Contract Report 633

Ground-Water Investigation for the Village of Homer, Ogden Township, Champaign County, Illinois

by
Ellis W. Sanderson, RE.
and Adrian P. Visocky, P.E.
Office of Ground-Water Resources Evaluation

Prepared for the
Village of Homer

July 1998

Illinois State Water Survey
Hydrology Division
Champaign, Illinois

A Division of the Illinois Department of Natural Resources

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GROUND-WATER INVESTIGATION FOR THE VILLAGE OF HOMER, OGDEN TOWNSHIP, CHAMPAIGN COUNTY, ILLINOIS

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RECENT EXPLORATION EFFORTS

The village of Homer in Ogden Township in Champaign County, Illinois, operates a water utility to serve its residential and commercial customers. Since about 1992, the village has sought to supplement its existing well field to better meet summer and maximum daily water demands. During the previous two years, village officials considered several areas for test drilling and actually explored two locations to attempt to secure a supplemental water supply of at least 50 gallons per minute (gpm) (72,000 gallons per day).

In February 1995, the village contracted with Sims Drilling Company, Savoy, Illinois, for two test holes located approximately 2 miles east of the village in Section 3, Township 18 North (T. 18N), Range 14 West (R. 14W), Vermilion County, Illinois. Test Hole (TH) 1-95 and TH 2-95 were drilled to depths of 60 and 40 feet, respectively. The driller's log for TH 1-95 indicates the presence of two thin layers of sand and gravel while the log for TH 2-95 indicates no sand and gravel (see appendix A). No further exploration of this site was undertaken, because a potentially suitable aquifer was not found.

In the fall 1995, the village contracted with York Drilling Company, Urbana, Illinois, to drill several test holes about 3½ miles west of the village near County Highway 512. One test hole was completed as a well for conducting a preliminary pumping test. On the basis of the preliminary test pumping, the drilling contractor and the consultant (Sodemann and Associates, Inc.) concluded that this area did not show sufficient potential for development of the needed supplemental supply.

After such disappointing results, village officials sought the assistance of the Illinois State Geological Survey and the Illinois State Water Survey for further exploration efforts. Letters written by the Surveys in December 1992 had recommended exploration in an area north of Homer Lake in T. 18N, R. 10-11 E, and T. 18N, R. 14W, Champaign County (Ogden and St. Joseph Townships) (see appendix B). The Surveys confirmed their earlier recommendation for exploration efforts in this area. The Geological Survey developed a plan to prospect for water-bearing sand-and-gravel deposits using a reconnaissance electrical earth resistivity survey (EERS), and the Water Survey planned for an aquifer test if the EERS found a site worthy of testing.

The village contracted with the Geological Survey to conduct the reconnaissance EERS in a 15-square-mile area north of the village in March 1996. Production wells tapping water-bearing sand-and-gravel aquifers have furnished the water supply at the nearby villages of Ogden and St. Joseph for several decades. These wells are generally pumped at rates of about 35 to 130 gpm and tap sand-and-gravel deposits about 27 to 41 feet thick. (The St. Joseph wells are no longer in use because the water supply is now furnished by Northern Illinois Water Corporation, Champaign, Illinois.) The EERS, conducted during summer 1996, resulted in the recommendation of an area between Ogden and St. Joseph for test drilling (see EERS report by the Geological Survey, appendix C).

In December 1996, the village contracted with the Layne-Western Company, Inc., Aurora, Illinois, for test drilling to determine sand-and-gravel aquifer thickness and texture at three locations in the area recommended by the resistivity survey. The driller's log of the first test hole (TH 1-96) showed an unusually thick section of water-bearing sand and gravel of about 100 feet, much greater than had previously been found in the area of interest (see appendix D). Another test hole located about ¼ mile north also showed thinner sand-and-gravel deposits. The first and second test holes were cased with 2½-inch PVC pipe with slots sawed in the bottom 20 feet. The State Geological Survey made natural gamma geophysical logs of the three test holes at the time of drilling (see appendix E).

At the direction of the consulting engineer, Layne-Western Company, Inc., constructed a 6-inch test well and an additional observation well for an aquifer test. The test well (TW 1-97) was drilled in the NE¼, NE¼, Section 18, T. 19N, R. 14W, Champaign County, about 54 feet from the site of the first test hole. The test well confirmed the presence of the thick section of sand-and-gravel aquifer. The observation well was drilled about 264 feet northeast of the test well for the aquifer test. This test would enable an evaluation of the ground-water resources available and the possible withdrawal rate from an individual production well and well field tapping the sand-and-gravel aquifer.

ACKNOWLEDGMENTS

This cooperative investigation was conducted by the village of Homer, the Geological Survey, the Water Survey, Sodemann and Associates, Inc., and the Layne-Western Drilling Company, Inc.

We thank Mayor Ernest Wienke and the village Board of Trustees for the opportunity to cooperatively conduct this aquifer test and appreciate the opportunity to work with Mr. Andrew Kieser, Sodemann and Associates, Inc., and Mr. Mike Underwood and Gary Smith, village of Homer employees. Mr. Kieser's professional approach and the capable and reliable village employees allowed the planned test to proceed in an efficient manner. Mr. Kieser also provided the information on the village's recent exploration efforts.

Robert D. Olson, Associate Hydrologist, assisted with the field work during the step test and the aquifer test. Water samples collected by Water Survey staff during the tests were analyzed at the Survey's Analytical and Water Treatment Services laboratory under the supervision of Loretta Skowron.

We also acknowledge the assistance of Pamela Lovett (word processing of the reproducible copy of this report), Eva Kingston (editing of the manuscript), and Linda Hascall (preparation of the graphics).

INVESTIGATIVE METHODS AND PROCEDURES

Testing Program

Objective

The principal objective of this investigation was to estimate the potential for ground-water resource development in the vicinity of the initial test hole, TH 1-96 (see figure 1). A supplemental water supply of at least 50 gallons per minute (gpm) or 72,000 gallons per day (gpd) was desired. The aquifer test was designed to evaluate the yield of the sand-and-gravel aquifer to a well or well field.

Site Description

The target area for this investigation was in the NE¼, NE¼, Section 18, T. 19N, R. 14W, Champaign County. The proposed well field site is in the southwest corner of an 80-acre parcel of land located about 3/4 mile south of Route 150, about 2 miles west-southwest of the village of Ogden, and about 3 miles east of the village of St. Joseph. The site is located on broad, flat, rich agricultural land. Surface water runoff is toward a drainage ditch west of the site and south to the Homer Lake and Champaign County Conservation Area.

The Test Well (TW) 1-97 drilled near the southwest corner of the site and the observation well confirmed the presence of the locally thick sand-and-gravel aquifer found in TH 1-96. This aquifer was generally about 100 feet thick and overlain by about 30 to 40 feet of clay.

Test Design

The available information from the test drilling suggested that the sand-and-gravel aquifer was limited in areal extent. Whether it could furnish the desired supplemental water supply, a minimum of 50 gpm, was uncertain.

To achieve the objective of evaluating the potential yield of this local sand-and-gravel aquifer to a well or well field, the study focused on conducting an aquifer test for a period of about seven days. The aquifer test would consist of pumping the test well at a constant, uninterrupted rate for the test period while observing ground-water levels in the pumping test

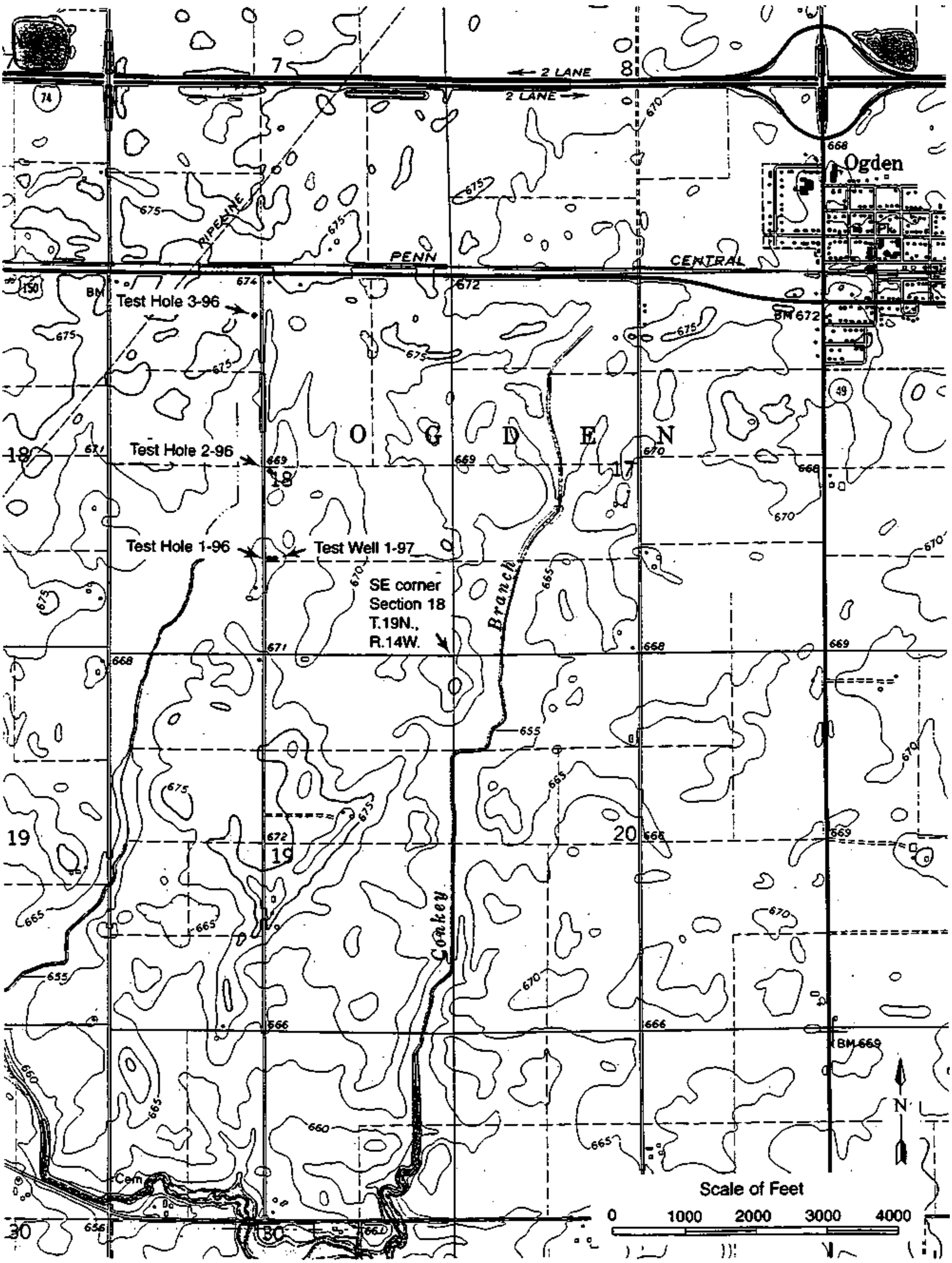

Figure 1. Well field site and location of Test Well 1-97

well and three observation wells. In addition to the two cased test holes (TH 1-96 and TH 2-96), the test well and one additional observation well were drilled at the site for the aquifer test.

Prior to the aquifer test, a step test was planned for the pumping test well to help determine an appropriate pumping rate for the 7-day aquifer test and to estimate the hydraulic efficiency of the test well. The aquifer response during the step test would help determine a pumping rate that could be sustained for the desired 7-day constant-rate aquifer test, while also stressing the aquifer system sufficiently to provide meaningful data for analysis. For this investigation the primary purpose of the step test was to collect data to determine the well-loss coefficient of the test well to enable calculation of the portion of observed drawdown attributable to well inefficiencies. Well loss, described in more detail below, is an additional component of observed drawdown in pumping wells that can significantly reduce sustainable yields. The step test would consist of pumping the test well at increasing increments of the full rate for about 30 minutes at each rate. During the test, ground-water levels would be observed in the pumping test well and in one or more observation wells, as convenient.

Evaluation Methodology for Step Tests

Well Loss

When a well is pumped, water is removed from storage within the aquifer, causing water levels to decline over time in the vicinity of the well. This effect, referred to as drawdown, is most pronounced at the pumped well and gradually diminishes at increasing distances away from the well. Drawdown is the distance that the water level declines from its nonpumping stage and, under ideal conditions, it is a function of pumping rate, time, and the aquifer's hydraulic properties. Aquifer boundaries, spatial variation in aquifer thickness or hydraulic properties, interference from nearby wells, and partial-penetration conditions all can affect observed drawdowns at both pumping and observation wells. On the other hand, well loss or the additional drawdown inside the pumped well due to turbulent flow of water into and inside the well is a measure of the hydraulic efficiency of the pumping well only, reflecting the unique flow geometry of the borehole, well screen, and pump placement.

Because of well loss, the observed drawdown in a pumped well is usually greater than that in the aquifer formation outside the borehole. In addition to considerations of flow geometry, as noted above, the amount of well loss can also depend on the materials used (screen openings, gravel-pack size distribution, drilling fluids, etc.) and the care taken in constructing and developing the well using mechanical and hydraulic means to remove drilling fluids from the borehole. Some well loss is natural because of the physical blocking of the aquifer interstices caused by the well screen and the disturbance of aquifer material around the borehole during construction. However, an improperly designed well and/or ineffective well construction and development techniques can result in unacceptable well losses. In addition, well losses often reflect a deterioration in the condition of an existing well, especially if they are observed to increase over time.

Well loss is a function of pumping rate, but ideally not of time. It is associated with changes in flow velocity in the immediate vicinity of the well, resistance to flow through the well screen, and changes in flow path and velocity inside the well, all of which cause the flow to change from laminar to turbulent in form. Head losses under turbulent conditions are nonlinear; that is, drawdowns increase more rapidly with increases in pumping rate than under laminar conditions, as discussed below.

While it is possible to have turbulent flow within the aquifer and laminar flow within a pumping well, under usual conditions the observed drawdown (s_o) in a pumping well has two components: formation loss (s_a), resulting from laminar flow head loss within the aquifer; and well loss (s_w), resulting from the turbulent flow of water into and inside the well, as shown in equation 1.

$$s_o = s_a + s_w \tag{1}$$

Jacob (1947) devised a technique for separating the well losses from the formation losses, assuming that all formation losses are laminar and all well losses are turbulent. These components of theoretical drawdown, s, in the pumped well are expressed as being proportional to pumping rate, Q, in the following manner:

$$s = BQ + CQ^2 \tag{2}$$

where B is the formation-loss coefficient at the well-aquifer interface per unit discharge, and C is the well-loss coefficient. For convenience, s is expressed in feet and Q in cubic feet per second (ftVsec). Thus, the well-loss coefficient C has the units sec^2/ft^5.

Rorabaugh (1953) suggested that the well-loss component be expressed as CQ^n, where n is a constant greater than 1. He thus expressed the drawdown as:

$$s = BQ + CQ^n \tag{3}$$

To evaluate the well-loss component of the total drawdown, one must know the well-loss coefficient (if using equation 2) or both the coefficient and the exponent (if using equation 3). This analysis requires a controlled pumping test, called a step-drawdown test (described below), in which total drawdown is systematically measured while pumping rates are varied in a stepwise manner.

Methodology for Determining Well Loss

If Jacob's equation is used to express drawdown, then the coefficients B and C must be determined. A graphical procedure (Bierschenk, 1964) can be used after first modifying equation 2 as:

$$s/Q = B + CQ \tag{4}$$

After this modification, a plot of s_o/Q versus Q can be prepared on arithmetic graph paper from data collected during a step drawdown test, with the observed drawdown, s_o, substituted for s. The slope of a line fitted to these data is equal to C, while the y-intercept is equal to B, as shown in figure 2. If the data do not fall along a straight line, but instead curve concavely upward, the second-order relationship between Q and s_o is not valid, and the Rorabaugh method of analysis usually is appropriate.

Occasionally the data plot of s_o/Q versus Q may yield a straight-line fit with essentially zero slope or with a negative slope, or the data may be too scattered to allow a reasonable fit. In these instances, the well-loss parameters are immeasurable. There are four possible explanations: 1) turbulent well loss was negligible for the range of pumping rates used during the test; 2) inadequate data collection or test methods were employed during the test; 3) the hydraulic condition of the well was unstable, as is the case during well development; or 4) the contribution of water from the aquifer was not uniform along the entire length of the well screen over the range of pumping rates, due to the pump setting in relationship to the screen or to vertical heterogeneity of the aquifer materials.

Step-Test Procedure

The primary objective of a step-drawdown test (or step test) is to determine the well-loss coefficient (and exponent, if using Rorabaugh's method). With this information, the turbulent well-loss portion of drawdown for any pumping rate of interest can be estimated. During the test, the discharge rate is successively increased or decreased over the previous rate, in approximately equal increments, in order to facilitate the data analysis. Each pumping period at a given rate is called a step, and all steps are of equal duration. Generally, the pumping rates increase from step to step, but the test also can be conducted by decreasing the pumping rates. During each step, the pumping rate is held constant. If data are collected manually, water-level measurements are made every minute for the first six minutes, every two minutes for the next ten minutes, and then every four to five minutes thereafter until the end of the step.

Schematically, the relationship between time and water level resembles that shown for a five-step test in figure 3. Incremental drawdowns for each step (shown as Δs_i) are measured as the distance between the extrapolated water levels from the previous step and the final water level of the current step. For step 1, the nonpumping water-level trend prior to the start of the test is extrapolated, and Δs_1 is measured from this datum. All data extrapolations should be performed on semilog graph paper for the most accurate results. For the purpose of plotting s_o/Q versus Q, values of observed drawdown s_o are equal to the sum of Δs_i for a given step. Thus, for step 3, $s_o = \Delta s_1 + \Delta s_2 + \Delta s_3$.

Evaluation Methodology for Aquifer Tests

Analysis

The capacity of a formation to transmit ground water is expressed by the *transmissivity*, which is the rate of flow of water, in gallons per day (gpd), through a one-foot-wide vertical strip

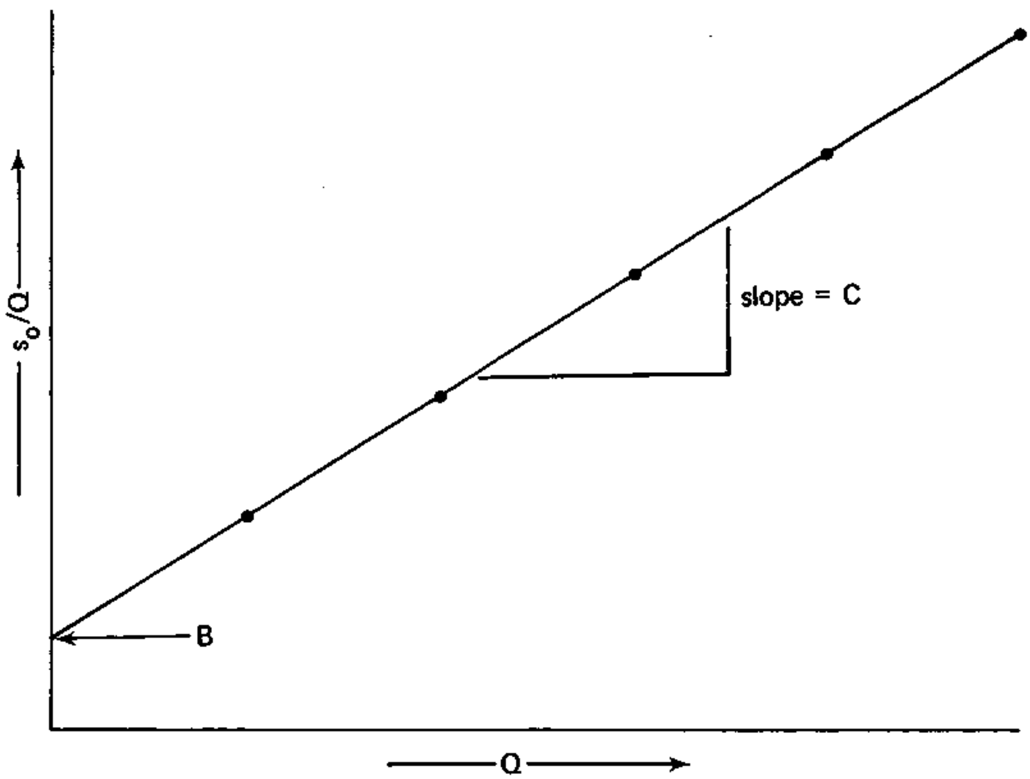

Figure 2. Graphical solution of Jacob's equation for well-loss coefficient, C

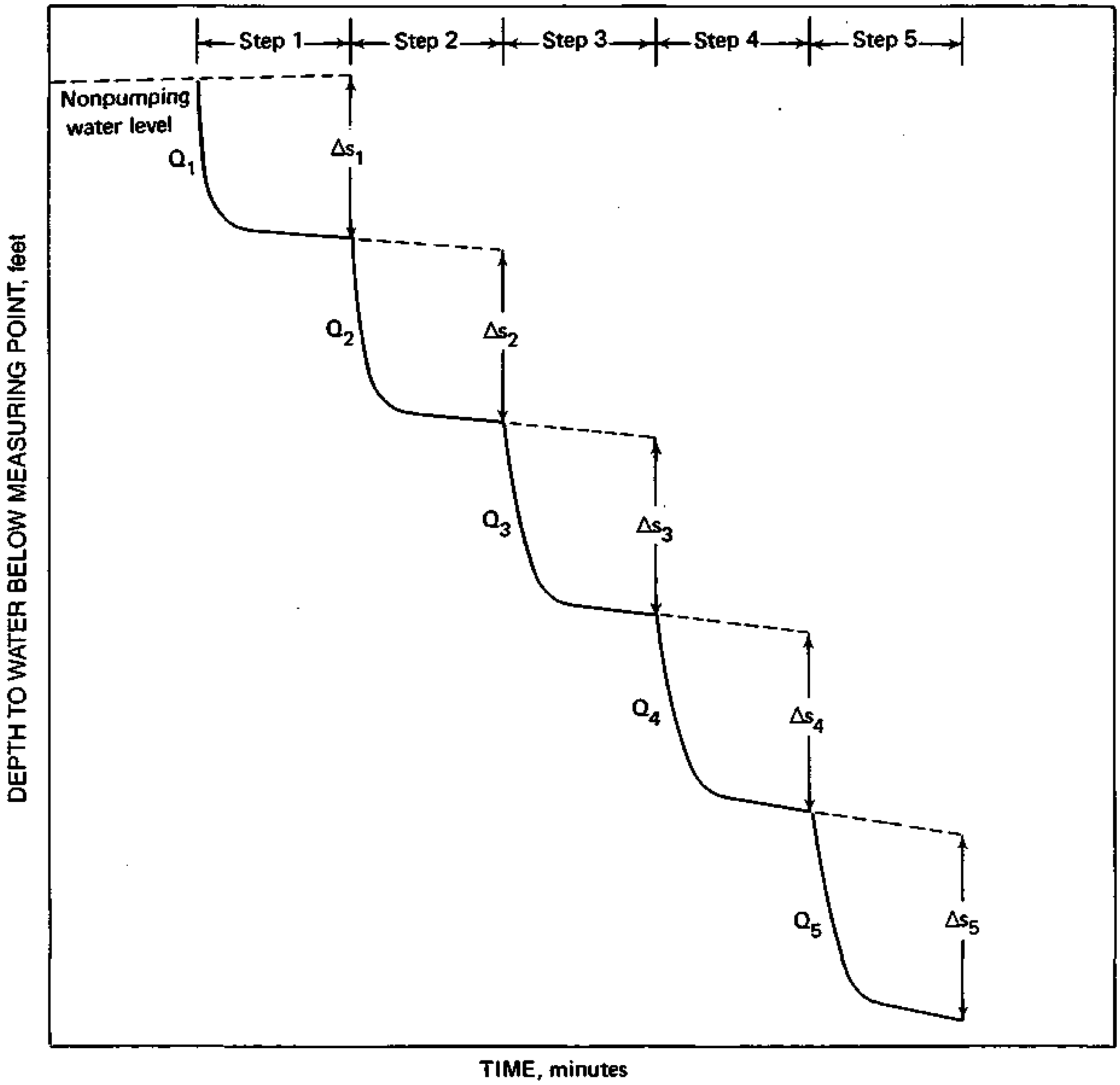

Figure 3. Relationship between time and water-level during a five step drawdown test

of the aquifer extending the full saturated thickness under a hydraulic gradient of 100 percent (one foot per foot) at the prevailing water temperature. Transmissivity is the product of the saturated thickness of the aquifer and the *hydraulic conductivity,* which is the rate of flow of water, in gpd, through a cross-sectional area of one square foot of the aquifer under a hydraulic gradient of 100 percent at the prevailing water temperature.

Storage properties of an aquifer are expressed by the *storage coefficient,* the volume of water released from storage per unit surface area of the aquifer per unit change in the water level. This parameter is dimensionless.

The hydraulic properties of an aquifer may be determined by means of an aquifer test, where the effect of pumping a well at a known constant rate is measured in the pumped well and at observation wells that penetrate the aquifer at various distances from the pumped well. Graphs of drawdown (the lowering of water levels in the wells) versus time after pumping starts and/or drawdown versus distance from the pumped well are used to solve equations that express the relation between the transmissivity, storage coefficient, pumping rate, and drawdown. Where appropriate, drawdown data must be adjusted to account for conditions that affect the observed rate of drawdown, such as variations in pumping rate, barometric pressure fluctuations, pumping in nearby wells, aquifer boundaries, leakage, significant dewatering (see later discussion of water-table conditions), or a partially penetrating pumped well. The two most common methods of analysis for field data under nonleaky artesian conditions—the type-curve method and the Jacob straight-line method—are described below.

Type-Curve Method

Theis (1935) introduced an analogy between the nonsteady flow of ground water and heat conduction. The nonequilibrium formula—popularly known as the Theis equation—describes radial flow toward a well pumping from an artesian aquifer as:

$$s = \frac{Q}{4\pi T} W(u) \tag{5}$$

or in commonly used units,

$$s = \frac{114.6Q}{T} W(u) \tag{6}$$

where:

$$W(u) = \int_u^\infty \frac{e^{-u}}{u} du = -0.5772 + \ln u + u - \frac{u^2}{2 \cdot 2!} + \frac{u^3}{3 \cdot 3!} - \frac{u^4}{4 \cdot 4!} + \cdots \tag{7}$$

and

$$u = \frac{2693 r^2 S}{Tt} \tag{8}$$

where:

s	=	drawdown at distance r from the pumped well, in feet
Q	=	well discharge, in gpm
T	=	transmissivity, in gpd/ft
r	=	distance from pumped well to observation point, in feet
S	.=	storage coefficient, decimal fraction
t	=	time since pumping began, in minutes

W(u), referred to as the *well function for nonleaky artesian aquifers,* has been extensively tabulated.

Theis devised a graphical procedure using superposition to solve for the aquifer properties, T and S, using equations 6 and 8, but inverting equation 8:

$$s = \frac{114.6Q}{T} W(u) \tag{9}$$

and

$$\frac{1}{u} = \frac{Tt}{2693r^2S} \tag{10}$$

Expanding the logarithm of both sides of these equations yields:

$$\log s = \log \left[\frac{114.6Q}{T}\right] + \log W(u) \tag{11}$$

and

$$\log \frac{1}{u} = \log \left[\frac{T}{2693r^2S}\right] + \log t \tag{12}$$

In equation 11 the term log [114.6Q/T] is a constant for a given pumping rate (hence, the need for a constant pumping rate during tests), so log s is directly related to log W(u). Also, in equation 12 the term log [$T/2693r^2S$] is a constant for a given distance r (a selected observation well), so log 1/u is directly related to log t. Thus,

$$\log s \propto \log W(u)$$

and

$$\log t \propto \log 1/u$$

From these relationships, one can construct a plot of the well function W(u) versus 1/u on log-log graph paper (figure 4). Such a plot of a mathematical function is called a *type curve.* Likewise, one can plot on identical log-log paper a plot of drawdown s versus time t from the data collected at each observation well.

The type curve is then superimposed over the field-data plot, keeping the corresponding ordinate and abscissa axes parallel until a best fit is obtained. A convenient match point chosen on the two graphs usually includes the convenient type-curve match point of W(u) = 1 and 1/u = 10. The corresponding coordinates of W(u), 1/u, s, and t are then substituted into equations 6 and 8 to solve for T and S.

In the same manner, one could make a type curve of W(u) versus u, noting the relationship between s versus W(u) and between u and r^2. For an aquifer test in which several observation wells were used, one could fit the new type curve to a field-data plot of s versus r^2 for a given time, and follow the same procedure of fitting the type curve to the field-data plot and selecting a match point.

Jacob Straight-Line Method

A popular graphical method derived from the Theis method by Cooper and Jacob (1946) is referred to as the *modified nonleaky artesian formula,* or simply the *Jacob straight-line method.* The method is based on the fact that when values of u are small (< 0.01), the sum of the series terms in equation 7 beyond ln u becomes insignificant. Examination of the terms in equation 8 shows that u becomes small when r becomes small (close-in observation wells) or t becomes large (long pumping periods).

