double Spike	Triple Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
489	ND	10	ND	15	Suppressed	ND	Double Spike	ND	Triple Spike
490	15	11	7	17	Double Spike	Triple Spike	Four Spikes	Double Spike	Four Spikes
491	8	7	9	14	Double Spike	Four Spikes	Triple Spike	Double Spike	Four Spikes
492	18	7	14	10	Double Spike	Six Spikes	Triple Spike	Triple Spike	Five Spikes
493	14	10	27	32	Double Spike	Triple Spike	Double Spike	Block/Dbl. Spike	Block/Triple Spike
494	ND	ND	ND	ND	ND	ND	ND	ND	ND
495	5	6	12	9	Double Spike	Double Spike	Triple Spike	Four Spikes	Triple Spike
496	5	14	14	12	Block	Double Spike	Five Spikes	Four Spikes	Seven Spikes
497	7	9	7	11	Double Spike	Four Spikes	Four Spikes	Double Spike	Five Spikes
498	6	7	6	13	Double Spike	Triple Spike	Triple Spike	Double Spike	Five Spikes
499	8	4	7	26	Double Spike	Four Spikes	Double Spike	Double Spike	Block/Six Spikes
500	8	7	17	23	Triple Spike	Triple Spike	Triple Spike	Block/Spike	Block/Six Spikes
501	6	6	12	21	Double Spike	Triple Spike	Triple Spike	Triple Spike	Six Spikes
502	5	6	9	28	Double Spike	Double Spike	Triple Spike	Double Spike	Six Spikes
503	5	6	8	17	Spike	Double Spike	Double Spike	Triple Spike	Six Spikes
504	6	8	10	23	Spike	Double Spike	Four Spikes	Triple Spike	Six Spikes
505	5	7	9	21	Spike	Double Spike	Double Spike	Triple Spike	Block/Five Spikes
506	5	7	11	22	Double Spike	Double Spike	Triple Spike	Double Spike	Block/Dbl. Spike
507	9	9	14	18	Spike	Triple Spike	Four Spikes	Triple Spike	Six Spikes
508	6	5	8	19	Double Spike	Double Spike	Double Spike	Triple Spike	Six Spikes
509	6	8	7	17	Double Spike	Double Spike	Triple Spike	Triple Spike	Four Spikes
510	17	7	7	11	Double Spike	Five Spikes	Spike	Five Spikes	Six Spikes
511	12	6	15	16	Double Spike	Five Spikes	Double Spike	Six Spikes	Seven Spikes
512	15	5	13	ND	Double Spike	Five Spikes	Triple Spike	Six Spikes	ND
513	14	8	13	17	Double Spike	Triple Spike	Double Spike	Four Spikes	Block/Dbl. Spike
514	18	3	10	14	Double Spike	Four Spikes	Spike	Five Spikes	Block/Spike
515	15	5	10	ND	Double Spike	Four Spikes	Double Spike	Five Spikes	ND
516	12	5	12	14	Double Spike	Triple Spike	Triple Spike	Triple Spike	Six Spikes
517	14	6	16	ND	Funnel	Five Spikes	Double Spike	Five Spikes	ND
518	15	7	12	25	Double Spike	Four Spikes	Double Spike	Four Spikes	Block/Dbl. Spike
519	17	9	10	25	Double Spike	Five Spikes	Double Spike	Triple Spike	Block/Dbl. Spike
520	17	6	10	9	Double Spike	Four Spikes	Triple Spike	Four Spikes	Four Spikes
521	14	9	11	ND	Double Spike	Four Spikes	Double Spike	Triple Spike	ND
522	17	5	14	ND	Double Spike	Triple Spike	Spike	Four Spikes	ND
523	16	6	13	16	Triple Spike	Five Spikes	Double Spike	Eight Spikes	Six Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
524	21	6	8	15	Triple Spike	Block/Triple Spike	Spike	Double Spike	Block/Spike
525	15	7	9	12	Triple Spike	Four Spikes	Spike	Five Spikes	Five Spikes
526	13	7	14	19	Triple Spike	Five Spikes	Double Spike	Triple Spike	Block/Triple Spike
527	19	7	12	ND	Triple Spike	Six Spikes	Four Spikes	Five Spikes	ND
528	15	8	9	ND	Triple Spike	Four Spikes	Triple Spike	Triple Spike	ND
529	14	7	8	ND	Triple Spike	Five Spikes	Triple Spike	Four Spikes	ND
530	10	12	13	ND	Triple Spike	Four Spikes	Double Spike	Four Spikes	ND
531	13	10	8	ND	Triple Spike	Four Spikes	Five Spikes	Triple Spike	ND
532	19	6	10	ND	Triple Spike	Five Spikes	Double Spike	Four Spikes	ND
533	17	7	26	ND	Triple Spike	Five Spikes	Double Spike	Block/Dbl. Spike	ND
534	18	14	7	ND	Triple Spike	Triple Spike	Block	Triple Spike	ND
535	15	10	14	ND	Triple Spike	Five Spikes	Five Spikes	Four Spikes	ND
536	15	10	9	ND	Triple Spike	Four Spikes	Four Spikes	Four Spikes	ND
537	10	6	15	ND	Triple Spike	Four Spikes	Spike	Six Spikes	ND
538	13	11	13	ND	Triple Spike	Four Spikes	Block	Five Spikes	ND
539	ND	5	14	ND	Many Spikes	ND	Five Spikes	Seven Spikes	ND
540	15	5	11	ND	Triple Spike	Triple Spike	Triple Spike	Four Spikes	ND
541	18	6	11	ND	Triple Spike	Triple Spike	Spike	Five Spikes	ND
542	22	7	18	14	Triple Spike	Four Spikes	Triple Spike	Six Spikes	Triple Spike
543	20	9	17	25	Triple Spike	Block/Triple Spike	Four Spikes	Six Spikes	Block/Four Spikes
544	14	6	9	ND	Triple Spike	Six Spikes	Double Spike	Four Spikes	ND
545	20	11	19	ND	Triple Spike	Five Spikes	Double Spike	Six Spikes	ND
546	13	5	12	ND	Triple Spike	Five Spikes	Double Spike	Triple Spike	ND
547	9	4	8	ND	Triple Spike	Four Spikes	Double Spike	Triple Spike	ND
548	15	6	15	17	Triple Spike	Four Spikes	Triple Spike	Six Spikes	Block/Spike
549	22	20	17	ND	Triple Spike	Block/Four Spikes	Block	Six Spikes	ND
550	26	7	14	ND	Triple Spike	Double Block	Four Spikes	Four Spikes	ND
551	15	5	9	ND	Triple Spike	Five Spikes	Double Spike	Five Spikes	ND
552	50	12	15	5	Triple Spike	Block/Spike	Block	Block/Spike	Double Spike
553	41	12	16	12	Triple Spike	Double Block	Funnel	Six Spikes	Six Spikes
554	21	8	20	10	Triple Spike	Block/Dbl.Spike	Spike	Bell/Spike	Triple Spike
555	29	13	20	11	Triple Spike	Block/Spike	Block	Four Spikes	Triple Spike
556	25	10	16	8	Funnel	Block/Spike	Spike	Block	Spike
557	18	10	17	23	Triple Spike	Five Spikes	Spike	Six Spikes	Block/Five Spikes
558	18	6	21	23	Triple Spike	Four Spikes	Double Spike	Four Spikes	Block/Triple Spike

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
559	ND	ND	ND	ND	ND	ND	ND	ND	ND
560	27	15	23	10	Triple Spike	Block/Spike	Funnel	Double Spike	Four Spikes
561	ND	ND	ND	ND	Triple Spike	ND	ND	ND	ND
562	19	8	24	10	Triple Spike	Block/Spike	Spike	Block/Spike	Triple Spike
563	18	9	18	ND	Triple Spike	Five Spikes	Triple Spike	Seven Spikes	ND
564	15	5	10	30	Triple Spike	Triple Spike	Spike	Four Spikes	Block/Triple Spike
565	9	6	12	9	Suppressed	Double Spike	Spike	Double Spike	Double Spike
566	18	5	28	13	Block/Spike	Block/Dbl.Spike	Spike	Block/Dbl. Spike	Five Spikes
567	17	8	20	11	Block/Spike	Block/Dbl.Spike	Double Spike	Five Spikes	Five Spikes
568	15	4	20	20	Block/Spike	Four Spikes	Spike	Block/Triple Spike	Block
569	ND	ND	ND	ND	ND	ND	ND	ND	ND
570	16	13	10	14	Double Spike	Block	Block	Double Spike	Triple Spike
571	13	14	11	19	Funnel/Spike	Four Spikes	Block	Block	Four Spikes
572	46	9	25	ND	Funnel/Spike	Block	Spike	Block/Dbl. Spike	ND
573	19	16	16	ND	Funnel/Spike	Six Spikes	Block/Spike	Four Spikes	ND
574	15	15	8	14	Funnel/Spike	Four Spikes	Funnel	Four Spikes	Double Spike
575	15	12	12	15	Funnel/Spike	Four Spikes	Funnel	Four Spikes	Double Spike
576	12	10	20	ND	Triple Spike	Double Spike	Funnel	Block/Triple Spike	ND
577	14	10	17	ND	Triple Spike	Six Spikes	Spike	Six Spikes	ND
578	25	12	16	ND	Triple Spike	Block/Spike	Block	Double Spike	ND
579	30	16	19	13	Triple Spike	Block	Block	Block/Spike	Four Spikes
580	8	5	9	9	Triple Spike	Four Spikes	Spike	Triple Spike	Triple Spike
581	7	4	15	6	Triple Spike	Four Spikes	Double Spike	Six Spikes	Triple Spike
582	20	7	24	ND	Triple Spike	Five Spikes	Double Spike	Five Spikes	ND
583	18	13	30	17	Triple Spike	Five Spikes	Triple Spike	Block/Dbl. Spike	Seven Spikes
584	14	18	16	ND	Triple Spike	Five Spikes	Block	Five Spikes	ND
585	16	7	21	ND	Triple Spike	Six Spikes	Spike	Six Spikes	ND
586	21	7	24	15	Funnel	Triple Spike	Spike	Block/Dbl. Spike	Six Spikes
587	21	16	21	ND	Funnel	Block/Dbl.Spike	Five Spikes	Block/Triple Spike	ND
588	16	8	26	ND	Triple Spike	Five Spikes	Triple Spike	Block/Triple Spike	ND
589	21	8	27	12	Triple Spike	Six Spikes	Four Spikes	Block/Triple Spike	Five Spikes
590	16	5	28	ND	Triple Spike	Four Spikes	Spike	Block/Triple Spike	ND
591	17	9	24	ND	Triple Spike	Five Spikes	Triple Spike	Six Spikes	ND
592	15	7	18	ND	Triple Spike	Four Spikes	Triple Spike	Five Spikes	ND
593	13	5	23	ND	Funnel/Spike	Four Spikes	Spike	Block/Triple Spike	ND

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
594	15	6	15	ND	Triple Spike	Four Spikes	Double Spike	Five Spikes	ND
595	17	5	18	15	Funnel/Dbl. Spike	Four Spikes	Double Spike	Block/Dbl. Spike	Triple Spike
596	21	16	ND	ND	Funnel/Dbl. Spike	Four Spikes	Funnel	ND	ND
597	17	10	28	22	Funnel/Dbl. Spike	Four Spikes	Spike	Block/Triple Spike	Seven Spikes
598	15	8	16	ND	Funnel/Dbl. Spike	Four Spikes	Triple Spike	Triple Spike	ND
599	12	5	24	ND	Funnel/Dbl. Spike	Four Spikes	Double Spike	Triple Spike	ND
600	12	5	35	18	Funnel/Dbl. Spike	Four Spikes	Triple Spike	Block/Triple Spike	Five Spikes
601	14	5	24	10	Funnel/Dbl. Spike	Four Spikes	Double Spike	Block/Dbl. Spike	Double Spike
602	12	5	27	13	Triple Spike	Four Spikes	Double Spike	Block/Dbl. Spike	Six Spikes
603	22	4	25	13	Funnel/Dbl. Spike	Four Spikes	Double Spike	Triple Spike	Six Spikes
604	12	5	17	6	Funnel/Dbl. Spike	Five Spikes	Double Spike	Triple Spike	Triple Spike
605	11	4	16	8	Funnel/Dbl. Spike	Five Spikes	Double Spike	Four Spikes	Four Spikes
606	13	4	30	9	Funnel/Dbl. Spike	Four Spikes	Spike	Block/Triple Spike	Four Spikes
607	21	6	29	7	Funnel/Dbl. Spike	Five Spikes	Triple Spike	Block/Dbl. Spike	Triple Spike
608	17	5	33	ND	Funnel/Dbl. Spike	Four Spikes	Spike	Block/Dbl. Spike	ND
609	22	4	20	ND	Funnel/Dbl. Spike	Block/Triple Spike	Spike	Block/Spike	ND
610	17	7	15	13	Double Spike	Four Spikes	Double Spike	Five Spikes	Five Spikes
611	15	6	26	16	Double Spike	Four Spikes	Spike	Five Spikes	Seven Spikes
612	10	8	26	7	Funnel/Dbl. Spike	Four Spikes	Spike	Block/Dbl. Spike	Four Spikes
613	ND	ND	ND	ND	ND	ND	ND	ND	ND
614	ND	ND	ND	ND	Triple Spike	ND	ND	ND	ND
615	13	5	20	12	Funnel/Dbl. Spike	Five Spikes	Spike	Four Spikes	Six Spikes
616	16	9	17	8	Funnel/Dbl. Spike	Block/Spike	Double Spike	Five Spikes	Five Spikes
617	18	6	19	ND	Funnel/Dbl. Spike	Five Spikes	Double Spike	Six Spikes	ND
618	19	6	18	ND	Funnel/Dbl. Spike	Seven Spikes	Double Spike	Four Spikes	ND
619	16	5	12	ND	Funnel/Dbl. Spike	Six Spikes	Double Spike	Five Spikes	ND
620	10	10	17	ND	Double Spike	Four Spikes	Double Spike	Five Spikes	ND
621	ND	7	26	13	Double Spike	ND	Double Spike	Block/Dbl. Spike	Four Spikes
622	12	5	17	13	Double Spike	Triple Spike	Double Spike	Triple Spike	Four Spikes
623	13	7	33	ND	Funnel/Spike	Four Spikes	Double Spike	Block/Spike	ND
624	16	16	29	ND	Funnel/Dbl. Spike	Five Spikes	Funnel	Block/Dbl. Spike	ND
625	19	8	19	18	Funnel/Spike	Block/Triple Spike	Double Spike	Five Spikes	Seven Spikes
626	18	14	17	14	Triple Spike	Block/Triple Spike	Funnel	Triple Spike	Seven Spikes
627	9	5	18	21	Double Spike	Triple Spike	Spike	Four Spikes	Six Spikes
628	ND	ND	ND	13	ND	ND	ND	ND	Four Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
629	19	10	22	14	Triple Spike	Seven Spikes	Spike	Seven Spikes	Seven Spikes
630	20	7	23	ND	Triple Spike	Five Spikes	Spike	Seven Spikes	ND
631	12	14	ND	ND	Block	Triple Spike	Funnel	ND	ND
632	13	7	21	10	Double Spike	Five Spikes	Triple Spike	Seven Spikes	Six Spikes
633	20	9	14	11	Double Spike	Block/Dbl.Spike	Funnel	Five Spikes	Five Spikes
634	7	6	7	5	Double Spike	Triple Spike	Spike	Double Spike	Triple Spike
635	20	8	20	20	Double Spike	Bell	Spike	Bell/Spike	Five Spikes
636	6	5	25	13	Double Spike	Double Spike	Spike	Block/Four Spikes	Five Spikes
637	7	5	12	6	Double Spike	Spike	Spike	Five Spikes	Triple Spike
638	7	6	26	6	Double Spike	Triple Spike	Double Spike	Block/Dbl. Spike	Triple Spike
639	ND	7	17	4	ND	ND	Double Spike	Four Spikes	Double Spike
640	9	4	15	11	Double Spike	Four Spikes	Triple Spike	Five Spikes	Six Spikes
641	7	11	14	ND	Double Spike	Four Spikes	Block	Four Spikes	ND
642	11	8	11	9	Double Spike	Five Spikes	Triple Spike	Four Spikes	Five Spikes
643	7	5	20	ND	Double Spike	Double Spike	Triple Spike	Seven Spikes	ND
644	13	6	11	ND	Double Spike	Double Spike	Double Spike	Four Spikes	ND
645	6	7	12	ND	Double Spike	Double Spike	Double Spike	Five Spikes	ND
646	8	6	16	17	Double Spike	Triple Spike	Double Spike	Triple Spike	Block/Triple Spike
647	7	7	17	13	Double Spike	Four Spikes	Four Spikes	Six Spikes	Five Spikes
648	8	5	11	12	Double Spike	Triple Spike	Double Spike	Triple Spike	Seven Spikes
649	10	5	12	11	Double Spike	Five Spikes	Spike	Double Spike	Five Spikes
650	6	12	11	19	Double Spike	Spike	Double Spike	Triple Spike	Triple Spike
651	11	6	7	8	Double Spike	Triple Spike	Double Spike	Triple Spike	Four Spikes
652	12	5	ND	10	Double Spike	Triple Spike	Spike	ND	Six Spikes
653	11	7	10	13	Double Spike	Four Spikes	Double Spike	Four Spikes	Five Spikes
654	17	7	6	17	Double Spike	Five Spikes	Double Spike	Four Spikes	Six Spikes
655	10	9	21	16	Double Spike	Triple Spike	Four Spikes	Seven Spikes	Six Spikes
656	8	28	24	11	Double Spike	Four Spikes	Block/Spike	Block/Dbl. Spike	Six Spikes
657	9	7	20	22	Double Spike	Four Spikes	Spike	Four Spikes	Block/Triple Spike
658	10	8	17	23	Double Spike	Four Spikes	Spike	Four Spikes	Block/Four Spikes
659	8	6	17	19	Double Spike	Four Spikes	Triple Spike	Triple Spike	Block/Four Spikes
660	10	7	11	11	Double Spike	Five Spikes	Spike	Four Spikes	Six Spikes
661	12	10	20	9	Double Spike	Triple Spike	Spike	Triple Spike	Four Spikes
662	13	10	19	17	Double Spike	Four Spikes	Spike	Five Spikes	Block/Four Spikes
663	9	5	22	13	Double Spike	Triple Spike	Spike	Triple Spike	Five Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
664	8	10	21	12	Double Spike	Triple Spike	Spike	Triple Spike	Five Spikes
665	9	12	15	20	Double Spike	Five Spikes	Double Spike	Four Spikes	Six Spikes
666	9	13	30	8	Double Spike	Four Spikes	Four Spikes	Four Spikes	Six Spikes
667	8	7	15	19	Double Spike	Triple Spike	Spike	Four Spikes	Six Spikes
668	7	8	22	19	Double Spike	Four Spikes	Spike	Block/Triple Spike	Block/Five Spikes
669	8	5	17	ND	Double Spike	Four Spikes	Double Spike	Block/Triple Spike	ND
670	8	13	13	15	Double Spike	Five Spikes	Funnel	Triple Spike	Four Spikes
671	13	18	13	ND	Double Spike	Triple Spike	Block/Spike	Five Spikes	ND
672	13	20	19	ND	Double Spike	Six Spikes	Funnel/Dbl.Spike	Five Spikes	ND
673	14	17	25	ND	Triple Spike	Five Spikes	Funnel/Dbl.Spike	Seven Spikes	ND
674	14	14	22	ND	Triple Spike	Triple Spike	Triple Spike	Block/Four Spikes	ND
675	12	11	27	ND	Double Spike	Six Spikes	Four Spikes	Block/Four Spikes	ND
676	16	11	13	15	Double Spike	Five Spikes	Triple Spike	Five Spikes	Seven Spikes
677	11	17	15	12	Double Spike	Six Spikes	Double Spike	Six Spikes	Five Spikes
678	ND	ND	ND	ND	ND	ND	ND	ND	ND
679	9	8	247		Double Spike	Five Spikes	Triple Spike	Block/Four Spikes	ND
680	9	11	24	19	Double Spike	Five Spikes	Four Spikes	Five Spikes	Seven Spikes
681	9	3	ND	7	Double Spike	Four Spikes	Double Spike	ND	Triple Spike
682	ND	ND	ND	ND	ND	ND	ND	ND	ND
683	17	7	14	17	Double Spike	Five Spikes	Double Spike	Four Spikes	Five Spikes
684	15	12	24	8	Double Spike	Four Spikes	Triple Spike	Five Spikes	Four Spikes
685	16	9	17	14	Double Spike	Four Spikes	Spike	Triple Spike	Funnel/Dbl. Spike
686	14	20	32	ND	Double Spike	Six Spikes	Funnel/Triple Spike	Seven Spikes	ND
687	20	16	22	24	Double Spike	Five Spikes	Five Spikes	Block/Four Spikes	Six Spikes
688	14	11	25	ND	Double Spike	Five Spikes	Triple Spike	Six Spikes	ND
689	12	10	18	20	Double Spike	Five Spikes	Four Spikes	Eight Spikes	Eight Spikes
690	11	16	19	ND	Double Spike	Four Spikes	Five Spikes	Eight Spikes	ND
691	12	12	26	ND	Double Spike	Five Spikes	Double Spike	Block/Six Spikes	ND
692	18	10	36	ND	Double Spike	Five Spikes	Five Spikes	Block/Six Spikes	ND
693	17	12	29	ND	Double Spike	Six Spikes	Triple Spike	Nine Spikes	ND
694	13	11	33	ND	Double Spike	Six Spikes	Triple Spike	Block/Seven Spikes	ND
695	12	12	24	ND	Double Spike	Four Spikes	Triple Spike	Seven Spikes	ND
696	12	12	29	ND	Double Spike	Five Spikes	Four Spikes	Ten Spikes	ND
697	11	12	26	ND	Double Spike	Four Spikes	Funnel/Spike	Block/Triple Spike	ND
698	13	15	33	ND	Double Spike	Five Spikes	Funnel/Dbl.Spike	Six Spikes	ND