When u ≤ 0.01, field-data plots of drawdown versus log time on semilog paper will yield a straight line. The straight-line portion of the s versus t plot is extrapolated to its intersection with the zero-drawdown axis. The slope of the straight line (drawdown per log cycle) is used to solve for the transmissivity, and the zero-drawdown intercept is used to solve for the storage coefficient. Expressions for these computations derived by Cooper and Jacob (1946) are:

$$T = \frac{264Q}{\Delta s} \tag{13}$$

and

$$S \simeq \frac{Tt_0}{4790r^2} \tag{14}$$

where:

T = transmissivity, in gpd/ft
Q = well discharge, in gpm
As = drawdown difference per log cycle, in feet

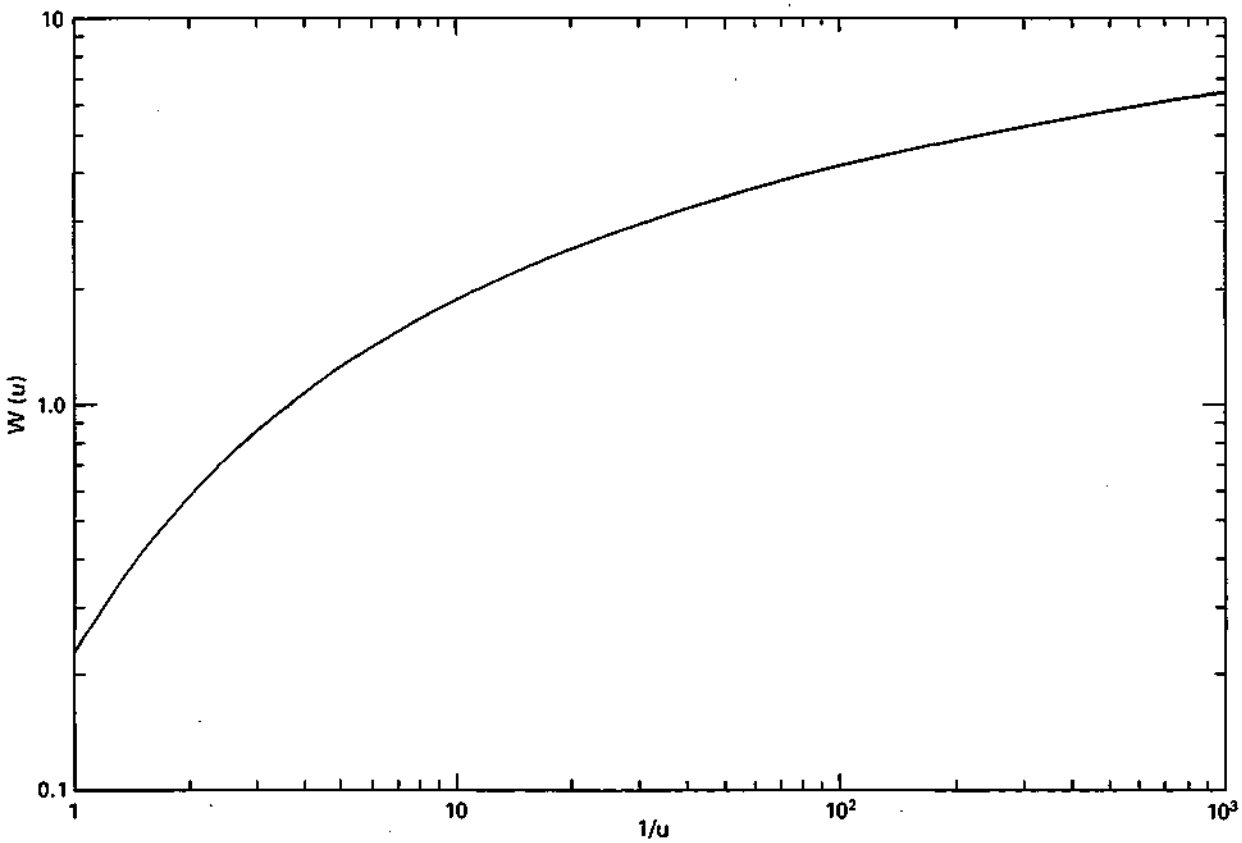

Figure 4. Nonleaky artesian type curve

S = storage coefficient, decimal fraction

t_0 = intersection of straight-line slope with zero-drawdown axis, in minutes

r = distance from pumped well to observation point, in feet

The method also can be extended to plots of drawdown versus distance for given time values. Field-data plots of drawdown versus log distance on semilog paper will yield a straight line in the region where $u \leq 0.01$. The straight-line portion of the graph is extrapolated to its intersection with the zero-drawdown axis. The slope of the straight line is used to solve for T, and the zero-drawdown intercept is used to solve for S, using the following expressions:

$$T = \frac{528Q}{\Delta s} \tag{15}$$

and

$$S = \frac{Tt}{4790r_0^2} \tag{16}$$

where:

r_0 = intersection of straight-line slope with zero-drawdown axis, in feet, and all other terms are as defined above.

The Jacob straight-line method is popular because of its simplicity; however, its use is restricted to field data that satisfy the "u-criterion" of $u < 0.01$. Deviation from a straight line becomes appreciable when u exceeds about 0.02 (Walton, 1962). The method should be used to supplement, rather than supersede, the type-curve method.

Water-Table Conditions

The methods described in the previous section pertain to artesian aquifer conditions; however, the formulas are also applicable to the results of aquifer tests made under water-table (unconfined) conditions. These formulas were developed in part based on the assumptions that the coefficient of storage is constant and that water is released from storage instantaneously with a decline in water levels. Under water-table conditions, water is derived largely from storage by the gravity drainage of the interstices in the portion of the aquifer dewatered by the pumping. The gravity drainage of water through stratified sediments is not immediate, and the nonsteady flow of water towards a well in an unconfined aquifer is characterized by slow drainage in interstices.

Gravity drainage of interstices decreases the saturated thickness and, therefore, the transmissivity of the aquifer. Under water-table conditions, it is necessary to compensate for observed values of drawdown by the decrease in saturated thickness before the data can be used to determine the hydraulic properties of the aquifer. The following equation derived by Jacob (1944) is used to adjust drawdown data for decreases in transmissivity:

$$s' = s - (s^2/2m) \quad (17)$$

where:

- s' = drawdown in an equivalent artesian aquifer
- s = observed drawdown under water-table conditions
- m = initial saturated thickness of aquifer

The effects of gravity drainage also present challenging problems for the analysis of data because the field data deviate from the ideal upon which the Theis and Jacob methods are based. Several methods of data analysis have been presented by researchers, including Boulton (1963) and Neuman (1975). Neuman's method is designed for assessing anisotropic conditions. Prickett (1965) presented an application of the Boulton method that is useful for conditions under which anisotropy is not considered to be significant or critical to an assessment of the aquifer.

WELL AND AQUIFER TEST RESULTS

Test Well 1-97

The pumping test well, TW 1-97, was finished at a depth of 140 feet. The borehole for TW 1-97 was drilled 12 inches in diameter, and the well was built with 6-inch-diameter steel casing and 8-inch stainless steel shutter well screen. A well screen with 60-slot shutter openings (0.060-inch), 20 feet long, was placed between depths of 120 and 140 feet. Northern No. 2 gravel pack was placed in the annulus surrounding the well screen. Three observation wells were used for the aquifer test: OW 1 (TH 1-96), 2, and 3 (TH 2-96) were completed with 2½-inch diameter PVC casing with sawed slots in the bottom 20 feet (see appendix F for construction details).

Test Protocol

Layne-Western Drilling Company, Inc. furnished and installed pumping equipment in the test well and discharge piping. Equipment to measure discharge rate and water levels, along with data-logging equipment, were furnished and installed by the Water Survey in the test well and in the observation wells.

The step test was conducted on February 13, 1997, and the 7-day aquifer test was conducted on February 17-24, 1997. Pumped ground water was conducted from the well head through flexible hose to the nearby roadside ditch. The water then flowed north to a culvert beneath the road, and into an existing underground drainage pipe that conveyed the water to a drainage ditch. A valve at the well head was used to control the pumping rates, and a Water Survey 4-inch orifice tube was used to measure discharge rates. Ground-water-level measuring equipment included In-Situ Hermit data loggers and pressure transmitters in each well, supplemented with electric dropline measurements.

Step Test

The step test began at a rate of about 100 gpm and increased in approximately 25-gpm increments. Ideally, a minimum of three steps is necessary for analysis, and five steps are desirable. For this test, six 30-minute steps were conducted at rates of about 100, 125, 150, 175, 200, and 225 gpm. Observed ground-water-level data for the step test are included in appendix G. The water-level data showed unusual fluctuations, which were later evaluated during the 7-day aquifer test. It was concluded that the pumped well water-level data were affected by electrical interference from the pump motor, which apparently was in too close proximity to the pressure transmitter suspended in the well. The electrical interference caused sporadic erratic signals from the transmitter, which, in turn, generated abnormal deviations from the general trend in observed water levels.

Step-Test Results

Data collected during the step test conducted on February 13, 1997, were analyzed using the Jacob step-test methodology described earlier. A regression analysis of the observed water-level data for each step made the data suitable for graphical analysis. The results of the analysis indicate that TW 1-97 had a relatively high well-loss coefficient of approximately 15.3 sec^2/ft^5 (see figure 5). Since drawdown due to well loss is proportional to the square of the pumping rate, about 30 to 47 percent of the observed drawdown in the test well was due to well loss.

7-Day Aquifer Test

The 7-day aquifer test began at 1:20 p.m. on February 17, 1997, and ended at 12:30 p.m. on February 24, 1997, a total pumping period of 10,030 minutes. Pumping at TW 1-97 was maintained at a constant discharge rate of about 195 gpm throughout the test. During the pumping period water levels were measured in TW 1-97 and in observation wells OW 1, 2, and 3, located 53.7 feet W, 263.4 feet NE, and 1290 feet N, respectively. In addition, a barometric pressure transmitter was used to record changes in atmospheric pressure. At the end of the pumping period the pump was turned off, and water-level recovery was measured in all four wells until 9:30 a.m. on February 26, a recovery period of 2,700 minutes. Water-level data for the aquifer test are presented in appendix H. Analyses of water samples collected at 3:20 p.m. on February 17 and at 12:00 p.m. on February 24 are presented in appendix I.

7-Day Aquifer Test Results

The effects of hydrologic barrier boundaries were evident within the first 30 minutes of the aquifer test at both the pumped well and the closest observation well (OW 1). By the end of the pumping period, multiple barrier boundaries were discernible in the water-level data at all but the far observation well (OW 3), indicating that the aquifer was limited in areal extent. Data from OW 3 were not consistent with comparable data from the other wells, suggesting a poor degree of areal continuity in the sand-and-gravel material between that well and TW 1-97. At OW 2, water-level data exhibited an unusual time lag that produced questionable values of aquifer hydraulic properties upon analysis. From the evidence it was theorized that the time lag

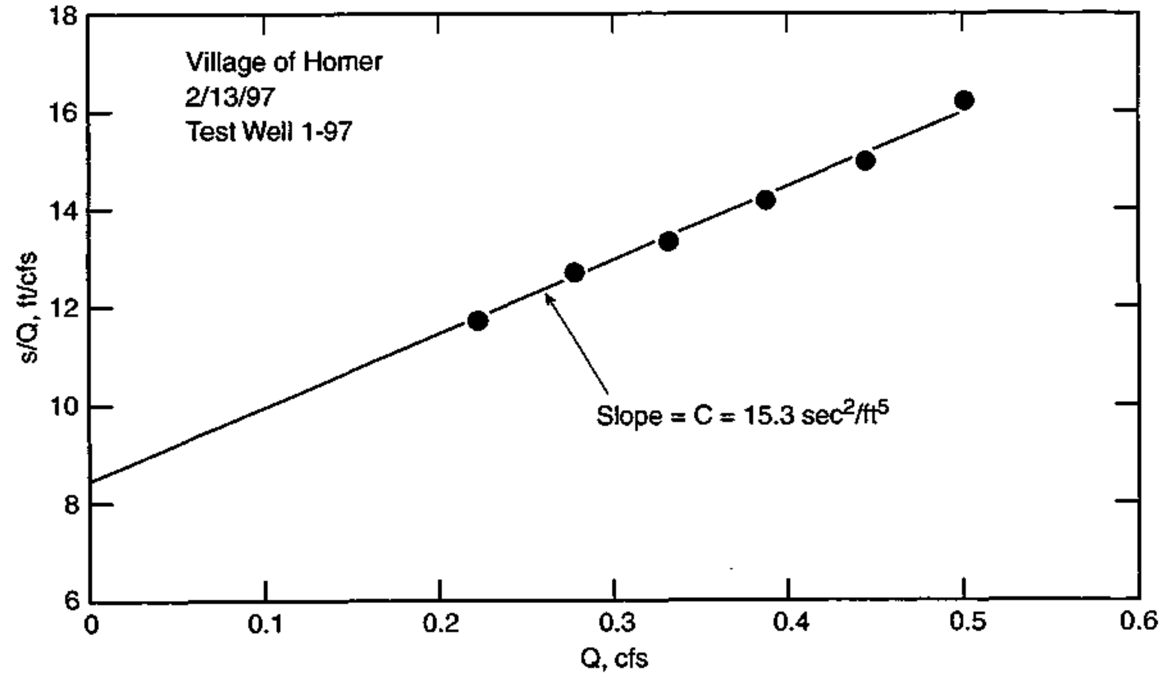

Figure 5. Graphical solution of Jacob's equation for well loss coefficient C, for Homer Test Well 1-97

was caused by residual drilling mud in the borehole, which hampered the hydraulic connection between the well and aquifer. Recovery data (figure 6 and appendix J) taken after the test through March 12, 1997, confirmed the initial diagnosis of a poor hydraulic connection, likely due to muddy borehole conditions. Data from OW 2 and 3 were, therefore, not included in the data analysis.

As during the step test, pumped well data were affected by electrical interference from the pump motor, which apparently was in too close proximity to the pressure transmitter suspended in the well. The electrical interference caused sporadic erratic signals from the transmitter, which, in turn, generated abnormal deviations from the general trend in observed water levels. Electric dropline measurements were made to observe whether abnormal water-level fluctuations were actually taking place. The measurements indicated normal conditions and verified the electrical interference from the pump. In order to render the raw data from TW 1-97 more tractable for graphical analysis, regression analysis was successfully performed.

Unusual water-level fluctuations were observed in all four wells between 4,000 and 6,000 minutes into the test. Upon inspection, the fluctuations were attributable to corresponding changes in atmospheric pressure during that period. Water-level rises during decreases in atmospheric pressure were followed by declines in water level that were concurrent with increases in atmospheric pressure. These fluctuations were taken into account during the data analysis.

Time-drawdown graphs of the water-level data were constructed and analyzed, using Theis type-curve (log-log) and Jacob straight-line (semi-log) methods for data from OW 1 and the Jacob method for pumped well data. The log-log time-drawdown graph from OW 1, shown in figure 7, illustrates the effects of barrier boundaries and atmospheric pressure fluctuations on water levels and demonstrates the Theis type-curve analysis.

Analysis of the time-drawdown data indicated that the most reasonable and consistent results came from OW 1. The transmissivity was calculated to be approximately 171,900 gpd/ft, and the storage coefficient was 1.5×10^{-3}. The average hydraulic conductivity, which is the quotient of transmissivity divided by the aquifer saturated thickness (101 feet), was calculated to be about 1,700 gpd/ft^2. By applying the law of times (Ingersoll et al., 1948) to divergences of drawdown caused by the effect of image wells, estimates of distances to hydrologic barrier boundaries were made. This analysis indicated that barrier boundaries were present at distances of about 850 feet and 1,500 feet from OW 1, with a possible third boundary at 400 feet.

In order to facilitate the application of analytical formulas to the complex aquifer boundary conditions at the site, an idealized mathematical model of the aquifer was hypothesized. The model was a semi-infinite strip aquifer, 2,350 feet in width, with the production well 850 feet from one side, 1,500 feet from the other side, and 400 feet from the closed end. A theoretical distance-drawdown graph was constructed for a model aquifer whose hydraulic properties matched those calculated in the field-data analysis described above. Since the desired yield of TW 1-97 was known to be approximately 100 gpm, the distance-drawdown graph was constructed for continuous pumping at a rate of 100 gpm for 180 days. Using image-

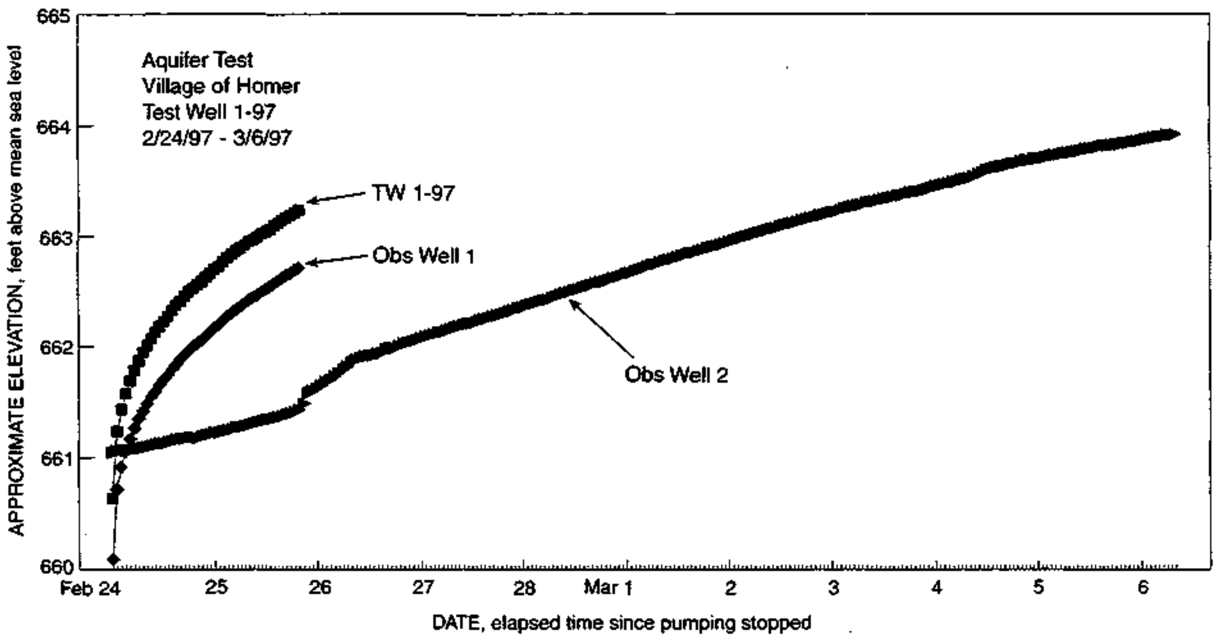

Figure 6. Ground-water-level recovery

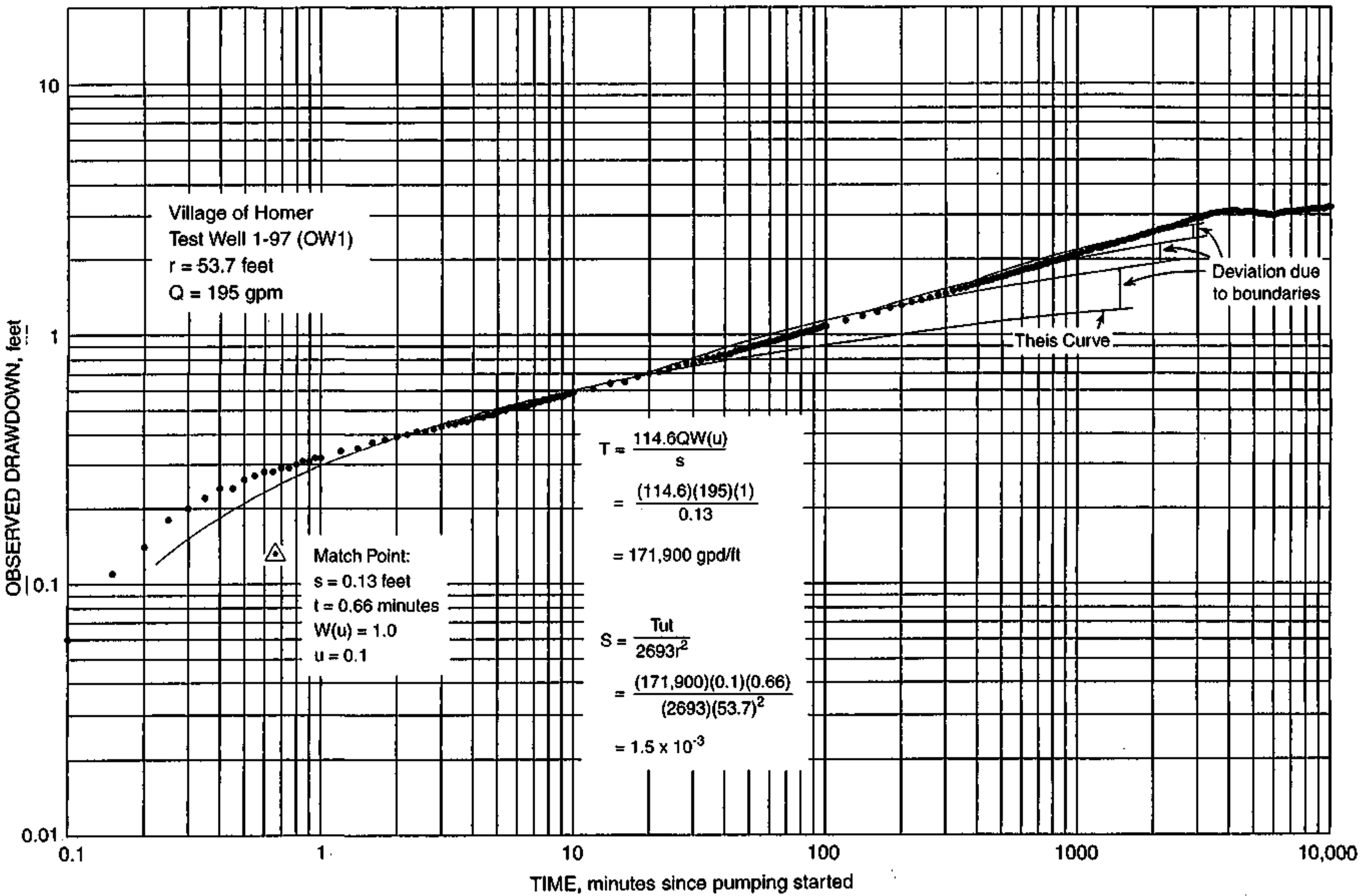

Figure 7. Type curve of Observation Well 1, observed water-level data

well theory for multiple boundaries (Ferris et al., 1962), image wells associated with the barrier boundaries were located graphically, and the interferences associated with those image wells were estimated by referring to the appropriate distances on the theoretical distance-drawdown graph. The interference effects of all the image wells were summed to determine the total additional drawdown attributable to boundary conditions.

The theoretical drawdown from the pumped well for a continuous pumpage of 100 gpm for 180 days in an infinite aquifer was determined by extrapolating observed drawdowns at TW 1-97 prior to the onset of boundary effects and adjusting for the reduced pumping rate. The drawdown at the pumped well was then added to the interference effects from boundaries in order to determine the total expected drawdown at the pumped well for conditions of continuous withdrawal. The results suggest that the desired sustainable yield of about 100 gpm (144,000 gpd) is feasible at TW 1-97 with a pump setting between 75 and 80 feet below land surface.

Potential Effect at Ogden

The potential for long-term effects of pumpage at the TW 1-97 site on ground-water levels in municipal supply wells at the village of Ogden was investigated by using the same assumptions about aquifer boundaries and applying the same distance-drawdown relationship that was used at TW 1-97. Wells 1 and 2 at Ogden are 65 feet and 67 feet deep, respectively, and located approximately 9,600 feet to the northeast of TW 1-97. The theoretical long-term drawdown at that distance is nominally quite small, less than one-half foot. The long-term theoretical effects of aquifer boundaries were estimated, using image-well theory, and the total interference at Ogden from pumpage and boundary effects was estimated to be less than 5 feet.

The estimate of potential effects at Ogden assumed that the aquifer materials there are continuous and in close hydraulic connection with the aquifer materials penetrated at TW 1-97. Since it is not certain that such continuity exists in the aquifer materials between TW 1-97 and Ogden, the above estimates of potential interferences are likely conservative. In addition, it is not likely that actual ground-water withdrawals by the village of Homer will be as much as 100 gpm (144,000 gpd) because of pumping costs and water demands. Actual water-level interference, should it occur, between the two sites will probably be much less. Potential loss of production capacity will be very small because of the high ground-water levels at the Ogden well sites.

SUMMARY

The presence of such a thick sequence of sands and gravels at the site of TW 1-97 is highly unusual, inasmuch as nothing of comparable thickness is known in this region of Champaign County. For this reason, the areal extent of these aquifer materials is the least known yet most likely factor in determining the ultimate long-term sustainable yield of a production well at the site of TW 1-97. Based on the results of the aquifer testing described above, it appears that the desired yield of 100 gpm is feasible at that site. It is prudent, however, to also recommend that water levels at the production well be measured on a regular basis, once the well is placed into production, in order to monitor the long-term response of the aquifer to ground-water withdrawals. Test data indicated the presence of boundaries and their approximate distances to the pumping well but did not support the accurate determination of boundary directions or configuration. Close monitoring, therefore, of the relationship between long-term pumpage and water levels at the production well site is a wise and desirable management policy for operation of this new production well.

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Appendix A.

Test Hole Information, February 1995

DATE 2-14-95

TEST HOLE #1-95

CONTRACTOR — **SIMS DRILLING COMPANY**

OWNER Village of Homer

ADDRESS

LOCATION Vermilion County Vance Twp, T18N , R14W, Sec 3, approx 500'N of SE cor on east line of section

Drilling Time	Depth	Formation	Fluid Loss Water	Fluid Loss Mud	Weight
	0-1	topsoil			
	1-7	gray clay			
	7-14	yellow fine to coarse sand & small gravel			
	14-18	soft gray-blue clay			
	18-20	gray sand & gravel			
	20-27	interlayered fine to coarse sand & gray clay			
	27-30 9 feet	gavelly gray sand			
	30-31	fine gray sand			
	31-36	gravelly gray clay-green tint			
	36-38	white limestone			
	38-54	gray-white limestone, some thin layers darker			
	54-60	black shale (oil slick on tank)			

Ai marks

DATE 2-17-95

CONTRACTOR —**SIMS DRILLING COMPANY**

Test Hole # 2-95

OWNER Village of Homer

ADDRESS

LOCATION Vermilion County Vance Twp T18N R14W Sec 3 [illegible] SE/NE/SE

Drilling Time	Depth	Formation	Fluid Loss Water	Fluid Loss Mud	Weight
	0-1	topsoil			
	1-4	brown dirt			
	4-14	brown clay			
	14-34	gray clay			
	34-37	white-gray limestone			
	37-38	brown shale			
	38-40	gray limestone			

Appendix B.

Correspondence:

Illinois State Water Survey:
Ground-Water Conditions in the Vicinity of Homer, December 16, 1992

Illinois State Geological Survey:
Ground-Water Geology in the Vicinity of Homer, December 22, 1992

Illinois State Water Survey

Hydrology Division
2204 Griffith Drive
Champaign, Illinois 61820-7495
Telephone (217) 333-4300
Telefax (217) 333-6540

December 16, 1992

Mr. John Stayton
Member, Homer Water Committee
c/o Village Clerk
101 North Main Street
Homer, IL 61849

Dear Mr. Stayton:

This letter is in response to your visit to our office on November 24, 1992, and your subsequent telephone call on December 2, 1992, regarding interest by the officials of the village of Homer to begin to determine and to evaluate alternatives for additional water supply for the village.

The present water supply for the village is obtained from 3 wells that range in depth from about 59 to 72 feet deep. The wells are individually pumped at rates from about 50 to 100 gallons per minute (gpm). The wells tap a sand and gravel aquifer that is known to be limited in areal extent. Beginning as early as the mid-1960s, it was known that this sand and gravel aquifer had a long-term yield of about 125,000 gallons per day. Average ground-water withdrawals in excess of this amount previously have caused declines in ground-water levels and reduced pumping capacity (see copies of enclosed file memos). That the village has been able to keep water use at about the same amount for more than 25 years is surprising. Whether this same use can be sustained for many more years is speculative and I endorse the plan to begin to determine and to evaluate water supply alternatives.

Over the years, several episodes of exploratory test hole drilling have been undertaken by the village without locating another sand and gravel aquifer suitable for development. The area in the nearby vicinity of the town is now known to have only very limited deposits of water-bearing sand and gravel. As I indicated to you during your visit to my office, it appears that an area several miles north and west of Homer may have merit for ground-water exploration activity. Sand and gravel deposits are known to be present in the unconsolidated glacial materials in the area as evidenced by the production wells used by St. Joseph, Ogden, and Fithian. Although these water-bearing sand and gravel deposits may not be present at all sites, they do seem to be fairly persistent in this area. The texture and thickness of the deposits also may vary from site to site. The public supply wells range in depth from about 65 to 86 feet and are pumped at rates of about 60 to 125 gpm. The new wells in use for Fithian are located about 2 miles east of Ogden near the SE/c, Section 10, T.19 N., R.14 W., Vermilion County, while the wells at Ogden and St. Joseph are located within the towns.

A Division of the
Illinois Department of Energy and Natural Resources

The area between Ogden and St. Joseph was included in a cooperative study conducted by the State Geological Survey and State Water Survey about 10 years ago. The enclosed copy of Cooperative Report 8 describes that study. I have asked Ross Brower at the State Geological Survey to review the geologic information associated with that study report and to prepare an interpretive letter that may better indicate more specific areas for exploration. It will be important to maintain some distance, perhaps two miles or so, between any new production wells for Homer and the present wells located at Ogden and St. Joseph to minimize withdrawal interference between the well fields. Accordingly, it may be found that areas in or near Sections 7 and 18, T.19 N., R. 11 E., and Sections 7 and 18, T.19 N., R.14 W., Champaign County, may include sites with potential for the occurrence of a sand and gravel aquifer suitable for development.

As this area is some six miles or so from the village, the associated cost of ground-water supply exploration and evaluation, engineering design, well and pipeline construction, and continued operation of your water treatment plant may mean that a pipeline to the village of Sidney to connect to the pipeline supply from the Northern Illinois Water Corporation also should be considered. Whether this is feasible depends on the present flow capacity of the pipeline at Sidney or the engineering improvements that would be needed to increase the pipeline capacity. As it is my understanding that the pipeline is owned by the village of Sidney, the Sidney village officials and their consulting engineer will need to be contacted to determine the extent of engineering improvements that would be needed.

Please contact me if you wish to discuss these water supply options further.

Very truly yours,

Ellis W. Sanderson

Ellis W. Sanderson
Senior Engineer
Office of Ground-Water Resource
Evaluation and Management
Phone: (217) 333-0235

Enclosures as stated.

cc: R. Brower, ISGS
IEPA (2)

Illinois State Geological Survey

ENR

Illinois Department of Energy and Natural Resources

Natural Resources Building
615 East Peabody Drive
Champaign, IL 61820-6964
217/333-4747
FAX 217/244-7004

December 22, 1992

Mr. John Stayton
Member, Homer Water Committee
c/o Village Clerk
101 North Main Street
Homer, IL 62849

Dear Mr. Stayton:

This letter has been prepared at your request regarding development of a supplemental groundwater supply for the Village of Homer. Your request was directed to my attention by Mr. Ellis Sanderson of the State Water Survey. An area located 3 to 7 miles north-northwest of the village, or in the northern parts of Ranges 10 E., 11 E., and 14 W., in T. 19 N., Champaign County, has been suggested as a potential area for consideration. Map coverage of the study area is provided by the Homer and St. Joseph 7-1/2 minute topographic quadrangle maps. These maps can be obtained from the Geological Survey.

The village water supply is currently obtained from wells completed in a relatively thin sand and gravel outwash deposit of the Illinoian-age Glasford Formation, the middle of three formations comprising the glacial deposits in Champaign and Vermilion Counties., This sand and gravel, which is one of several outwashes that may be found in the Glasford Formation, lies near the base of this formation. The bulk of this formation is composed of pebbly clay deposits (till) that were deposited by glacial ice each time the ice front retreated from the area. The multiple tills present in this formation indicate at least three and possibly four advances and retreats of the ice front through this area of Champaign County during the Illinoian Stage of glaciation. Immediately following each retreat of the ice front, glacial meltwater flowing away from the ice front deposited outwash on top of the till that had just been deposited. Most Glasford outwashes were deposited in broad, low-gradient drainageways that trended westerly to southwesterly. Outwash thicknesses may range from a few inches to over 30 feet. Large variations in texture (grain size) can be expected over short distances in these outwashes. Many of the Glasford outwashes are relatively fine-grained and may include significant quantities of water-laid, interbedded or intermixed, silty, clayey materials.

The outwash deposit tapped by the Homer water supply wells lies 59 to 72 feet below the surface and trends southward through the village to a position lying nearly one mile south of the village where it turns westerly toward Sidney. The northeastern extremity of this deposit appears to lie a short distance northeast of the village. In the village it is 1/4 to nearly 3/4 mile wide, but spreads to nearly 1-1/2 miles in width to the west. Rapid changes in thickness and texture can be expected over short distances. The water-yielding potential at most locations is expected to range from adequate for household and farmstead water supply needs, to nearly approaching the size of the municipal supply used by Homer utilizing multiple, adequately spaced wells. Broader areas of Glasford outwash are known to occur in the southern part of the county, but yield potential at most locations is fairly limited. Well records and information compiled during investigations of groundwater conditions in the area suggest the presence of thicker, somewhat more permeable Glasford outwashes in an area stretching from 3 to more than 12 miles north of Homer.

The glacial deposits in the Homer area have a thickness range of 20 to over 170 feet and are composed of multiple, pebbly clay tills and some interbedded sand and gravel outwashes that were deposited during three episodes of glacial ice incursion into Illinois. The thinnest glacial deposits are found east of Homer where the bedrock surface lies near the land surface. A thickness exceeding 170 feet is noted a few miles to the west in a south-southwesterly-trending valley on the bedrock surface where deposits of the pre-Illinoian (oldest), the Illinoian, and the Wisconsinan glaciation completely bury this bedrock valley. Other bedrock valleys have been mapped 3 miles west of St. Joseph (trends south-southwesterly) and a short distance northeast of Ogden (trends northerly). The bedrock surface has its highest elevation position (635 to 670 feet msl) east and southeast of Homer. It lies at an elevation of 560 +10 feet msl beneath Homer, Ogden, and St. Joseph. A gentle regional slope to the northwest in the northwestern part of the study area carries the bedrock surface to an elevation of less than 360 feet at the center of the Mahomet Bedrock Valley in northwestern Champaign County.

The following discussion describes the general character of the three formations making up the glacial sequence in the Homer area. Banner Formation deposits accumulated during the pre-Illinoian glaciation (the oldest glacial event) and lie between the bedrock surface and an elevation of 565 feet msl west of Homer, to as high as 610 feet msl a short distance east of Homer. The intermediate position glacial deposits, the Glasford Formation, were deposited during the Illinoian glaciation. The Glasford is found between elevations of 565 feet and about 620 feet msl in the west, and 610 to 640 feet msl east of Homer. The Wedron Formation accumulated during the most recent glacial event, the Wisconsinan glaciation. It lies between the Glasford Formation and a thin layer of Wisconsinan-age, wind-blown silt that accumulated on the Wedron after the glacial ice had retreated from this immediate area of Illinois. This silt layer forms the present-day land surface and is the parent material for the soil.

The basal Banner Formation is composed of several silty, sandy, clayey tills and one or two discontinuous outwashes. Outwash is found mostly in those areas overlying small, buried bedrock valleys, but the areal distribution of the thicker occurrences of the Banner Formation outwashes may cover only a fraction of the total width of these bedrock valleys. Banner outwashes are relatively fine-grained and thicknesses are expected to range from 0 to possibly 15 feet. There is a general trend toward thicker, broader outwashes westward toward the Mahomet Bedrock Valley. Outwash is the dominant lithology in the Mahomet Bedrock Valley. Yield expectation from Banner outwashes in the study area is limited but may be more than adequate for meeting household and farmstead water supply needs at some locations.

The Glasford Formation is composed of three or more sandy, silty tills and several fine to medium-grained outwashes. Glasford deposition began on the weathered, gently westward sloping surface of the Banner Formation. To the east, the Banner Formation thins and the bedrock surface was exposed at the land surface prior to the initial deposition event of the Glasford Formation. The lowest position on this pre-Glasford land surface formed a north-south lowland in the east half of R. 10 E. The basal Glasford outwash is found in parts of this lowland and in small drainageways that drained westward to south-westward into it. Many of the sand and gravel bodies throughout the Glasford follow similar trends. Most Glasford sands and gravels are relatively narrow (less than one-quarter to over three-quarters mile wide) and exhibit rapid changes in textures over short distances. After each till was deposited, outwash accumulated in the drainageways that carried meltwater westward from the retreating ice front. Wherever erosion in the bottom of these drainage-ways reached to the top of a more deeply buried outwash and outwash was subsequently deposited in the eroded channel, a fairly thick interval of outwash resulted.

Glasford outwashes occurring as westerly to southwesterly-trending bands have been mapped: 1) in southern Champaign County (broad band of mostly fine-grained outwash and some associated, very fine-grained lake deposits), 2) beneath Homer and extending westward toward Sidney (band about 1/4 to 1-1/2 miles wide), 3) about 1-1/2 miles south of Ogden and extending into the central part of Section 30 in R. 11 E. (narrow band 1/4 to 3/4 mile wide), 4) from Ogden to the northeastern corner of Section 24, T. 19 N., R. 10 E. (narrow band), 5) from Section 5, T. 19 N., R. 14 W. to Section 13, T. 19 N., R. 10 E. (band 1/4 to 1 mile wide), 6) from Section 31, T. 20 N., R. 11 E., to Section 15, T. 19 N., R. 10 E., a fairly broad band, and 7) in a broad area north of Ogden in T. 20 N., R. 14 W., N-l/2 of T. 20 N., R. 11 E., and in a large part of T. 20 N., R. 10 E. Outwash thicknesses of 10 to over 30 feet are possible, especially where several outwashes overlie one another. Generally, the potential for encountering thicker, more permeable sands and gravels increases northward. Changes in grain size (texture) may vary rapidly over short distances, particularly perpendicular to the trend of the meltwater drainageways.

The upper glacial unit, the Wisconsinan-age Wedron Formation, is composed of two and possibly three silty, clayey tills and several thin, discontinuous outwashes. Thin outwashes are found at the top of the formation, at a depth of about 30+7 feet, and between the basal till unit and the soil horizon (locally peat) that had developed on top of the Glasford prior to the arrival of Wisconsinan glacial ice. Near-surface outwash is found as a broad, apron-like deposit south of the Newtown-Gifford Moraine (east-west trending ridge located north of Royal) and along present-day streams and drainageways. The intermediate and basal outwashes trend southwesterly and are most prevalent in the NW-1/4 of T. 19 N., R. 14 W., and in the vicinity of the Salt Fork north of St. Joseph. Wedron outwashes offer only a limited potential for moderate yields, and the more productive of these outwashes are probably too far distant from Homer to be considered as a water supply source. Locally, small patches of Wedron outwash may directly overlie Glasford outwashes, and thus, contribute to the total thickness of outwash present.

The Pennsylvanian-age bedrock lying beneath the glacial deposits has no potential for yielding adequate quantities of groundwater for a village water supply. Non-water-yielding shales predominate and the few, thin sandstones, limestones, and coals that are present yield only limited quantities of water. One exception is a narrow, westerly-trending channel sandstone (1/4 to 1/2 mile wide) located several miles south of Homer and lying at least 200 feet below the surface. This sandstone is expected to yield more water than is typically needed for individual household or farmstead water supply needs. Mineralization of groundwater in the bedrock increases as depth increases. Fairly highly mineralized water is found below a depth of 175 to 225 feet. Water from greater depths is too highly mineralized for most uses.

In summary, there is little or no groundwater resource availability east and south of Homer and no additional capacity in the existing well field. Limited resource is expected to the west. A fair to good potential for supply development is expected in narrow bands of Glasford outwash located 3 to more than 12 miles north and north-northwest of the village. Yield potential in these bands is expected to increase northward. A test drilling program is recommended to identify outwash distribution, character, and water-yielding potential. From this information the better sites for new production wells can be selected. Test drilling can be initiated in those areas in which existing information shows the greatest potential for outwash occurrence.

If you or members of the water committee have additional questions related to geologic and groundwater conditions in the study area, please feel free to contact me at the Geological Survey by calling (217) 333-5851.

Sincerely yours,

Ross D. Brower RDB.
Associate Staff Geologist
Hydrogeology Section

RDB:ey

cc: -E.W. Sanderson
-Illinois EPA (2)

Ltrl2.182

Appendix C.

Illinois State Geological Survey
Electrical Earth Resistivity Survey Letter Report, July 22, 1996

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

ILLINOIS STATE GEOLOGICAL SURVEY
Natural Resources Building
615 East Peabody Drive
Champaign, IL 61820-6964
217/333-4747
FAX 217/244-7004

July 22, 1996

A RECONNAISSANCE ELECTRICAL EARTH RESISTIVITY SURVEY FOR THE VILLAGE OF HOMER, SECTIONS 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, and 30, T. 19N, R.14W, CHAMPAIGN COUNTY, ILLINOIS

By

Timothy C. Young, Assistant Staff Geoscientist
Groundwater Resources and Protection Section

Introduction

At the request of Mr.Andy Kieser, Sodemann & Associates, 340 North Neil St., Champaign, Il. 61820, and the Village Board of Homer, 101 North Main, Homer, Il. 61849 , an electrical earth resistivity survey was conducted between June 10 - June 27, 1996. The purpose of the geophysical survey was to locate a deposit of water-bearing sand and gravel from which a supply of water could be obtained for a supplemental municipal supply.

The study area covered approximately 7.5 square miles, 2.5 miles north and south by 3.0 miles east and west. 18 miles of road were used for right of way access for the resistivity soundings. The south line of the survey, Old State Road (county road 1460 N), is approximately 2.5 miles north of Homer. Approximately 1.5 miles of the survey was concentrated to the south of Old State road and directly west of Homer Lake on county road 2500 East. The north line of the survey, State Highway 150, is approximately 5.0 miles north of Homer. The east-west line of the survey extends 3 miles west from the Champaign and Vermillion County line to the west line of R. 14 W.

Hydrogeologic Framework

The acreage is situated on ice-deposited materials (glacial drift) of Wisconsinan and Illinoian age. The glacial drift consists of about 150 feet of sandy, silty, pebbly clay with some layers of sand and gravel. The layers of sand and gravel, where present, are generally less than 1-2 feet thick but may exceed 15 or 20 feet in thickness at a few locations. Depth intervals where sand and gravel deposits are most likely to be present are between 15-20 feet, 40-60, and 100-135 feet. The upper 30-40 feet of glacial drift is predominately a yellow-orange weathered till called the Wedron formation of Wisconsinan age (most recent glacial event). Below the Wedron is the Glasford formation of Illinoisan age. The Glasford consists of several or more different till units with sand and gravel outwashes sometimes present between these deposits. The most prevalent depth interval where sand and gravel is present is from 35-45 feet, or between the Wedron and Glasford formations, or within the Glasford formation itself. Slightly south and west of the study area, sand and gravel deposits up to 100 feet in thickness have been reported. The Glasford may extend to depths of 100-120 feet within the study area. The Banner formation (of pre-Illinoisan age) is the oldest and deepest glacial drift in the study area. The Banner lies beneath the Glasford and on top of the bedrock and consists of one or more till members in the area. At least one sand and gravel outwash appears to exist in the Banner formation and have been reported by local driller's as producing up to 150 gpm (short term) at several recently built homes just north of Old State Road (1460 N) on county road 2550 E. Coarse sand and gravel has been encountered between 115 and 135 foot depth intervals. Static water levels in three wells within this depth range have been recorded at 6.0 feet below ground surface to flowing above ground. Other wells in the study area indicate sand and gravel present in the 40-60 foot depth range.

Resistivity Survey

The electrical earth resistivity survey is based on the principal that compact glacial till, alluvium and shale present less resistance to the passage of an electric current than sand and gravel of the glacial drift, or sandstone and limestone of the bedrock. The purpose of the survey is to test the glacial drift in order to obtain a basis for recommendations for test drilling. The accompanying sketch map shows the approximate location of the 144 stations occupied during the course of the survey. All stations are marked by spray paint on the edge of the township roads and\or numbered flags placed into the ground. Fourteen readings were taken at each station to a depth of 200 feet. Stations were spaced at every 540 feet (approximately 1/10 of a mile), and where readings were more favorable, stations were spaced every 300 feet.

Overall, the resistivities at the stations occupied were in a low to intermediate range with higher readings at station nos. 29-31 and 37-52. Of these 18 stations, 4 were considerably higher than all others. The higher values indicate that the glacial materials may contain saturated sand and gravel deposits sufficient to develop an adequate water supply to a properly constructed well.

The most favorable area within the limits of the survey is shown by the hachures on the accompanying map. Three locations have been chosen specificically for test drilling.

The stations with the highest readings and therefore the most favorable stations are nos. 49, 42 or 43, and 30 with no. 49 having the best reading, and therefore the best location to test. If the testing is unsuccessful at station 49 then successive testing should be performed, in order, at station nos. 42-43 and 30. Station no. 49 is approximately 3,540 feet south of the center of hwy route 150.

The testing should be performed by a driller capable of constructing a small-diameter drilled well in the depth range of 140-160 feet in sand and gravel. Drilling should be carried to bedrock, and then drilled an additional 10 feet to confirm the existence of a bedrock surface and to allow for geophysical logging of the borehole to bedrock.

In order to evaluate the results of this survey more fully, we would like to have a geologist at the test site to collect and log sample cuttings for interpretation and correlation. Borehole geophysical logging is also required to confirm the results of the resistivity survey. Logging will precisely identify the thickness and depth intervals of an aquifer, and help to determine certain physical characteristics within a test hole which will aid in proper well construction.

Conclusion

The interpretation of the resistivity data strongly suggests the presence of a sand and gravel deposit with a northeast to southwest trend as was stated by Ross Brower in his 1992 letter to Homer concerning the groundwater possibilities to the north of Homer. An obvious anomoly in the data indicated that the deposit may be more extensive in width and possibly in thickness than previously suspected. The extent to the south, however, appears to be as was expected; spotty to non-existent.

The Illinois Water Use Act (Public Act 83-700) requires any person who proposes to develop a water well with a capacity in excess of 100,000 gallons on any given day (70 gpm) to notify the County Soil and Water Conservation District. The purpose of the Act is to establish a means of reviewing potential water-use conflicts before damage is incurred. The Act is not intended to restrict or regulate groundwater withdrawals.

For additional information on this Act, contact your County Soil and Water Conservation District or the Division of Natural Resources, Illinois Department of Agriculture, State Fairgrounds, Springfield, Illinois 62706, phone 217-782-6297.

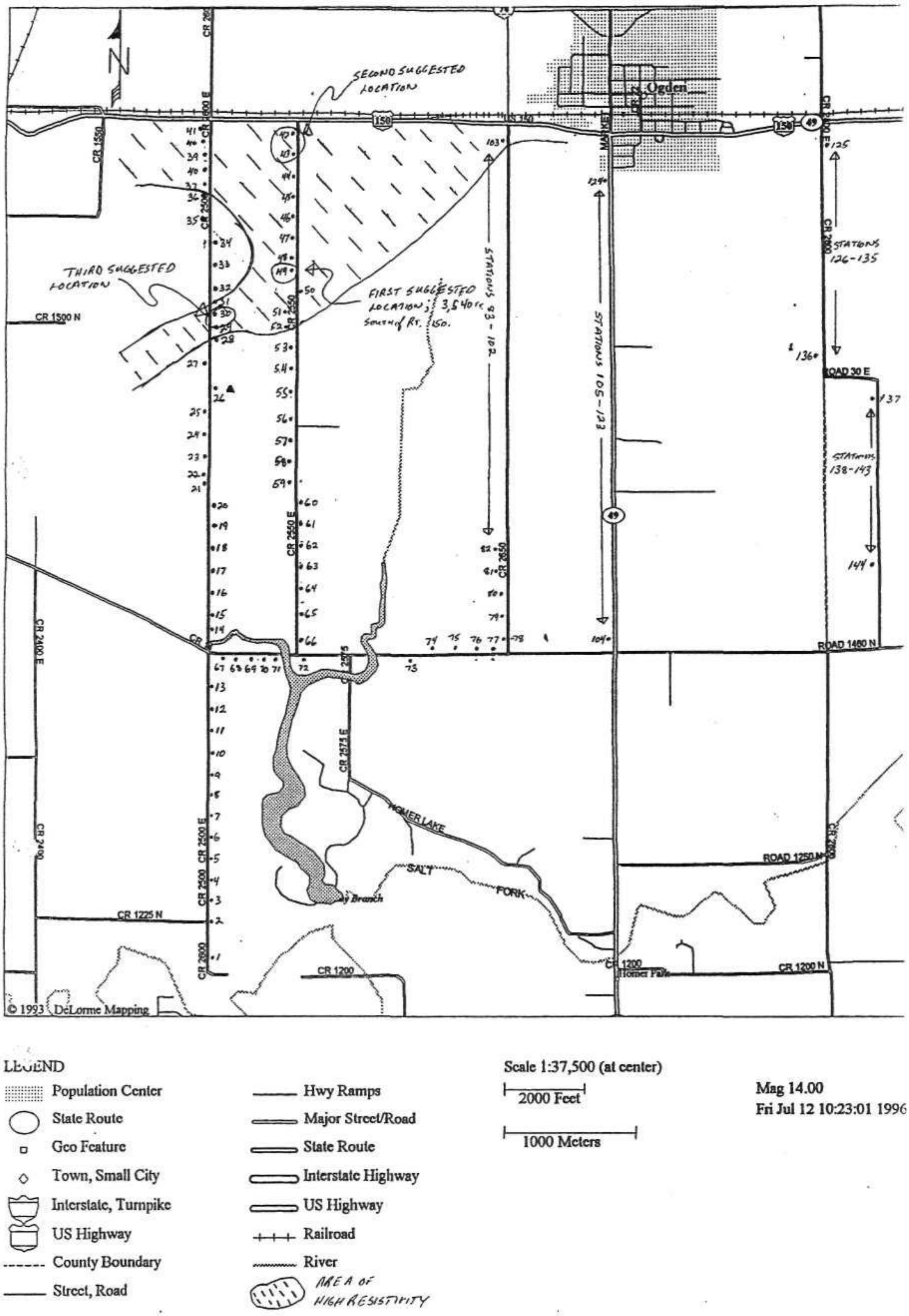
Any future correspondence referring to this report should be addressed to the State Geological Survey, 615 East Peabody Drive, Champaign, Illinoiss 61820.

TCY:ey

Enclosure

cc: -State Water Survey
-Illinois EPA (2)
-Homer Village Board
101 N. Main
Homer, Il.
-Sodemann & Associates
340 N. Neil St.
Champaign, IL 62401

Rpt-EER.hom



A RECONNAISSANCE ELECTRICAL EARTH RESISTIVITY SURVEY FOR THE VILLAGE OF HOMER, SECTION 6. T. 18 N., R. 41 W., CHAMPAIGN COUNTY, ILLINOIS

July 15, 1996 Timothy C. Young

Groundwater Resources Section

Appendix D.

Test Hole Information, December 1996 - January 1997

Appendix D. Test Hole Logs

Test Hole No.:	1-96 (Observation Well 1)
Site:	Ogden Township
Drilling Contractor:	Layne-Western Company, Inc.
Date Drilled:	December 17, 1996
Drilling Method:	Straight rotary
Depth:	170 feet
Hole Record:	4 7/8-inch; 0-170 feet
Casing Record:	2½-inch PVC, +0.5-125 feet
Screen Record:	2½-inch PVC; sawed slots, 125-145 feet
Ground Elevation:	670 feet above mean sea level (msl), topographic map
Location:	Approximately 2600 feet West and 1340 feet North of the SE corner, Section 18, T.19 N., R.14 W., Champaign County
Remarks:	Geophysical log by ISGS

DRILLERS LOG

<u>Formation</u>	From *(feet)*	To *(feet)*
Black top soil	0	2
Brown silty clay, slightly sandy	2	13
Gray sandy clay	13	17
Hard gray clay, medium sand to small gravel embedded	17	33
Brown hard sandy clay	33	37
Brown soft clay	37	46
Very fine sand	46	64
Fine to medium gray sand	64	70
Fine to medium layered sand, organics, and wood present	70	93
Fine to medium sand with clay lenses	93	100
Medium to coarse sand and gravel	100	110
Fine to medium sand	110	115
Medium sand with clay traces	115	120
Coarse gravel	120	135
Medium to coarse sand and small gravel	135	147
Coal lenses, blue gray shale; darker gray and harder @ 160 feet	147	170

Appendix D. Continued

Test Hole No.:	2-96 (Observation Well 3)
Site:	Ogden Township
Drilling Contractor:	Layne-Western Company, Inc.
Date Drilled:	December 26, 1996
Drilling Method:	Straight rotary
Depth:	105 feet
Hole Record:	4 7/8-inch; 0-135 feet
Casing Record:	2½-inch PVC, +5.4-95 feet
Screen Record:	2½-inch PVC; sawed slots 95-105 feet
Ground Elevation:	670 feet above mean sea level (msl), topographic map
Location:	Approximately 2600 feet West and 2630 feet North of the SE corner, Section 18, T.19 N., R.14 W., Champaign County
Remarks:	Geophysical log by ISGS

DRILLERS LOG

Formation	From (*feet*)	To (*feet*)
Black top soil	0	3
Brown silty clay	3	14
Gray sandy clay, gravel embedded	14	37
Brown sandy clay	37	44
Fine sand	44	89
Fine sand layered with clay and silt seams	89	100
Medium sand, clay throughout with leses of green clay	100	110
Layered brown clay with oxidized red seams	110	115
Blue-green shale layered with black harder seams	115	135

Appendix D. Continued

Test Hole No.:	3-96
Site:	Ogden Township
Drilling Contractor:	Layne-Western Company, Inc.
Date Drilled:	January 15, 1997
Drilling Method:	Straight rotary
Depth:	100 feet
Hole Record:	4 7/8-inch; 0-100 feet
Casing Record:	None
Screen Record:	None
Ground Elevation:	670 feet above mean sea level (msl), topographic map
Location:	Approximately 2090 feet East and 600 feet South of the NW corner, Section 18, T.19 N., R.14 W., Champaign County
Remarks:	No split spoon samples collected; Geophysical log by ISGS

DRILLERS LOG

Formation	From *(feet)*	To *(feet)*
Black top soil	0	3
Brown clay	3	8
Gray silty clay with gravel embedded	8	37
Brown sandy clay	37	41
Fine sand	41	43
Gray silty clay	43	47
Sand and gravel	47	60
Gray silty clay with gravel embedded	60	72
Gray sandy clay	72	75
Gray clay	75	86
Light gray weathered shale	86	90
Gray weathered shale	90	100
Black shale and coal @ 100 feet		

Appendix D. Continued

Test Hole No.:	4-96 (Observation Well 2)
Site:	Ogden Township
Drilling Contractor:	Layne-Western Company, Inc.
Date Drilled:	January 23, 1997
Drilling Method:	Straight rotary
Depth:	145 feet
Hole Record:	4 7/8-inch; 0-170 feet
Casing Record:	2½-inch PVC pipe, +4.1-125 feet
Screen Record:	2½-inch PVC; sawed slots, 125-145 feet,
Ground Elevation:	670 feet above mean sea level (msl), topographic map
Location:	Approximately 2400 feet West and 1420 feet North of the SE corner, Section 18, T.19 N., R. 14 W., Champaign County

Remarks:

DRILLERS LOG

Formation	From *(feet)*	To *(feet)*
Black top soil	0	4
Brown silty clay	4	12
Gray sandy clay	12	34
Brown hard silty clay	34	45
Fine sand with layers of coarse sand seams	45	110
Fine to medium sand	110	115
Medium to coarse sand and gravel	115	143
Trace of shale and weathered lime, becoming more solid	143	170

Appendix D. Concluded

Test Hole No.:	5-96 (Test Well 1-97)
Site:	Ogden Township
Drilling Contractor:	Layne-Western Company, Inc.
Date Drilled:	January 31, 1997
Drilling Method:	Straight rotary
Depth:	feet
Hole Record:	12-inch; 0-146 feet
Casing Record:	6-inch steel (T&C), +1.5-120 feet
Screen Record:	6-inch stainless steel shutter, 120-140 feet, 0.060-inch slot (60 slot), 20 feet long
Ground Elevation:	670 feet above mean sea level (msl), topographic map
Location:	Approximately 2550 feet West and 1340 feet North of the SE corner, Section 18, T. 19 N., R.14 W., Champaign County
Remarks:	Geophysical log by ISGS

DRILLERS LOG

Formation	From *(feet)*	To *(feet)*
Black top soil	0	*2*
Brown silty clay, slightly sandy	2	13
Gray sandy clay	13	17
Hard gray clay, medium sand to small gravel embedded	17	33
Brown hard sandy clay	33	37
Brown soft clay	37	46
Very fine sand	46	64
Fine to medium gray sand	64	70
Fine to medium layered sand, organics and wood present	70	93
Fine to medium sand with clay lenses	93	100
Medium to coarse sand and gravel	100	110
Fine to medium sand	110	115
Medium sand with clay traces	115	120
Coarse gravel	120	137
Medium to coarse sand and small gravel	137	147
Coal lenses, blue gray shale, darker gray and harder @ 150 feet	147	150

Appendix E.

Illinois State Geological Survey
Geophysical Logging Report of Test Borings, February 27, 1997

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

ILLINOIS STATE GEOLOGICAL SURVEY

Natural Resources Building
615 East Peabody Drive
Champaign, IL 61820-6964
217/333-4747
FAX 217/244-7004

March 3. 1997

Ernest Wienke, Mayor
Homer Village Board
101 North Main Street
Homer, Illinois 61849

Dear Mayor Wienke and Village Board:

Enclosed is a report summarizing the results of the geophysical logging and test drilling conducted in December 1996 and January 1997 for the Village of Homer. Along with the report you will find a site map. geophysical logs and headers of each test hole, and a geophysical log plot cross section.