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
699	16	18	28	16	Double Spike	Five Spikes	Four Spikes	Six Spikes	Nine Spikes
700	15	12	25	ND	Double Spike	Five Spikes	Four Spikes	Six Spikes	ND
701	15	16	24	ND	Triple Spike	Four Spikes	Funnel	Block/Five Spikes	ND
702	10	16	32	ND	Double Spike	Four Spikes	Funnel/Four Spikes	Nine Spikes	ND
703	15	18	29	ND	Double Spike	Four Spikes	Four Spikes	Eight Spikes	ND
704	14	12	20	15	Funnel	Double Spike	Block	Seven Spikes	Triple Spike
705	11	7	31	11	Funnel	Double Spike	Spike	Block/Triple Spike	ND
706	12	13	30	ND	Double Spike	Triple Spike	Four Spikes	Six Spikes	ND
707	11	10	18	14	Double Spike	Triple Spike	Spike	Double Spike	Triple Spike
708	15	16	26	15	Double Spike	Triple Spike	Block/Spike	Six Spikes	Five Spikes
709	14	18	26	20	Double Spike	Five Spikes	Five Spikes	Seven Spikes	Seven Spikes
710	10	17	27	23	Double Spike	Triple Spike	Block	Funnel/Triple Spike	Block/Dbl.Spike
711	12	13	32	ND	Double Spike	Four Spikes	Double Spike	Five Spikes	ND
712	13	13	27	24	Double Spike	Four Spikes	Funnel	Five Spikes	Block/Four Spikes
713	13	14	32	ND	Double Spike	Five Spikes	Four Spikes	Six Spikes	ND
714	12	16	29	ND	Double Spike	Five Spikes	Five Spikes	Nine Spikes	ND
715	14	14	32	ND	Double Spike	Four Spikes	Triple Spike	Eight Spikes	ND
716	12	9	26	ND	Double Spike	Five Spikes	Spike	Five Spikes	ND
717	15	13	26	ND	Double Spike	Seven Spikes	Four Spikes	Nine Spikes	ND
718	9	12	21	ND	Double Spike	Triple Spike	Double Spike	Five Spikes	ND
719	11	10	28	ND	Double Spike	Four Spikes	Five Spikes	Five Spikes	ND
720	12	13	23	ND	Double Spike	Four Spikes	Funnel/Spike	Block/Triple Spike	ND
721	14	11	17	ND	Double Spike	Four Spikes	Triple Spike	Block/Dbl. Spike	ND
722	9	16	29	ND	Double Spike	Four Spikes	Five Spikes	Ten Spikes	ND
723	11	12	24	ND	Double Spike	Five Spikes	Four Spikes	Eight Spikes	ND
724	11	10	32	ND	Double Spike	Five Spikes	Five Spikes	Block/Seven Spikes	ND
725	10	13	31	ND	Double Spike	Five Spikes	Funnel/Triple Spike	Block/Seven Spikes	ND
726	13	13	27	ND	Double Spike	Five Spikes	Funnel/Dbl.Spike	Eight Spikes	ND
727	8	12	19	15	Double Spike	Four Spikes	Triple Spike	Six Spikes	Six Spikes
728	6	16	21	16	Double Spike	Spike	Block	Six Spikes	Six Spikes
729	8	15	21	13	Double Spike	Spike	Block	Six Spikes	Four Spikes
730	9	12	21	13	Double Spike	Four Spikes	Triple Spike	Block/Five Spikes	Four Spikes
731	12	8	23	ND	Double Spike	Four Spikes	Triple Spike	Seven Spikes	ND
732	7	10	17	14	Double Spike	Triple Spike	Spike	Block/Five Spikes	Six Spikes
733	7	11	19	ND	Double Spike	Triple Spike	Four Spikes	Five Spikes	ND

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
734	9	7	14	12	Double Spike	Spike	Spike	Triple Spike	Five Spikes
735	7	7	16	14	Double Spike	Triple Spike	Spike	Four Spikes	Five Spikes
736	10	7	16	ND	Double Spike	Spike	Double Spike	Five Spikes	ND
737	9	10	16	ND	Double Spike	Double Spike	Triple Spike	Eight Spikes	ND
738	6	10	18	14	Double Spike	Spike	Spike	Seven Spikes	Six Spikes
739	7	7	15	9	Double Spike	Spike	Triple Spike	Four Spikes	Six Spikes
740	8	13	19	17	Double Spike	Spike	Block/Spike	Block/Four Spikes	Block/Five Spikes
741	5	6	13	15	Double Spike	Double Spike	Spike	Triple Spike	Seven Spikes
742	4	11	15	13	Double Spike	Spike	Double Spike	Five Spikes	Six Spikes
743	3	7	23	11	Double Spike	Spike	Triple Spike	Five Spikes	Four Spikes
744	6	10	11	11	Double Spike	Double Spike	Spike	Triple Spike	Four Spikes
745	6	9	16	14	Double Spike	Triple Spike	Double Spike	Five Spikes	Seven Spikes
746	7	6	12	12	Double Spike	Triple Spike	Double Spike	Triple Spike	Six Spikes
747	4	12	24	12	Double Spike	Double Spike	Block	Block/Spike	Four Spikes
748	5	14	17	16	Funnel	Triple Spike	Block	Double Spike	Five Spikes
749	7	10	15	ND	Double Spike	Four Spikes	Four Spikes	Six Spikes	ND
750	7	10	15	16	Double Spike	Four Spikes	Triple Spike	Six Spikes	Seven Spikes
751	7	6	18	ND	Double Spike	Four Spikes	Triple Spike	Five Spikes	ND
752	6	5	12	ND	Double Spike	Triple Spike	Triple Spike	Five Spikes	ND
753	9	8	21	ND	Double Spike	Four Spikes	Four Spikes	Block/Triple Spike	ND
754	9	15	25	ND	Double Spike	Four Spikes	Block/Triple Spike	Block/Dbl. Spike	ND
755	8	7	18	14	Double Spike	Four Spikes	Double Spike	Block/Dbl. Spike	Seven Spikes
756	7	9	12	12	Double Spike	Triple Spike	Triple Spike	Triple Spike	Seven Spikes
757	ND	ND	ND	ND	ND	ND	ND	Triple Spike	ND
758	8	9	11	8	Double Spike	Four Spikes	Double Spike	Four Spikes	Five Spikes
759	8	11	15	11	Funnel	Double Spike	Triple Spike	Block/Spike	Triple Spike
760	7	7	16	12	Funnel	Spike	Double Spike	Double Spike	Triple Spike
761	5	4	10	13	Funnel	Spike	Double Spike	Five Spikes	Triple Spike
762	7	3	12	10	Double Spike	Double Spike	Spike	Double Spike	Six Spikes
763	6	10	25	14	Double Spike	Double Spike	Spike	Block/Spike	Five Spikes
764	6	8	12	16	Double Spike	Double Spike	Double Spike	Four Spikes	Seven Spikes
765	12	7	10	18	Triple Spike	Triple Spike	Triple Spike	Five Spikes	Six Spikes
766	9	13	8	8	Funnel	Triple Spike	Four Spikes	Five Spikes	Four Spikes
767	12	10	13	13	Funnel/Spike	Double Spike	Double Spike	Four Spikes	Four Spikes
768	12	7	5	11	Funnel/Spike	Triple Spike	Double Spike	Triple Spike	Four Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
769	11	7	11	16	Triple Spike	Four Spikes	Four Spikes	Triple Spike	Five Spikes
770	10	6	12	10	Triple Spike	Four Spikes	Double Spike	Five Spikes	Five Spikes
771	13	7	8	12	Triple Spike	Four Spikes	Double Spike	Four Spikes	Four Spikes
772	9	8	16	11	Triple Spike	Four Spikes	Triple Spike	Block/Spike	Four Spikes
773	12	8	13	11	Double Spike	Triple Spike	Double Spike	Four Spikes	Five Spikes
774	12	6	8	9	Triple Spike	Four Spikes	Triple Spike	Four Spikes	Five Spikes
775	17	6	10	11	Triple Spike	Four Spikes	Four Spikes	Five Spikes	Six Spikes
776	21	6	8	4	Double Spike	Block/Dbl. Spike	Double Spike	Four Spikes	Double Spike
777	10	4	4	4	Triple Spike	Triple Spike	Spike	Double Spike	Double Spike
778	14	9	8	8	Triple Spike	Five Spikes	Four Spikes	Four Spikes	Five Spikes
779	11	7	9	11	Triple Spike	Four Spikes	Triple Spike	Four Spikes	Four Spikes
780	13	7	12	10	Triple Spike	Four Spikes	Triple Spike	Four Spikes	Five Spikes
781	9	9	9	8	Triple Spike	Four Spikes	Four Spikes	Four Spikes	Five Spikes
782	13	7	6	13	Triple Spike	Five Spikes	Triple Spike	Four Spikes	Six Spikes
783	11	10	9	14	Triple Spike	Six Spikes	Triple Spike	Five Spikes	Six Spikes
784	16	7	9	11	Triple Spike	Six Spikes	Triple Spike	Five Spikes	Six Spikes
785	15	9	14	10	Triple Spike	Triple Spike	Four Spikes	Seven Spikes	Six Spikes
786	15	9	11	12	Triple Spike	Four Spikes	Triple Spike	Four Spikes	Five Spikes
787	6	6	8	7	Triple Spike	Triple Spike	Triple Spike	Triple Spike	Four Spikes
788	11	8	ND	9	Triple Spike	Four Spikes	Four Spikes	ND	Four Spikes
789	12	5	6	11	Triple Spike	Five Spikes	Four Spikes	Five Spikes	Seven Spikes
790	16	5	9	13	Triple Spike	Four Spikes	Triple Spike	Five Spikes	Seven Spikes
791	12	6	10	6	Triple Spike	Four Spikes	Triple Spike	Four Spikes	Double Spike
792	11	8	14	ND	Triple Spike	Triple Spike	Four Spikes	Seven Spikes	ND
793	11	10	8	11	Triple Spike	Five Spikes	Four Spikes	Six Spikes	Five Spikes
794	12	7	8	18	Triple Spike	Six Spikes	Six Spikes	Six Spikes	Seven Spikes
795	ND	ND	ND	ND	Triple Spike	ND	ND	ND	ND
796	ND	0	5	5	Triple Spike	ND	NA	Double Spike	Double Spike
797	4	0	7	5	Triple Spike	Double Spike	NA	Double Spike	Double Spike
798	ND	ND	ND	ND	Triple Spike	ND	ND	ND	ND
799	18	9	12	16	Triple Spike	Six Spikes	Triple Spike	Six Spikes	Six Spikes
800	ND	7	21	13	Triple Spike	ND	Spike	Block/Triple Spike	Five Spikes
801	15	6	12	8	Double Spike	Six Spikes	Double Spike	Five Spikes	Four Spikes
802	14	8	12	14	Triple Spike	Triple Spike	Triple Spike	Four Spikes	Five Spikes
803	12	8	13	12	Triple Spike	Four Spikes	Triple Spike	Four Spikes	Five Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
804	17	8	13	ND	Triple Spike	Triple Spike	Triple Spike	Eight Spikes	ND
805	14	5	8	16	Triple Spike	Triple Spike	Double Spike	Seven Spikes	Six Spikes
806	13	9	14	ND	Triple Spike	Four Spikes	Triple Spike	Five Spikes	ND
807	14	9	14	10	Triple Spike	Block	Triple Spike	Five Spikes	Eight Spikes
808	20	4	12	12	Double Spike	Double Spike	Double Spike	Five Spikes	Six Spikes
809	22	4	14	13	Double Spike	Block/Dbl. Spike	Double Spike	Five Spikes	Seven Spikes
810	22	9	18	12	Double Spike	Block	Four Spikes	Seven Spikes	Seven Spikes
811	10	7	16	12	Double Spike	Double Spike	Triple Spike	Four Spikes	Five Spikes
812	18	8	11	12	Double Spike	Block/Dbl. Spike	Four Spikes	Four Spikes	Five Spikes
813	18	8	7	ND	Double Spike	Double Spike	Triple Spike	Double Spike	ND
814	27	5	8	9	Double Spike	Block	Double Spike	Triple Spike	Four Spikes
815	34	10	9	6	Funnel	Block	Triple Spike	Triple Spike	Triple Spike
816	18	6	17	15	Double Spike	Four Spikes	Triple Spike	Six Spikes	Seven Spikes
817	17	6	20	ND	Double Spike	Block/Spike	Triple Spike	Six Spikes	ND
818	17	9	14	15	Funnel	Block/Dbl. Spike	Double Spike	Four Spikes	Five Spikes
819	41	5	13	14	Funnel	Block/Dbl. Spike	Spike	Four Spikes	Four Spikes
820	19	11	11	13	Funnel	Block/Dbl. Spike	Triple Spike	Five Spikes	Six Spikes
821	18	9	15	11	Funnel	Triple Spike	Double Spike	Four Spikes	Four Spikes
822	45	8	16	24	Funnel	Double Block	Double Spike	Double Spike	Block/Five Spikes
823	28	7	12	13	Funnel/Spike	Bell	Triple Spike	Double Spike	Four Spikes
824	30	5	9	14	Funnel	Double Spike	Triple Spike	Triple Spike	Seven Spikes
825	17	7	11	19	Funnel	Double Spike	Triple Spike	Triple Spike	Seven Spikes
826	28	7	10	ND	Double Spike	Block/Spike	Triple Spike	Four Spikes	ND
827	22	10	12	15	Funnel	Block/Spike	Four Spikes	Five Spikes	Seven Spikes
828	29	11	9	12	Funnel	Block/Dbl. Spike	Block	Triple Spike	Five Spikes
829	20	10	12	11	Funnel	Block/Dbl. Spike	Triple Spike	Five Spikes	Five Spikes
830	43	8	15	12	Funnel	Block	Spike	Five Spikes	Five Spikes
831	33	5	ND	13	Funnel	Double Block	Double Spike	ND	Five Spikes
832	20	9	12	8	Funnel	Four Spikes	Triple Spike	Four Spikes	Five Spikes
833	13	9	13	10	Funnel	Double Spike	Triple Spike	Four Spikes	Five Spikes
834	25	8	8	8	Funnel	Block	Double Spike	Triple Spike	Triple Spike
835	20	7	10	10	Funnel	Block	Triple Spike	Triple Spike	Triple Spike
836	40	5	11	ND	Double Spike	Block	Triple Spike	Four Spikes	ND
837	17	8	13	ND	Double Spike	Double Spike	Triple Spike	Five Spikes	ND
838	15	14	15	ND	Double Spike	Five Spikes	Six Spikes	Eight Spikes	ND

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
839	10	7	14	11	Double Spike	Triple Spike	Double Spike	Six Spikes	Five Spikes
840	13	6	13	11	Triple Spike	Four Spikes	Triple Spike	Six Spikes	Five Spikes
841	13	3	8	14	Funnel	Block	Spike	Double Spike	Five Spikes
842	18	3	22	11	Funnel	Block/Spike	Spike	Block	Five Spikes
843	17	6	12	ND	Double Spike	Block/Spike	Double Spike	Eight Spikes	ND
844	15	6	13	10	Double Spike	Block/Spike	Double Spike	Triple Spike	Six Spikes
845	22	5	13	ND	Double Spike	Block/Dbl. Spike	Double Spike	Five Spikes	ND
846	25	4	8	14	Double Spike	Block/Dbl. Spike	Spike	Triple Spike	Four Spikes
847	28	3	14	10	Funnel	Block/Dbl. Spike	Spike	Four Spikes	Four Spikes
848	40	4	10	7	Funnel	Block	Spike	Double Spike	Four Spikes
849	25	0	7	12	Funnel	Block/Dbl. Spike	ND	Double Spike	Four Spikes
850	20	4	17	ND	Funnel	Triple Spike	Spike	Double Spike	ND
851	36	5	12	8	Double Spike	Block/Dbl. Spike	Spike	Four Spikes	Triple Spike
852	6	2	5	4	Triple Spike	Double Spike	Spike	Triple Spike	Double Spike
853	26	2	4	7	Double Spike	Block	Spike	Triple Spike	Triple Spike
854	38	5	11	16	Double Spike	Block/Dbl. Spike	Spike	Triple Spike	Five Spikes
855	32	5	6	13	Funnel	Block/Spike	Spike	Triple Spike	Five Spikes
856	28	6	12	11	Double Spike	Block/Triple Spike	Triple Spike	Triple Spike	Six Spikes
857	35	8	13	ND	Double Spike	Block/Spike	Triple Spike	Triple Spike	ND
858	22	12	15	15	Double Spike	Block/Triple Spike	Triple Spike	Triple Spike	Six Spikes
859	28	10	12	9	Double Spike	Double Spike	Spike	Four Spikes	Four Spikes
860	24	6	14	14	Double Spike	Triple Spike	Spike	Five Spikes	Six Spikes
861	11	9	24	12	Double Spike	Triple Spike	Double Spike	Block/Dbl. Spike	Five Spikes
862	17	6	17	ND	Double Spike	Block/Dbl. Spike	Triple Spike	Five Spikes	ND
863	28	4	21	11	Double Spike	Block/Dbl. Spike	Double Spike	Block/Four Spikes	Six Spikes
864	22	7	ND	ND	Double Spike	Block/Four Spikes	Triple Spike	ND	ND
865	6	8	18	8	Double Spike	Spike	Double Spike	Block/Four Spikes	Triple Spike
866	6	10	22	9	Double Spike	Double Spike	Spike	Triple Spike	Triple Spike
867	9	9	11	8	Funnel	Four Spikes	Spike	Four Spikes	Triple Spike
868	12	11	14	19	Double Spike	Five Spikes	Triple Spike	Double Spike	Five Spikes
869	12	7	19	8	Double Spike	Triple Spike	Spike	Five Spikes	Triple Spike
870	35	7	12	13	Double Spike	Block	Double Spike	Block	ND/56
871	14	11	16	16	Double Spike	Four Spikes	Double Spike	Block/Dbl. Spike	Five Spikes
872	10	6	14	13	Double Spike	Triple Spike	Spike	Block/Dbl. Spike	Five Spikes
873	14	6	10	12	Triple Spike	Triple Spike	Double Spike	Double Spike	Five Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
874	22	8	15	10	Triple Spike	Block	Double Spike	Block/Spike	Triple Spike
875	23	4	12	16	Double Spike	Block/Dbl. Spike	Double Spike	Triple Spike	Four Spikes
876	7	6	9	5	Double Spike	Double Spike	Double Spike	Triple Spike	Four Spikes
877	25	9	17	10	Double Spike	Block/Dbl. Spike	Spike	Block/Triple Spike	Four Spikes
878	11	7	11	13	Double Spike	Block	Spike	Double Spike	Four Spikes
879	34	7	12	10	Double Spike	Block/Spike	Spike	Four Spikes	Four Spikes
880	12	2	3	5	Triple Spike	Double Spike	Spike	Double Spike	Triple Spike
881	13	3	10	3	Triple Spike	Double Spike	Spike	Spike	Spike
882	10	0	9	5	Double Spike	Block/Spike	NA	Triple Spike	Triple Spike
883	10	2	6	3	Funnel	Triple Spike	Spike	Double Spike	Double Spike
884	22	4	13	12	Double Spike	Block/Dbl. Spike	Double Spike	Four Spikes	Six Spikes
885	29	8	17	11	Funnel	Block/Triple Spike	Double Spike	Block	Six Spikes
886	44	5	14	15	Double Spike	Double Block	Double Spike	Block/Spike	Six Spikes
887	50	14	11	ND	Double Spike	Block	Triple Spike	Triple Spike	ND
888	33	ND	ND	ND	Double Spike	Block/Triple Spike	ND	ND	ND
889	18	ND	ND	ND	Funnel	Double Spike	ND	ND	ND
890	21	7	12	ND	Double Spike	Block	Spike	Double Spike	ND
891	26	12	14	13	Double Spike	Block	Triple Spike	Six Spikes	Six Spikes
892	20	5	14	9	Funnel	Block/Spike	Triple Spike	Double Spike	Four Spikes
893	40	8	5	12	Funnel	Block	Spike	Double Spike	Triple Spike
894	62	8	8	9	Funnel	Block	Spike	Double Spike	Triple Spike
895	40	6	9	10	Funnel	Block	Spike	Four Spikes	Four Spikes
896	45	8	15	12	Funnel	Double Block	Spike	Block	Triple Spike
897	70	8	11	ND	Funnel	Block	Triple Spike	Five Spikes	ND
898	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
899	56	6	6	9	Funnel	Block	Double Spike	Double Spike	Four Spikes
900	55	10	6	13	Funnel	Block	Double Spike	Double Spike	Six Spikes
901	54	7	8	10	Funnel	Block	Double Spike	Double Spike	Triple Spike
902	20	10	8	16	Funnel	Bell	Spike	Double Spike	Four Spikes
903	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
904	17	7	6	13	Funnel	Block	Spike	Double Spike	Block
905	10	12	10	12	Funnel	Four Spikes	Triple Spike	Four Spikes	Six Spikes
906	17	ND	ND	ND	Funnel	Triple Spike	ND	ND	ND
907	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
908	30	ND	ND	ND	Funnel	Block	ND	ND	ND

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
909	36	ND	ND	ND	Funnel	Block	ND	ND	ND
910	22	ND	ND	ND	Funnel	Triple Spike	ND	ND	ND
911	22	ND	ND	ND	Funnel	Triple Spike	ND	ND	ND
912	24	ND	ND	ND	Funnel	Triple Spike	ND	ND	ND
913	43	7	13	12	Funnel	Block	Spike	Block	Five Spikes
914	28	ND	ND	ND	Funnel	Double Spike	ND	ND	ND
915	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
916	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
917	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
918	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
919	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
920	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
921	16	ND	ND	ND	Funnel	Triple Spike	ND	ND	ND
922	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
923	22	ND	ND	ND	Funnel	Triple Spike	ND	ND	ND
924	28	8	12	ND	Funnel	Block/Spike	Double Spike	Double Spike	ND
925	25	17	12	17	Funnel	Block/Spike	Triple Spike	Double Spike	Four Spikes
926	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
927	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
928	29	ND	ND	ND	Funnel	Block/Spike	ND	ND	ND
929	39	4	10	11	Funnel	Block	Spike	Spike	Six Spikes
930	22	ND	ND	ND	Funnel	Block/Spike	ND	ND	ND
931	23	6	5	9	Funnel	Double Block	Double Spike	Double Spike	Triple Spike
932	25	8	15	8	Double Spike	Block/Dbl. Spike	Double Spike	Triple Spike	Four Spikes
933	17	4	10	11	Triple Spike	Block/Triple Spike	Spike	Double Spike	Four Spikes
934	39	5	8	7	Funnel	Block	Spike	Spike	Four Spikes
935	38	6	14	10	Funnel	Block	Spike	Double Spike	Four Spikes
936	27	10	13	16	Funnel	Block/Dbl. Spike	Spike	Triple Spike	Four Spikes
937	21	6	9	ND	Funnel	Block/Dbl. Spike	Double Spike	Triple Spike	ND
938	9	6	8	12	Double Spike	Double Spike	Spike	Triple Spike	Five Spikes
939	7	6	9	10	Double Spike	Double Spike	Spike	Spike	Four Spikes
940	8	6	14	10	Double Spike	Triple Spike	Double Spike	Four Spikes	Four Spikes
941	12	7	9	10	Double Spike	Triple Spike	Double Spike	Triple Spike	Four Spikes
942	18	7	10	8	Triple Spike	Triple Spike	Spike	Four Spikes	Five Spikes
943	17	5	7	10	Triple Spike	Block/Dbl. Spike	Double Spike	Double Spike	Four Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
944	8	9	11	13	Double Spike	Triple Spike	Double Spike	Four Spikes	Five Spikes
945	18	7	9	10	Triple Spike	Block/Spike	Double Spike	Four Spikes	Four Spikes
946	10	8	11	12	Double Spike	Triple Spike	Triple Spike	Four Spikes	Five Spikes
947	11	9	19	ND	Triple Spike	Four Spikes	Triple Spike	Five Spikes	ND
948	8	6	14	8	Triple Spike	Double Spike	Double Spike	Five Spikes	Four Spikes
949	ND	ND	ND	ND	Double Spike	ND	ND	ND	ND
950	14	4	11	10	Funnel	Block/Spike	Double Spike	Five Spikes	Five Spikes
951	6	3	13	6	Double Spike	Double Spike	Spike	Block/Spike	Triple Spike
952	8	8	7	7	Triple Spike	Triple Spike	Double Spike	Triple Spike	Triple Spike
953	9	6	10	5	Triple Spike	Triple Spike	Double Spike	Four Spikes	Double Spike
954	10	3	11	10	Double Spike	Triple Spike	Spike	Four Spikes	Triple Spike
955	7	3	10	9	Triple Spike	Double Spike	Double Spike	Four Spikes	Four Spikes
956	6	3	5	5	Triple Spike	Double Spike	Double Spike	Double Spike	Double Spike
957	5	13	10	5	Funnel	Double Spike	Double Spike	Triple Spike	Double Spike
958	6	6	7	7	Double Spike	Double Spike	Double Spike	Double Spike	Triple Spike
959	9	8	5	7	Triple Spike	Double Spike	Double Spike	Double Spike	Triple Spike
960	5	6	8	9	Funnel	Double Spike	Double Spike	Four Spikes	Triple Spike
961	10	15	17	ND	Double Spike	Triple Spike	Double Spike	Five Spikes	ND
962	8	6	ND	ND	Funnel	Triple Spike	Spike	ND	ND
963	17	5	15	10	Double Spike	Five Spikes	Spike	Five Spikes	Six Spikes
964	13	15	16	13	Double Spike	Four Spikes	Triple Spike	Five Spikes	Five Spikes
965	11	13	15	14	Double Spike	Four Spikes	Block	Five Spikes	Four Spikes
966	ND	8	14	ND	Double Spike	ND	Triple Spike	Triple Spike	ND
967	15	ND	ND	ND	Double Spike	Double Spike	ND	ND	ND
968	12	7	11	9	Double Spike	Four Spikes	Triple Spike	Triple Spike	Five Spikes
969	16	8	10	12	Double Spike	Five Spikes	Spike	Six Spikes	Four Spikes
970	19	9	25	13	Triple Spike	Five Spikes	Double Spike	Eight Spikes	Five Spikes
971	10	20	23	18	Funnel	Four Spikes	Block/Spike	Block/Five Spikes	Four Spikes
972	11	4	18	14	Triple Spike	Four Spikes	Double Spike	Five Spikes	Five Spikes
973	8	7	15	12	Triple Spike	Triple Spike	Double Spike	Four Spikes	Six Spikes
974	20	8	ND	ND	Double Spike	Four Spikes	Double Spike	ND	ND
975	19	6	21	14	Double Spike	Four Spikes	Double Spike	Seven Spikes	Six Spikes
976	9	9	15	9	Double Spike	Four Spikes	Double Spike	Seven Spikes	Triple Spike
977	14	9	14	10	Double Spike	Five Spikes	Triple Spike	Five Spikes	Four Spikes
978	11	11	14	13	Double Spike	Double Spike	Double Spike	Four Spikes	Four Spikes

	Related Reservoir Thicknesses				Related Reservoir Wireline Signature Shapes				
	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone	Oswego Limestone	Prue Sandstone	Upper Skinner Sandstone	Lower Skinner Sandstone	Red Fork Sandstone
979	9	5	16	8	Double Spike	Triple Spike	Double Spike	Four Spikes	Four Spikes
980	11	9	14	7	Double Spike	Double Spike	Spike	Five Spikes	Triple Spike
981	9	8	12	ND	Double Spike	Double Spike	Triple Spike	Five Spikes	ND
982	14	9	8	9	Funnel	Double Spike	Double Spike	Triple Spike	Four Spikes
983	6	9	15	ND	Block	Triple Spike	Triple Spike	Four Spikes	ND
984	8	5	17	11	Double Spike	Triple Spike	Double Spike	Triple Spike	Four Spikes
985	33	10	10	7	Funnel	Double Block	Spike	Double Spike	Double Spike
986	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
987	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
988	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
989	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
990	25	12	17	11	Funnel	Block/Dbl. Spike	Four Spikes	Triple Spike	Four Spikes
991	18	10	15	13	Funnel	Four Spikes	Double Spike	Four Spikes	Four Spikes
992	20	7	10	15	Funnel	Four Spikes	Double Spike	Double Spike	Five Spikes
993	14	7	5	6	Funnel	Block/Spike	Double Spike	Double Spike	Double Spike
994	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
995	ND	ND	ND	ND	Funnel	ND	ND	ND	ND
996	11	6	8	5	Funnel	Triple Spike	Spike	Triple Spike	Triple Spike
997	ND	7	9	6	Funnel	ND	Triple Spike	Triple Spike	Double Spike
998	13	6	8	9	Funnel	Double Spike	Double Spike	Five Spikes	Six Spikes
999	11	ND	ND	ND	Funnel	Double Spike	ND	ND	ND
1000	12	ND	ND	ND	Funnel	Double Spike	ND	ND	ND
1001	12	9	16	12	Funnel	Triple Spike	Double Spike	Triple Spike	Four Spikes

APPENDIX C

ADDITION OF DATA TO THE DATABASE: GENERAL EFFECT ON MAPPING VARIATION IN THICKNESS OF BARTLESVILLE "BB" SANDSTONE

APPENDIX C

ADDITION OF DATA TO THE DATABASE: GENERAL EFFECT ON MAPPING VARIATION IN THICKNESS OF BARTLESVILLE "BB" SANDSTONE

The database for the study area is large; it was composed from about 1000 wireline logs. Additional well logs were available. Questions evolved concerning the worth ofenlarging such an extensive database. Wireline logs of 117 wells in T 17N, R 8E were copied at Oklahoma Well Log Library, Tulsa, Oklahoma. Estimation of the value of this secondary database was attempted by addressing these questions:

1. Consider a map that shows variation in thickness of a rock-stratigraphic unit: Suppose that this map were augmented by a quantity of data posted well-by-well and revised appropriately. To what extent would the original map be retained in the second version?
2. To what extent would the original map be improved?
3. Would the additional information be efficient – i.e., worth the time and effort necessary to acquire the data, post them to the map, and revise the map?

To approximate the amount of change between two versions of a thickness-map, either of two attributes could be measured: contour lines, or "belts" of thickness bounded by two contour lines. The latter were measured from the thickness-map of the Bartlesville "BB Sandstone" (Plate P), because areas were determined easily by tracing of thickness-belts onto gridded paper.

A 20-sq.-mi. area of the Bartlesville "BB Sandstone" thickness-map (Plate P) was the test-area. The test was structured in this manner: Figure 30 shows patterns extracted from maps made as Trial 1 and Trial 2 of "BB Sandstone" thickness. The patterns show (a) the original belt of 20-to-40-ft. sandstone, mapped as Trial 1 (orange, plus white bordered by orange and purple), and (b) the belt of 20-to-40-ft. sandstone, mapped as Trial 2 (purple, plus white bordered by orange and purple). In Trial 1, the area encompassed by the 20-to-

40-ft. belt was 1007 units (orange pattern plus white bordered by orange and purple). After addition of data and construction of the map in Trial 2, 547 units of Trial 1 had not been changed; approximately approximately 54% of the belt of thickness shown as Trial 1 was retained. This fraction of the original map composed 60% of the map shown as Trial 2. Table 3 shows summary statistics relative to the several belts of thickness. On the average, (a) addition of 25 data-points resulted in retention of 58% of Trial 1, the original map, and (b) this retained portion composed 61% of the second version of thickness of the "BB Sandstone."

Question 1, "To what extent would the original map be retained in the second version?" can be answered on the basis of statistics shown in Table 1: First, consider the proposition that Trial 1 and Trial 2 are versions of one map, revised one time. Therefore, the quantification of change should take into account (a) the amount of version 1 that was retained, (2) the amount of version 1 that was eliminated, and, (3) because version 2 shows modification of the sand-belt in the attributes of area and location, the quantification of change should take into account the amount of version 2 that was added. Table 1 shows the amounts retained of Trial 1 in Trial 2 of the "BB Sandstone Thickness-map," belt-by-belt.

Question 2, "To what extent would the map be improved?" is not answerable on the basis of quantities. Trial 2 surely can be compared to Trial 1, as Trial 3 could be compared to Trial 2. But in the inevitable absence of a version of the thickness-map that does show the truth, the amount (extent) of improvement cannot be measured; but of course, addition of data and revision of a map leads a mapper intuitively to the assumption that of the series of such maps, the last interpretation is the best available approximation of the truth.

Question 3, "Would the additional information be efficient...?" is dependent on the purpose of the map. If a general documentation of extent and thickness of sandstone were the purpose of the endeavor, then the answer probably would be "No." If the purpose of mapping were to discover the up-dip margins of Bartlesville "BB" sandstone for the purpose of isolating small areas where petroleum might be trapped, then the answer certainly would be "Yes."