Very truly yours,

Timothy C. Young
Associate Staff Geologist
Groundwater Resources and Protection Section

Enclosure

cc: -State Water Survey
-Illinois EPA (2)
-Andy Kieser

L-Rpt EER. Moore

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

ILLINOIS STATE GEOLOGICAL SURVEY

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217/333-4747
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February 27, 1997

REPORT ON THE TEST DRILLING AND GEOPHYSICAL LOGGING FOR THE VILLAGE OF HOMER, SECTION 18, T. 19 N., R. 14 W., CHAMPAIGN COUNTY, ILLINOIS

By

Timothy C. Young
Groundwater Resources and Protection Section, ISGS

INTRODUCTION

This report on the correlation and lithological description of the earth materials at five well sites on County Road 2550 East in Section 18, T. 19 N., R. 14 W., Champaign County, Illinois, was undertaken as part of the Illinois State Geological Survey (ISGS) commitment to assist the citizens, municipalities, and counties of the state of Illinois and to further evaluate the groundwater resources throughout Illinois.

After several years of unsuccessful test drilling a request was made in February 1996 to the ISGS and the ISWS (Illinois State Water Survey) by Andy Kieser, Engineer of Sodemann & Associates, Champaign to assist the Village of Homer in locating a groundwater source capable of supplying a long term yield of 100 g.p.m. The Illinois EPA had placed Homer on a restricted status due to pumping limitations on their current well field. In March of 1996 at a Homer Board meeting, the ISGS proposed (refer to the proposal entitled Geotechnical Support Request Entitled "A Reconnaissance Electrical Earth Resistivity Survey to Locate a Supplemental Groundwater Supply for the Village of Homer") exploring an area north and west of Homer for potential test drilling using electrical earth resistivity (EER) soundings. The area picked for the EER study was determined by existing well data within and around the proposed study area and a groundwater possibilities report written by Ross Brower, Staff Geologist of the ISGS. Following the EER study in June 1996, recommendations on the best potential locations to test drill were made based on the results of the study. Five test holes were drilled by Layne-Western of Aurora, IL to confirm the results of the EER survey.

This report discusses the results of the test drilling and the geophysical logging of TH-1, TH-2, TH-3, TH-4, and TH-5.

Initial Observations

From domestic wells drilled in the southern portion of the study area within the past few years and this past summer, there was some evidence that at least two, possibly three sand and gravel outwashes were connected based on water levels and short duration pump tests. One well drilled this past summer was artesian, while others surrounding it had near surface levels. The elevation of the top of the sand and gravel aquifer these wells penetrated averaged 550 feet msl with surface elevations ranging from 660-670 feet msl, a depth of over 100 feet from the ground surface to the top of the aquifer. The thickness of this deposit averaged 15-30 feet and bedrock elevations were slightly higher than those of TH-1, TH-4 and TH-5. Ogden well records indicated a shallower deposit (35-75 feet) of sand and gravel. The record does not show what was encountered below 75.0 feet. A static water level of 14.0 feet bgs was recorded in

Ogden's well that was drilled in 1952. Surface elevation was recorded at 670 ft. Msl +/-. Water levels at all locations indicated a confined aquifer and strongly suggested interconnection between all of the sand and gravel deposits from each location. Evidence of near surface sand and gravel deposits exists within the study region from both EER soundings and eyewitness accounts of an attempted quarry operation south of the test wells.

BOREHOLE GEOPHYSICAL LOGGING

Borehole geophysical logging at the Illinois State Geological Survey (ISGS) is under the supervision of Ms. Beverly L. Herzog, Senior Hydrogeologist and Head, Groundwater Resources and Protection Section. The geophysical logging program's primary goal is to record the insitu physical and chemical properties of earth materials in and around a borehole to aid in groundwater and environmental investigations.

Geophysical logging at the Illinois State Geological Survey is accomplished with an upgraded Model 3500 truck-mounted analog system built by Gearhart-Owen Industries and Mineral Logging Systems (Halliburton Energy Services) and modified to digital by Mt. Sopris Instrument Company, Inc in 1994. The ISGS conducts downhole logging with as many as ten types of hydrogeo|ogic sensing devices commonly known as tools, probes or sondes, which are run sequentially in boreholes that are cased, uncased, fluid or air filled. Survey sondes, ranging in length from 3.0-14.7 feet and in diameter from 1.69-2.2 inches, are lowered into a well or borehole attached to the end of a 1/8-inch, 3500 foot, four-conductor armored cable. The cable is raised and lowered using a winch that is connected to a depth encoder. The cable is connected to an electrical control panel and a rack mounted computer. The computer records downhole signals digitally from four channels as the sonde passes through the earth materials providing a continuous insitu record. Since the downhole signals are recorded and stored on computer, the logs can be analyzed and reproduced at any scale desired.

Natural Gamma Log

A natural gamma-ray log is a graph of the gross gamma radiation (high energy electromagnetic radiation) emitted by the earth materials surrounding the sonde. Most natural occurring radiation is generated from isotopes of Potassium-40, Thorium-232 and Uranium-238. In Illinois, these elements are more concentrated in shale and clay and less concentrated in clean quartz sand, gravel, and pure dolomite or limestone rock. Consequently, low CPS values on natural gamma logs normally indicate zones of porous and permeable earth materials in unconsolidated (glacial) deposits. Fluid or air-filled, plastic or steel cased boreholes generally have limited effect on levels of radiation detected by the sodium iodide crystal in the gamma sonde. The radius of detection is generally about 6 inches but may exceed this distance in some instances. ISGS natural gamma logs are graduated in CPS and/or API values. API values can be related to oil field borehole logs.

The chief use of the gamma log is for stratigraphic correlation and identification of lithology. Detrital sediments with fine-grained textures such as shale, buried soil zones and clay normally have the highest gamma intensity. The correlation between natural gamma log configurations and particle size analysis of Illinois earth materials is well established. Typically in unconsolidated glacial deposits of Illinois, the smaller the particle size, the higher the gamma intensity. When clay, silt, till, sand and gravel are mentioned in this report, the author is referring to the general lithology of the formation as perceived by the response of the natural gamma sonde in conjunction with the driller's log. Concentrations or percentages of particle sizes cannot be determined with the . Tills in Illinois generally are clay rich and have gamma intensities similar to clay. Depending on clay content, gamma radiation from tills can vary widely

Caliper Log

The caliper sonde, which measures borehole diameter up to 30 inches , has three arms that extend radially by a spring-loaded mechanism outward to the borehole wall. The probe may show boundaries associated with lithologic change, the presence of fractures and cavities, and the narrowing or widening of the borehole, which is depicted as a single line on the chart record. The caliper log can also show casing joints, borehole rugosity (changes in the shape of the borehole wall that affect diameter), variations in casing size, transitions from an open to a cased borehole and unusual obstructions or damages to existing casing. The advisability of running logs that require nuclear sources can be determined with the caliper log. Caliper logs are generally considered essential in the interpretation of other geophysical logs since most logs are affected by changes in borehole diameter. ISGS caliper logs are graduated in inches.

Density Log

The density log is a record of the approximate rock density determined by the back scatter of radiation from a 125-millicurie Cesium-137 gamma ray source measured along with the secondary emission from the lithology surrounding the borehole. The gamma ray flux is inversely proportional to the bulk density, therefore density increases when secondary emission decreases (the lower CPS the higher the density). Dense rock materials (i.e., dolomite) absorb more radiation emitted from the source than less dense material (i.e., shale). Natural background gamma emissions from earth materials are generally insignificant and do not affect the log. Since changes in borehole diameter can affect the log considerably, a caliper log is generally necessary to aid in interpretation. The radius of investigation of the density probe is about 6 inches but may exceed this distance in some instances. ISGS density logs are graduated in Counts Per Second (CPS) and/or American Petroleum Institute (API) units (see scales on top of log).

Neutron Log

The neutron log is potentially one of the most useful logs in hydrogeologic investigations because most of the sonde response is due to hydrogen concentration in and around the borehole. The ISGS sonde uses a 3.0-curie Americium-241/Beryllium (Am/Be) source, that has a flux of 6.67×10^6 neutrons per second. The Am/Be source is screwed onto the bottom of the probe. Approximately 1.2 feet above the source is the Helium-3 tube which is used to detect the influx of epithermal neutrons (0.1 to 100 electron volts) originating as fast neutrons (more than 100,000 electron volts) from the Am/Be source. Initially, neutrons are emitted in the form of fast neutrons from the source and are eventually slowed down, becoming epithermal neutrons or thermal neutrons, or are captured by hydrogen. Hydrogen is the most effective element in slowing down and capturing neutrons because its nucleus has nearly the same mass as a neutron. Because the flux of the neutrons is inversely proportional to the amount of hydrogen present, and most of the hydrogen present is in water, the flux is inversely proportional to the amount of water. In other words, when water fills interstitial pore space, the neutron log records relative amounts of rock porosity with porosity increasing and CPS decreasing to the left side of the log or with porosity decreasing and CPS increasing to the right side of the log.

A neutron log cannot discriminate between hydrogen water associated with the porosity in a formation and hydrogen in bound water associated with hydroxyl ions (OH^-) found in clay minerals, the primary constituents of shales. As a result, shale and other lithologies containing minerals with hydrogen, such as coal, have log departures that resemble high porosity on neutron logs. It is necessary to run a natural gamma log to determine clay mineral content for correcting false high moisture anomalies associated with clay and shale on neutron logs. The neutron logs of sandstone, limestone, and dolomite with very low clay mineral content are good indicators of relative porosity. The radius of investigation of the neutron probe is about 12 inches but may exceed this distance in some instances. ISGS logs can be graduated in both CPS and/or API values.

LOGGING RESULTS

On the colored geophysical log plot only three wells are represented; TH-5, TH-2, and TH-3. TH-1 is not depicted on the log plot because it was logged through casing and has nearly the same lithology as TH-5 and TH-4. TH-5 was logged immediately after drilling in an uncased open borehole. TH-1 was not able to log to bedrock because fine sand had filled the casing, most likely caused from heaving sand due to the lack of a bottom plug or cap. TH-5 could not be drilled beyond 150 feet because the drillers were not setup to go beyond 150 feet the day it was drilled.

TH-1 is located approximately 3,940 feet south and 40 feet east of the intersection of Route. 150 and CR 2550 East TH-5 is 50 feet east of TH-1, and TH-4 is approximately 220 feet east and 120 feet north of TH-5. TH-2 is approximately 1,320 feet north TH-1. TH-4 was not logged because access to the site was not possible with the ISGS logging vehicle. An attempt was made while the ground was frozen, but the logging vehicle became stuck in a tractor rut. The drilling results however confirmed the bedrock surface and lithology as being nearly the same as TH-1 and TH-5. Therefore when referring to TH-5 in this report TH-1 and TH-4 are being represented also.

All three natural gamma log configurations were depicted using a scale from 20-70 cps (counts per second) on the geophysical log plot and 0-100 cps on individual well logs. The 20-70 cps scale on the geophysical log plot was used in order to show contrast between clay, sand and gravel, and shale more clearly and to correlate between TH-5, TH-2, and TH-3.

Neutron logs were recorded in TH-1, TH-2, and TH-5. A density log was recorded in TH-2 only. Although these logs were not depicted in the geophysical log plot their information was useful in determining certain physical characteristics of the earth materials that the gamma log could not provide alone.

Caliper logs were recorded in TH-2 and TH-5 and were used to correct for borehole rugosity effects on the nuclear logs.

Individual Test Holes

TH-5

The natural gamma log configuration gives the general lithologic character of the earth materials encountered in the test hole to a depth of approximately 140 feet below ground surface (bgs). TH-5 was actually drilled to 150 feet bgs but there was 10 feet of fill in after the drill rods were pulled and logging began. The log indicates a lithology of mainly till, clay and/or silt in the upper 45 feet of the formation. There is a gradual fades change from 45-47 feet to a clean sand. From 47-140 feet the log indicates, for the most part, clean sand and gravel. From 47-93 feet the gamma log depicts a lower average count rate than the depth interval from 93-140 feet. The difference in count rates is most likely attributed to the rock types that make up these two outwashes. As indicated in the driller's log, the interval from 47-93 feet is fine to medium sand, and from 100-147 the driller indicated coarse sand to coarse gravel throughout the majority of this depth interval. Rock types within the interval from 47-93 might have a higher concentration of quartz minerals and other rocks that produce low gamma count rates. The interval from 100-147 may have a higher concentration of gravel (such as shale fragments) that would emit a higher gamma count rate than a mostly quartz sand deposit. Although there is a higher count rate in the lower sand and gravel deposit, the increase is small suggesting that the higher gamma emitting particles are dispersed in minute quantities throughout the formation. The reason for the lithologic change in the lower and upper sand and gravel deposits may be attributed to the different weathering and depositional environments they were associated with. The lower unit was deposited within a narrow bedrock channel that is composed mainly of shale. The upper unit was deposited much later and on top of or within the extreme edges of the bedrock channel and therefore not influenced as much by local bedrock formations.

The depth interval from 123.5-125.5 feet bgs is depicted on the log plot as a sharp increase in gamma indicating a deposit with an increase in fine particles (clay and /or silt). A split spoon sample was taken by the driller slightly above this depth interval and was shown to have some clay mixed with coarse sand and gravel.

The driller recorded the interval from 120-147 feet as coarse sand and gravel and was shown by rotary samples as having shale fragments and some granitic pebbles. Coarse gravel would indicate high energy flow, suggesting that greater erosion was taking place at this depth interval. An interesting correlation between the driller's log and the geophysical log is grain size versus the gamma count rate. Within the outwash the coarser material from 93.0-140.0 feet was depicted as having a slightly higher count rate than the upper unit from 47.0-93.0 feet. This is often seen near the bedrock surface where shale and sometimes granitic pebbles are more likely to accumulate. Granite is an igneous rock that does not reflect the bedrock geology in Illinois. It's presence is due to glacial advances from Canada and is a source rock of much of lllinois's unconsolidated glacial deposits. Granite can give off gamma count rates similar to clays and shales.

TH-2

TH-2 showed considerable change from TH-5, most notably the difference in bedrock surface elevations. The bedrock elevation in TH-5 is approximately 523 feet msl cr 147.0 feet bgs. The bedrock surface elevation in TH-2 is approximately 560 feet msl or 110.0 feet bgs. There is a rise in surface elevation of 37 feet from south to north covering a distance of approximately 1/4 mile. Resistivity readings confirmed the change as readings became less favorable to the north. Fine-grained material such as till, clay, and silt comprised the majority of the upper 40 feet of earth material encountered in the test hole. Sand and gravel accounted for most of the interval from 40.0-103 feet bgs, except for the sandy clay from 70-77 feet bgs. The driller's log did not record this interval, but was very obvious as a clayey unit in the gamma, density and neutron logs. This interval happens to correlate with the interval where laminated wood and silt zones were cored in TH-1. From 103-110 feet a till and possibly weathered shale is present. The gamma log indicates a gradual transition to a shale from 110-112 feet. From approximately 123.0-125.0 feet bgs the gamma log shows a decrease in gamma count The neutron and density logs depict large departures away from one another indicating (low density, high hydrogen concentration) a coal deposit The full suite of logs also indicated another potential coal deposit from 128.0-129.0.

The gamma log of TH-2 indicates a shale deposit beneath the coal seams from 130-133 feet bgs with a slightly higher than average gamma count rate of 150 cps for a borehole of this diameter. This shale is eroded away in TH-5 and is possibly exposed to the aquifer somewhere between TH-2 and TH-5. Gamma count rates for the shale deposit above the coal seams averaged 80-100 cps. Count rates for shale deposits beneath 133 feet were hot recorded due to the total depth of the borehole.

TH-3

The results from the test drilling of TH-3 were unexpected. Resistivity readings indicated that the bedrock had possibly dipped again near Rte. 150. Drilling and logging confirmed that the bedrock was actually rising and the sand and gravel thinning heading north from TH-5.. Bedrock elevation at this location was approximately 592 feet msl or 82.0 feet bgs, compared to 110.0 feet bgs at TH-2 and 147.0

feet bgs for TH-5. Also unexpected was the rapid change in thickness of the sand and grave! deposit from 100 feet in thickness at TH-5 to only 10 feet in thickness at TH-3.

One explanation for the resistivity anomaly near Rte 150 may be due to a natural gas pipeline that crosses Rte 150 (refer to the Test Drilling Site Map). Gas and power companies utilize a method called cathodic protection to prevent rusting of gas pipelines. A small amount of current and voltage (1400-2200 millivolts) are sent through the steel pipeline. Anodes (or anode bags) are used to attract negative ions instead of the surface of the pipe. Rectifiers are used to transform alternating current into direct current, which is then sent through the pipeline (our test equipment also uses direct current). By placing anodes around pipes and installing rectifiers near pipelines ionization can be directed towards the anodes and away from pipes, preventing corrosion of the outer surface of the pipe. I spoke with Chris Burkehammer of Trunkline Gas in Tuscola, the company who owns the gas line. He said the nearest rectifier is at Sidney but that the pipeline alone should still create an electrical field. He also mentioned that an underground power line existed between Rte. 150 and the railroad tracks.

Another possible reason for the anomaly was the presence of coal at 100 feet bgs. EER is also used for coal exploration. Coal, sand, and gravel give similar EER responses. However, it is unlikely that the 15 foot thick sandy clay and 18 foot thick shale deposits above the coal would go undetected. Shale and clay have a low resistance to current as compared to sand and gravel and coal. In hindsight both the pipeline and coal deposit could have been contributing factors in the anomaly recorded at stations no. 42 and 43.

Geophysical Log Plot

The geophysical log plot or cross section was created to better understand the correlation of the geology and hydrogeology between the three test holes depicted on the log plot Exact locations and surface elevations of the wells have not been surveyed and are approximate. Earth materials are assigned general lithologic descriptions in the cross section based solely on the response of the total gamma radiation detected by the gamma probe. The driller's logs were not used on the cross plot to correlate between test holes. Picks were made using gamma responses, except for the coal deposits which were determined with a combination of the gamma, neutron, density and caliper logs. The driller's lithology column is represented as symbols on the right hand side of each gamma configuration on the log plot. Refer to individual logs and headers for a driller's log of each test hole.

Collection of Drill Cuttings and Core Samples

The Samples of rotary drill cuttings were collected every five feet in the outwash deposits of TH-1 and at ten foot intervals in TH-5. Sieve and particle size analysis were performed on samples from TH-1 only by the ISGS Geotechnical Lab. Split spoon core samples were collected at random in TH-1 and TH-5. Samples of the clay and bedrock formations were recorded by the driller but not collected. Remaining samples were washed, dried and stored at the ISGS Samples Annex.

CONCLUSION

The results of the drilling and logging confirmed th at there is connection between several different outwashes on top of what may be considered a narrow valley train deposit, or simply just another outwash. Valley train deposits are fluvioglacial deposits that form in preexisting channels or valleys that may dissect through outwash plains or as in this case, the bedrock surface. When high water levels downslope of a fluvioglacial valley eventually recede, the water in the backed up channel or valley is allowed to flow and carry it's heavy load. Over time as the glacier decays, run-off from the glacier slows and the load in the valley is slowly deposited. The sediments carried in these valleys are poorly sorted coarse sand and gravel. Shapes of the sand and gravel can vary from rounded to angular. Variations in size and shape can be attributed to a high flow rate and a steep gradient within a valley. Outwash deposits consist of silt, sand and gravel. They can be deposited near ice margins which may cover larger widespread areas or they can be deposited into narrow braided channels dissecting outwash plains. Unlike valley train deposits, grains are well sorted and for the most part well-rounded. Consistencies in the size and shape of the sand and gravel reflect a body of water with a more constant, slower flow rate than what you might see from water in a valley train deposit.

Several separate glacial events contributed the outwash deposits that are present at TH-5. The oldest outwash (or valley train) deposit in the bedrock channel appears to be from the Pre-Illinoian Banner Formation. The top of the Banner Formation may coincide with the change in lithology noticed at elevation 577 feet msl, 93 feet bgs. At this elevation, silt and clay lenses were reported by the driller and is confirmed by the gamma log. Above the Banner is the Glasford Formation of the Illinoian Glacial Episode. The outwash deposits of the Glasford are responsible for supplying many domestic and public wells throughout Illinois. Unfortunately these outwash deposits can vary greatly over short distances. Outwash sand and gravel deposits of the Glasford can range from 0-100 feet in thickness. The thickness within the vast majority of the study area may range from 0-5 feet. The Glasford thickness at TH-5 appears to be approximately 24 feet +/-. The interval ranges from 69.0-93.0 feet bgs. Above the Glasford begins the Henry Formation of the Wisconsin Glacial Episode which includes the Ashmore Tongue and the remaining unconsolidated deposits. The Ashmore Tongue accounts for the sand and gravel outwash from 47.0-69.0 feet bgs. The Tiskilwa and Batestown tills make up the majority of the sediments overlying the Ashmore.

Possible Bedrock Contribution

Coal deposits within the Pennsylvanian bedrock are known to be potential producers of groundwater, contributing hydrogen sulfide and methane gases. At least one and possible two coal seams were recorded by gamma, density and neutron logs in TH-2. These coal deposits are eroded away somewhere between TH-2 and TH-5, less than 1/4 mile. If exposed to the sand and gravel deposits, these seams may contribute a small amount of groundwater to the aquifer. The organics that were encountered at a depth of 70-75 feet in TH-1 may also contribute hydrogen sulfide and methane. Being a relatively narrow bedrock channel with organic deposits increases the chance of these gases accumulating within the aquifer. The underlying shale deposit with a total gamma count rate of 150 cps may have a slight affect on groundwater quality as well.

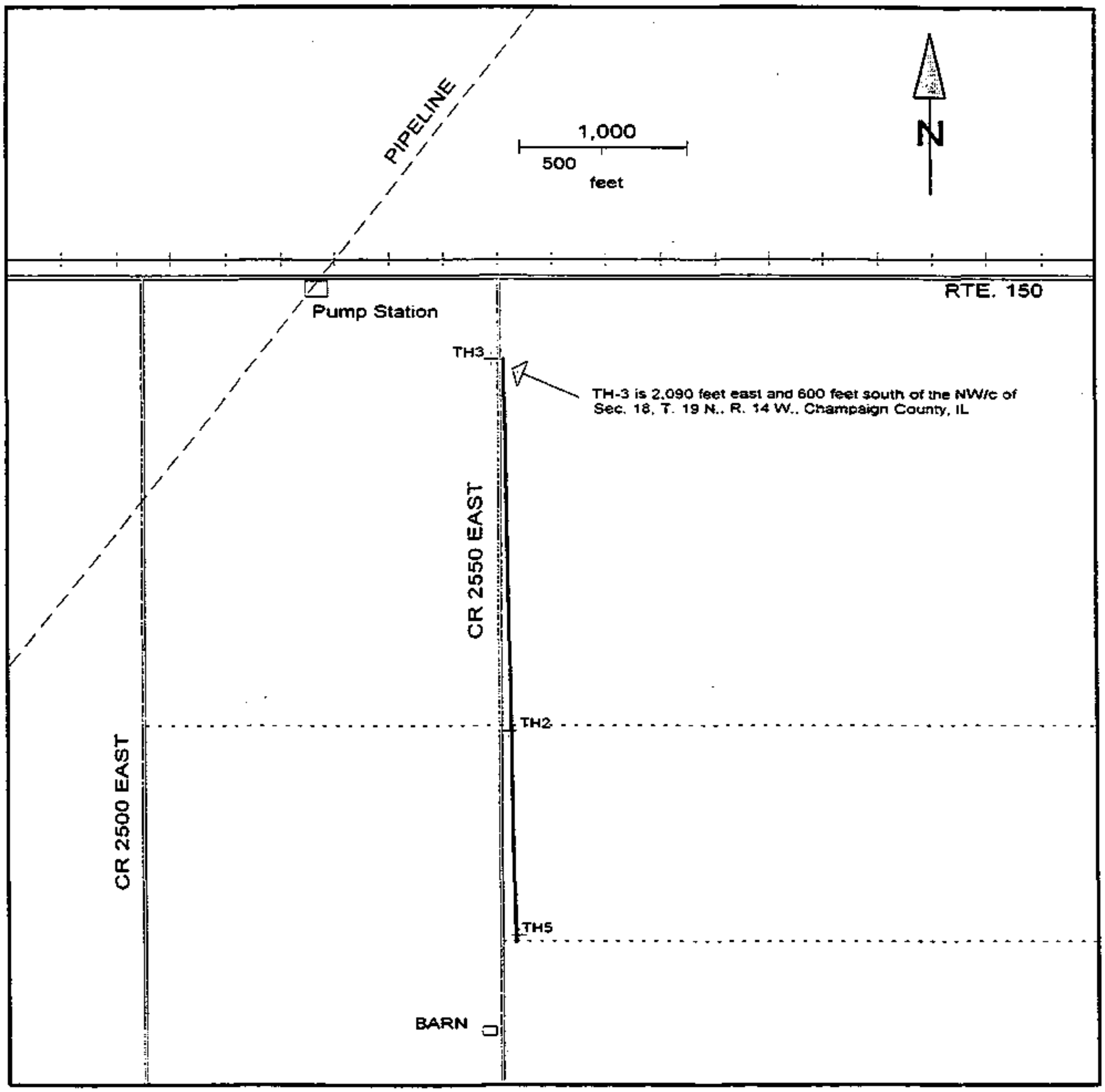
The results of the EER survey, test drilling and geophysical logging will serve as a useful reference for any future groundwater and geologic investigations within this area of Champaign County. The records of this study may also prove useful if any unforeseeable problems arise concerning water quality and production at this site.

ACKNOWLEDGMENTS

I would like to thank a number of people who were instrumental in the overall success of the EER study which led to favorable test drilling for the Village of Homer. Thanks to Ross Brower who wrote the groundwater possibilities report in 1994 which helped to define the window of exploration eliminating potentially a much larger area than was explored. Thanks to Warren York who voluntarily gave a considerable amount of information on water wells he drilled in and around the study area. Mr. York also allowed us to geophysically log two wells he drilled that were within the study area and adjacent to resistivity stations giving us a reference on how the resistivity was responding to the earth materials at these locations. Thanks to Andy Kieser of Sodemann and Associates and to the Mayor and Village Board of Homer for having the confidence in the ISGS and ISWS to lead and carry out the groundwater search and testing for the Village of Homer. Thanks to Phil Reed, Rick Rice and Paul Jahn for assisting with borehole logging in difficult field and weather conditions. Finally, thanks to Mike Underwood, Gary Smith, Ryan Byerly and James Griffin, the four man EER survey crew who had the patience and perseverance to see the project through to the end. They lasted through 14 long hot days of boring monotonous field work without complaint, a job well done.