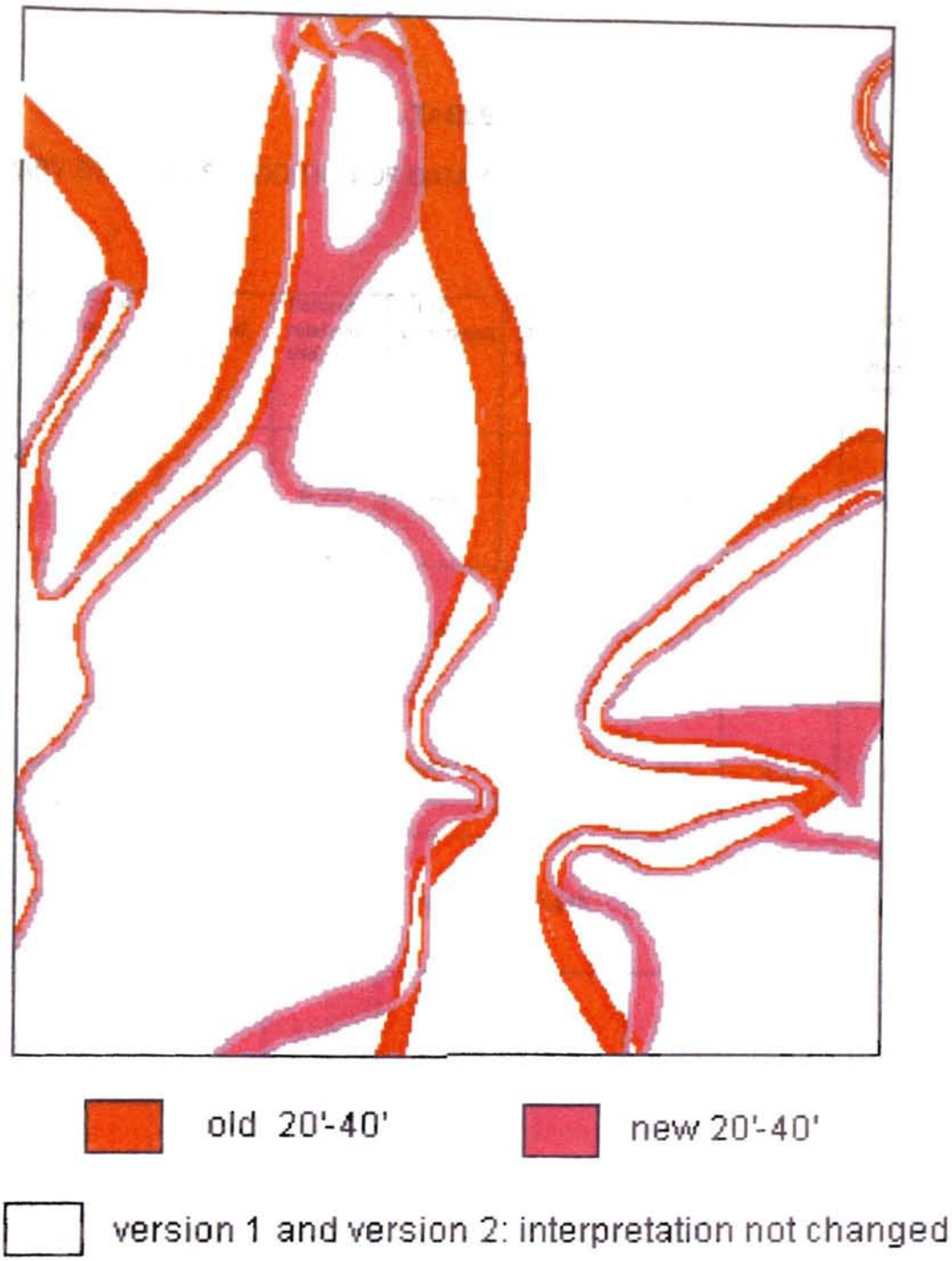


Figure 30. Thickness of Bartlesville "BB" sandstone. The originally mapped belt of 20-to-40 ft. sandstone is shown as orange, plus white bordered by orange and purple. The revised 20-to-40-ft. belt is shown as purple, plus white bordered by orange and purple. Summary statistics of the effect on mapping are shown in Table 3.

TABLE 3

SUMMARY STATISTICS: ADDITION OF DATA TO DATABASE, AND EFFECT ON MAPPING

Belt of thickness (FT.)	Total area, trial 1	Area retained, trial 1	Percent retained, trial 1	Area eliminated, trial 1	Percent eliminated, trial 1	Area added, trial 2	Total area*, trial 2	Percentage of trial 2 retained from trial 1
0' only	1646	1197	0.727	449	0.273	50	1247	0.96
0' – 20'	1172	525	0.448	647	0.552	161	686	0.765
20' – 40'	1007	547	0.543	460	0.457	363	910	0.601
40' – 60'	668	235	0.352	433	0.648	581	816	0.288
60' – 80'	844	446	0.528	398	0.472	542	988	0.451
80' – 100'	831	712	0.857	119	0.143	466	1178	0.604
Average			0.576		0.424			0.612

APPENDIX D

PHOTOGRAPHS OF CORES AND SUMMARY INTERPRETATION, PRUE, LOWER SKINNER AND BARTLESVILLE, SANDSTONES, GULF OIL NO. 9 BROWN, SEC. 33, T 17N, R 7E

APPENDIX D

PHOTOGRAPHS OF CORES AND SUMMARY INTERPRETATION, PRUE, LOWER SKINNER AND BARTLESVILLE, SANDSTONES, GULF OIL NO. 9 BROWN, SEC. 33, T 17N, R 7E

To describe properly the lithic characteristics of sandstones of the Bartlesville interval relative to the study area, acquisition and description of a core was necessary. Further, it was most desirable to acquire a core from a productive well. This would allow description not only of the lithic characteristics of sandstone of the Bartlesville interval, but description also of sandstone that has proven to be characterized by qualities favorable for production of petroleum.

In order to locate such a core, I contacted the Oklahoma Core Library in Norman, Oklahoma and asked for a printout that listed all of available cores from Creek County, Oklahoma. Having received and studied this list, it became apparent that there was no core within the study area that was either fully or partly composed of rock from the Bartlesville interval and also from a productive well. The next step, therefore, became to locate such a core from a well as close to the study area as possible. The core located was the Gulf Oil No. 9 P. Brown; this well is in Sec. 33, T 17N, R 7E.

The purpose of acquiring and describing this core was to be able to compare lithic characteristics of the Bartlesville in this core to findings from study of the Bartlesville in areas nearby (Mason, 1982). If study of the core were to yield results similar to characteristics described by Mason, then the generalized conclusion would be justified that lithic characteristics of Bartlesville sandstone(s) are similar throughout a large area. Testing of this hypothesis was stopped short when the fact was discovered that Mason had described this core (see Mason, 1982, p. 59-60).

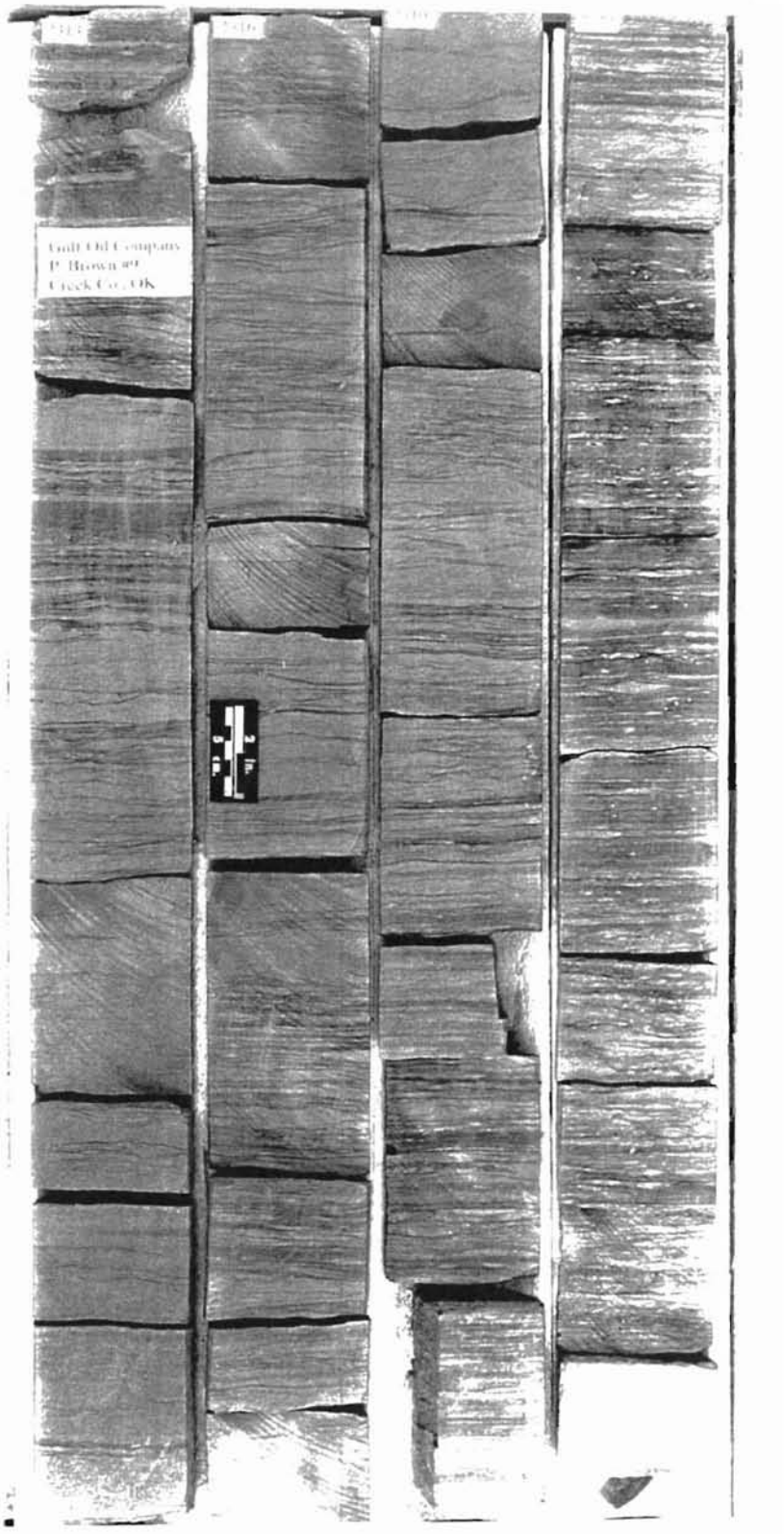
However, Mason did not address the Skinner and Prue sandstones, which also had been cored. The following discussion briefly addresses observations of the Skinner and

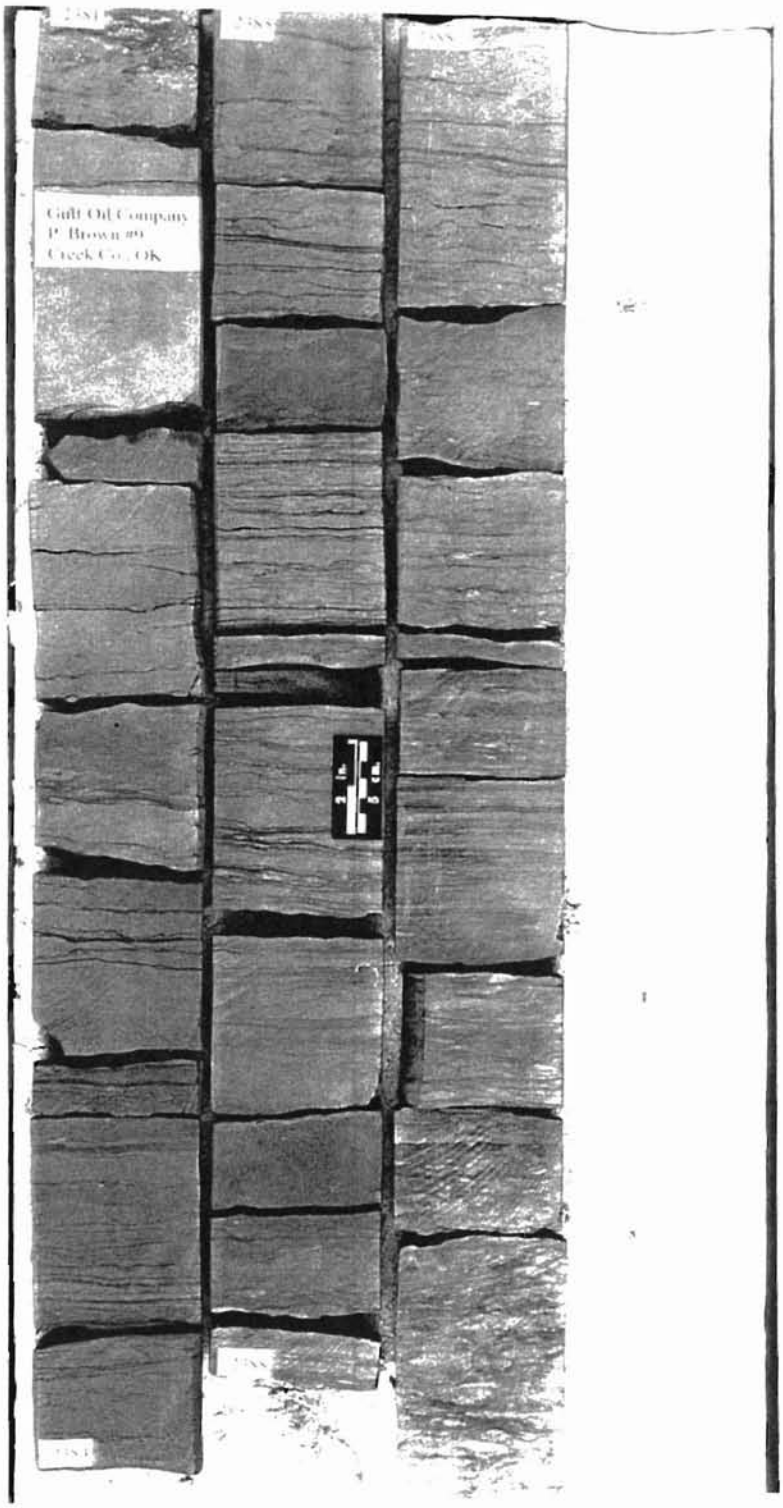
Prue in the core, and supplements Mason with regard to his description of the Bartlesville.

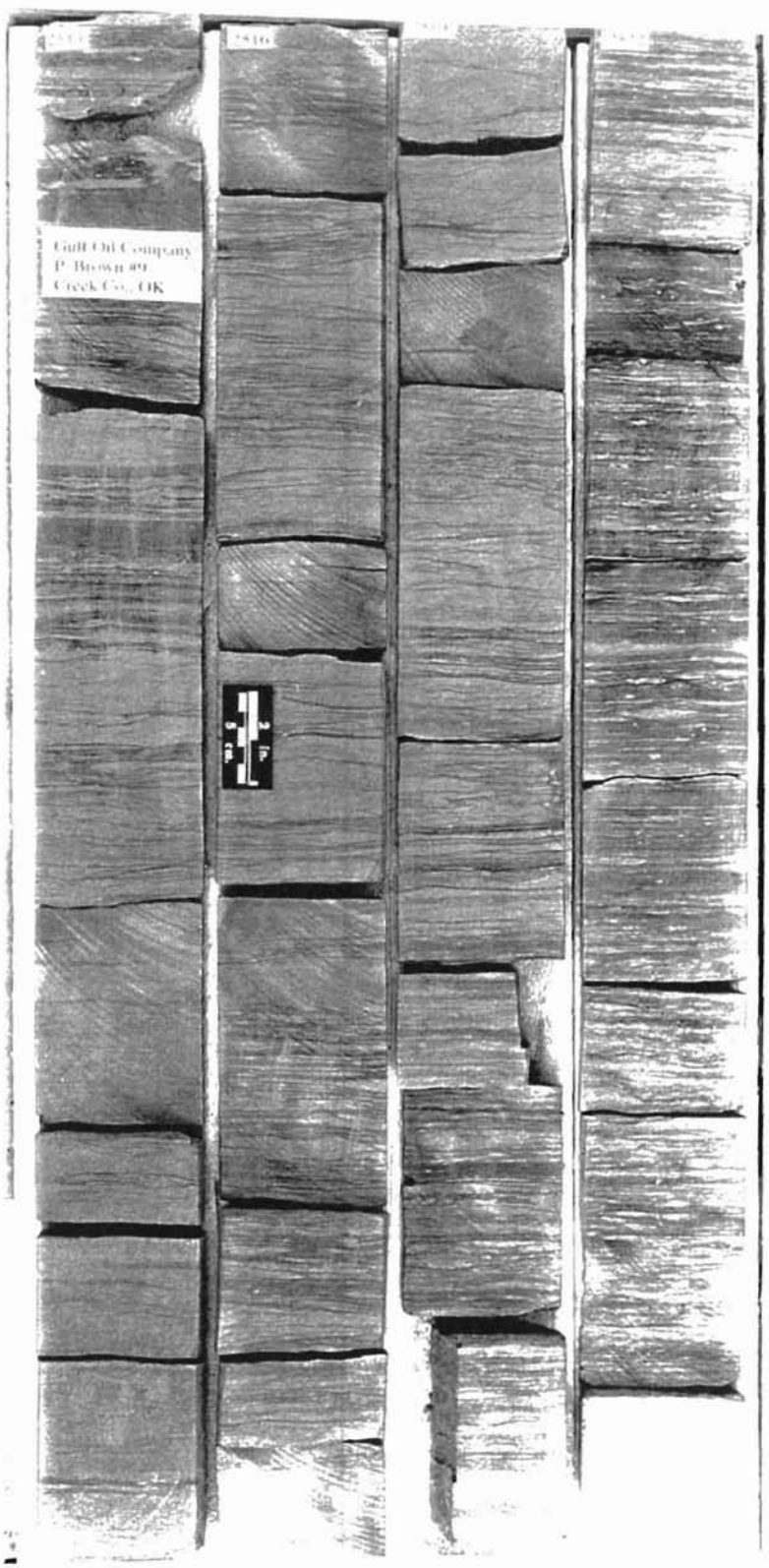
The Skinner and Prue intervals are very similar. In both, the grain size is predominantly clay/silt. Each is characterized by shale laminations, and each is bioturbated. These intervals were most likely cored because of resistivity "spikes" associated with each interval. However, the increase in resistivity probably is related to combined factors of small grain size, shale laminations, and bioturbated rock, which altogether caused the rock to be "tight."

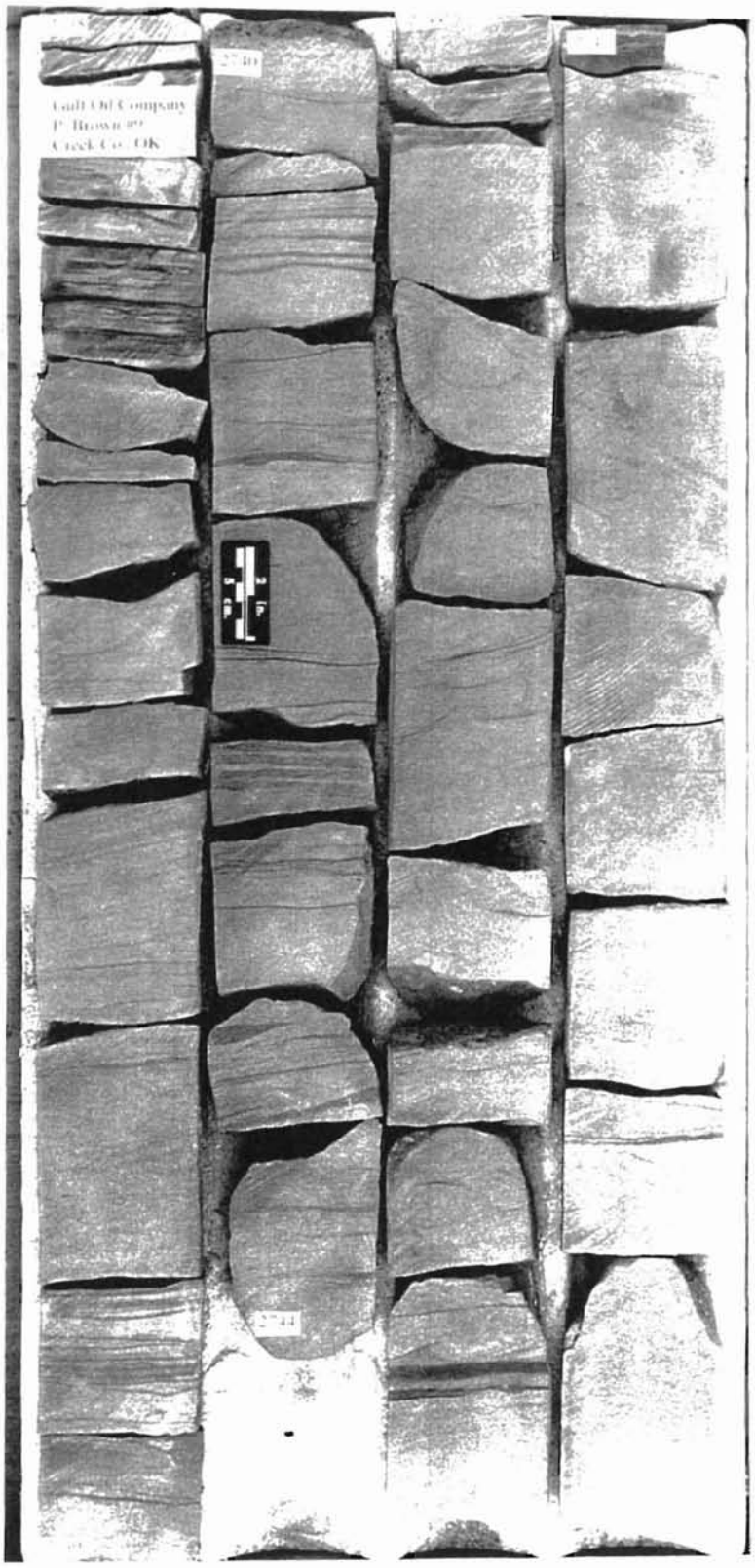
The Bartlesville is characterized throughout by cross-bedding. The rock could not be divided satisfactorily; it appears to be a single genetic unit. As such, the rock belongs solely to the BA half of the Bartlesville interval. Most likely, the rock cored represents a portion of a channel-fill sandstone.

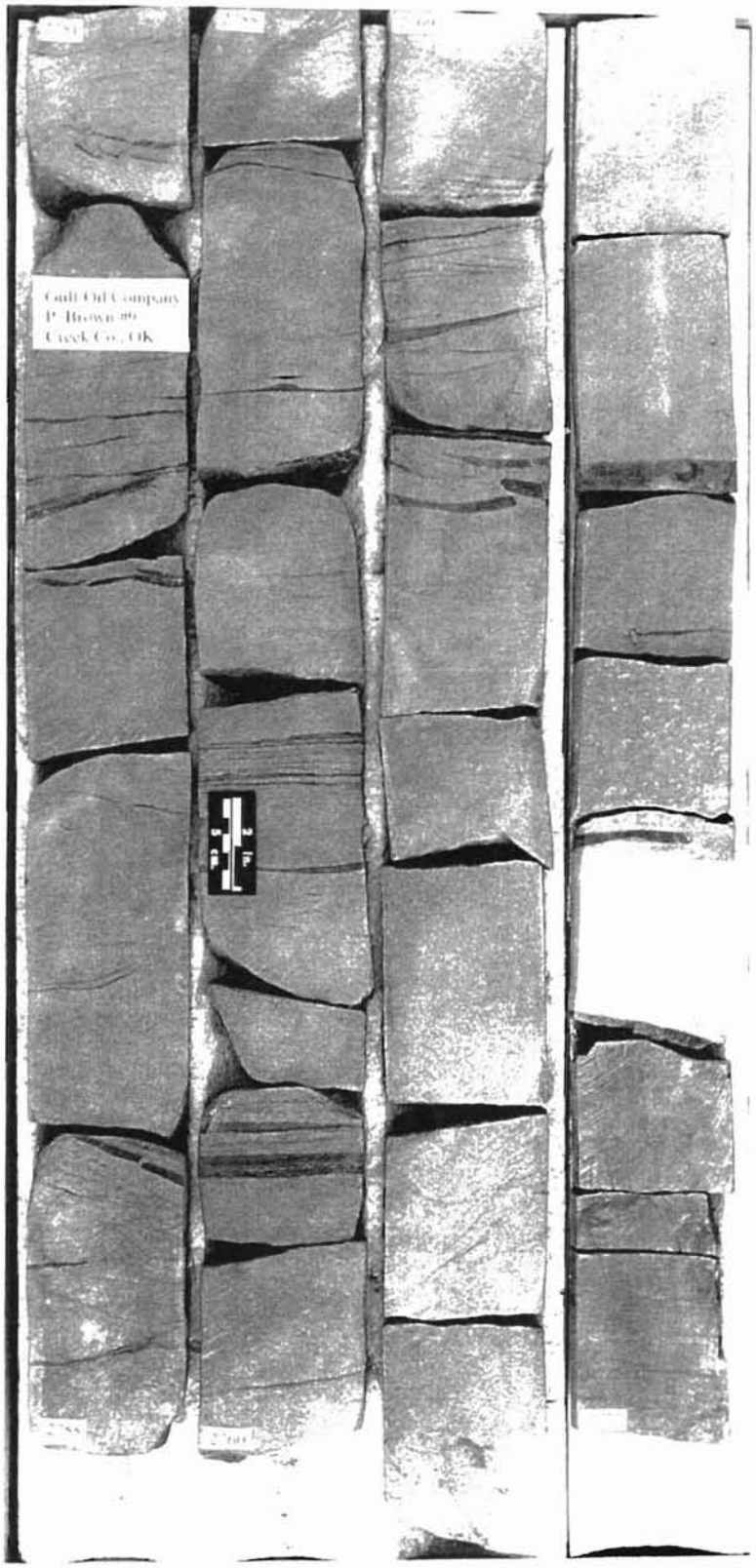
With regard to the work of Mason, one point of contention must be addressed. Mason described carbonate nodules within the Bartlesville. This was suspicious, however, because cross-bedding of the Bartlesville was distinguishable only because of dark, organic matter between cross-beds. Because of the organic material, deposition of this sandstone seems to have been related to a reducing environment. A sample of what Mason described as "carbonate nodules" was tested by X-ray diffraction. This test identified the sample as siderite. Siderite forms in a reducing environment. Thus, it is suggested that what Mason described are not "carbonate nodules," but are siderite layers "broken" as a result of overburden pressure.




Gulf Oil Company
P. Brown #9
Creek Co., OK


Gulf Oil Company
P. Brown #9
Creek Co., OK




Gulf Oil Company
P. Brown #9
Creek Co., Ok

APPENDIX E

SUGGESTIONS FOR FURTHER STUDY

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Suggestions For Further Study, For "Academic" Purposes

1. Some of the well logs of Bartlesville sandstone suggest that the rock may be a "low-resistivity" reservoir – i.e., it may produce (or have produced) oil and gas at localities where well logs indicate that the sandstone should produce almost entirely salt water. Detailed study of lithology of bit cuttings and of production histories of wells might be very informative.
2. Study of the structural configuration of the Provisional Base of Bartlesville marker-bed might permit testing of this hypothesis: A significant part of the structure of the Inola Limestone is owing to differential compaction.
3. Momentary inspection of the database and the base map shows that the number of wells in the study area is many more than 1000. Acquisition of additional wireline logs, scout cards and Oklahoma Corporation Commission logs should lead to significant refinement of structural contour maps and reservoir-thickness maps.

Suggestions For Further Study, For "Applied" Purposes

1. Plates B, D and E show local distribution of the Prue, Lower Skinner and Red Fork sandstones. Thorough search for additional information and embellishment of the maps might indicate localities in oilfields where productive in-fill wells could be drilled. Any such endeavor should take into account the likelihood that long-term production nearby may have depleted "undrilled" leases to a significant extent.

2. Detailed mapping of the Prue, Lower Skinner and Red Fork sandstones should result in description of geologically similar but undeveloped oilfields.
3. Geology of the perimeter of the study area could be described much more informatively if information from the bordering 1-mi.-wide "strips" were incorporated (for example, Plate X, Sec. 1, 12, 13, 24, 25 and 36, T 17N, R 7E).

APPENDIX F

EVIDENCE SUGGESTIVE OF FAULTING, DRAWN FROM CORRELATION CROSS-SECTIONS

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EVIDENCE SUGGESTIVE OF FAULTING, DRAWN FROM CORRELATION CROSS-SECTIONS

Plates F, G, H and I are correlation cross-sections. Well logs are not shown to horizontal scale. The rock-stratigraphic unit of reference is the Inola Limestone. This formation is shown in horizontal position, which almost certainly approximates closely its configuration at the time of its deposition.

Inspection of pairs of wells shows that thicknesses of some rock-stratigraphic intervals differ by amounts that seem to be so improbable as to suggest the effects of differential movement of blocks bounded by active faults. The principal hypothesis is that thick sequences of sediment were deposited in structurally and topographically low terrain, on the down-thrown sides of active faults. (The likelihood of obvious variation in thickness owing to differential compaction was taken into account; certainly this alternate hypothesis should be evaluated in testing that that arises from evidence set out below.)

Evidence is summarized below, in reference to pairs of well logs; logs are denoted by section, township and range, left-hand position first.

Plate F: Cross Section A-A'

21-18N-9E | 23-18N-9E	Sequence from Oswego Limestone to Provisional Base of Bartlesville marker is thicker in Sec. 23.

Plate G: Cross-Section B-B'

19-17N-8E | 21-17N-8E	Oswego Limestone-to-Inola Limestone section is thinner in Well 29. Provisional Base of Bartlesville marker higher.

Plate H: Cross-Section C-C'

16-18N-8E | 27-18N-8E	Sequence from Oswego Limestone to Provisional Base of Bartlesville is thicker than in Sec. 27.
16-17N-8E | 22-17N-8E	Overall, stratigraphic section of "Cherokee Group" thickens southward, but stratigraphic section from Oswego Limestone to Inola Limestone is thinner in Sec. 22.

Plate I: Cross-Section D-D'

33-18N-9E | 3-17N-9E | 9-17N-9E	Overall, stratigraphic section of "Cherokee Group" thickens southward, but in Sec. 3. Oswego Limestone is thicker than in Sec. 33 and Sec. 9. Pink Limestone-to-Inola Limestone section is thicker in Sec. 3.

APPENDIX G

CORRECTIONS OF ERRORS IN DATA REPORTED ABOUT WELLS

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CORRECTIONS OF ERRORS IN DATA REPORTED ABOUT WELLS

The database for the study area is large; it was composed from about 1000 wireline logs. Generally, subsurface elevations reported remained consistent with regional dip of the study area; exceptions were those wells that seem to have been affected by faulting (Appendix F). However, data obtained from records of three wells (in localities that seem to be unaffected by faulting) showed elevations that are anomalously high.

20-17N-9E Swearingin No. 1 Baker-Langspecht

Well checked against topographic map; surface elevation reported 100 ft. too high.

9-17N-9E Golden Eagle Development No. 3 Bussett, and

32-17N-9E Bristow Resources No. 6 Elias Kerns

Subsurface elevation of Inola Limestone reported approximatel 300 ft. too high. No evidence for faulting observed. Regional dip suggests that these wells were inappropriately plotted in R 9E; regional dip suggests that these wells almost certainly should have been plotted in R 10E.

PLATES

A, B, C, D, E, F,

G, H, I, J, K, L,

M, N, O, P, Q,

R, S, T, U, V,

and W.

18N 8E

18N 9E

17N 8E

17N 9E

BA/B

BC

BU

WELL STATUS

PROD	P&A	TYPE
●		Oil
✳	✳	Gas
✳	✳	Oil&G
⊹		Dry
⊙		Salt Water
⊙		Injection
○		Location

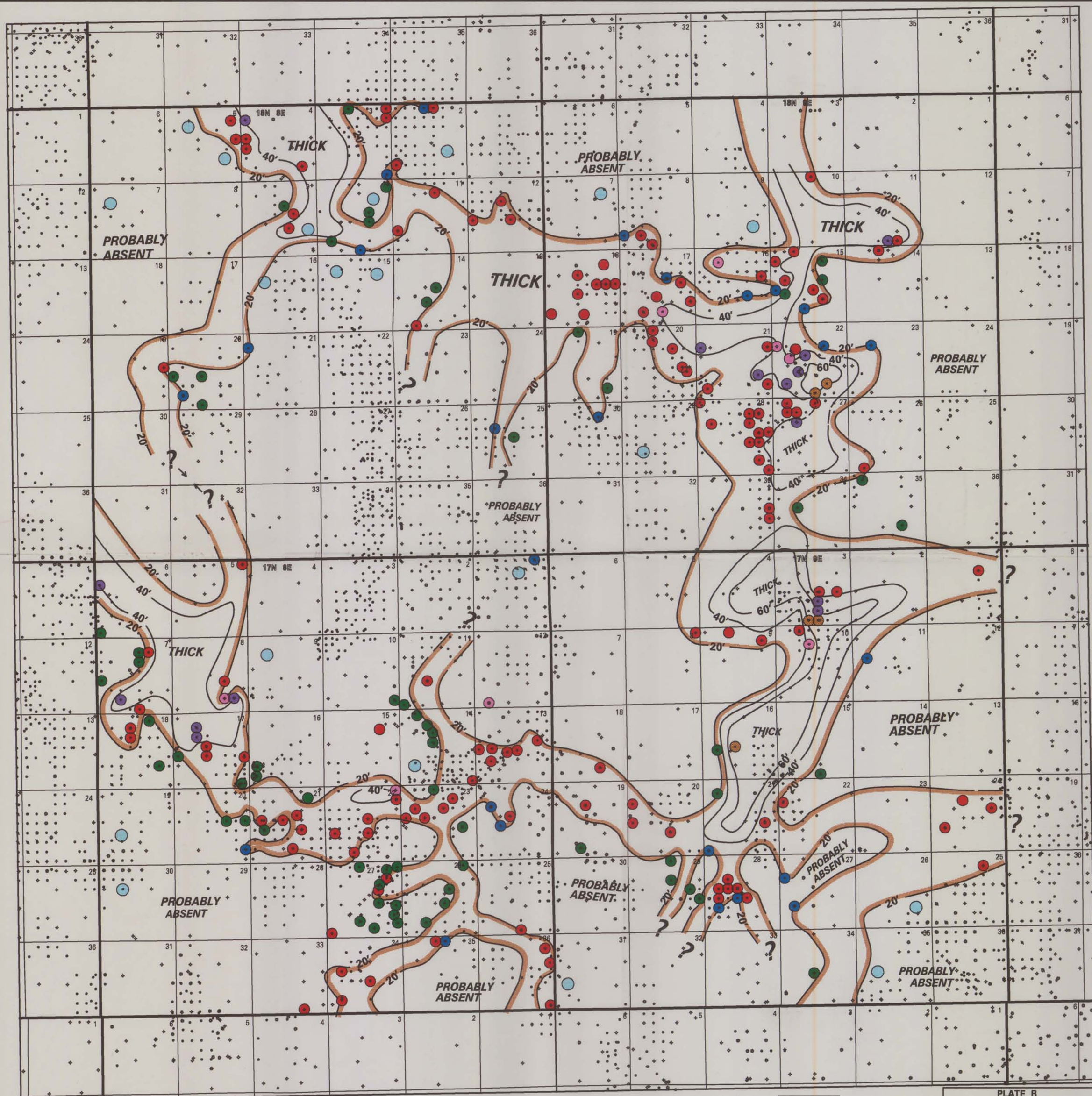
PLATE A

SPOT LOCATIONS OF "BA/B", "BC" AND "BU" Bartlesville Sandstones

Scale 1" = 4000'

T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore *1999*



In the quarter section is a well where the Lower Skinner is as thick as 18 or 19 feet. The 20-ft-thick terrain of Prue might be mappable, or mapped differently in this quarter-section, by reference to database.