ILLINOIS STATE GEOLOGICAL SURVEY

Test Drilling Site Map



Gamma Log Plot Reference Homer, IL

Homer Groundwater Availability Project	
North-South Cross Plot	
Date: Feb. 1997	Units: feet
Groundwater Section	Figure

GEOPHYSICAL LOG
ILLINOIS STATE GEOLOGICAL SURVEY
CHAMPAIGN, ILLINOIS

Wellname HOMER TH-1
Filename C:\VLW\1SGSLOGS\HOMER\HEADRTH1. HDR
Log Type: Natural Gamma
County: Champaign

Location
Legal Description: SW/C, NW 1/4, SE1/4 SEC 18, T19N, R14W
Physical Description: 3940 FEET S.,40 FEET E. OF INTERSEC. RTE 150 AND CR 2550

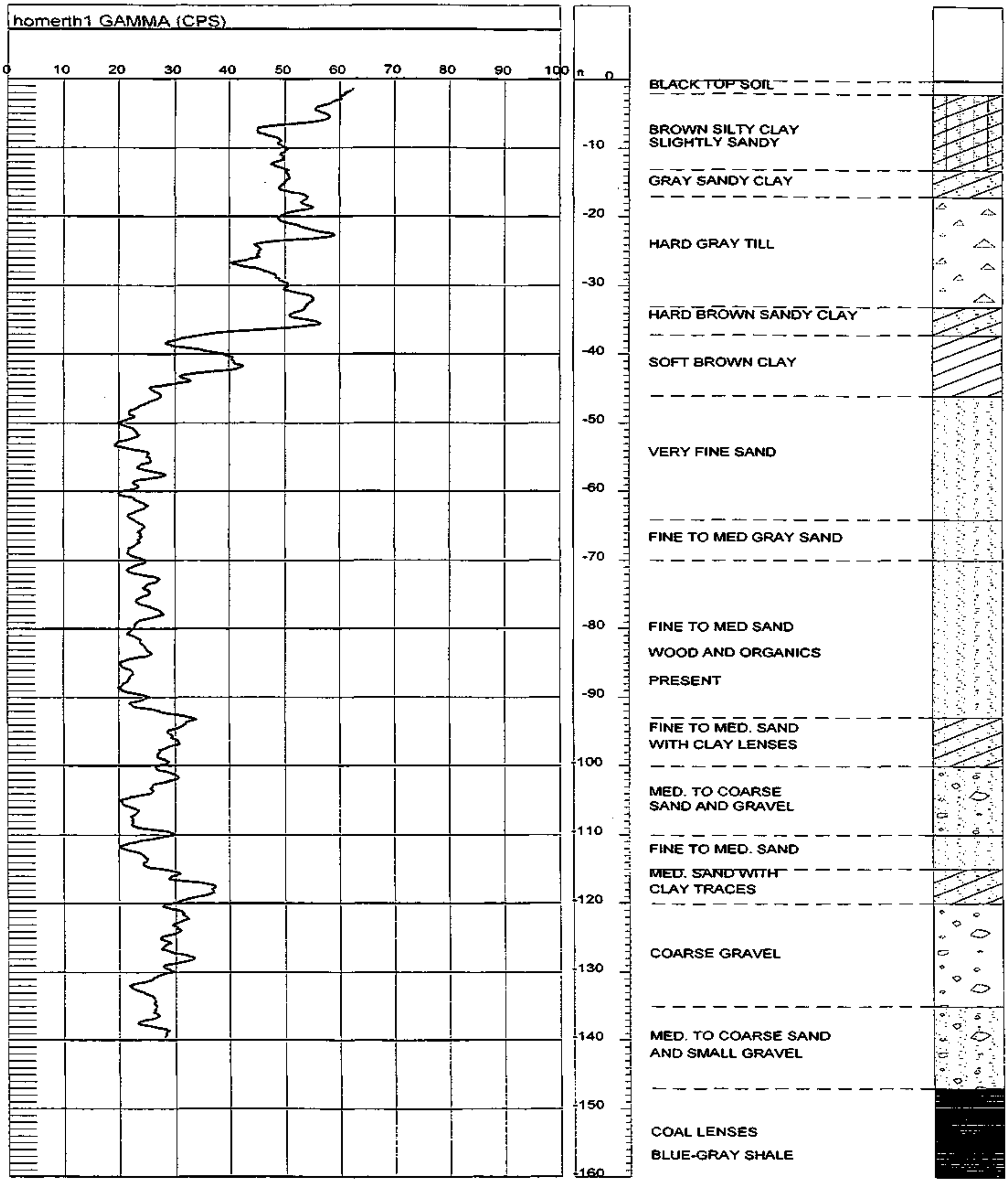
Elevation: 0 Reference Ground Surface
OWNER, COMPANY: Village of Homer
WELL OR TEST: TH-1
CONTRACTOR\DRILLER: Layne-Western, Aurora,IL\Mike Kopp
LOG MEA. FROM (KB, DF, or GL): GL

ELEVATION, SOURCE, AND QUAD: 670 feet, USGS 7.5' topo, Homer 1975
LOG SEQUENCE: Natural Gamma, Gamma Ray-Neutron.
RUN NO: 1
DATE DRILLED: December 16 and 17, 1996.
DATE LOGGED: December 26, 1996.
FIRST READING: 139.4 feet bgs(below ground surface)
LAST READING: 1.4 feet bgs
FOOTAGE LOGGED: 138.0 feet
BOTTOM (Driller/Log): 170.0 feet bgs/140.7 feet bgs
CASING TYPE & SIZE: 2.5 inch I.D. PVC
CASING INTERVAL (Driller/Log): +3.6 feet,-160 feet/NA
SCREENED INTERVAL: 135-145 feet bgs.
BIT TYPE & SIZE: 4 7/8 inch drag bit.
HOLE FLUID TYPE: Formation.
DENSITY:..
VISCOSITY:..
PH:..
RESISTIVITY:...
RES. @ BHT:...
CIRC. TEMP:...
B.H. TEMP:..
SPECIFIC COND:...
LEVEL: 11.9 feet below top of casing or 8.6 feet bgs.
LOGGED BY: T. Young and P. Jahn
WITNESSED BY: Mike Kopp

REMARKS: The driller's log and lithology column do not reflect the Illinois State Geological Survey's assessment of the earth materials or interpretation of the geology or hydrogeology at this site, but serve rather as a reference to the geophysical for further evaluation.

Comments:

Well Name: HOMER TH-1
File Name: C:\VLW\ISGSLOGS\HOMER\HOMERTH1.HDR
Location: 3940 FEET S.,40 FEET E. OF INTERSEC RTE 150 AND CR 2550 E
Elevation: 0 Reference: Ground Surface



GEOPHYSICAL LOG
ILLINOIS STATE GEOLOGICAL SURVEY
CHAMPAIGN, ILLINOIS

Wellname HOMER TH-2
Filename C:\VLW\ISGSLOGS\HOMER\HEADRTH2.HDR
Log Type: Natural Gamma
County: Champaign

Location
Legal Description: NW/C, SE 1/4 SEC 18, T19N, R14W
Physical Description:2620 FEET S.,40 FEET E.OF INTERSEC RTE 150 AND CR 2550 E.

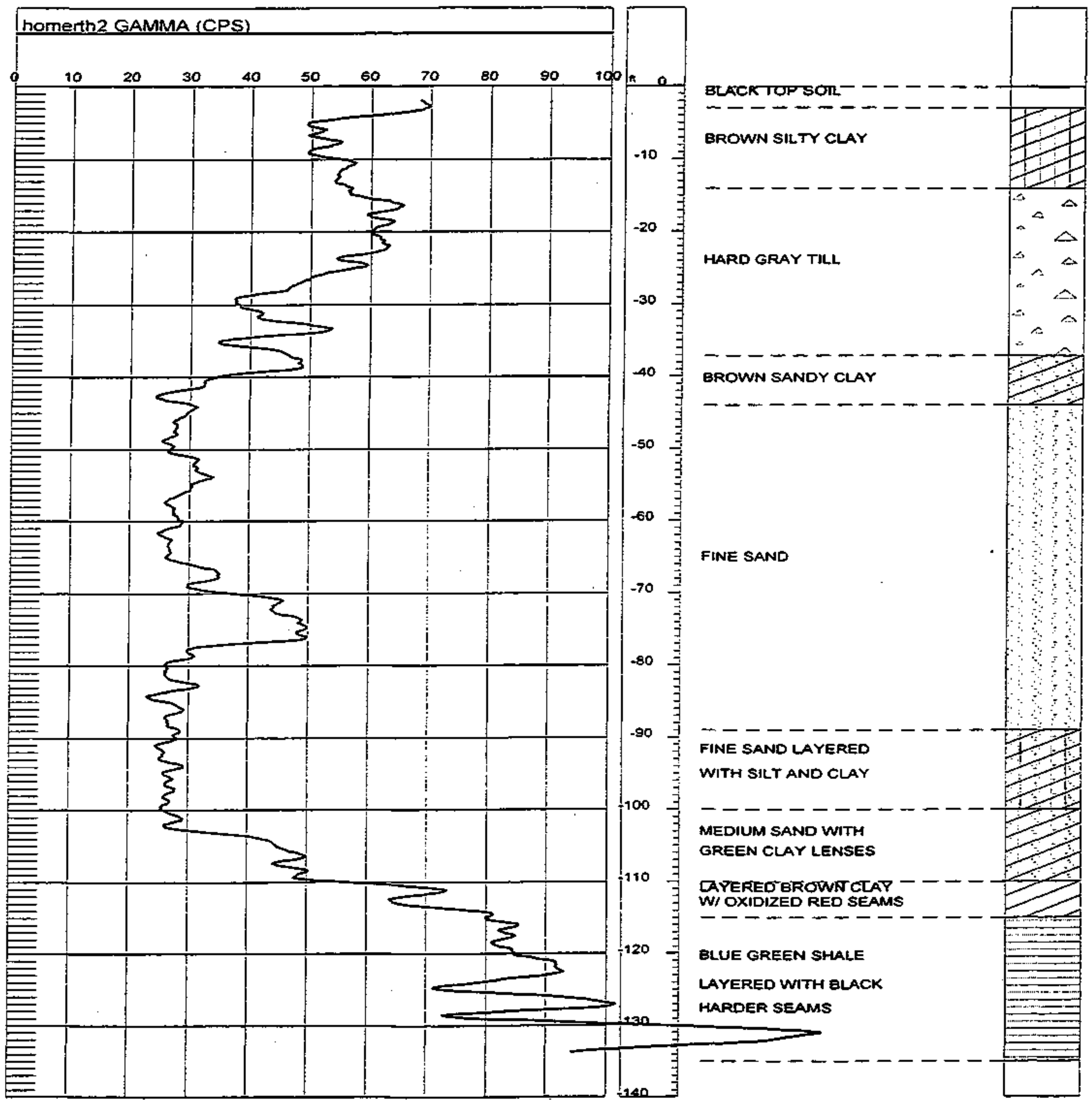
Elevation: 0 Reference Ground Surface
OWNER, COMPANY: Village of Homer
WELL OR TEST: TH-2
CONTRACTOR\DRILLER: Layne-Western, Aurora,IL\Mike Kopp
LOG MEA. FROM (KB, DF, or GL): GL

ELEVATION, SOURCE, AND QUAD: 670 feet, USGS 7.5' topo, Homer 1975
LOG SEQUENCE: Natural Gamma, Gamma Ray-Neutron, Density, Caliper.
RUN NO: 1
DATE DRILLED: December 26, 1996.
DATE LOGGED: December 27, 1996.
FIRST READING: 133.6 feet bgs(below ground surface)
LAST READING: 1.9 feet bgs
FOOTAGE LOGGED: 131.7 feet
BOTTOM (Driller/Log): 135.0 feet bgs/134.9 feet bgs
CASING TYPE & SIZE: n/a, open borehole.
CASING INTERVAL (Driller/Log): Not cased.
SCREENED INTERVAL: n/a
BIT TYPE & SIZE: 4 7/8 inch drag bit.
HOLE FLUID TYPE: Drilling mud.
DENSITY:..
VISCOSITY:...
PH:..
RESISTIVITY:..
RES. @ BHT:..
CIRC. TEMP:..
B.H. TEMP:..
SPECIFIC COND:...
LEVEL: Surface.
LOGGED BY: T. Young and P. Jahn
WITNESSED BY: Don Murdock.

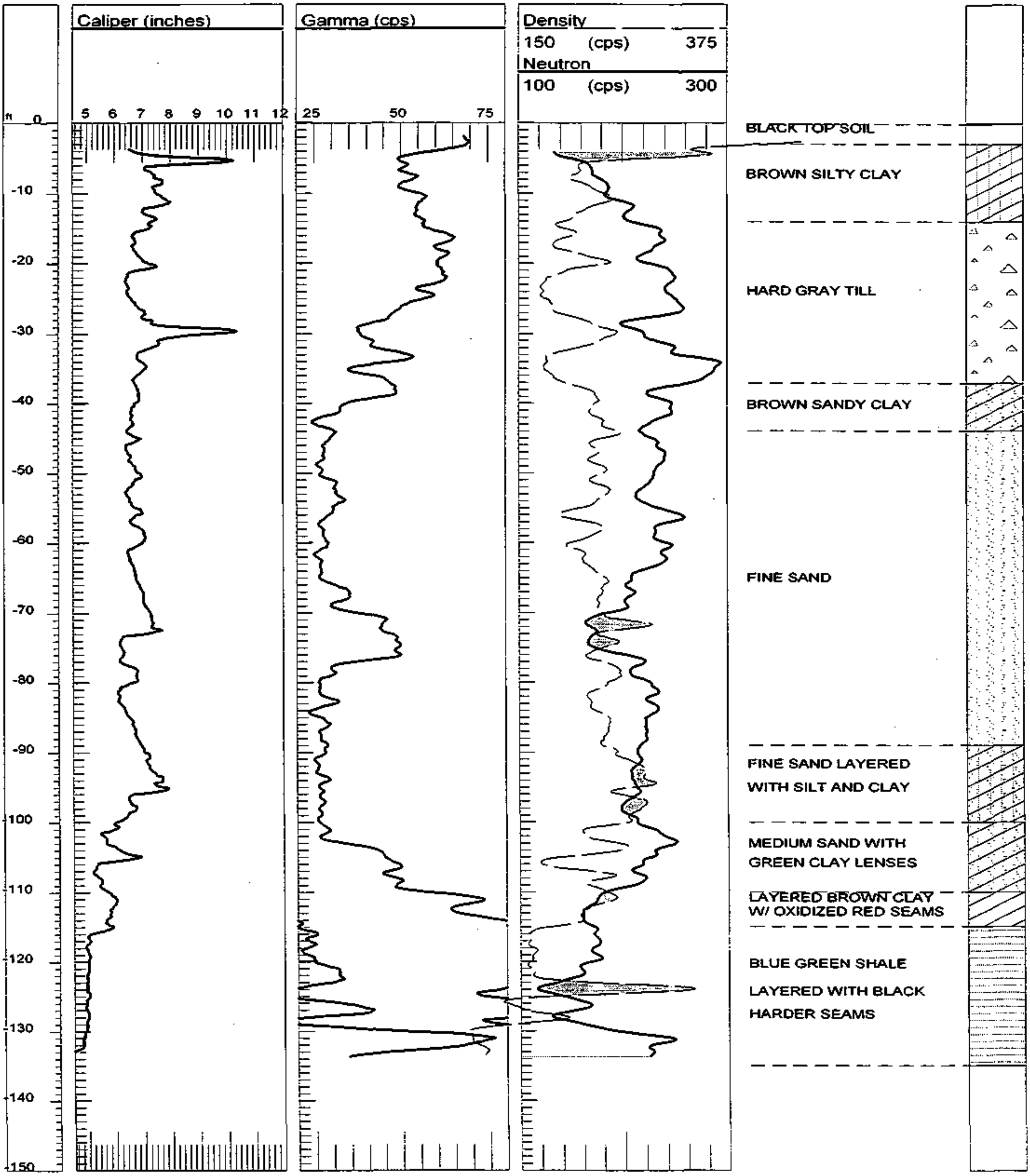
REMARKS: The driller's log and lithology column do not reflect the Illinois State Geological Survey's assessment of the earth materials or interpretation of the geology or hydrogeology at this site, but serve rather as a reference to the geophysical for further evaluation.

Comments:

Well Name: HOMER TH-2
File Name: C:\VLW\ISGSLOGS\HOMER\HOMERTH2.HDR
Location: 2620 FEET S., 40 FEET E., OF INTERSEC. RTE 150 AND CR 2550 E
Elevation: 0 Reference: Ground Surface



Well Name: HOMER TH-2



GEOPHYSICAL LOG
ILLINOIS STATE GEOLOGICAL SURVEY
CHAMPAIGN, ILLINOIS

Wellname HOMER TH-3
Filename C:\VLW\ISGSLOGS\HOMER\HEADRTH3.HDR
Log Type: Natural Gamma
County: Champaign

Location
Legal Description: SE/C, NE 1/4, NE 1/4, NW 1/4 SEC 18, T19N, R14W
Physical Description: 600 FEET S.,40 FEET W. OF INTERSEC. RTE 150 AND CR 2550

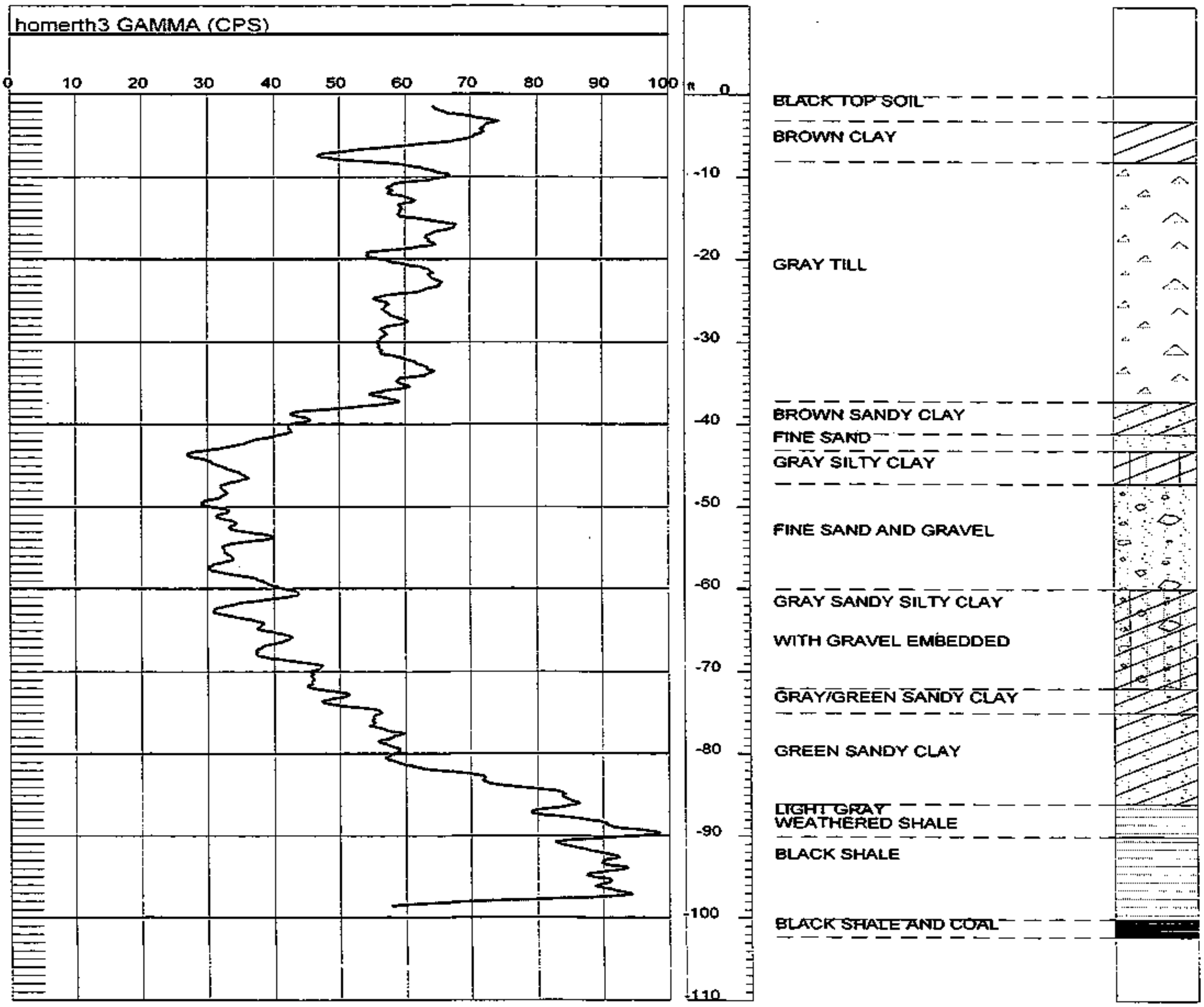
Elevation: 0 Reference Ground Surface
OWNER, COMPANY: Village of Homer
WELL OR TEST: TH-1
CONTRACTOR\DRILLER: Layne-Westem, Aurora,IL\M. Rife
LOG MEA. FROM (KB, DF, or GL): GL

ELEVATION, SOURCE, AND QUAD: 670 feet, USGS 7.5' topo, Homer 1975
LOG SEQUENCE: Natural Gamma.
RUN NO: 1
DATE DRILLED: January 15, 1997.
DATE LOGGED: January 15, 1997.
FIRST READING: 98.5 feet bgs(below ground surface)
LAST READING: 1.4 feet bgs
FOOTAGE LOGGED: 97.1 feet
BOTTOM (Driller/Log): 100.0 feet bgs/99.8 feet bgs
CASING TYPE & SIZE: n/a, open borehole.
CASING INTERVAL (Driller/Log): Not cased.
SCREENED INTERVAL: n/a
BIT TYPE & SIZE: 4 7/8 inch drag bit.
HOLE FLUID TYPE: Drilling mud.
DENSITY:..
VISCOSITY:...
PH:...
RESISTIVITY:..
RES. @ BHT:..
CIRC. TEMP:..
B.H. TEMP:..
SPECIFIC COND:..
LEVEL: Surface.
LOGGED BY: T. Young and R. Rice.
WITNESSED BY: M. Rife and D. Murdock.

REMARKS: The driller's log and lithology column do not reflect the Illinois State Geological Survey's assessment of the earth materials or interpretation of the geology or hydrogeology at this site, but serve rather as a reference to the geophysical for further evaluation.

Comments:

Well Name: HOMER TH-3
File Name: C:\VLW\ISGSLOGS\HOMER\HOMERTH3.HDR
Location: 600 FEET S., 40 FEET W., OF INTERSEC. RTE. 150 AND CR 2550 E
Elevation: 0 Reference: Ground Surface



GEOPHYSICAL LOG
ILLINOIS STATE GEOLOGICAL SURVEY
CHAMPAIGN, ILLINOIS

Wellname HOMER TH-5
Filename C:\VLW\ISGSLOGS\HOMER\HEADRTH5.HDR
Log Type: Natural Gamma
County: Champaign

Location
Legal Description: SW/C, NW 1/4, SE 1/4, SEC 18, T19N, R14W
Physical Description:3,940 FEET S.,90 FEET E.OF INTERSEC RTE 150 AND CR 2550 E.

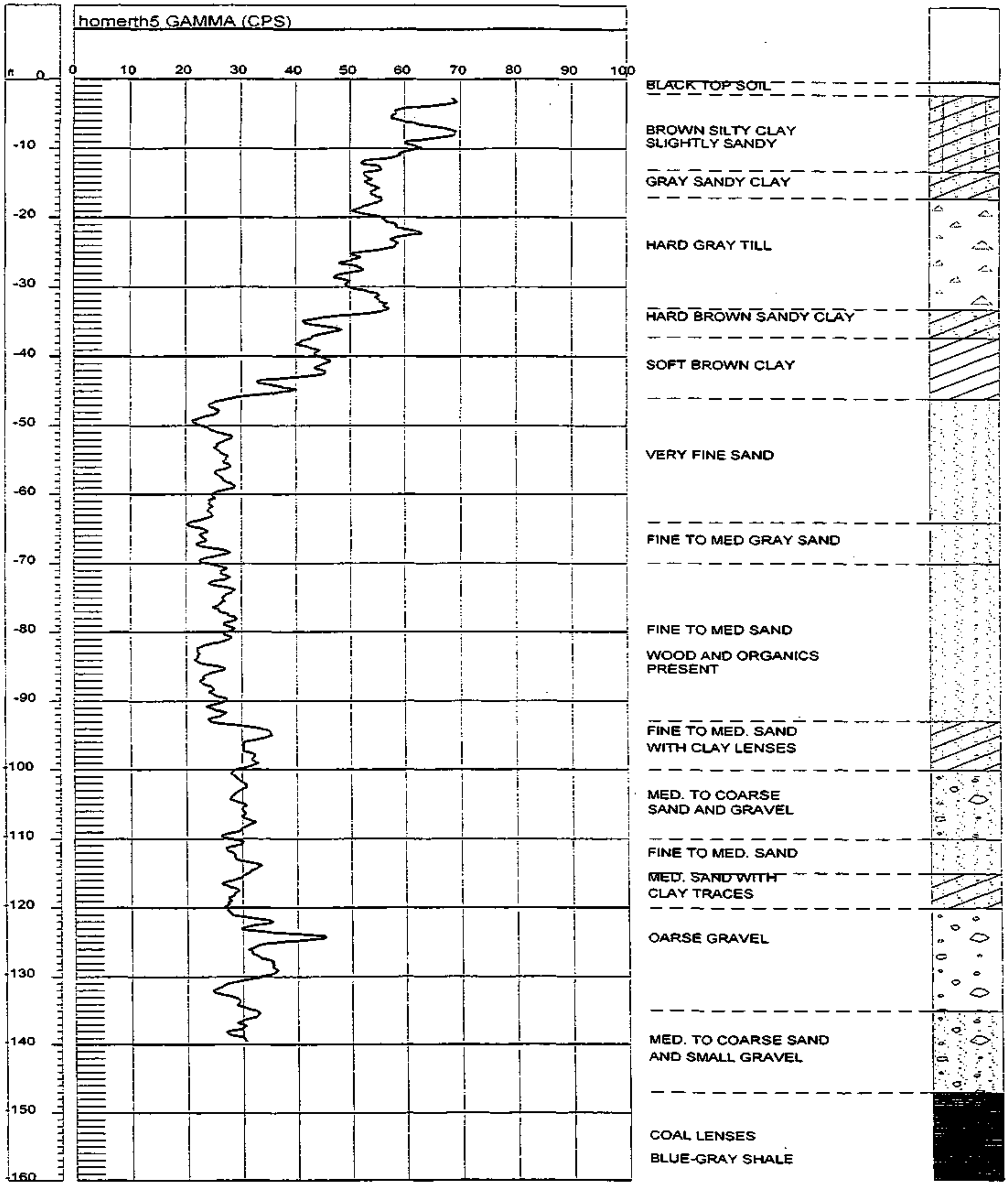
Elevation: 0 Reference Ground Surface
OWNER, COMPANY: Village of Homer
WELL OR TEST: TH-5
CONTRACTOR\DRILLER: Layne-Western, Aurora, IL\Mike Kopp
LOG MEA. FROM (KB, DF, or GL): GL

ELEVATION, SOURCE, AND QUAD: 670 feet, USGS 7.5' topo, Homer 1975
LOG SEQUENCE: Natural Gamma, Gamma Ray-Neutron, Caliper.
RUN NO: 1
DATE DRILLED: January 31, 1997.
DATE LOGGED: January 31, 1997.
FIRST READING: 139.4 feet bgs(below ground surface)
LAST READING: 2.7 feet bgs
FOOTAGE LOGGED: 136.7 feet
BOTTOM (Driller/Log): 150.0 feet bgs/140.7 feet bgs
CASING TYPE & SIZE: n/a, open borehole.
CASING INTERVAL (Driller/Log): Not cased; pilot hole for pump test well.
SCREENED INTERVAL: n/a
BIT TYPE & SIZE: 4 7/8 inch drag bit.
HOLE FLUID TYPE: Drilling mud.
DENSITY:..
VISCOSITY:..
PH:..
RESISTIVITY:..
RES. @ BHT:..
CIRC. TEMP:..
B.H. TEMP:..
SPECIFIC COND:..
LEVEL: Approximately 8 feet bgs.
LOGGED BY: T. Young and P. Reed.
WITNESSED BY: Don Murdock.

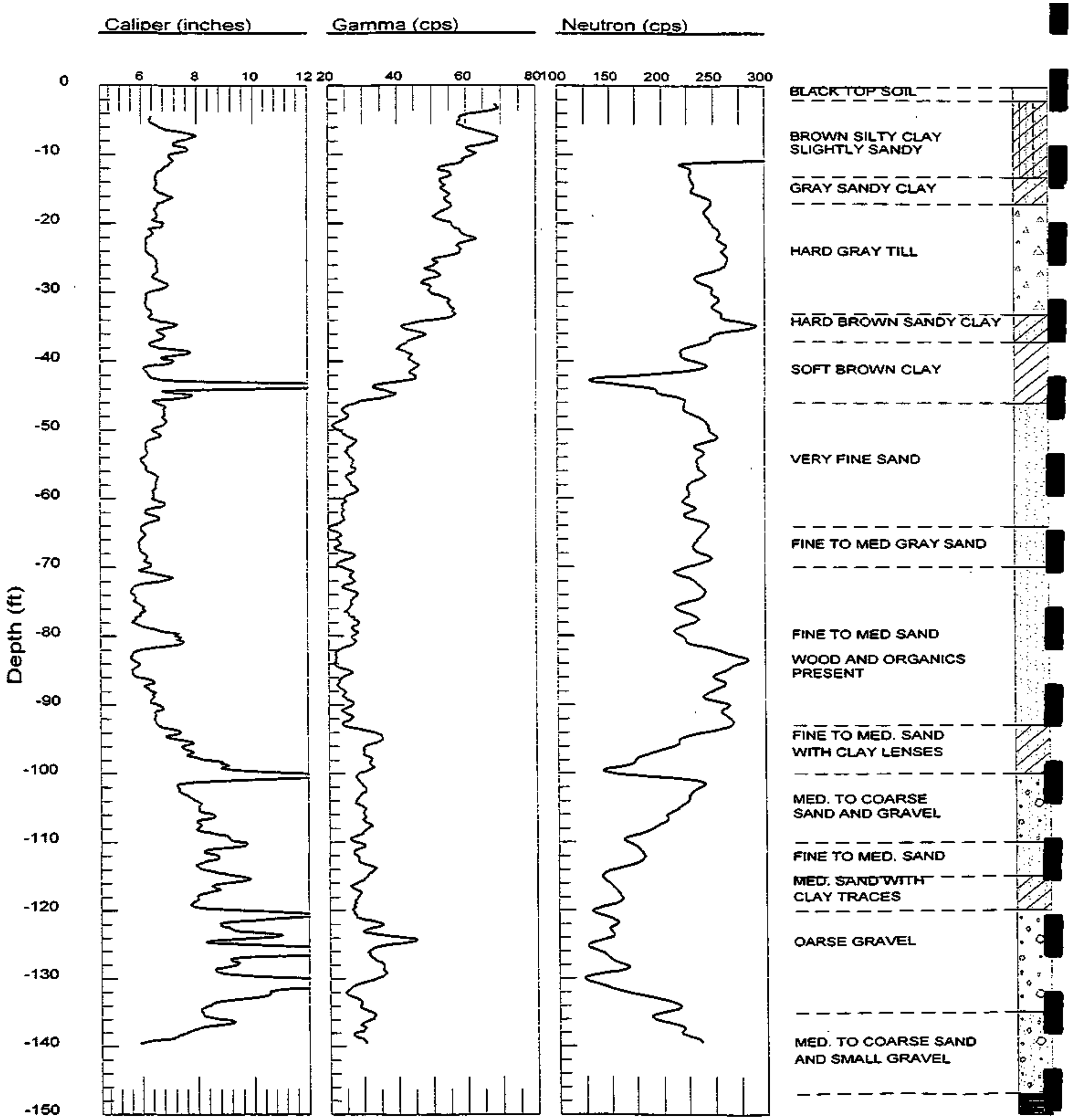
REMARKS: The driller's log and lithology column do not reflect the Illinois State Geological Survey's assessment of the earth materials or interpretation of the geology or hydrogeology at this site, but serve rather as a reference to the geophysical for further evaluation.