- <20'
- Exactly 20'
- 21-40
- Exactly 40'
- 41-60
- Exactly 60'
- 61-80'

WELL STATUS

PROD	P&A	TYPE
●	●	Oil
✳	✳	Gas
✳	✳	O&G
◇		Dry
⊙		Salt Water
⊙		Injection
○		Location

PLATE B

Thickness Map,
PRUE SANDSTONE
C.I. = 20'
Scale 1" = 4000'

T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore 1999

18N 8E

17N 8E

Exactly 20′

> 20′

WELL STATUS

PROD	P&A	TYPE
		Oil
		Gas
		O&G
		Dry
		Salt Water
		Injection
		Location

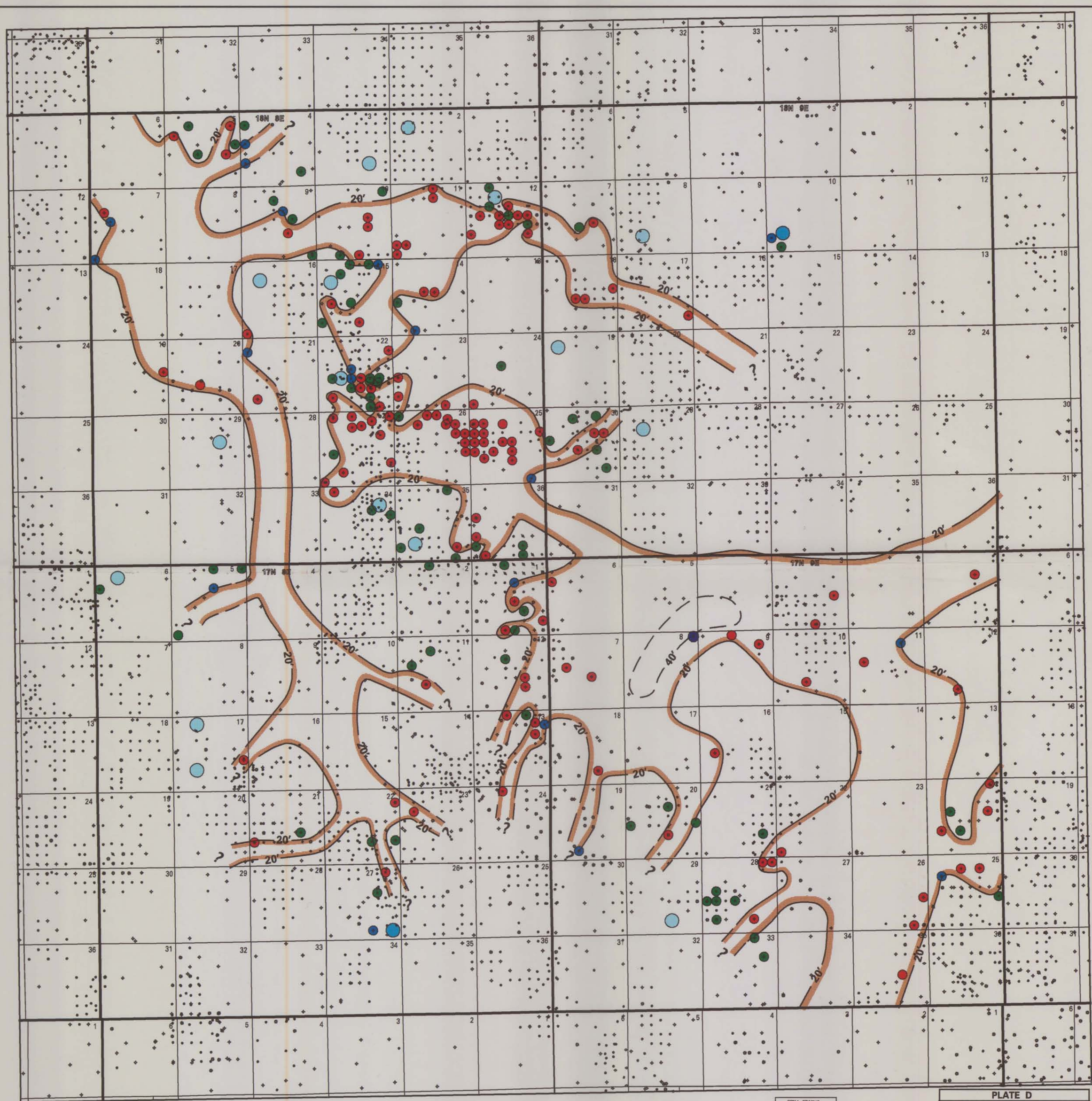
PLATE C

Distribution of
UPPER SKINNER SANDSTONE

Scale 1″ = 4000′

T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore *1999*



In the quarter section is a well where the Lower Skinner is as thick as 18 or 19 feet. The 20-ft-thick terrain of Lower Skinner might be mappable, or mapped differently in this quarter-section, by reference to database.

In the quarter-section are 2 wells where the Lower Skinner is 20 ft thick or thicker, but the 20-ft-thick terrain of Lower Skinner cannot be extended to the well if the basic rules of mapping are honored. The terrain of 20-ft-thick sandstone could be mapped if data were plotted well-by-well.

- 15-19'
- Exactly 20'
- Greater than 20', less than 40'
- 41-60'

WELL STATUS

PROD	P&A	TYPE
●	●	Oil
✳	✳	Gas
✳	✳	O&G
✧		Dry
⊙		Salt Water
☿		Injection
○		Location

PLATE D

Thickness Map,
LOWER SKINNER SANDSTONE
C.I. = 20'
Scale 1" = 2000'

T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore 1999

18N 8E

18N 9E

17N 8E

17N 9E

20'

ABSENT

40'

? ?

○ In the quarter section is a well where the Red Fork is as thick as 18 or 19 feet. The 20-ft-thick terrain of Red Fork might be mappable, or mapped differently in this quarter-section, by reference to database.

- 15-19'
- Exactly 20'
- Greater than 20', less than 40'

WELL STATUS

PROD	P&A	TYPE
●	●	Oil
✳	✳	Gas
✳	✳	O&G
◇	◇	Dry
⊙	⊙	Salt Water
☿	☿	Injection
○	○	Location

PLATE E

Thickness Map,
RED FORK SANDSTONE
C.I. = 20'
Scale 1" = 2000'

T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore *1999*

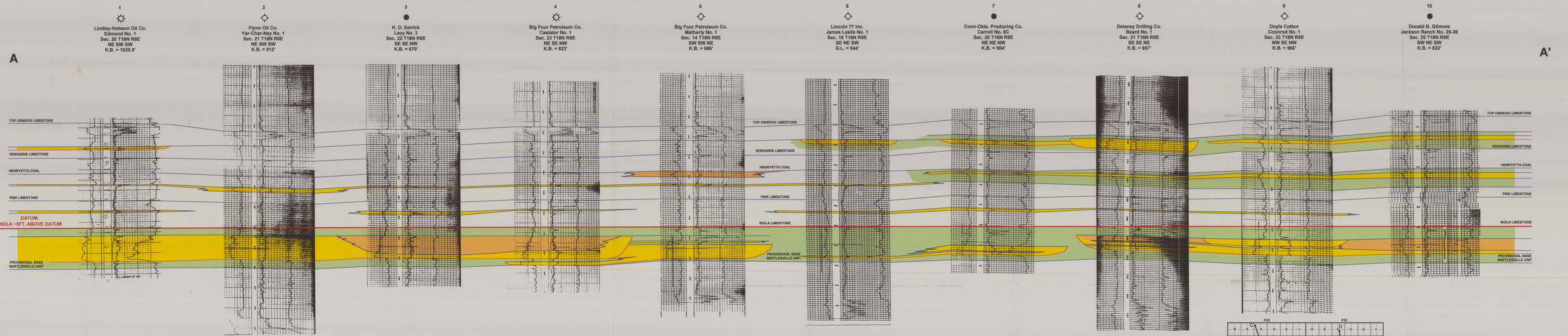


PLATE F

EAST - WEST STRATIGRAPHIC CROSS - SECTION

Township 18 North

Creek County, Oklahoma

Doug Moore *1999*

1

W.M. Shibley
Cubbie No. 1
Sec. 19 T17N R8E
NE SE SW
K.B. = 1062'

2

Coffield and Howard
Kelly - Herring No. 3
Sec. 21 T17N R8E
SE SW NW
K.B. = 899'

3

Hanlon and Boyle
Johnson No. 2
Sec. 22 T17N R8E
SW NW SE
D.F. = 930'

4

Waggoner Drilling Co.
Foster B No. 4
Sec. 24 T17N R8E
SW SW SW
K.B. = 935.5'

5

M.R. Swearingin
Montford No. 1
Sec. 20 T17N R9E
SW NW SE
K.B. = 851'

6

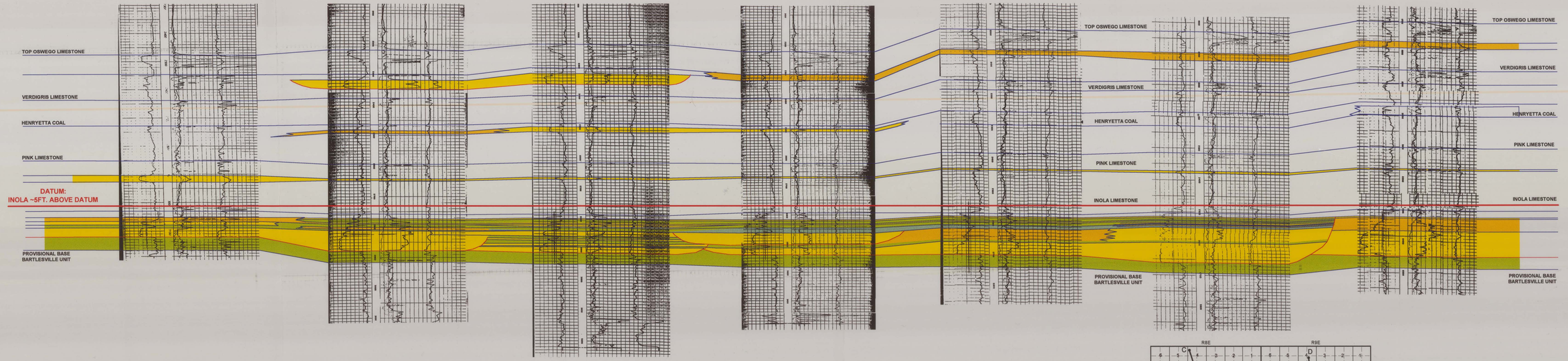
C. R. Colpitt
Harjochie No. 3-A
Sec. 21 T17N R9E
SW NE SE
K.B. = 858.5'

7

St. Anthony Development Co.
Marlin No. 1
Sec. 24 T17N R9E
SW SE NE
K.B. = 794'

B

B'



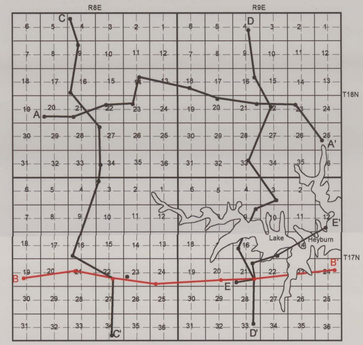


PLATE G

EAST - WEST STRATIGRAPHIC CROSS - SECTION

Township 17 North
Creek County, Oklahoma

Doug Moore *1999*

C

C'

1
M. P. & R. Production Co.
Keyes No. 3
Sec. 4 T18N R8E
SW NW NW
K.B. = 823'

2
Autumn Exploration Ltd.
Autumn No. 1
Sec. 9 T18N R8E
C NE NE NW
K.B. = 901'

3
M. P. & R. Production Co.
Okemah No. 2
Sec. 16 T18N R8E
SW SW SW
K.B. = 883'

4
Johnson and Gill
Marrs No. 1
Sec. 27 T18N R8E
NE NW NW
K.B. = 938'

5
James W. Owens
Dix No. 10
Sec. 34 T18N R8E
SE NW SW
K.B. = 901'

6
James W. Owens
Kemp No. 10
Sec. 3 T17N R8E
NW NW
K.B. = 961'

7
C. A. Overstreet
Vick No. 1
Sec. 16 T17N R8E
SE NW SW SW
K.B. = 877'

8
Hanion and Boyle
Johnson No. 2
Sec. 22 T17N R8E
SW NW SE
K.B. = 930'

9
Sopac Exploration
Bry No. 1
Sec. 34 T17N R8E
NW SW SE
K.B. = 900'

TOP OSWEGO LIMESTONE
VERDIGRIS LIMESTONE
HENRYETTA COAL
PINK LIMESTONE
INOLA LIMESTONE
PROVISIONAL BASE BARTLESVILLE UNIT

DATUM:
INOLA ~5FT. ABOVE DATUM

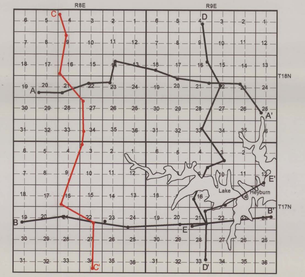


PLATE H

NORTH - SOUTH STRATIGRAPHIC CROSS - SECTION
Range 8 East
Creek County, Oklahoma

Doug Moore 1999

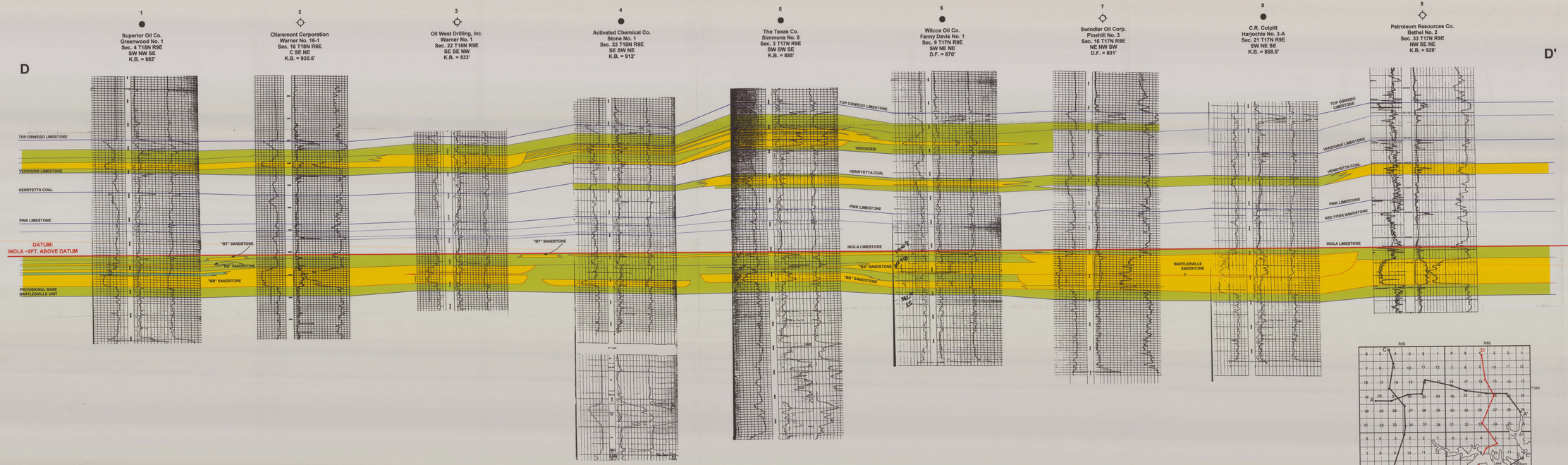


PLATE I

NORTH - SOUTH STRATIGRAPHIC CROSS - SECTION

Range 9 East

Creek County, Oklahoma

Doug Moore 1999

18N 8E

17N 8E

0'
5'
10'
15'
20'

THICK

THIN

PROBABLY ABSENT

?

Sandstone not present

Merged contour lines result of tightly spaced data

WELL STATUS

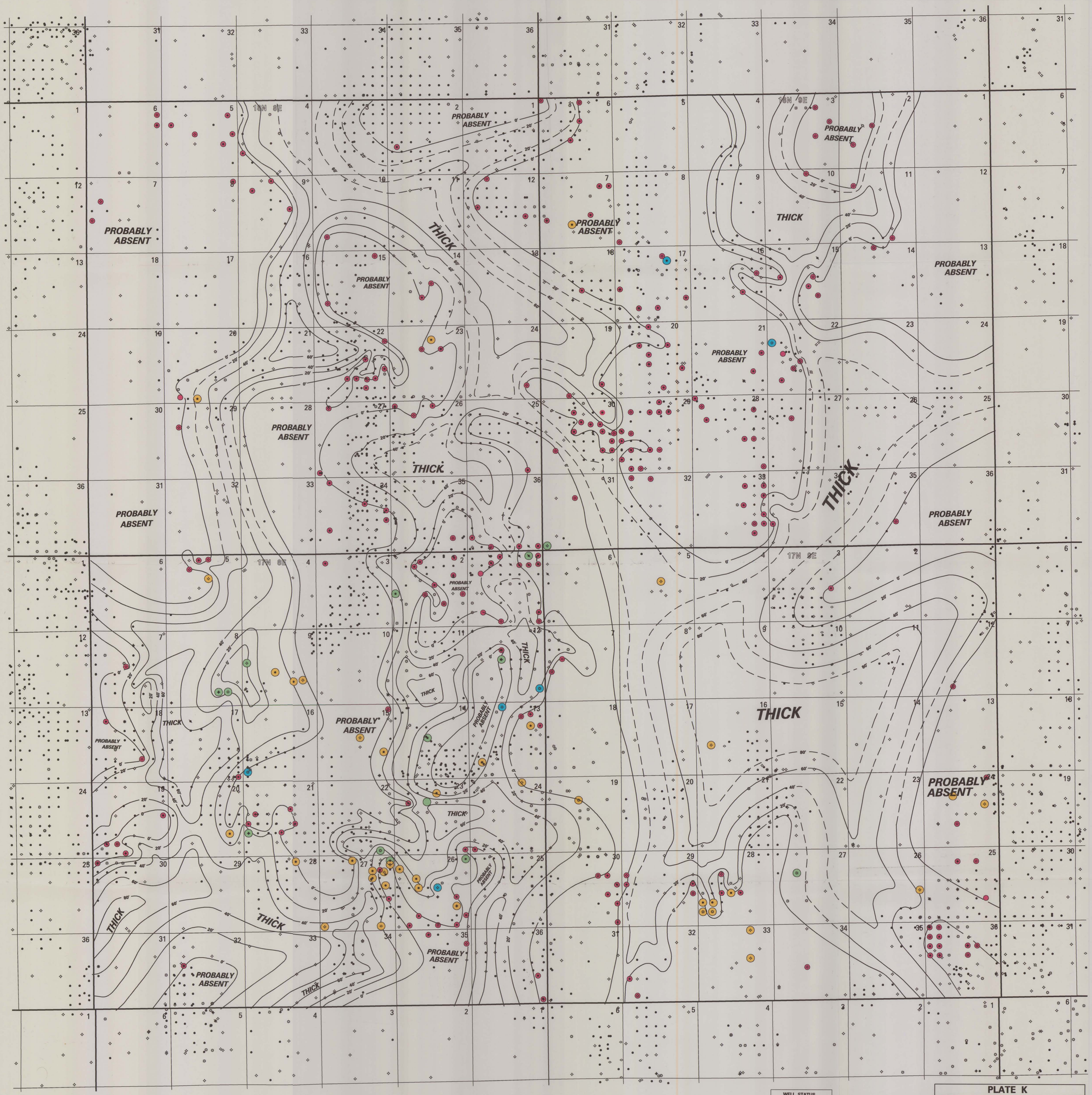
PROD	P&A	TYPE
●	●	Oil
✳	✳	Gas
✳	✳	O&G
⊹		Dry
⊙		Salt Water
▽		Injection
○		Location

PLATE J

Distribution of
"BT" SANDSTONE
C. I. = 5'
Scale 1" = 4000'

T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore *1999*



BA/B
BC
BU
Sandstone not Present

WELL STATUS

PROD	P&A	TYPE
●		Oil
☼	☼	Gas
✹	✹	O&G
○		Dry
⊕		Salt Water
☿		Injection
○		Location

PLATE K

Distribution of

"BA" SANDSTONE

Scale 1" = 2000'

C. I. = 20'

T 17 and 18 N, R 8 and 9 E

Creek County, Oklahoma

Doug Moore *1999*

18N 8E

18N 9E

17N 8E

17N 9E

PROBABLY ABSENT

PROBABLY ABSENT

PROBABLY ABSENT

PROBABLY ABSENT

PROBABLY ABSENT

● Sandstone not present

WELL STATUS

PROD	P&A	TYPE
●		Oil
✲	✲	Gas
✲	✲	O&G
☼		Dry
ⓢ		Salt Water
☿		Injection
○		Location