Comments:

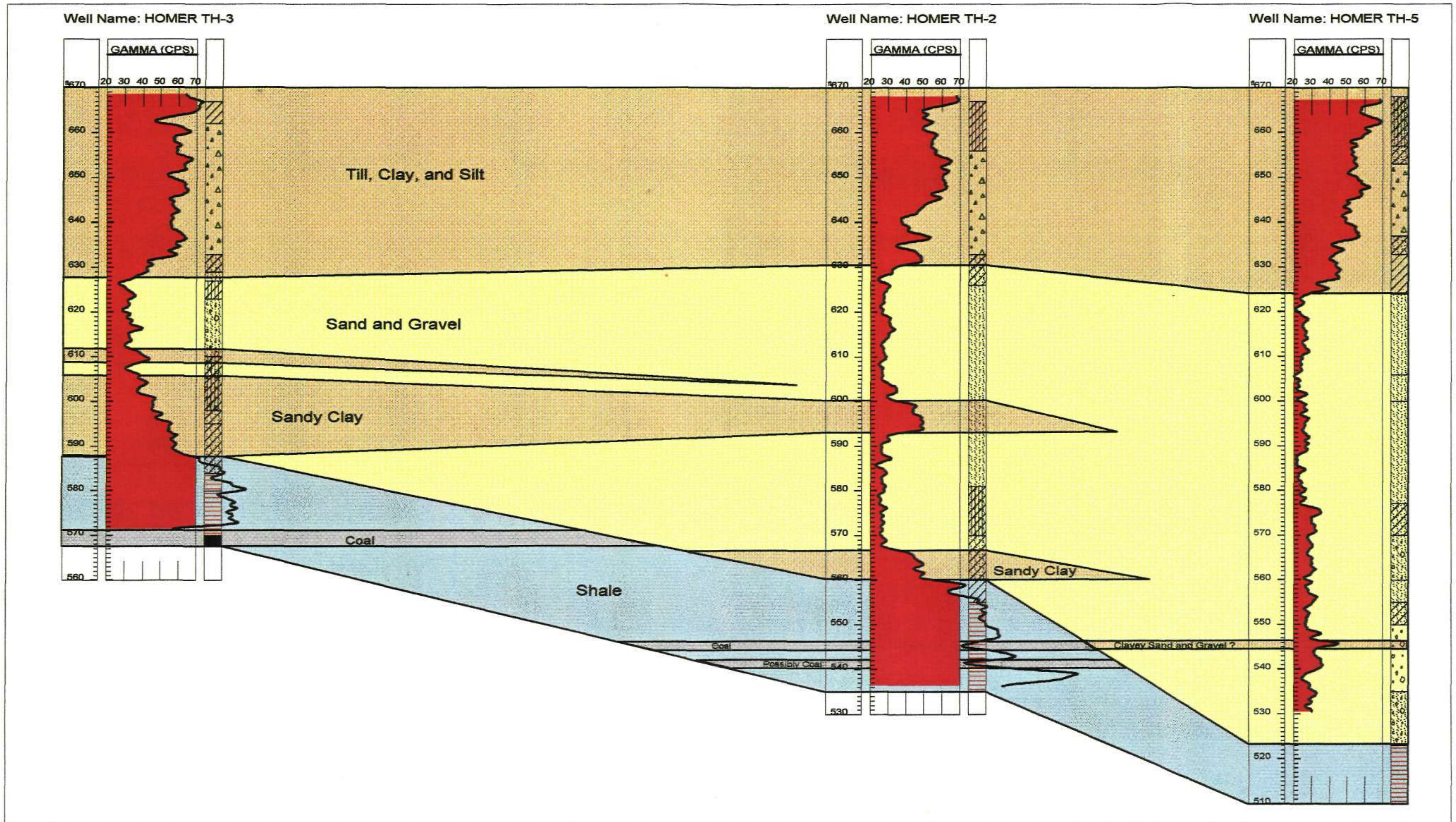
Well Name: HOMER TH-5
File Name: C:\VLW\ISGSLOGS\HOMER\HOMERTH5.HDR
Location: 3,940 FEET S., 90 FEET E. OF INTERSEC. RTE. 150 AND CR 2550
Elevation: 0 Reference: Ground Surface



Well Name: HOMER TH-5
File Name: C:\VLW\ISGSLOGS\HOMER\TH-5ALL.HDR
Location: E 1/2, NW 1/4, SW 1/4, SE 1/4, SEC 18, 19N, R14W
Elevation: 0 Reference: Ground Surface



ILLINOIS STATE GEOLOGICAL SURVEY



Geophysical Log Plot - Homer, IL

Compiled by

Timothy C. Young

Homer Groundwater Availabilty Project	
North-South Cross Section	
Date: Feb. 1997	Units: feet
Groundwater Section	Figure 1

Appendix F.

Test Well 1-97 and Observation Well Information

Appendix F. Test Well and Observation Well Information

AQUIFER TEST
VILLAGE OF HOMER, OGDEN TOWNSHIP WELL FIELD
CHAMPAIGN COUNTY, ILLINOIS

by
Illinois State Water Survey
Trustees and Staff, Village of Homer

Well Owner:	Village of Homer
Site:	Ogden Township
Well Location:	Approximately 2550 feet West and 1340 feet North of the SE corner, Section 18, T.19 N., R.14 W., Champaign County, Illinois
Date Well Completed:	February 7, 1997
Date of Step Test:	February 13, 1997
Length of Step Test:	6 30-minute steps
Date of 7-Day Aquifer Test:	February 17-24, 1997
No. of Observation Wells:	3
Aquifer:	Sand and Gravel

PUMPED TEST WELL DATA

Well No.:	Test Well 1-97
Depth:	140 feet
Drilling Contractor:	Layne-Western Company, Aurora, IL
Formation Samples:	
Drilling Method:	Straight rotary
Hole Record:	12-inch, 0-150 feet
Casing Record:	6-inch steel (T&C), +1.5-120 feet
Screen Record:	8-inch stainless steel shutter, 120-140 feet; 0.060-inch slot (60 slot), 20-feet long
Annulus and Gravel Pack Record:	Bentonite chips 85-90 ft; Northern Gravel No. 2, 90 ft to 150 feet
Ground Elevation at Well:	Approximately 670 feet above mean sea level (msl), topographic map
Measuring Point:	Top of well casing (TOC), 1.5 feet above land surface (lsd)
Elevation Top of Well Casing:	Not determined

Appendix F. Continued

Nonpumping Water Level:	8.03 feet below TOC, 9:09 am, February 13, 1997
	8.09 feet below TOC, 9:22 am, February 17, 1997
Measuring Equipment:	Electric dropline, InSitu Hermit datalogger w/ pressure transmitters, SWS 4-inch orifice tube with plate 34
Test Pump and Power:	Submersible turbine w/ diesel generator
Test Pump Setting:	Not reported
Time Water Samples Collected:	3:20 pm, February 17, 1997 12:00 pm, February 24, 1997
Temperature of Water:	54.3 ° F
Remarks:	Geophysical log by ISGS

TEST WELL
DRILLERS LOG
(Test Hole 5-96 at site of Test Well)

Formation	From *(feet)*	To *(feet)*
Black top soil	0	2
Brown silty clay, slightly sandy	2	13
Gray sandy clay	13	17
Hard gray clay, medium sand to small gravel embedded	17	33
Brown hard sandy clay	33	37
Brown soft clay	37	46
Very fine sand	46	64
Fine to medium gray sand	64	70
Fine to medium layered sand, organics and wood present	70	93
Fine to medium sand with clay lenses	93	100
Medium to coarse sand and gravel	100	110
Fine to medium sand	110	115
Medium sand with clay traces	115	120
Coarse gravel	120	137
Medium to coarse sand and small gravel	137	147
Coal lenses, blue gray shale, darker gray and harder @ 150 feet	147	150

Appendix F. Continued

OBSERVATION WELL NO. 1 DATA

Observation Well No.:	1 (Test Hole 1-96)
Distance and Direction from Pumped Well:	53.7 feet West
Site:	Ogden Township
Drilling Contractor:	Layne-Western Company, Inc.
Date Drilled:	December 17, 1996
Drilling Method:	Straight rotary
Depth:	145 feet
Hole Record:	4 7/8-inch; 0-170 feet
Casing Record:	2½-inch PVC, +0.5-125 feet
Screen Record:	2½-inch PVC; sawed slots, 125-145 feet
Annulus and Gravel Pack Record:	Not reported
Ground Elevation:	670 feet above mean sea level (msl), topographic map
Measuring Point:	Top of well casing (TOC), 0.5 feet above land surface (lsd)
Nonpumping Water Level:	7.54 feet below TOC, 9:24 a.m. February 17, 1997
Location:	Approximately 2600 feet West and 1340 feet North of the SE corner, Section 18, T. 19 N., R.14 W., Champaign County, Illinois
Remarks:	Geophysical log by ISGS

DRILLERS LOG

Formation	From *(feet)*	To *(feet)*
Black top soil	0	2
Brown silty clay, slightly sandy	2	13
Gray sandy clay	13	17
Hard gray clay, medium sand to small gravel embedded	17	33
Brown hard sandy clay	33	37
Very fine sand	46	64
Fine to medium gray sand	64	70
Fine to medium layered sand, organics, and wood present	70	93
Fine to medium sand with clay lenses	93	100
Medium to coarse sand and gravel	100	110
Fine to medium sand	110	115
Medium sand with clay traces	115	120
Coarse gravel	120	135
Medium to coarse sand and small gravel	135	147
Coal lenses, blue gray shale; darker gray and harder @ 160 feet	147	170

Appendix F. Continued

OBSERVATION WELL NO. 2 DATA

Observation Well No.:	2 (Test Hole 4-96)
Distance and Direction from Pumped Well:	263.4 feet Northeast
Site:	Ogden Township
Drilling Contractor:	Layne-Western Company, Inc.
Date Drilled:	January 23, 1997
Drilling Method:	Straight rotary
Depth:	145 feet
Hole Record:	4 7/8-inch; 0-170 feet
Casing Record:	2½-inch PVC, +4.1-125 feet
Screen Record:	2½-inch PVC; sawed slots, 125-145 feet
Annulus and Gravel Pack Record:	Not reported
Ground Elevation:	670 feet above mean sea level (msl), topographic map
Measuring Point:	Top of well casing (TOC), 4.1 feet above land surface (lsd)
Nonpumping Water Level:	11.02 feet below TOC, 9:15 a.m. February 17, 1997
Location:	Approximately 2400 feet West and 1420 feet North of the SE corner, Section 18, T.19 N., R.14 W., Champaign County, Illinois
Remarks:	

DRILLERS LOG

Formation	From *(feet)*	To *(feet)*
Black top soil	0	4
Brown silty clay	4	12
Gray sandy clay	12	34
Brown hard silty clay	34	45
Fine sand with layers of coarse sand seams	45	110
Fine to medium sand	110	115
Medium to coarse sand and gravel	115	143
Trace of shale and weathered lime, becoming more solid	143	170

Appendix F. Concluded

OBSERVATION WELL NO. 3 DATA

Observation Well No.:	3 (Test Hole 2-96)
Distance and Direction from Pumped Well:	1290 feet North
Site:	Ogden Township
Drilling Contractor:	Layne-Western Company, Inc.
Date Drilled:	December 26, 1996
Drilling Method:	Straight rotary
Depth:	105 feet
Hole Record:	4 7/8-inch; 0-135 feet
Casing Record:	2½-inch PVC, +5.4-95 feet
Screen Record:	2½-inch PVC; sawed slots, 95-105 feet
Annulus and Gravel Pack Record:	Not reported
Ground Elevation:	670 feet above mean sea level (msl), topographic map
Measuring Point:	Top of well casing (TOC), 5.4 feet above land surface (Isd)
Nonpumping Water Level:	13.31 feet below TOC, 10:31 a.m. February 17, 1997
Location:	Approximately 2620 feet West and 2620 feet North of the SE corner, Section 18, T.19 N., R.14 W., Champaign County, Illinois
Remarks:	Geophysical log by ISGS

DRILLERS LOG

Formation	From *(feet)*	To *(feet)*
Black top soil	0	3
Brown silty clay	3	14
Gray sandy clay, gravel embedded	14	37
Brown sandy clay	37	44
Fine sand	44	89
Fine sand layered with clay and silt seams	89	100
Medium sand, clay throughout with lenses of green clay	100	110
Layered brown clay with oxidized red seams	110	115
Blue-green shale layered with black harder seams	115	135

Appendix G.

Test Well 1-97
Step Test: Water-Level Measurements, February 13, 1997

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II Step Test: February 13, 1997

Date/ hour	Elapsed time (min)	TW 1-97 Depth to water (ft)		OW I (TH 1-96) Depth to water (ft)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/13/97							
09:09 AM	0			7.48			Solinst dropline
09:10 AM	0	8.03					Solinst dropline
09:50 AM	0	8.04		7.48			Data logging started
09:51 AM	1	8.04		7.47			Water level trend
09:52 AM	2	8.03		7.47			
09:53 AM	3	8.03		7.47			
09:54 AM	4	8.03		7.47			
09:55 AM	5	8.03		7.47			
09:56 AM	6	8.02		7.48			
09:57 AM	7	8.03		7.47			
09:58 AM	8	8.03		7.47			
09:59 AM	9	8.03		7.47			
10:00 AM	10	8.04		7.48			
10:01 AM	11	8.03		7.48			
10:02 AM	12	8.04		7.48			
10:03 AM	13	8.04		7.48			
10:04 AM	14	8.04		7.48			
10:05 AM	15	8.03		7.48			
10:06 AM	16	8.04		7.48			
10:07 AM	17	8.04		7.48			
10:08 AM	18	8.04		7.47			
10:09 AM	19	8.04		7.48			
10:10 AM	20	8.02		7.47			
10:11 AM	21	8.03		7.46			
10:12 AM	22	8.04		7.47			
10:13 AM	23	8.04		7.47			
10:14 AM	24	8.03		7.47			
10:15 AM	25	8.04		7.47			
10:16 AM	26	8.04		7.47			
10:17 AM	27	8.04		7.47			
10:18 AM	28	8.03		7.48			
10:19 AM	29	8.03		7.48			
10:20 AM	30	8.04		7.48			
10:21 AM	31	8.04		7.47			
10:22 AM	32	8.04		7.48			
10:23 AM	33	8.03		7.47			
10:24 AM	34	8.04		7.48			
10:25 AM	35	8.03		7.47			
10:26 AM	36	8.04		7.47			
10:27 AM	37	8.04		7.47			
10:28 AM	38	8.04		7.47			
10:29 AM	39	8.04		7.47			
10:30 AM	0	11.21	*	7.49			Pump ON
10:31 AM	1	9.65	*	7.68			Step 1
10:32 AM	2	10.55	*	7.70	0.87	100	
10:33 AM	3	10.63	*	7.72			
10:34 AM	4	10.94	*	7.73			
10:35 AM	5	10.75	*	7.74	0.87	100	
10:36 AM	6	10.44	*	7.76			
10:37 AM	7	10.53	*	7.77			
10:38 AM	8	10.64	*	7.77			
10:39 AM	9	10.07	*	7.78			
10:40 AM	10	10.49	*	7.79			
10:41 AM	11	10.63	*	7.79			
10:42 AM	12	10.70	*	7.80	0.87	100	
10:43 AM	13	10.68	*	7.81			
10:44 AM	14	10.82	*	7.81			
10:45 AM	15	10.94	*	7.82			
10:46 AM	16	10.48	*	7.83			
10:47 AM	17	10.74	*	7.83			
10:48 AM	18	10.63	*	7.83			
10:49 AM	19	10.77	*	7.84			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II Step Test: February 13, 1997

Date/ hour	Elapsed time (min)	TW1-97 Depth to water (ft)	OW 1 (TH 1-96) Depth to water (ft)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
10:50 AM	20	10.66 *	7.84	0.86	100	
10:51 AM	21	10.90 *	7.85			
10:52 AM	22	10.61 *	7.85			
10:53 AM	23	10.44 *	7.86			
10:54 AM	24	10.09 *	7.86			
10:55 AM	25	10.60 *	7.86			
10:56 AM	26	10.87 *	7.87			
10:57 AM	27	10.78 *	7.88			
10:58 AM	28	10.70 *	7.88	0.86	100	
10:59 AM	29	10.75 *	7.88			
11:00 AM	30	10.52 *	7.88	0.86	100	Increase rate
11:01 AM	1	11.43 *	7.93	1.36	125	Step 2
11:02 AM	2	11.18 *	7.94	1.36	125	
11:03 AM	3	11.42 *	7.95			
11:04 AM	4	11.17 *	7.96			
11:05 AM	5	11.46 *	7.96			
11:06 AM	6	11.92 *	7.97	1.37	125	
11:07 AM	7	11.58 *	7.98			
11:08 AM	8	11.31 *	7.98			
11:09 AM	9	11.61 *	7.99			
11:10 AM	10	11.32 *	7.99			
11:11 AM	11	11.65 *	8.00			
11:12 AM	12	11.37 *	8.00			
11:13 AM	13	11.58 *	8.00			
11:14 AM	14	11.37 *	8.01			
11:15 AM	15	11.80 *	8.02			
11:16AM	16	11.39 *	8.02			
11:17 AM	17	11.91 *	8.02			
11:18 AM	18	11.31 *	8.03			
11:19 AM	19	11.73 *	8.03	1.37	125	
11:20 AM	20	11.61 *	8.04			
11:21 AM	21	11.43 *	8.04			
11:22 AM	22	11.78 *	8.05			
11:23 AM	23	11.52 *	8.05			
11:24 AM	24	11.14 *	8.05			
11:25 AM	25	11.57 *	8.05	1.37	125	
11:26 AM	26	11.86 *	8.06			
11:27 AM	27	11.19 *	8.06			
11:28 AM	28	11.80 *	8.06			
11:29 AM	29	11.49 *	8.07	1.37	125	
11:30 AM	30	11.53 *	8.07	1.37	125	Increase rate
11:31 AM	1	12.84 *	8.11	1.93	150	Step 3
11:32 AM	2	12.47 *	8.12	1.92	150	
11:33 AM	3	12.42 *	8.13			
11:34 AM	4	12.71 *	8.14			
11:35 AM	5	12.05 *	8.14			
11:36 AM	6	12.36 *	8.15	1.92	150	
11:37 AM	7	12.61 *	8.16			
11:38 AM	8	12.53 *	8.16			
11:39 AM	9	12.37 *	8.17			
11:40 AM	10	12.12 *	8.17			
11:41 AM	11	12.54 *	8.18			
11:42 AM	12	12.59 *	8.18			
11:43 AM	13	12.81 *	8.18	1.93	150	
11:44 AM	14	12.49 *	8.18			
11:45 AM	15	12.70 *	8.19			
11:46 AM	16	12.42 *	8.19			
11:47 AM	17	12.41 *	8.20			
11:48 AM	18	12.96 *	8.20	1.93	150	
11:49 AM	19	12.22 *	8.20			
11:50 AM	20	12.70 *	8.21			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II Step Test: February 13, 1997

Date/ hour	*Elapsed time (min)*	*TW 1-97 Depth to water (ft)*	*OW 1 (TH 1-96) Depth to water (ft)*	*Piezometer head (ft)*	*Pumping rate (gpm)*	*Remarks*
11:51AM	21	12.44 *	8.21			
11:52 AM	22	12.36 *	8.21			
11:53 AM	23	12.79 *	8.22			
11:54 AM	24	12.75 *	8.22			
11:55 AM	25	12.80 *	8.22	1.93	150	
11:56 AM	26	12.61 *	8.23			
11:57 AM	27	12.79 *	8.23			
11:58 AM	28	12.35 *	8.23			
11:59 AM	29	12.18 *	8.24			
12:00 PM	30	12.43 *	8.24	1.94	150	Increase rate
12:01 PM	1	13.54 *	8.28	2.62	175	Step 4
12:02 PM	2	13.54 *	8.30	2.62	175	
12:03 PM	3	13.47 *	8.31			
12:04 PM	4	13.66 *	8.33			
12:05 PM	5	13.91 *	8.33			
12:06 PM	6	13.23 *	8.32	2.62	175	
12:07 PM	7	13.77 *	8.33			
12:08 PM	8	13.90 *	8.33			
12:09 PM	9	13.42 *	8.34			
12:10 PM	10	13.29 *	8.34			
12:11PM	11	13.72 *	8.35			
12:12 PM	12	13.64 *	8.36	2.62	175	
12:13 PM	13	13.85 *	8.37			
12:14 PM	14	13.64 *	8.37			
12:15 PM	15	13.51 *	8.37			
12:16 PM	16	13.80 *	8.38			
12:17 PM	17	13.49 *	8.38			
12:18 PM	18	13.25 *	8.38			
12:19 PM	19	13.48 *	8.39			
12:20 PM	20	13.90 *	8.39			
12:21 PM	21	13.90 *	8.40			
12:22 PM	22	13.59 *	8.40			
12:23 PM	23	14.13 *	8.40	2.62	175	
12:24 PM	24	13.76 *	8.40			
12:25 PM	25	13.61 *	8.40			
12:26 PM	26	13.79 *	8.40			
12:27 PM	27	13.69 *	8.41			
12:28 PM	28	13.64 *	8.41			
12:29 PM	29	13.64 *	8.41			
12:30 PM	30	13.27 *	8.41	2.62	175	Increase rate
12:31 PM	1	14.90 *	8.45	3.42	200	Step 5
12:32 PM	2	14.85 *	8.47	3.42	200	
12:33 PM	3	15.50 *	8.48			
12:34 PM	4	14.40 *	8.48			
12:35 PM	5	14.92 *	8.49			
12:36 PM	6	14.36 *	8.49			
12:37 PM	7	14.49 *	8.50			
12:38 PM	8	14.98 *	8.50			
12:39 PM	9	15.00 *	8.51			
12:40 PM	10	13.51 *	8.51			
12:41 PM	1i	15.24 *	8.52	3.42	200	
12:42 PM	12	14.85 *	8.53			
12:43 PM	13	14.44 *	8.53			
12:44 PM	14	14.12 *	8.54			
12:45 PM	15	15.96 *	8.54			
12:46 PM	16	14.80 *	8.54			
12:47 PM	17	15.34 *	8.55	3.42	200	
12:48 PM	18	15.02 *	8.55			
12:49 PM	19	14.69 *	8.55			
12:50 PM	20	16.17 *	8.56			
12:51PM	21	14.76 *	8.56			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II Step Test: February 13, 1997

Date/ hour	*Elapsed time (min)*	*TW 1-97 Depth to water (ft)*	*OW 1 (TH 1-96) Depth to water (ft)*	*Piezometer head (ft)*	*Pumping rate (gpm)*	*Remarks*
12:52 PM	22	13.98 *	8.56			
12:53 PM	23	14.46 *	8.57	3.42	200	
12:54 PM	24	14.95 *	8.57			
12:55 PM	25	14.42 *	8.57			
12:56 PM	26	15.35 *	8.58			
12:57 PM	27	14.56 *	8.58			
12:58 PM	28	14.68 *	8.58			
12:59 PM	29	14.44 *	8.59			
01:00 PM	30	15.49 *	8.59	3.42	200	Increase rate
01:01 PM	1	16.42 *	8.63	4.36		Step 6
01:02 PM	2	16.36 *	8.65	4.36		
01:03 PM	3	16.47 *	8.66	4.35	225	
01:04 PM	4	16.17 *	8.66			
01:05 PM	5	15.81 *	8.66			
01:06 PM	6	16.29 *	8.67			
01:07 PM	7	16.42 *	8.68			
01:08 PM	8	16.16 *	8.68	4.35	225	
01:09 PM	9	16.15 *	8.69			
01:10 PM	10	16.45 *	8.70			
01:11 PM	11	16.13 *	8.71			
01:12 PM	12	16.49 *	8.71			
01:13 PM	13	16.66 *	8.71			
01:14 PM	14	16.20 *	8.72			
01:15 PM	15	15.75 *	8.72			
01:16 PM	16	16.35 *	8.73	4.35	225	
01:17 PM	17	17.17 *	8.73			
01:18 PM	18	16.42 *	8.74			
01:19 PM	19	15.98 *	8.74			
01:20 PM	20	16.52 *	8.74			
01:21 PM	21	15.90 *	8.75			
01:22 PM	22	15.98 *	8.76	4.35	225	
01:23 PM	23	16.10 *	8.76			
01:24 PM	24	16.39 *	8.76			
01:25 PM	25	16.13 *	8.77			
01:26 PM	26	16.47 *	8.77			
01:27 PM	27	16.39 *	8.77			
01:28 PM	28	16.74 *	8.77			
01:29 PM	29	16.30 *	8.77			
01:30 PM	30	16.24 *	8.77	4.35	225	End of Step Test

Note:
* Measurements erratic, possibly due to electrical interference from pump motor

Appendix H.

Test Well 1-97
7-Day Aquifer Test: Water-Level Measurements,
February 17-24, 1997

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observed drawdown (ft)	Approximate barometric pressure (psia)	(ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/17/97														
09:15 AM	0					11.02								Solinst dropline
09:22 AM	0	8.09												Solinst dropline
09:24 AM	0			7.54										Solinst dropline
10:18 AM	0	8.08		7.53		11.01								Data logging started
10:20 AM	2	8.08		7.53		11.00								Water level trend
10:22 AM	4	8.08		7.53		11.00								
10:24 AM	6	8.08		7.53		11.01								
10:26 AM	8	8.08		7.52		11.01				14.54	33.55			
10:28 AM	10	8.08		7.53		11.01				14.54	33.55			
10:30 AM	12	8.07		7.53		11.01				14.54	33.55			
10:31 AM	13							13.31						Solinst dropline
10:32 AM	14	8.08		7.52		11.01				14.54	33.55			
10:34 AM	16	8.08		7.52		11.01				14.54	33.54			
10:36 AM	18	8.08		7.53		11.01				14.54	33.54			
10:38 AM	20	8.07		7.52		11.00		13.31		14.54	33.54			
10:40 AM	22	8.07		7.52		10.99		13.33		14.54	33.54			
10:42 AM	24	8.06		7.52		11.01		13.33		14.54	33.54			
10:44 AM	26	8.06		7.52		11.01		13.32		14.54	33.53			
10:46 AM	28	8.07		7.52		11.01		13.32		14.54	33.54			
10:48 AM	30	8.05		7.52		11.01		13.33		14.53	33.53			
10:50 AM	32	8.07		7.52		11.00		13.33		14.53	33.53			
10:52 AM	34	8.06		7.51		10.99		13.32		14.53	33.53			
10:54 AM	36	8.08		7.52		11.01		13.32		14.53	33.52			
10:56 AM	38	8.08		7.52		10.99		13.32		14.53	33.52			
10:58 AM	40	8.05		7.52		11.00		13.32		14.53	33.52			
11:00 AM	42	8.07		7.52		11.00		13.32		14.53	33.52			
11:02 AM	44	8.06		7.52		11.00		13.32		14.53	33.51			
11:04 AM	46	8.07		7.52		11.01		13.32		14.53	33.51			
11:06 AM	48	8.07		7.52		11.00		13.32		14.53	33.51			
11:08 AM	50	8.07		7.52		11.00		13.32		14.53	33.51			
11:10 AM	52	8.06		7.52		11.01		13.32		14.52	33.51			
11:12AM	54	8.05		7.51		11.02		13.33		14.52	33.50			
11:14 AM	56	8.06		7.52		11.00		13.32		14.52	33.50			
11:16AM	58	8.07		7.52		11.00		13.32		14.52	33.50			
11:18AM	60	8.07		7.52		11.00		13.32		14.52	33.50			
11:20 AM	62	8.05		7.52		11.00		13.32		14.52	33.50			
11:22 AM	64	8.06		7.51		11.01		13.32		14.52	33.50			
11:24 AM	66	8.06		7.51		11.01		13.32		14.52	33.50			
11:26 AM	68	8.06		7.51		11.01		13.32		14.52	33.49			
11:28 AM	70	8.05		7.51		11.00		13.31		14.52	33.49			
11:30 AM	72	8.06		7.52		11.01		13.32		14.52	33.49			
11:32 AM	74	8.06		7.52		11.00		13.32		14.52	33.49			
11:34 AM	76	8.06		7.52		11.01		13.32		14.52	33.49			
11:36 AM	78	8.06		7.52		11.02		13.32		14.52	33.49			
11:38 AM	80	8.05		7.51		11.01		13.32		14.52	33.49			
11:40 AM	82	8.05		7.51		11.00		13.32		14.52	33.49			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/17/97														
11:42 AM	84	8.05		7.51		11.00		13.31		14.51	33.48			
11:44 AM	86	8.06		7.52		11.00		13.31		14.51	33.48			
11:46 AM	88	8.06		7.52		11.00		13.32		14.51	33.48			
11:48 AM	90	8.05		7.51		11.00		13.32		14.51	33.48			
11:50 AM	92	8.05		7.51		11.00		13.32		14.51	33.48			
11:52 AM	94	8.05		7.51		11.00		13.31		14.51	33.48			
11:54 AM	96	8.05		7.51		11.00		13.31		14.51	33.47			
11:56 AM	98	8.05		7.52		11.01		13.31		14.51	33.47			
11:58 AM	100	8.05		7.51		11.00		13.31		14.51	33.47			
12:00 PM	102	8.05		7.51		11.00		13.31		14.51	33.47			
12:02 PM	104	8.05		7.51		11.00		13.31		14.51	33.47			
12:04 PM	106	8.05		7.51		10.99		13.31		14.51	33.46			
12:06 PM	108	8.05		7.51		11.00		13.32		14.51	33.46			
12:08 PM	110	8.05		7.51		11.00		13.31		14.50	33.46			
12:10 PM	112	8.05		7.51		11.00		13.31		14.50	33.46			
12:12 PM	114	8.05		7.51		11.00		13.31		14.50	33.46			
12:14 PM	116	8.05		7.51		11.00		13.31		14.50	33.46			
12:16 PM	118	8.05		7.51		11.01		13.32		14.50	33.46			
12:18 PM	120	8.05		7.51		11.00		13.31		14.50	33.45			
12:20 PM	122	8.05		7.51		11.00		13.31		14.50	33.45			
12:22 PM	124	8.05		7.51		11.01		13.31		14.50	33.45			
12:24 PM	126	8.05		7.50		11.00		13.31		14.50	33.45			
12:26 PM	128	8.05		7.51		11.00		13.32		14.50	33.45			
12:28 PM	130	8.05		7.51		11.00		13.32		14.50	33.45			
12:30 PM	132	8.04		7.50		11.00		13.31		14.50	33.44			
12:32 PM	134	8.05		7.51		11.01		13.30		14.50	33.44			
12:34 PM	136	8.05		7.51		11.00		13.31		14.50	33.44			
12:36 PM	138	8.04		7.51		11.01		13.31		14.50	33.44			
12:38 PM	140	8.04		7.51		11.00		13.32		14.50	33.44			
12:40 PM	142	8.04		7.51		11.01		13.32		14.49	33.44			
12:42 PM	144	8.05		7.51		11.01		13.31		14.49	33.44			
12:44 PM	146	8.04		7.51		11.01		13.32		14.49	33.44			
12:46 PM	148	8.03		7.51		11.00		13.31		14.49	33.43			
12:48 PM	150	8.04		7.51		11.00		13.31		14.49	33.43			
12:50 PM	152	8.03		7.50		10.99		13.31		14.49	33.43			
12:52 PM	154	8.03		7.50		11.00		13.30		14.49	33.43			
12:54 PM	156	8.03		7.50		11.00		13.31		14.49	33.43			
12:56 PM	158	8.03		7.50		11.00		13.31		14.49	33.42			
12:58 PM	160	8.03		7.50		11.00		13.31		14.49	33.42			
01:00 PM	162	8.04		7.51		11.00		13.30		14.49	33.42			
01:02 PM	164	8.03		7.51		11.00		13.31		14.49	33.42			
01:04 PM	166	8.03		7.50		11.00		13.30		14.49	33.42			
01:06 PM	168	8.03		7.50		11.00		13.31		14.49	33.42			
01:08 PM	170	8.03		7.51		11.00		13.31	13.31	14.49	33.42			
01:10PM	172	8.03		7.50		11.01				14.48	33.41			
01:12 PM	174	8.03		7.51		11.00				14.48	33.41			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Dale/ hour	*Elapsed time (min)*	*Test Well 1-97 (TH 5-96) Depth to water (ft)*	*Observed drawdown (ft)*	*Observation Well 1 (TH 1-96) Depth to water (ft)*	*Observed drawdown (ft)*	*Observation Well 2 (TH 4-96) Depth to water (ft)*	*Observed drawdown (ft)*	*Observation Well 3 (TH 2-96) Depth to water (ft)*	*Observed drawdown (ft)*	*Approximate barometric pressure (psia)*	*(ft of water)*	*Piezometer head (ft)*	*Pumping rate (gpm)*	*Remarks*
02/17/97														
01:14 PM	176	8.02		7.50		11.00				14.48	33.41			
01:20 PM	0.000	8.03		7.49		11.00	0.00	13.31		14.48	33.40			Pump ON
	0.008	16.92 *	8.89	7.50	0.00	11.01	0.01			14.48	33.41			
	0.017	11.40 *	3.37	7.51	0.01	11.01	0.01	13.31	0.00	14.48	33.41			
	0.025	11.67 *	3.64	7.51	0.01	11.01	0.01			14.48	33.41			
	0.033	10.51 *	2.48	7.51	0.01	11.01	0.01	13.31	0.00	14.48	33.41			
	0.042	11.92 *	3.89	7.52	0.02	11.01	0.01			14.48	33.41			
	0.050	11.16 *	3.13	7.53	0.03	11.02	0.02	13.31	0.00	14.48	33.41			
	0.058	11.78 *	3.75	7.53	0.03	11.01	0.01			14.48	33.41			
	0.067	13.28 *	5.25	7.54	0.04	11.01	0.01	13.31	0.00	14.48	33.41			
	0.075	11.91 *	3.88	7.54	0.04	11.02	0.02			14.48	33.41			
	0.083	12.55 *	4.52	7.55	0.05	11.02	0.02	13.31	0.00	14.48	33.41			
	0.092	13.94 *	5.91	7.56	0.05	11.01	0.01			14.48	33.41			
	0.100	13.45 *	5.42	7.56	0.06	11.01	0.01	13.31	0.00	14.48	33.40			
	0.108	14.30 *	6.27	7.57	0.07	11.01	0.01			14.48	33.41			
	0.117	14.51 *	6.48	7.57	0.07	11.01	0.01	13.32	0.01	14.48	33.40			
	0.125	14.80 *	6.77	7.58	0.08	11.03	0.03			14.48	33.40			
	0.133	14.08 *	6.05	7.59	0.09	11.03	0.03	13.31	0.00	14.48	33.41			
	0.142	13.58 *	5.55	7.60	0.10	11.02	0.02			14.48	33.39			
	0.150	13.12 *	5.09	7.61	0.11	11.01	0.01	13.32	0.01	14.48	33.39			
	0.158	14.23 *	6.20	7.61	0.11	11.02	0.02			14.48	33.39			
	0.167	13.35 *	5.32	7.62	0.12	11.02	0.02	13.32	0.01	14.48	33.40			
	0.175	13.64 *	5.61	7.63	0.13	11.01	0.01			14.48	33.40			
	0.183	14.91 *	6.88	7.63	0.13	11.02	0.02	13.31	0.00	14.48	33.40			
	0.192	13.94 *	5.91	7.64	0.14	11.02	0.02			14.48	33.40			
	0.200	13.96 *	5.93	7.64	0.14	11.02	0.02	13.31	0.00	14.48	33.41			
	0.208	14.27 *	6.24	7.66	0.16	11.01	0.01			14.48	33.40			
	0.217	14.38 *	6.35	7.66	0.16	11.02	0.02	13.32	0.01	14.48	33.41			
	0.225	14.25 *	6.22	7.66	0.16	11.02	0.02			14.48	33.41			
	0.233	14.69 *	6.66	7.67	0.17	11.02	0.02	13.31	0.00	14.48	33.41			
	0.242	13.74 *	5.71	7.68	0.18	11.01	0.01			14.48	33.41			
	0.250	14.23 *	6.20	7.68	0.18	11.02	0.02	13.31	0.00	14.48	33.41			
	0.258	13.51 *	5.48	7.68	0.18	11.02	0.02			14.48	33.41			
	0.267	14.16 *	6.13	7.68	0.18	11.02	0.02	13.30	0.00	14.48	33.41			
	0.275	13.48 *	5.45	7.69	0.19	11.01	0.01			14.48	33.41			
	0.283	14.12 *	6.09	7.69	0.19	11.01	0.01	13.31	0.00	14.48	33.41			
	0.292	13.89 *	5.86	7.70	0.20	11.02	0.02			14.48	33.41			
	0.300	13.53 *	5.50	7.70	0.20	11.01	0.01	13.31	0.00	14.48	33.41			
	0.308	13.49 *	5.46	7.71	0.21	11.02	0.02			14.48	33.41			
	0.317	14.10 *	6.07	7.71	0.21	11.02	0.02	13.31	0.00	14.48	33.41			
	0.325	13.28 *	5.25	7.71	0.21	11.01	0.01			14.48	33.41			
	0.333	14.94 *	6.91	7.72	0.22	11.02	0.02	13.31	0.00	14.48	33.41			
	0.350	14.38 *	6.35	7.72	0.22	11.01	0.01			14.48	33.40			
	0.367	13.55 *	5.52	7.73	0.23	11.01	0.01	13.31	0.00	14.48	33.41			
	0.383	14.39 *	6.36	7.73	0.23	11.01	0.01	13.31	0.00	14.48	33.41			
	0.400	13.74 *	5.71	7.74	0.24	11.01	0.01	13.31	0.00	14.48	33.41			

Ground-Water Investigation in Ogden Township for the Village of Homer

Test Well 1-97 II 7-day Aquifer Test: February 17-24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observed drawdown (ft)	Approximate barometric pressure (psia)	(ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/17/97														
	0.417	13.82 *	5.79	7.74	0.24	11.02	0.02	13.31	0.00	14.48	33.41			
	0.433	13.77 *	5.74	7.75	0.25	11.02	0.02	13.30	-0.01	14.48	33.40			
	0.450	14.86 *	6.83	7.74	0.24	11.02	0.02	13.31	0.00	14.48	33.41			
	0.467	14.52 *	6.49	7.75	0.25	11.02	0.02	13.31	0.00	14.48	33.41			
	0.483	13.75 *	5.72	7.75	0.25	11.02	0.02	13.31	0.00	14.48	33.41			
	0.500	14.70 *	6.67	7.76	0.26	11.01	0.01	13.31	0.00	14.48	33.41			
	0.517	14.17 *	6.14	7.77	0.27	11.01	0.01	13.31	0.00	14.48	33.41			
	0.533	14.18 *	6.15	7.76	0.26	11.02	0.02	13.30	-0.01	14.48	33.41			
	0.550	15.04 *	7.01	7.77	0.27	11.01	0.01	13.31	0.00	14.48	33.41			
	0.567	13.78 *	5.75	7.77	0.27	11.01	0.01	13.31	0.00	14.48	33.41			
	0.583	14.10 *	6.07	7.77	0.27	11.01	0.01	13.31	0.00	14.48	33.41			
	0.600	14.55 *	6.52	7.78	0.28	11.01	0.01	13.30	-0.01	14.48	33.41			
	0.617	14.50 *	6.47	7.77	0.27	11.01	0.01	13.30	-0.01	14.48	33.41			
	0.633	13.82 *	5.79	7.78	0.28	11.02	0.02	13.31	0.00	14.48	33.41			
	0.650	14.70 *	6.67	7.79	0.28	11.02	0.02	13.31	0.00	14.48	33.41			
	0.667	13.95 *	5.92	7.79	0.29	11.02	0.02	13.31	0.00	14.48	33.41			
	0.683	13.74 *	5.71	7.79	0.29	11.01	0.01	13.31	0.00	14.48	33.41			
	0.700	13.83 *	5.80	7.79	0.29	11.02	0.02	13.31	0.00	14.48	33.41			
	0.717	14.01 *	5.98	7.79	0.29	11.02	0.02	13.30	-0.01	14.48	33.41			
	0.733	14.90 *	6.87	7.80	0.30	11.02	0.02	13.31	0.00	14.48	33.41			
	0.750	14.20 *	6.17	7.79	0.29	11.01	0.01	13.31	0.00	14.48	33.41			
	0.767	13.48 *	5.45	7.80	0.30	11.01	0.01	13.31	0.00	14.48	33.41			
	0.783	14.10 *	6.07	7.80	0.30	11.02	0.02	13.31	0.00	14.48	33.41			
	0.800	14.13 *	6.10	7.80	0.30	11.01	0.01	13.32	0.01	14.48	33.41			
	0.817	13.47 *	5.44	7.80	0.30	11.02	0.02	13.32	0.01	14.48	33.41			
	0.833	14.86 *	6.83	7.80	0.30	11.01	0.01	13.32	0.01	14.48	33.41			
	0.850	14.52 *	6.49	7.81	0.31	11.02	0.02	13.32	0.01	14.48	33.41			
	0.867	13.96 *	5.93	7.81	0.31	11.01	0.01	13.31	0.00	14.48	33.41			
	0.883	13.71 *	5.68	7.81	0.31	11.01	0.01	13.31	0.00	14.48	33.40			
	0.900	14.03 *	6.00	7.81	0.31	11.01	0.01	13.32	0.01	14.48	33.41			
	0.917	14.19 *	6.16	7.82	0.32	11.00	0.00	13.32	0.01	14.48	33.41			
	0.933	13.86 *	5.83	7.81	0.31	11.01	0.01	13.31	0.00	14.48	33.41			
	0.950	14.12 *	6.09	7.82	0.32	11.01	0.01	13.30	-0.01	14.48	33.41			
	0.967	14.25 *	6.22	7.82	0.32	11.02	0.02	13.32	0.01	14.48	33.41			
	0.983	14.62 *	6.59	7.82	0.32	11.02	0.02	13.31	0.00	14.48	33.41			
01:21 PM	1.0	14.41 *	6.38	7.82	0.32	11.01	0.01	13.31	0.00	14.48	33.40	3.28	196	Generator not running steady
	1.2	14.76 *	6.73	7.84	0.34	11.01	0.01	13.31	0.00	14.48	33.40			
	1.4	13.98 *	5.95	7.85	0.35	11.01	0.01	13.30	-0.01	14.48	33.40			
	1.6	13.93 *	5.90	7.87	0.37	11.01	0.01	13.30	-0.01	14.48	33.40			
	1.8	14.31 *	6.28	7.88	0.38	11.01	0.01	13.30	-0.01	14.48	33.40			
01:22 PM	2.0	13.38 *	5.35	7.89	0.39	11.01	0.01	13.30	-0.01	14.48	33.40			
	2.2	13.62 *	5.59	7.90	0.40	11.02	0.02	13.30	-0.01	14.48	33.40			
	2.4	14.50 *	6.47	7.91	0.41	11.01	0.01	13.31	0.00	14.48	33.40			
	2.6	14.59 *	6.56	7.91	0.41	11.00	0.00	13.31	0.00	14.48	33.40			
	2.8	14.53 *	6.50	7.92	0.42	11.00	0.00	13.30	-0.01	14.48	33.40			
01:23 PM	3.0	13.95 *	5.92	7.93	0.43	11.01	0.01	13.31	0.00	14.48	33.40	3.27	195	