PLATE L

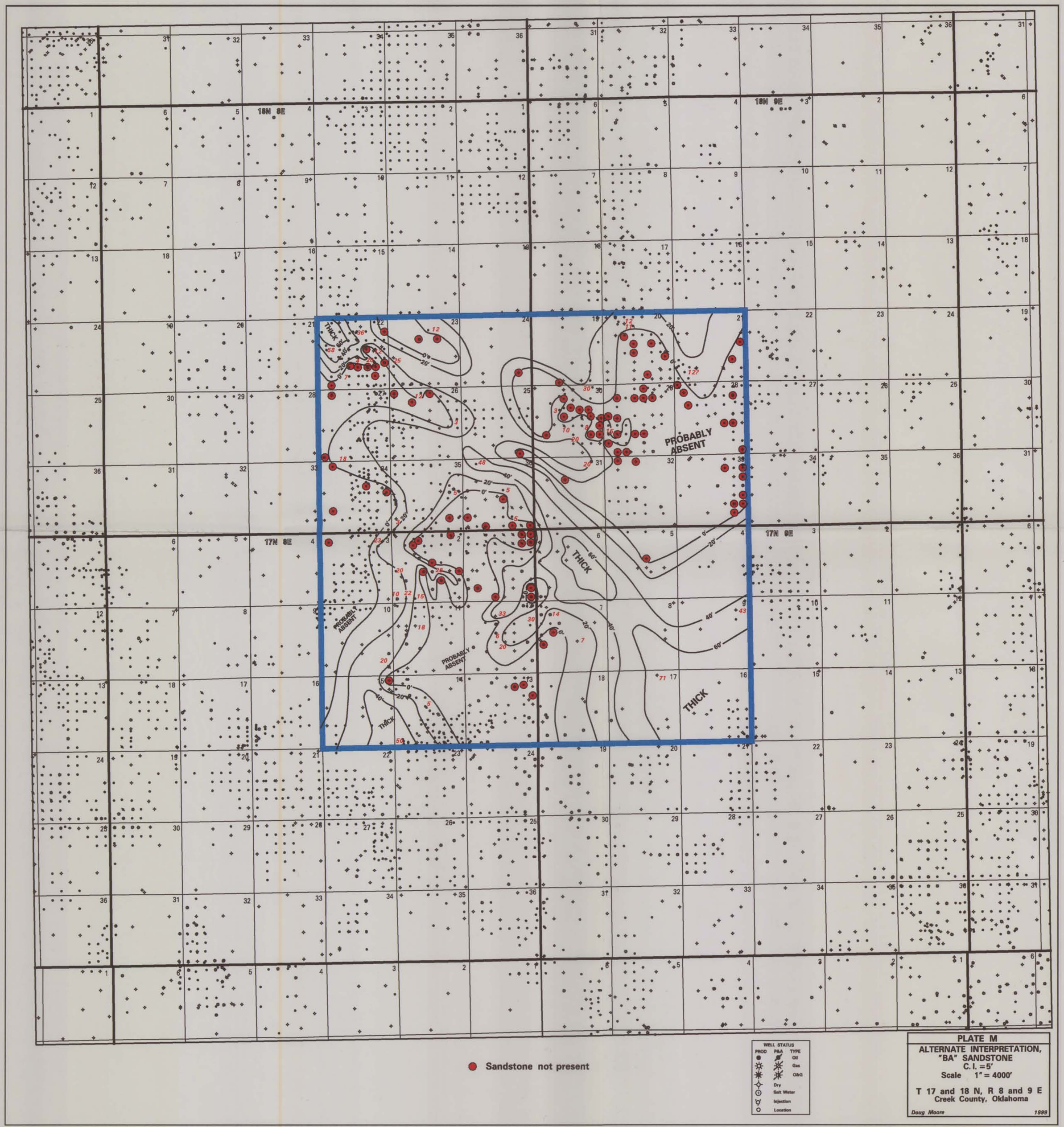
ALTERNATE INTERPRETATION, "BA" SANDSTONE

C. I. = 5'

Scale 1" = 4000'

T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore 1999


18N 8E
18N 9E
17N 8E
17N 9E
THICK
PROBABLY ABSENT
Sandstone not present
WELL STATUS
PROD
P&A
TYPE
Oil
Gas
O&G
Dry
Salt Water
Injection
Location
PLATE M
ALTERNATE INTERPRETATION, "BA" SANDSTONE
C.I. = 5'
Scale 1" = 4000'
T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma
Doug Moore
1999

18N 8E

18N 9E

17N 8E

17N 9E

PROBABLY ABSENT

THICK

0'

20'

40'

60'

Sandstone not present

WELL STATUS

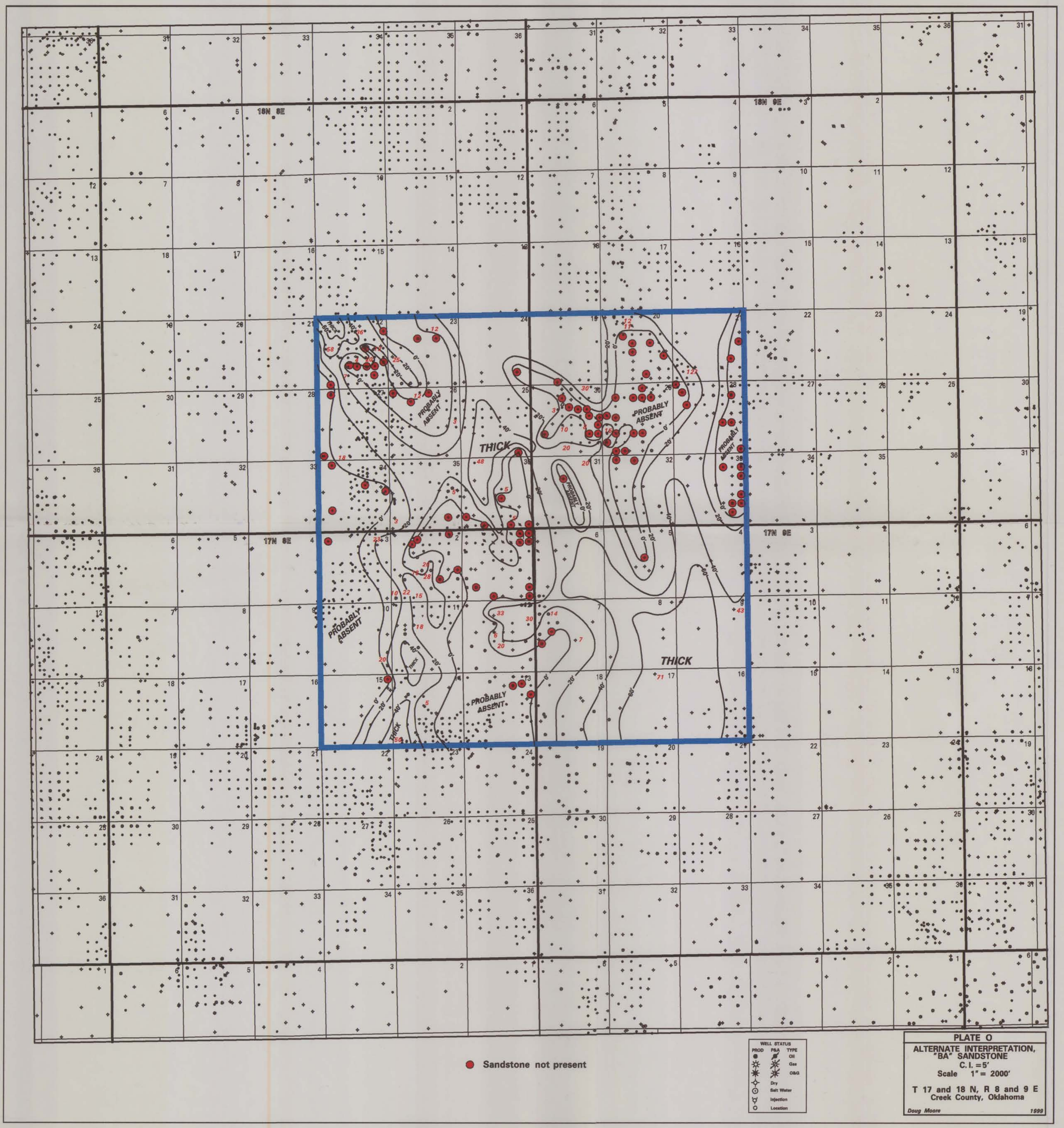
PROD	P&A	TYPE
●		Oil
✲	✲	Gas
✲	✲	O&G
⊖		Dry
⊙		Salt Water
⚥		Injection
○		Location

PLATE N

ALTERNATE INTERPRETATION, "BA" SANDSTONE
C. I. = 5'
Scale 1" = 2000'

T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore *1999*


18N 8E
18N 9E
17N 8E
17N 9E
THICK
PROBABLY ABSENT
Sandstone not present
WELL STATUS
PROD
P&A
TYPE
Oil
Gas
O&G
Dry
Salt Water
Injection
Location
PLATE O
ALTERNATE INTERPRETATION, "BA" SANDSTONE
C. I. = 5'
Scale 1" = 2000'
T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma
Doug Moore
1999

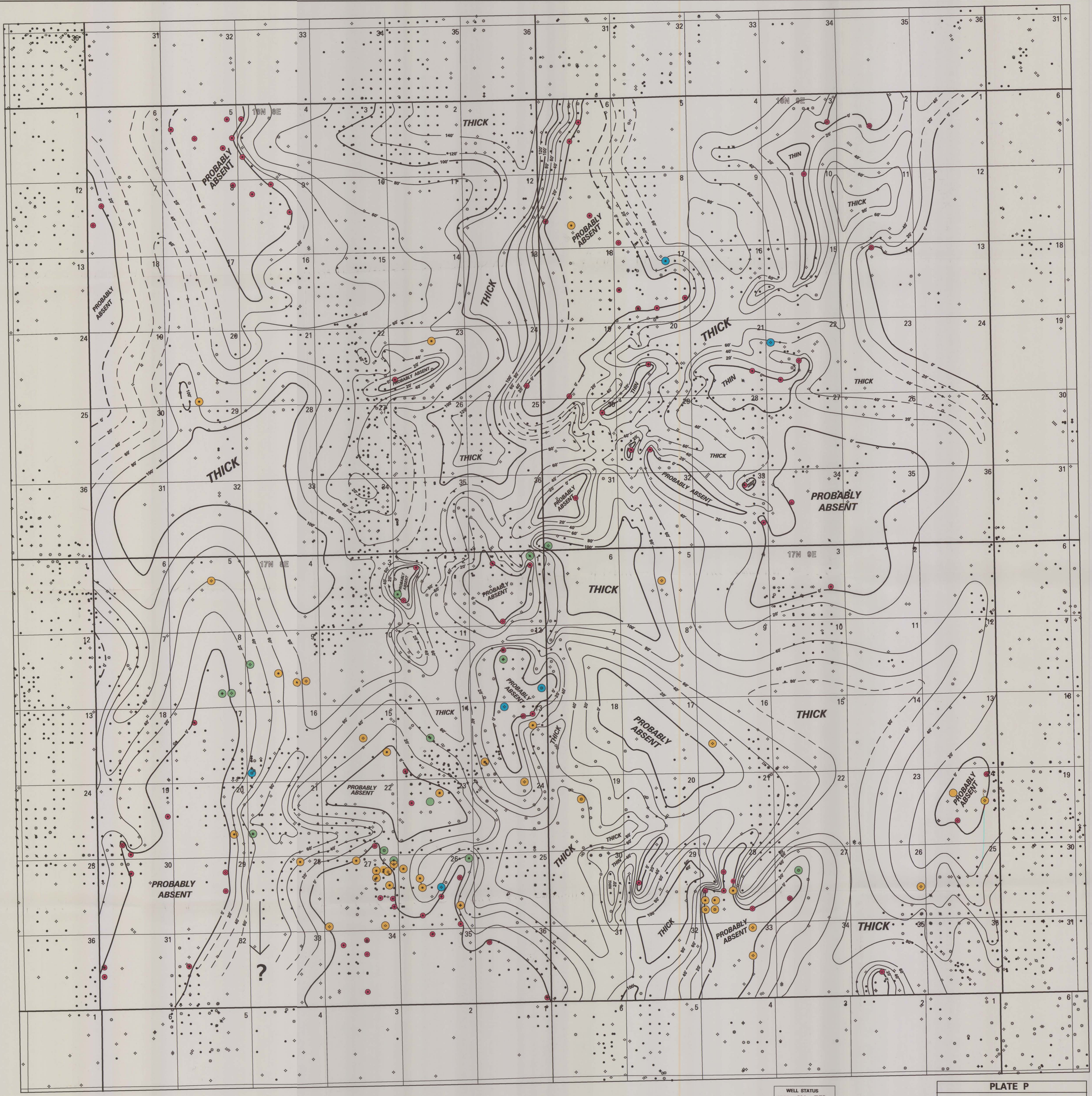


PLATE P

Distribution of

"BB" SANDSTONE

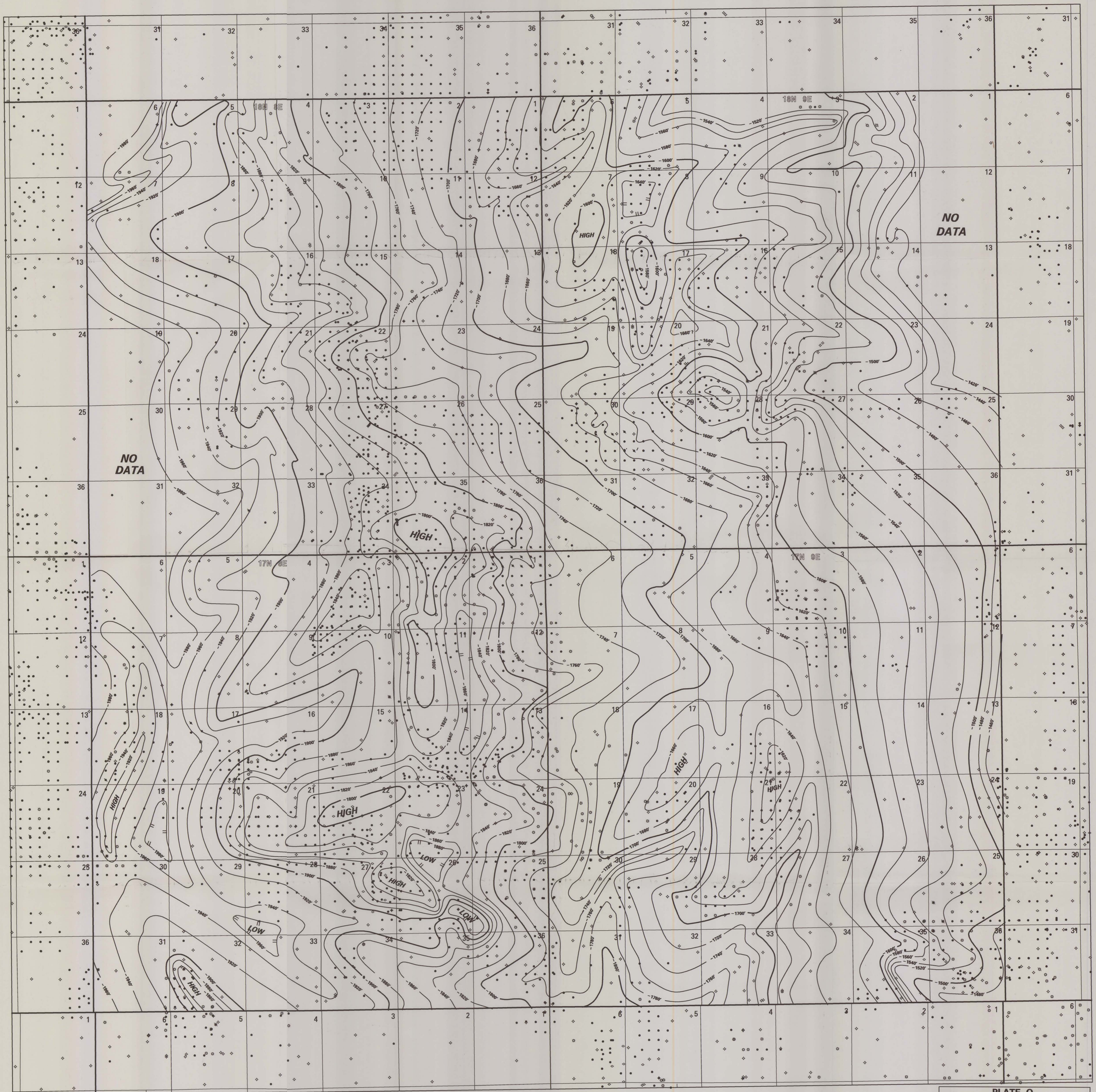
Scale 1" = 2000'

C. I. = 20'

T 17 and 18 N, R 8 and 9 E

Creek County, Oklahoma

Doug Moore *1999*



WELL STATUS

PROD	P&A	TYPE
●	●	Oil
☼	☼	Gas
✸	✸	O&G
⊕		Dry
⊕		Salt Water
♉		Injection
○		Location

PLATE Q

Structural Contour Map,

INOLA LIMESTONE

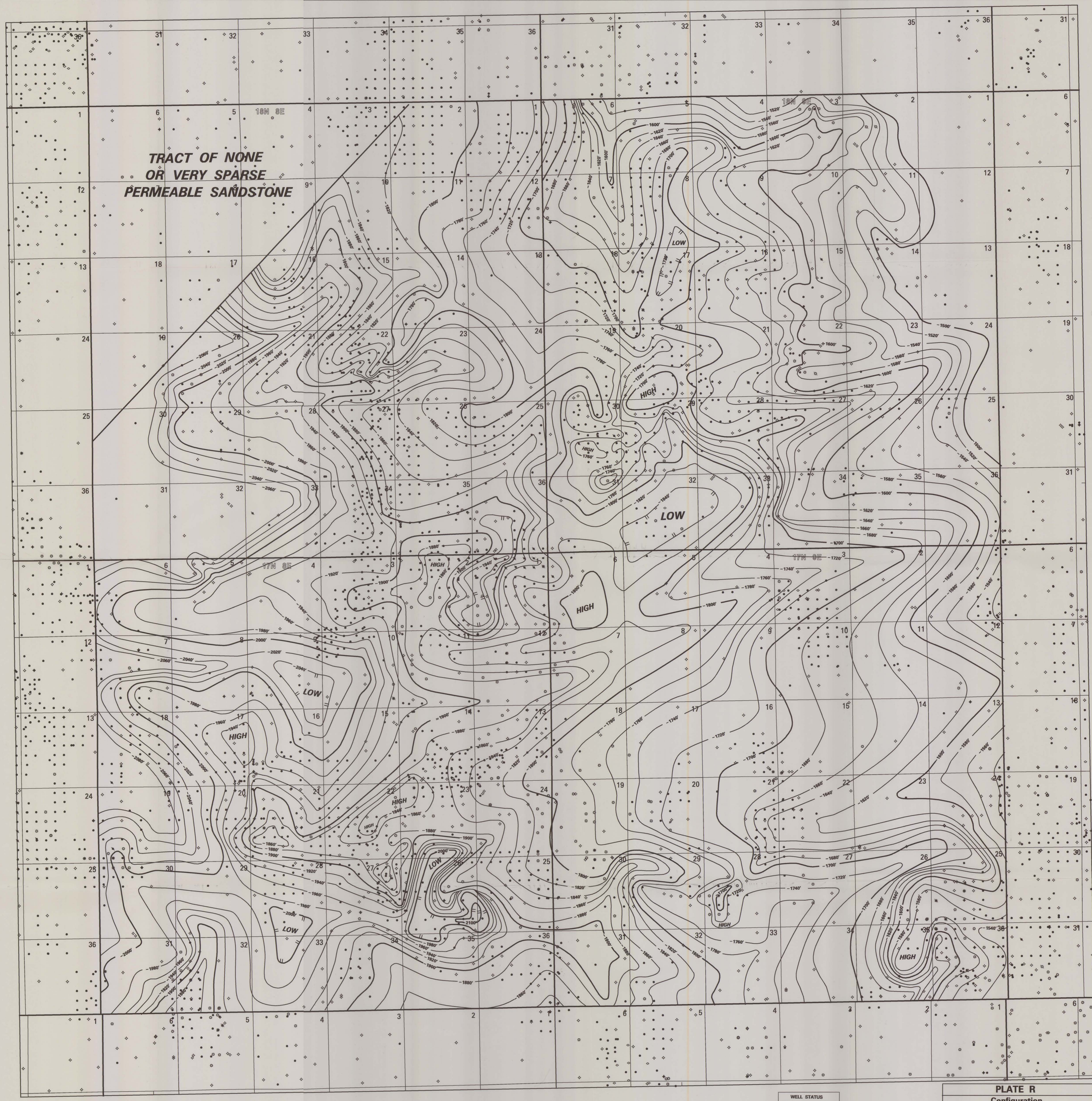
Scale 1" = 2000'

C. I. = 20'

T 17 and 18 N, R 8 and 9 E

Creek County, Oklahoma

Doug Moore *1999*



WELL STATUS

PROD	P&A	TYPE
●	●	Oil
☼	☼	Gas
✹	✹	O&G
⊖		Dry
⊕		Salt Water
☿		Injection
○		Location

PLATE R

Configuration,
TOP OF PERMEABLE BARTLESVILLE SANDSTONE
Scale 1" = 2000'
C.I. = 20'
T 17 and 18 N, R 8 and 9 E
Creek County, Oklahoma

Doug Moore *1999*

18N 8E

17N 8E

HIGH

WELL STATUS

PROD	P&A	TYPE
●	●	Oil
✳	✳	Gas
✳	✳	O&G
○	○	Dry
⊕		Salt Water
♉		Injection
○		Location

PLATE S

Axis Map,

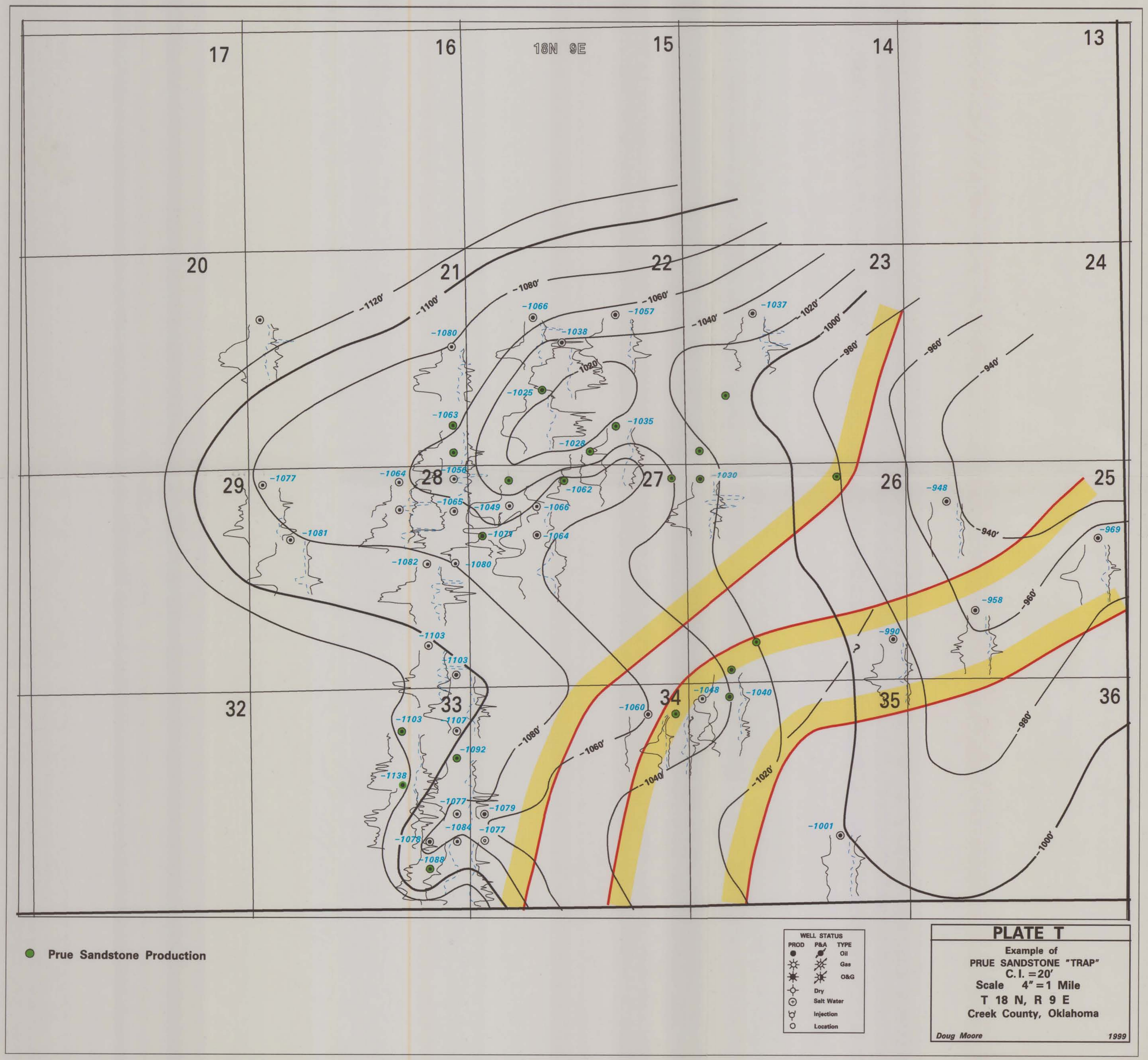
INOLA LIMESTONE

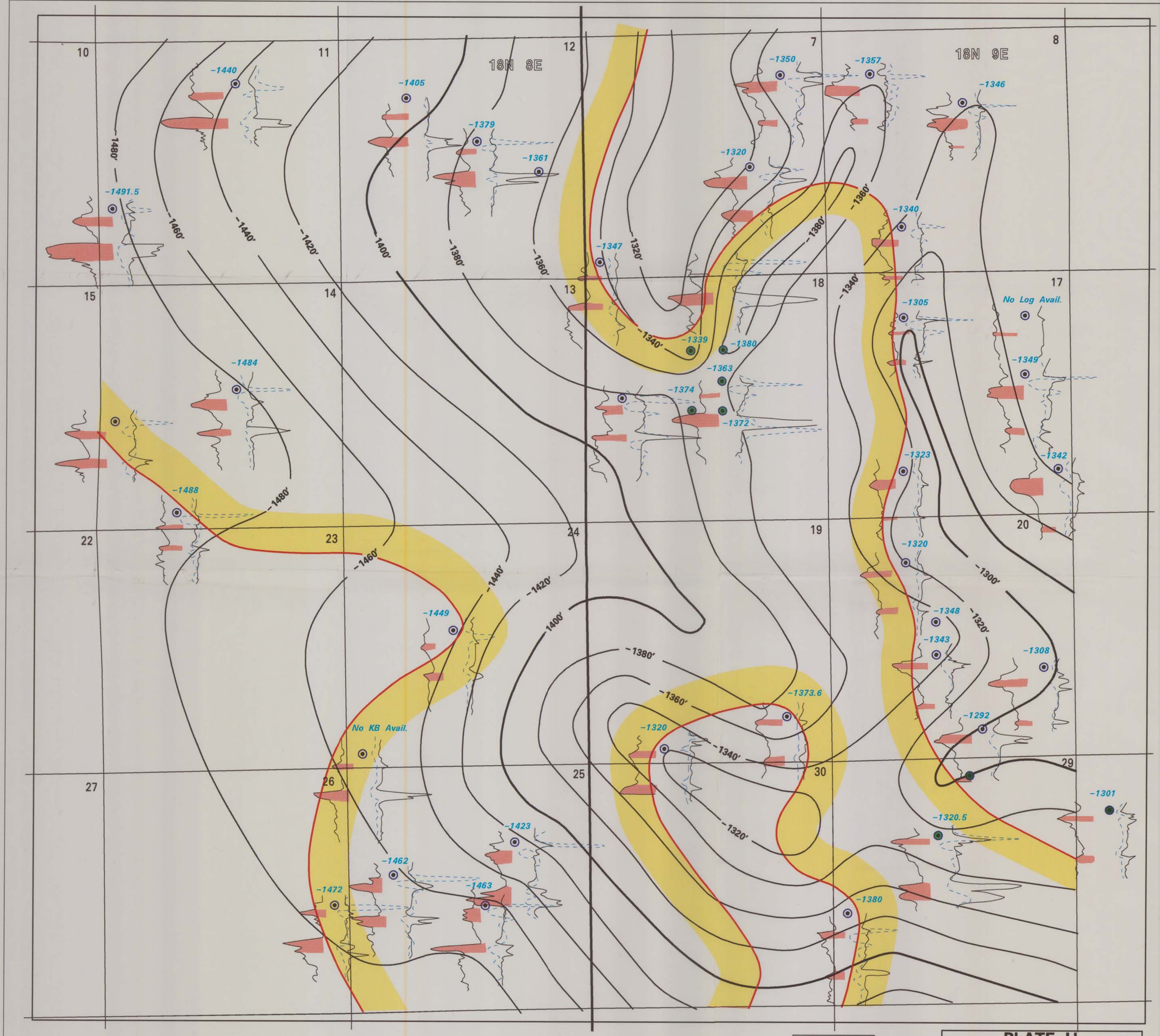
Scale 1" = 2000'

T 17 and 18 N, R 8 and 9 E

Creek County, Oklahoma

Doug Moore *1999*


18N 9E
17
16
15
14
13
20
21
22
23
24
29
28
27
26
25
32
33
34
35
36
-1120'
-1100'
-1080'
-1060'
-1040'
-1020'
-1000'
-980'
-960'
-940'
-1066
-1057
-1037
-1080
-1038
-1025
-1063
-1035
-1028
-1077
-1064
-1056
-1030
-1062
-1065
-1049
-1066
-1081
-1071
-1064
-1082
-1080
-948
-969
-958
-990
-1103
-1103
-1048
-1040
-1060
-1103
-1107
-1092
-1138
-1077
-1079
-1084
-1077
-1078
-1088
-1001
Prue Sandstone Production
WELL STATUS
PROD
P&A
TYPE
Oil
Gas
O&G
Dry
Salt Water
Injection
Location
PLATE T
Example of
PRUE SANDSTONE "TRAP"
C.I. = 20'
Scale 4" = 1 Mile
T 18 N, R 9 E
Creek County, Oklahoma
Doug Moore
1999



● Lower Skinner Production

WELL STATUS

PROD	P&A	TYPE
●		Oil
☼	☼	Gas
✸	✸	O&G
⊖		Dry
⊕		Salt Water
☿		Injection
○		Location

PLATE U

Example of

LOWER SKINNER SANDSTONE "TRAP"

C. I. = 20'

Scale 4" = 1 Mile

T 18 N, R 8 and 9 E

Creek County, Oklahoma

Doug Moore 1999

18N 8E

9 10 11 12

16 15 14 13

21 22 23 24

28 27 26 25

33 34 35 36

-1560'
-1578
-1554
-1580'
-1600'
-1620'
-1640'
-1673 No KB
-1700'
-1720'
-1740'
-1760'
-1780'
-1800'
-1764
-1769
-1752
-1813
-1680'
-1660'
No KB
-1688
-1665
-1687
-1680
-1678
-1720
-1607
-1624
-1647
-1653
-1653
-1596
-1660
-1665
-1674
-1667
-1667
-1650
-1700
-1637
-1618
-1649
-1647
-1658
-1654
-1663
-1635
-1708
-1683
-1765
-1780
-1623

● Red Fork Production

WELL STATUS

PROD	P&A	TYPE
●	●	Oil
☼	☼	Gas
✸	✸	O&G
⊹		Dry
⊕		Salt Water
⚲		Injection
○		Location

PLATE V

Example of
RED FORK SANDSTONE "TRAP"
C. I. = 20'
Scale 4" = 1 Mile
T 18 N, R 8 E
Creek County, Oklahoma

Doug Moore *1999*

E

1

Bristow Resources Inc.
Elias-Shoppa No. 10
Sec. 21 T17N R9E
SW SW SW
K.B. = 893.5'

2

C. R. Colpitt
Harjochie No. 3-A
Sec. 21 T17N R9E
SW NE SE
K.B. = 858.5'

3

Bristow Resources Inc.
Elias-Shoppa No. 17
Sec. 21 T17N R9E
SE NW NE
K.B. = 871'

4

Elias Oil Company
Elias-Bruce No. 2
Sec. 15 T17N R9E
SW SW SE
K.B. = 784'

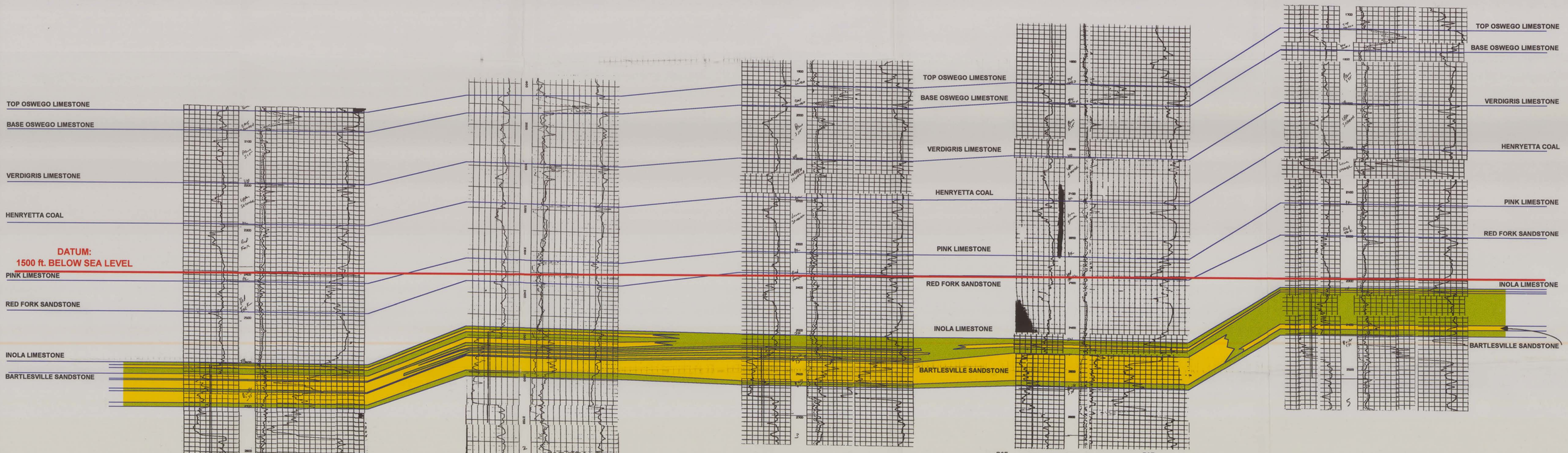
5

Bristow Resources Inc.
Elias-Shoppa No. 24
Sec. 12 T17N R9E
E/2 SE SW
K.B. = 796'

E'

TOP OSWEGO LIMESTONE
BASE OSWEGO LIMESTONE
VERDIGRIS LIMESTONE
HENRYETTA COAL
PINK LIMESTONE
RED FORK SANDSTONE
INOLA LIMESTONE
BARTLESVILLE SANDSTONE

DATUM:
1500 ft. BELOW SEA LEVEL



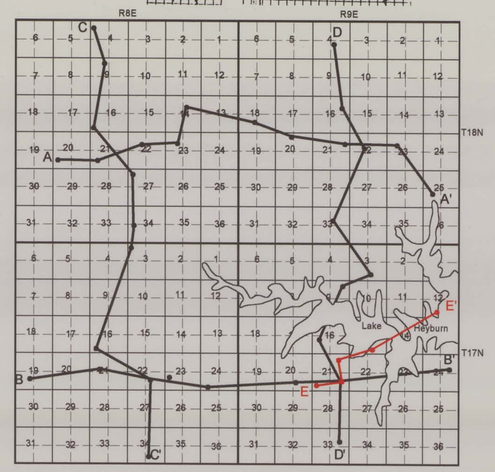


PLATE W

STRUCTURAL CROSS - SECTION
BARTLESVILLE SANDSTONE
Creek County, Oklahoma

Doug Moore *1999*

VITA

Douglas Scott Moore

Candidate for the Degree of

Master of Science

THESIS: SELECTED METHODS OF MAPPING SANDSTONES OF THE "CHEROKEE GROUP," TOWNSHIPS 17 AND 18 NORTH, RANGES 8 AND 9 EAST, CREEK COUNTY, OKLAHOMA

Major Field: Geology

Biographical:

Personal Data: Born in Tulsa, Oklahoma on March 11, 1974, the son of Gloria Ann and Robert Homer Moore.

Education: Graduated from Broken Arrow High School, Broken Arrow, Oklahoma in May 1992; received Bachelor of Science degree in Geology from Oklahoma State University, Stillwater, Oklahoma in May 1998. Completed the requirements for the Master of Science Degree with a major in Geology at Oklahoma State University in December, 1999.

Experience: Employed by Oklahoma State University School of Geology as a Teaching Assistant in Geomorphology. Worked as a Geology intern for Phillips Petroleum Company, Borger, Texas, during the summer and winter, 1998.

Professional Memberships: American Association of Petroleum Geologists, Geological Society of America, Tulsa Geological Society, Oklahoma State University Geological Society, Phi Kappa Phi, Golden Key, Pi Kappa Alpha.