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	*Test Well 1-97 (TH 5-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 1 (TH 1-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 2 (TH 4-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 3 (TH 2-96)* Depth to water (ft)	Observed drawdown (ft)	Approximate barometric pressure (psia)	(ft of water)	iPiezometer head (ft)	Pumping rate (gpm)	Remarks
02/17/97														
	3.2	14.00 *	5.97	7.94	0.44	11.01	0.01	13.31	0.00	14.48	33.40			
	3.4	13.67 *	5.64	7.94	0.44	11.00	0.00	13.30	-0.01	14.48	33.40			
	3.6	13.88 *	5.85	7.95	0.45	11.01	0.01	13.30	-0.01	14.48	33.40			
	3.8	14.73 *	6.70	7.95	0.45	11.02	0.02	13.30	-0.01	14.48	33.40			
01:24 PM	4.0	13.57 *	5.54	7.96	0.46	11.01	0.01	13.30	-0.01	14.48	33.40			
	4.2	14.95 *	6.92	7.97	0.47	11.01	0.01	13.30	-0.01	14.48	33.40			
	4.4	14.82 *	6.79	7.97	0.47	11.02	0.02	13.30	-0.01	14.48	33.40			
	4.6	13.86 *	5.83	7.98	0.48	11.01	0.01	13.31	0.00	14.48	33.40			
	4.8	14.45 *	6.42	7.98	0.48	11.02	0.02	13.30	-0.01	14.48	33.40			
01:25 PM	5.0	13.95 *	5.92	7.99	0.49	11.01	0.01	13.31	0.00	14.48	33.40			
	5.2	13.98 *	5.95	8.00	0.50	11.01	0.01	13.31	0.00	14.48	33.40			
	5.4	13.84 *	5.81	8.00	0.50	11.01	0.01	13.30	-0.01	14.48	33.40			
	5.6	13.37 *	5.34	8.01	0.51	11.01	0.01	13.30	-0.01	14.48	33.39			
	5.8	14.20 *	6.17	8.01	0.51	11.01	0.01	13.32	0.01	14.48	33.39			
01:26 PM	6.0	14.73 *	6.70	8.02	0.52	11.01	0.01	13.30	-0.01	14.47	33.39			
	6.2	14.04 *	6.01	8.02	0.52	11.01	0.01	13.30	-0.01	14.47	33.39			
	6.4	14.03 *	6.00	8.02	0.52	11.01	0.01	13.30	-0.01	14.48	33.39			
	6.6	14.37 *	6.34	8.02	0.52	11.01	0.01	13.31	0.00	14.48	33.39			
	6.8	14.30 *	6.27	8.03	0.53	11.01	0.01	13.31	0.00	14.47	33.39			
01:27 PM	7.0	14.18 *	6.15	8.03	0.53	11.01	0.01	13.30	-0.01	14.48	33.40	3.27	195	
	7.2	14.78 *	6.75	8.04	0.54	11.01	0.01	13.30	-0.01	14.47	33.39			
	7.4	13.78 *	5.75	8.04	0.54	11.02	0.02	13.30	-0.01	14.47	33.39			
	7.6	14.54 *	6.51	8.05	0.55	11.01	0.01	13.31	0.00	14.48	33.40			
	7.8	14.49 *	6.46	8.05	0.55	11.02	0.02	13.30	-0.01	14.47	33.39			
01:28 PM	8.0	14.10 *	6.07	8.05	0.55	11.01	0.01	13.31	0.00	14.48	33.40			
	8.2	14.98 *	6.95	8.06	0.56	11.00	0.00	13.30	-0.01	14.48	33.40			
	8.4	15.07 *	7.04	8.06	0.56	11.01	0.01	13.30	-0.01	14.48	33.39			
	8.6	14.30 *	6.27	8.07	0.57	11.02	0.02	13.30	-0.01	14.48	33.39			
	8.8	14.47 *	6.44	8.07	0.57	11.01	0.01	13.30	-0.01	14.47	33.39			
01:29 PM	9.0	14.61 *	6.58	8.07	0.57	11.01	0.01	13.30	-0.01	14.48	33.40			
	9.2	13.70 *	5.67	8.07	0.57	11.01	0.01	13.30	-0.01	14.48	33.40			
	9.4	14.89 *	6.86	8.08	0.58	11.01	0.01	13.30	-0.01	14.48	33.40			
	9.6	15.05 *	7.02	8.08	0.58	11.02	0.02	13.30	-0.01	14.48	33.40			
	9.8	14.25 *	6.22	8.09	0.59	11.01	0.01	13.31	0.00	14.48	33.40			
01:30 PM	10	13.75 *	5.72	8.09	0.59	11.01	0.01	13.30	-0.01	14.48	33.40			
01:32 PM	12	14.36 *	6.33	8.11	0.61	11.00	-0.00	13.29	-0.02	14.48	33.40	3.27	195	
01:34 PM	14	14.46 *	6.43	8.14	0.64	11.00	0.00	13.31	0.00	14.48	33.39			
01:36 PM	16	14.51 *	6.48	8.16	0.65	10.99	-0.01	13.30	-0.01	14.48	33.39			
01:38 PM	18	14.38 *	6.35	8.18	0.68	11.02	0.02	13.31	0.00	14.47	33.39			
01:40 PM	20	14.68 *	6.65	8.20	0.70	11.00	0.00	13.31	0.00	14.47	33.39	3.27	195	
01:42 PM	22	14.08 *	6.05	8.21	0.71	11.00	0.00	13.30	-0.01	14.47	33.39			
01:44 PM	24	14.34 *	6.31	8.23	0.73	11.00	0.00	13.31	0.00	14.47	33.38			
01:46 PM	26	14.60 *	6.57	8.25	0.75	11.01	0.01	13.31	0.00	14.47	33.38			
01:48 PM	28	14.66 *	6.63	8.27	0.77	11.01	0.01	13.30	-0.01	14.47	33.39			
01:50 PM	30	14.69 *	6.66	8.27	0.77	10.99	-0.01	13.29	-0.02	14.47	33.39	3.27	195	
01:52 PM	32	14.68 *	6.65	8.29	0.79	11.00	0.00	13.30	-0.01	14.47	33.39			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/17/97														
01:54 PM	34	14.90 *	6.87	8.31	0.81	11.02	0.02	13.31	0.00	14.47	33.38	3.27	195	
01:56 PM	36	14.57 *	6.54	8.31	0.81	11.00	-0.00	13.29	-0.02	14.47	33.38			
01:58 PM	38	15.03 *	7.00	8.33	0.83	11.01	0.01	13.31	0.00	14.47	33.38			
02:00 PM	40	14.76 *	6.73	8.33	0.83	11.00	0.00	13.30	-0.01	14.47	33.37	3.26	195	Generator smoothed out
02:02 PM	42	15.05 *	7.02	8.34	0.84	11.00	-0.00	13.29	-0.02	14.47	33.38			
02:04 PM	44	14.09 *	6.06	8.36	0.86	11.01	0.01	13.30	-0.01	14.47	33.38	3.26	195	
02:06 PM	46	14.73 *	6.70	8.37	0.87	11.02	0.02	13.30	-0.01	14.47	33.38			
02:08 PM	48	14.50 *	6.47	8.38	0.88	11.00	0.00	13.30	-0.01	14.47	33.37			
02:10 PM	50	15.08 *	7.05	8.39	0.89	11.00	0.00	13.30	-0.01	14.47	33.37	3.26	195	
02:12 PM	52	14.92 *	6.89	8.40	0.90	11.01	0.01	13.30	-0.01	14.47	33.37			
02:14 PM	54	14.18 *	6.15	8.41	0.91	11.02	0.02	13.31	0.00	14.47	33.37			
02:16 PM	56	14.49 *	6.46	8.42	0.92	10.99	-0.01	13.30	-0.01	14.47	33.37			
02:18 PM	58	14.85 *	6.82	8.43	0.93	11.00	0.00	13.30	-0.01	14.47	33.38			
02:20 PM	60	15.57 *	7.54	8.44	0.94	11.00	0.00	13.30	-0.01	14.47	33.38	3.26	195	
02:22 PM	62	14.47 *	6.44	8.44	0.94	11.00	0.00	13.30	-0.01	14.47	33.38			
02:24 PM	64	14.86 *	6.83	8.45	0.95	11.01	0.01	13.30	-0.01	14.47	33.38			
02:26 PM	66	15.01 *	6.98	8.46	0.96	11.01	0.01	13.30	-0.01	14.47	33.37			
02:28 PM	68	14.38 *	6.35	8.47	0.97	11.01	0.01	13.30	-0.01	14.47	33.37			
02:30 PM	70	14.94 *	6.91	8.47	0.97	11.01	0.01	13.30	-0.01	14.47	33.38			
02:32 PM	72	14.30 *	6.27	8.48	0.98	11.02	0.02	13.30	-0.01	14.47	33.38			
02:34 PM	74	14.61 *	6.58	8.49	0.99	11.01	0.01	13.30	-0.01	14.47	33.37			
02:36 PM	76	15.05 *	7.02	8.50	1.00	11.01	0.01	13.30	-0.01	14.47	33.37			
02:38 PM	78	14.37 *	6.34	8.51	1.01	11.00	0.00	13.30	-0.01	14.47	33.37			
02:40 PM	80	14.66 *	6.63	8.52	1.02	11.01	0.01	13.30	-0.01	14.47	33.38	3.26	195	
02:42 PM	82	13.94 *	5.91	8.52	1.02	11.01	0.01	13.30	-0.01	14.47	33.38			
02:44 PM	84	14.80 *	6.77	8.53	1.03	11.01	0.01	13.30	-0.01	14.47	33.38			
02:46 PM	86	14.43 *	6.40	8.53	1.03	11.01	0.01	13.30	-0.01	14.47	33.38			
02:48 PM	88	15.07 *	7.04	8.54	1.04	11.01	0.01	13.31	0.00	14.47	33.38			
02:50 PM	90	14.17 *	6.14	8.55	1.05	11.02	0.02	13.31	0.00	14.47	33.38	3.26	195	
02:52 PM	92	14.73 *	6.70	8.55	1.05	11.01	0.01	13.30	-0.01	14.47	33.38			
02:54 PM	94	14.84 *	6.81	8.56	1.06	11.01	0.01	13.30	-0.01	14.46	33.37			
02:56 PM	96	14.22 *	6.19	8.57	1.07	11.01	0.01	13.30	-0.01	14.47	33.38			
02:58 PM	98	15.36 *	7.33	8.58	1.08	11.01	0.01	13.30	-0.01	14.47	33.37			
03:00 PM	100	14.97 *	6.94	8.58	1.08	11.02	0.02	13.30	-0.01	14.47	33.39			
03:20 PM	120	15.00 *	6.97	8.64	1.14	11.01	0.01	13.30	-0.01	14.47	33.37	3.26	195	Water sample collected; T = 54.3° F
03:40 PM	140	15.10 *	7.07	8.69	1.19	11.02	0.02	13.31	0.00	14.46	33.36			
04:00 PM	160	15.39 *	7.36	8.73	1.23	11.04	0.04	13.30	-0.01	14.45	33.35	3.26	195	
04:20 PM	180	14.92 *	6.89	8.78	1.28	11.03	0.03	13.31	0.00	14.45	33.33	3.26	195	
04:40 PM	200	15.82 *	7.79	8.81	1.31	11.04	0.04	13.30	-0.01	14.44	33.31	3.26	195	
05:00 PM	220	15.34 *	7.31	8.85	1.35	11.03	0.03	13.31	0.00	14.43	33.30	3.26	195	
05:20 PM	240	15.41 *	7.38	8.88	1.38	11.03	0.03	13.31	0.00	14.43	33.29	3.26	195	
05:40 PM	260	15.39 *	7.36	8.91	1.41	11.03	0.03	13.31	0.00	14.42	33.27	3.26	195	
06:00 PM	280	15.73 *	7.70	8.95	1.45	11.04	0.04	13.32	0.01	14.42	33.26	3.26	195	
06:20 PM	300	15.48 *	7.45	8.97	1.47	11.04	0.04	13.32	0.01	14.41	33.25	3.26	195	
06:40 PM	320	15.74 *	7.71	9.00	1.50	11.05	0.05	13.32	0.01	14.41	33.24			
07:00 PM	340	14.93 *	6.90	9.03	1.53	11.05	0.05	13.32	0.01	14.41	33.24			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/17/97														
07:20 PM	360	15.42 *	7.39	9.05	1.55	11.06	0.06	13.33	0.02	14.40	33.23	3.26	195	
07:40 PM	380	15.61 *	7.58	9.08	1.58	11.06	0.06	13.33	0.02	14.40	33.22			
08:00 PM	400	15.56 *	7.53	9.10	1.60	11.06	0.06	13.34	0.02	14.40	33.22			
08:20 PM	420	16.27 *	8.24	9.13	1.63	11.07	0.07	13.33	0.02	14.40	33.22	3.26	195	
08:40 PM	440	15.74 *	7.71	9.15	1.65	11.07	0.07	13.34	0.03	14.40	33.22			
09:00 PM	460	14.98 *	6.95	9.17	1.67	11.07	0.07	13.34	0.03	14.40	33.22			
09:20 PM	480	15.68 *	7.65	9.19	1.69	11.08	0.08	13.34	0.03	14.40	33.22	3.26	195	
09:40 PM	500	15.65 *	7.62	9.21	1.71	11.08	0.08	13.35	0.03	14.40	33.22			
10:00 PM	520	16.00 *	7.97	9.23	1.73	11.08	0.08	13.35	0.03	14.40	33.21			
10:20 PM	540	14.81 *	6.78	9.26	1.76	11.09	0.09	13.35	0.04	14.39	33.20	3.26	195	
10:40 PM	560	15.46 *	7.43	9.27	1.77	11.10	0.10	13.35	0.04	14.38	33.18			
11:00 PM	580	16.25 *	8.22	9.29	1.79	11.10	0.10	13.35	0.04	14.38	33.17			
11:20 PM	600	16.17 *	8.14	9.31	1.81	11.10	0.10	13.36	0.05	14.38	33.18	3.26	195	
11:40 PM	620	15.37 *	7.34	9.33	1.83	11.12	0.12	13.36	0.05	14.39	33.19			
02/18/97														
12:00 AM	640	15.84 *	7.81	9.34	1.84	11.12	0.12	13.36	0.05	14.39	33.19			
12:20 AM	660	15.63 *	7.60	9.35	1.85	11.12	0.12	13.36	0.05	14.39	33.19	3.26	195	
12:40 AM	680	16.12 *	8.09	9.37	1.87	11.13	0.13	13.37	0.06	14.39	33.20			
01:00 AM	700	15.63 *	7.60	9.38	1.88	11.13	0.13	13.37	0.06	14.39	33.20			
01:20 AM	720	16.47 *	8.44	9.40	1.90	11.14	0.14	13.37	0.06	14.39	33.20	3.26	195	
01:40 AM	740	15.99 *	7.96	9.42	1.92	11.15	0.15	13.37	0.06	14.39	33.19			
02:00 AM	760	15.48 *	7.45	9.43	1.93	11.15	0.15	13.38	0.07	14.39	33.19			
02:20 AM	780	16.17 *	8.14	9.45	1.95	11.16	0.16	13.38	0.07	14.38	33.18	3.26	195	
02:40 AM	800	15.55 *	7.52	9.47	1.97	11.16	0.16	13.37	0.06	14.38	33.17			
03:00 AM	820	15.95 *	7.92	9.47	1.97	11.17	0.17	13.38	0.07	14.38	33.16			
03:20 AM	840	16.05 *	8.02	9.49	1.99	11.18	0.18	13.38	0.07	14.38	33.17	3.26	195	
03:40 AM	860	16.11 *	8.08	9.50	2.00	11.18	0.18	13.40	0.09	14.37	33.16			
04:00 AM	880	15.39 *	7.36	9.51	2.01	11.19	0.19	13.39	0.08	14.37	33.16			
04:20 AM	900	15.76 *	7.73	9.53	2.03	11.20	0.20	13.39	0.08	14.38	33.16	3.26	195	
04:40 AM	920	15.37 *	7.34	9.54	2.04	11.20	0.20	13.39	0.08	14.38	33.17			
05:00 AM	940	16.00 *	7.97	9.56	2.06	11.21	0.21	13.39	0.08	14.38	33.18			
05:20 AM	960	15.32 *	7.29	9.57	2.07	11.21	0.21	13.39	0.08	14.38	33.17	3.26	195	
05:40 AM	980	15.57 *	7.54	9.58	2.08	11.22	0.22	13.39	0.08	14.38	33.17			
06:00 AM	1000	15.77 *	7.74	9.59	2.09	11.23	0.23	13.39	0.08	14.38	33.17			
06:20 AM	1020	16.27 *	8.24	9.60	2.10	11.23	0.23	13.39	0.08	14.38	33.17	3.26	195	
06:40 AM	1040	16.09 *	8.06	9.62	2.12	11.24	0.24	13.40	0.09	14.38	33.17			
07:00 AM	1060	15.84 *	7.81	9.63	2.13	11.25	0.25	13.40	0.09	14.38	33.17			
07:20 AM	1080	15.90 *	7.87	9.64	2.14	11.26	0.26	13.41	0.09	14.38	33.17	3.26	195	
07:40 AM	1100	15.90 *	7.87	9.65	2.15	11.26	0.26	13.40	0.09	14.39	33.19			
08:00 AM	1120	16.00 *	7.97	9.67	2.17	11.27	0.27	13.40	0.09	14.39	33.20			
08:20 AM	1140	16.39 *	8.36	9.68	2.18	11.27	0.27	13.40	0.09	14.39	33.20	3.24	194	
08:40 AM	1160	15.93 *	7.90	9.70	2.20	11.28	0.28	13.41	0.10	14.39	33.20			
09:00 AM	1180	15.81 *	7.78	9.70	2.20	11.30	0.30	13.42	0.10	14.40	33.21			
09:20 AM	1200	16.94 *	8.91	9.72	2.22	11.30	0.30	13.41	0.10	14.40	33.22	3.24	194	
09:40 AM	1220	15.30 *	7.27	9.72	2.22	11.32	0.31	13.42	0.11	14.39	33.20			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	iElapsed time (min)	*Test Well 1-97 (TH 5-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 1 (TH 1-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 2 (TH 4-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 3 (TH 2-96)* Depth to water (ft)	Observed drawdown (ft)	Approximate barometric pressure (psia)	(ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/18/97														
10:00 AM	1240	15.57 *	7.54	9.71	2.21	11.31	0.31	13.42	0.10	14.40	33.21	3.23	194	Tighten piezometer hose
10:20 AM	1260	16.28 *	8.25	9.74	2.24	11.33	0.33	13.42	0.11	14.40	33.22	3.25	195	fitting; stopped leak
10:40 AM	1280	16.35 *	8.32	9.75	2.25	11.32	0.32	13.42	0.11	14.41	33.23			
11:00 AM	1300	16.32 *	8.29	9.75	2.25	11.33	0.33	13.42	0.11	14.41	33.24			
11:20 AM	1320	16.19 *	8.16	9.78	2.28	11.34	0.34	13.42	0.11	14.41	33.25	3.25	195	
11:40 AM	1340	15.44 *	7.41	9.78	2.28	11.35	0.35	13.43	0.12	14.41	33.25			
12:00 PM	1360	16.00 *	7.97	9.79	2.29	11.35	0.35	13.42	0.11	14.41	33.24			
12:20 PM	1380	16.04 *	8.01	9.80	2.30	11.36	0.36	13.44	0.13	14.39	33.20	3.25	195	
12:40 PM	1400	15.90 *	7.87	9.80	2.30	11.36	0.36	13.44	0.13	14.40	33.21			
01:00 PM	1420	16.38 *	8.35	9.81	2.31	11.38	0.38	13.45	0.14	14.39	33.20			
01:20 PM	1440	16.31 *	8.28	9.82	2.32	11.39	0.39	13.44	0.13	14.39	33.19	3.25	195	
01:40 PM	1460	15.76 *	7.73	9.84	2.34	11.39	0.39	13.45	0.14	14.39	33.19			
02:00 PM	1480	16.41 *	8.38	9.85	2.35	11.40	0.40	13.44	0.13	14.38	33.17			
02:20 PM	1500	16.67 *	8.64	9.85	2.35	11.41	0.41	13.44	0.13	14.37	33.16	3.25	195	
02:40 PM	1520	16.73 *	8.70	9.86	2.36	11.40	0.40	13.45	0.14	14.38	33.16			
03:00 PM	1540	15.59 *	7.56	9.86	2.36	11.42	0.42	13.43	0.12	14.36	33.14			
03:20 PM	1560	15.78 *	7.75	9.87	2.37	11.43	0.43	13.42	0.11	14.37	33.14	3.25	195	
03:40 PM	1580	15.44 *	7.41	9.88	2.38	11.44	0.44	13.44	0.13	14.36	33.13			
04:00 PM	1600	15.89 *	7.86	9.89	2.39	11.44	0.44	13.44	0.13	14.35	33.11			
04:20 PM	1620	16.66 *	8.63	9.89	2.39	11.44	0.44	13.45	0.14	14.35	33.11	3.25	195	
04:40 PM	1640	16.28 *	8.25	9.90	2.40	11.45	0.45	13.44	0.13	14.35	33.10			
05:00 PM	1660	16.76 *	8.73	9.91	2.41	11.45	0.45	13.44	0.13	14.35	33.10			
05:20 PM	1680	15.84 *	7.81	9.92	2.42	11.47	0.47	13.44	0.13	14.34	33.09	3.24	194	
05:35 PM	1695													Adjusted valve
05:40 PM	1700	16.04 *	8.01	9.93	2.43	11.47	0.47	13.43	0.12	14.35	33.10			
05:55 PM	1715											3.26	195	
06:00 PM	1720	16.19 *	8.16	9.94	2.44	11.48	0.48	13.43	0.12	14.35	33.10			
06:20 PM	1740	16.48 *	8.45	9.95	2.45	11.49	0.49	13.43	0.12	14.35	33.11	3.26	196	
06:40 PM	1760	17.05 *	9.02	9.96	2.46	11.49	0.49	13.44	0.13	14.35	33.11			
07:00 PM	1780	16.36 *	8.33	9.97	2.47	11.50	0.50	13.45	0.14	14.35	33.10			
07:20 PM	1800	16.68 *	8.65	9.98	2.48	11.51	0.51	13.44	0.13	14.36	33.12	3.26	195	
07:40 PM	1820	15.65 *	7.62	9.98	2.48	11.51	0.51	13.44	0.13	14.35	33.11			
08:00 PM	1840	15.77 *	7.74	9.99	2.49	11.52	0.52	13.44	0.13	14.36	33.12			
08:20 PM	1860	16.82 *	8.79	10.01	2.51	11.53	0.53	13.44	0.13	14.36	33.12	3.26	195	
08:40 PM	1880	16.75 *	8.72	10.01	2.51	11.53	0.53	13.44	0.13	14.35	33.11			
09:00 PM	1900	16.43 *	8.40	10.02	2.52	11.54	0.54	13.44	0.13	14.36	33.12			
09:20 PM	1920	16.92 *	8.89	10.03	2.53	11.55	0.55	13.44	0.13	14.36	33.12	3.26	195	
09:40 PM	1940	16.47 *	8.44	10.04	2.54	11.56	0.56	13.44	0.13	14.36	33.13			
10:00 PM	1960	17.05 *	9.02	10.05	2.55	11.56	0.56	13.45	0.14	14.36	33.12			
10:20 PM	1980	15.93 *	7.90	10.06	2.56	11.57	0.57	13.44	0.13	14.36	33.12	3.26	195	
10:40 PM	2000	16.64 *	8.61	10.06	2.56	11.58	0.58	13.44	0.13	14.36	33.12			
11:00 PM	2020	16.10 *	8.07	10.07	2.57	11.59	0.59	13.45	0.14	14.36	33.12			
11:20 PM	2040	17.75 *	9.72	10.08	2.58	11.60	0.60	13.45	0.14	14.36	33.13	3.26	195	
11:40 PM	2060	16.14 *	8.11	10.09	2.59	11.61	0.61	13.45	0.14	14.37	33.14			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Dale/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/19/97														
12:00 AM	2080	16.70 *	8.67	10.09	2.59	11.61	0.61	13.45	0.14	14.36	33.13			
12:20 AM	2100	17.19 *	9.16	10.10	2.60	11.62	0.62	13.45	0.14	14.37	33.14	3.26	195	
12:40 AM	2120	17.29 *	9.26	10.11	2.61	11.63	0.63	13.46	0.15	14.37	33.14			
01:00 AM	2140	15.62 *	7.59	10.12	2.62	11.64	0.64	13.45	0.14	14.36	33.14			
01:20 AM	2160	16.38 *	8.35	10.13	2.63	11.64	0.64	13.46	0.15	14.36	33.14	3.26	195	
01:40 AM	2180	16.08 *	8.05	10.13	2.63	11.65	0.65	13.46	0.15	14.36	33.13			
02:00 AM	2200	15.75 *	7.72	10.14	2.64	11.66	0.65	13.46	0.15	14.36	33.12			
02:20 AM	2220	16.05 *	8.02	10.14	2.64	11.66	0.66	13.46	0.15	14.36	33.12	3.26	195	
02:40 AM	2240	16.77 *	8.74	10.14	2.64	11.67	0.67	13.46	0.15	14.35	33.11			
03:00 AM	2260	16.96 *	8.93	10.15	2.65	11.67	0.67	13.45	0.14	14.36	33.13			
03:20 AM	2280	15.66 *	7.63	10.15	2.65	11.68	0.68	13.46	0.15	14.36	33.13	3.26	195	
03:40 AM	2300	15.97 *	7.94	10.16	2.66	11.69	0.69	13.46	0.15	14.35	33.11			
04:00 AM	2320	16.26 *	8.23	10.17	2.67	11.70	0.70	13.46	0.15	14.36	33.12			
04:20 AM	2340	16.26 *	8.23	10.18	2.68	11.70	0.70	13.46	0.15	14.36	33.13	3.26	195	
04:40 AM	2360	17.11 *	9.08	10.19	2.69	11.71	0.71	13.46	0.15	14.36	33.14			
05:00 AM	2380	16.50 *	8.47	10.19	2.69	11.72	0.72	13.46	0.15	14.37	33.14			
05:20 AM	2400	16.18 *	8.15	10.19	2.69	11.73	0.73	13.46	0.15	14.37	33.14	3.26	195	
05:40 AM	2420	15.34 *	7.31	10.20	2.70	11.74	0.74	13.46	0.15	14.37	33.14			
06:00 AM	2440	16.10 *	8.07	10.20	2.70	11.73	0.73	13.46	0.15	14.37	33.15			
06:20 AM	2460	16.67 *	8.64	10.23	2.73	11.75	0.75	13.46	0.15	14.36	33.14	3.26	195	
06:40 AM	2480	16.52 *	8.49	10.23	2.73	11.75	0.75	13.46	0.15	14.37	33.14			
07:00 AM	2500	16.58 *	8.55	10.23	2.73	11.76	0.76	13.46	0.15	14.38	33.16			
07:20 AM	2520	17.06 *	9.03	10.24	2.74	11.77	0.77	13.46	0.15	14.38	33.18	3.26	195	
07:40 AM	2540	16.79 *	8.76	10.25	2.75	11.78	0.78	13.46	0.15	14.39	33.19			
08:00 AM	2560	16.91 *	8.88	10.25	2.75	11.78	0.78	13.46	0.15	14.39	33.20			
08:20 AM	2580	16.89 *	8.86	10.27	2.77	11.78	0.78	13.46	0.15	14.39	33.20	3.26	195	
08:40 AM	2600	16.94 *	8.91	10.27	2.77	11.78	0.78	13.46	0.15	14.39	33.19			
09:00 AM	2620	17.09 *	9.06	10.27	2.77	11.78	0.78	13.46	0.15	14.39	33.20			
09:20 AM	2640	15.88 *	7.85	10.29	2.79	11.79	0.79	13.46	0.15	14.39	33.19	3.26	195	
09:40 AM	2660	16.72 *	8.69	10.29	2.79	11.79	0.79	13.46	0.15	14.39	33.20			
10:00 AM	2680	16.21 *	8.18	10.30	2.80	11.80	0.80	13.46	0.15	14.40	33.21			
10:20 AM	2700	16.85 *	8.82	10.30	2.80	11.81	0.81	13.46	0.15	14.41	33.23	3.23	194	Adjusted valve
10:40 AM	2720	17.47 *	9.44	10.32	2.82	11.82	0.82	13.46	0.15	14.41	33.25	3.26	195	
11:00 AM	2740	16.42 *	8.39	10.34	2.84	11.83	0.83	13.46	0.15	14.42	33.26			
11:20 AM	2760	16.70 *	8.67	10.35	2.85	11.83	0.83	13.46	0.15	14.43	33.29	3.36	198	Adjusted valve
11:40 AM	2780	15.75 *	7.72	10.34	2.84	11.84	0.84	13.46	0.15	14.43	33.30	3.27	195	
12:00 PM	2800	16.45 *	8.42	10.35	2.85	11.85	0.85	13.47	0.16	14.44	33.31			
12:20 PM	2820	15.83 *	7.80	10.35	2.85	11.86	0.86	13.47	0.16	14.44	33.32	3.27	195	
12:40 PM	2840	16.49 *	8.46	10.36	2.86	11.87	0.87	13.46	0.15	14.45	33.33			
01:00 PM	2860	17.02 *	8.99	10.36	2.86	11.87	0.87	13.47	0.16	14.45	33.33			
01:20 PM	2880	15.92 *	7.89	10.39	2.89	11.88	0.88	13.47	0.16	14.45	33.34	3.27	195	
01:40 PM	2900	16.34 *	8.31	10.39	2.89	11.89	0.89	13.47	0.16	14.46	33.35			
02:00 PM	2920	17.05 *	9.02	10.38	2.88	11.89	0.89	13.47	0.16	14.47	33.37			
02:20 PM	2940	16.44 *	8.41	10.40	2.90	11.90	0.90	13.47	0.16	14.47	33.38	3.27	195	
02:40 PM	2960	16.84 *	8.81	10.39	2.89	11.90	0.90	13.47	0.16	14.47	33.38			
03:00 PM	2980	16.87 *	8.84	10.40	2.90	11.91	0.91	13.47	0.16	14.47	33.39			

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/19/97														
03:20 PM	3000	16.83 *	8.80	10.41	2.91	11.92	0.92	13.47	0.16	14.47	33.39	3.27	195	
03:40 PM	3020	17.35 *	9.32	10.40	2.90	11.93	0.93	13.47	0.16	14.47	33.39			
04:00 PM	3040	16.96 *	8.93	10.41	2.91	11.93	0.93	13.47	0.16	14.47	33.38			
04:20 PM	3060	17.54 *	9.51	10.42	2.92	11.94	0.94	13.47	0.16	14.47	33.37	3.27	195	
04:40 PM	3080	16.82 *	8.79	10.42	2.92	11.95	0.95	13.47	0.16	14.46	33.36			
05:00 PM	3100	17.47 *	9.44	10.42	2.92	11.95	0.95	13.47	0.16	14.46	33.36			
05:20 PM	3120	16.64 *	8.61	10.43	2.93	11.96	0.96	13.47	0.16	14.46	33.35	3.27	195	
05:40 PM	3140	16.96 *	8.93	10.45	2.95	11.97	0.97	13.47	0.16	14.46	33.35			
06:00 PM	3160	17.38 *	9.35	10.46	2.96	11.97	0.97	13.47	0.16	14.46	33.35			
06:20 PM	3180	16.39 *	8.36	10.47	2.97	11.98	0.98	13.47	0.16	14.45	33.34	3.26	195	
06:40 PM	3200	16.81 *	8.78	10.46	2.96	11.99	0.98	13.47	0.16	14.45	33.32			
07:00 PM	3220	17.13 *	9.10	10.48	2.98	12.00	1.00	13.47	0.16	14.45	33.33			
07:20 PM	3240	17.92 *	9.89	10.47	2.97	12.00	1.00	13.47	0.16	14.44	33.32	3.26	195	
07:40 PM	3260	16.90 *	8.87	10.49	2.99	12.01	1.01	13.47	0.16	14.44	33.31			
08:00 PM	3280	16.45 *	8.42	10.48	2.98	12.01	1.01	13.47	0.16	14.44	33.31			
08:20 PM	3300	16.24 *	8.21	10.49	2.99	12.02	1.02	13.47	0.16	14.43	33.30	3.26	195	
08:40 PM	3320	16.79 *	8.76	10.50	3.00	12.03	1.03	13.47	0.16	14.43	33.30			
09:00 PM	3340	16.87 *	8.84	10.50	3.00	12.03	1.03	13.47	0.16	14.43	33.30			
09:20 PM	3360	17.20 *	9.17	10.52	3.02	12.04	1.04	13.47	0.16	14.43	33.29	3.26	195	
09:40 PM	3380	16.62 *	8.59	10.51	3.01	12.05	1.05	13.47	0.16	14.43	33.29			
10:00 PM	3400	16.38 *	8.35	10.53	3.03	12.06	1.06	13.47	0.16	14.43	33.29			
10:20 PM	3420	16.60 *	8.57	10.52	3.02	12.06	1.06	13.47	0.16	14.42	33.27	3.26	195	
10:40 PM	3440	17.23 *	9.20	10.54	3.04	12.07	1.07	13.47	0.16	14.42	33.27			
11:00 PM	3460	17.17 *	9.14	10.53	3.03	12.07	1.07	13.47	0.16	14.42	33.27			
11:20 PM	3480	16.82 *	8.79	10.54	3.04	12.08	1.08	13.47	0.16	14.42	33.26	3.26	195	
11:40 PM	3500	17.22 *	9.19	10.54	3.04	12.09	1.09	13.48	0.17	14.42	33.26			
02/20/97														
12:00 AM	3520	16.84 *	8.81	10.54	3.04	12.09	1.09	13.47	0.16	14.42	33.26			
12:20 AM	3540	17.80 *	9.77	10.55	3.05	12.10	1.10	13.48	0.17	14.41	33.25	3.26	195	
12:40 AM	3560	17.64 *	9.61	10.55	3.05	12.11	1.10	13.48	0.17	14.41	33.25			
01:00 AM	3580	17.25 *	9.22	10.55	3.05	12.11	1.11	13.48	0.17	14.42	33.26			
01:20 AM	3600	18.15 *	10.12	10.57	3.07	12.12	1.12	13.48	0.17	14.42	33.26	3.26	195	
01:40 AM	3620	17.01 *	8.98	10.57	3.07	12.13	1.13	13.48	0.17	14.42	33.26			
02:00 AM	3640	16.56 *	8.53	10.57	3.07	12.13	1.13	13.48	0.17	14.41	33.24			
02:20 AM	3660	16.63 *	8.60	10.57	3.07	12.14	1.14	13.48	0.17	14.41	33.24	3.26	195	
02:40 AM	3680	18.04 *	10.01	10.57	3.07	12.14	1.14	13.48	0.17	14.41	33.23			
03:00 AM	3700	16.96 *	8.93	10.57	3.07	12.15	1.15	13.48	0.17	14.40	33.22			
03:20 AM	3720	17.11 *	9.08	10.57	3.07	12.16	1.16	13.48	0.17	14.40	33.22	3.26	195	
03:40 AM	3740	18.16 *	10.13	10.58	3.08	12.17	1.17	13.48	0.17	14.40	33.22			
04:00 AM	3760	17.71 *	9.68	10.58	3.08	12.17	1.17	13.48	0.17	14.39	33.20			
04:20 AM	3780	16.63 *	8.60	10.59	3.09	12.18	1.18	13.48	0.17	14.39	33.21	3.26	195	
04:40 AM	3800	17.27 *	9.24	10.58	3.08	12.19	1.19	13.49	0.17	14.39	33.19			
05:00 AM	3820	16.90 *	8.87	10.59	3.09	12.19	1.19	13.49	0.17	14.39	33.19			
05:20 AM	3840	18.03 *	10.00	10.58	3.08	12.20	1.20	13.49	0.17	14.39	33.20	3.26	195	
05:40 AM	3860	17.27 *	9.24	10.59	3.09	12.20	1.20	13.48	0.17	14.39	33.19			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)		Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/20/97															
06:00 AM	3880	17.63	*	9.60	10.60	3.10	12.21	1.21	13.48	0.17	14.39	33.19			
06:20 AM	3900	16.41	*	8.38	10.60	3.10	12.22	1.22	13.49	0.17	14.39	33.19	3.26	195	
06:40 AM	3920	17.70	*	9.67	10.60	3.10	12.22	1.22	13.49	0.17	14.38	33.18			
07:00 AM	3940	16.79	*	8.76	10.61	3.11	12.23	1.23	13.49	0.17	14.38	33.17			
07:20 AM	3960	17.02	*	8.99	10.61	3.11	12.23	1.23	13.49	0.17	14.38	33.17	3.26	195	
07:40 AM	3980	17.05	*	9.02	10.61	3.11	12.24	1.24	13.49	0.18	14.38	33.17			
08:00 AM	4000	16.87	*	8.84	10.61	3.11	12.25	1.25	13.49	0.17	14.38	33.17			
08:20 AM	4020	17.13	*	9.10	10.62	3.12	12.25	1.25	13.49	0.18	14.38	33.17	3.26	195	
08:40 AM	4040	17.05	*	9.02	10.62	3.12	12.26	1.26	13.49	0.18	14.37	33.15			
09:00 AM	4060	17.01	*	8.98	10.62	3.12	12.27	1.27	13.49	0.18	14.36	33.14			
09:20 AM	4080	17.39	*	9.36	10.62	3.12	12.27	1.27	13.49	0.18	14.36	33.12	3.26	195	
09:40 AM	4100	16.55	*	8.52	10.62	3.12	12.28	1.28	13.49	0.18	14.35	33.11			
10:00 AM	4120	15.72	*	7.69	10.62	3.12	12.28	1.28	13.49	0.18	14.35	33.11			
10:20 AM	4140	17.08	*	9.05	10.63	3.13	12.29	1.29	13.49	0.18	14.35	33.11	3.26	195	
10:40 AM	4160	17.79	*	9.76	10.63	3.13	12.30	1.30	13.49	0.18	14.35	33.11			
11:00 AM	4180	16.47	*	8.44	10.63	3.13	12.30	1.30	13.50	0.18	14.35	33.11			
11:20 AM	4200	17.04	*	9.01	10.63	3.13	12.48	1.48	13.50	0.18	14.35	33.10	3.26	195	
11:40 AM	4220	16.39	*	8.36	10.63	3.13	12.45	1.45	13.50	0.18	14.35	33.10			
12:00 PM	4240	16.88	*	8.85	10.62	3.12	12.49	1.49	13.50	0.18	14.34	33.08			
12:20 PM	4260	16.72	*	8.69	10.62	3.12	12.50	1.50	13.50	0.18	14.33	33.06	3.26	195	
12:40 PM	4280	17.30	*	9.27	10.62	3.12	12.50	1.50	13.50	0.19	14.32	33.05			
01:00 PM	4300	17.11	*	9.08	10.61	3.11	12.50	1.50	13.50	0.19	14.32	33.03			
01:20 PM	4320	16.32	*	8.29	10.61	3.11	12.51	1.51	13.50	0.19	14.31	33.02	3.26	195	
01:40 PM	4340	16.76	*	8.73	10.60	3.10	12.51	1.51	13.50	0.19	14.30	33.00			
02:00 PM	4360	16.34	*	8.31	10.58	3.08	12.37	1.37	13.50	0.19	14.31	33.00			
02:20 PM	4380	16.44	*	8.41	10.57	3.07	12.37	1.37	13.50	0.19	14.30	32.98	3.25	195	
02:40 PM	4400	16.68	*	8.65	10.56	3.06	12.40	1.40	13.50	0.18	14.29	32.97			
03:00 PM	4420	16.39	*	8.36	10.56	3.06	12.44	1.44	13.49	0.18	14.29	32.97			
03:20 PM	4440	17.16	*	9.13	10.57	3.07	12.44	1.44	13.49	0.18	14.29	32.96	3.24	194	Adjusted valve
03:40 PM	4460	17.14	*	9.11	10.57	3.07	12.42	1.42	13.49	0.18	14.29	32.97	3.26	195	
04:00 PM	4480	16.84	*	8.81	10.57	3.07	12.45	1.45	13.49	0.18	14.29	32.96			
04:20 PM	4500	17.41	*	9.38	10.57	3.07	12.47	1.47	13.49	0.18	14.28	32.95	3.26	195	
04:40 PM	4520	16.89	*	8.86	10.58	3.08	12.49	1.49	13.49	0.18	14.28	32.95			
05:00 PM	4540	16.74	*	8.71	10.59	3.09	12.50	1.50	13.49	0.18	14.28	32.94			
05:20 PM	4560	16.53	*	8.50	10.58	3.08	12.51	1.51	13.49	0.18	14.27	32.92	3.26	195	
05:40 PM	4580	16.34	*	8.31	10.58	3.08	12.52	1.52	13.49	0.18	14.27	32.91			
06:00 PM	4600	17.03	*	9.00	10.58	3.08	12.52	1.52	13.50	0.18	14.27	32.92			
06:20 PM	4620	16.54	*	8.51	10.58	3.08	12.51	1.51	13.50	0.18	14.28	32.93	3.26	195	
06:40 PM	4640	17.16	*	9.13	10.59	3.09	12.51	1.51	13.49	0.18	14.28	32.93			
07:00 PM	4660	17.14	*	9.11	10.59	3.09	12.52	1.52	13.49	0.18	14.27	32.93			
07:20 PM	4680	17.06	*	9.03	10.59	3.09	12.53	1.53	13.50	0.18	14.27	32.92	3.26	195	
07:40 PM	4700	16.89	*	8.86	10.59	3.09	12.54	1.54	13.50	0.19	14.27	32.92			
08:00 PM	4720	17.40	*	9.37	10.59	3.09	12.56	1.56	13.49	0.18	14.27	32.91			
08:20 PM	4740	17.17	*	9.14	10.59	3.09	12.56	1.56	13.50	0.18	14.26	32.90	3.26	195	
08:40 PM	4760	16.79	*	8.76	10.59	3.09	12.56	1.56	13.50	0.19	14.26	32.89			
09:00 PM	4780	16.45	*	8.42	10.59	3.09	12.50	1.50	13.50	0.18	14.25	32.88			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/20/97														
09:20 PM	4800	17.24 *	9.21	10.59	3.09	12.53	1.53	13.50	0.18	14.25	32.87	3.26	195	
09:40 PM	4820	17.62 *	9.59	10.59	3.09	12.54	1.54	13.49	0.18	14.25	32.87			
10:00 PM	4840	17.18 *	9.15	10.59	3.09	12.54	1.54	13.50	0.18	14.24	32.85			
10:20 PM	4860	16.50 *	8.47	10.59	3.09	12.55	1.55	13.50	0.19	14.24	32.84	3.26	195	
10:40 PM	4880	17.24 *	9.21	10.59	3.09	12.56	1.56	13.50	0.18	14.23	32.84			
11:00 PM	4900	17.70 *	9.67	10.58	3.08	12.53	1.53	13.50	0.19	14.23	32.82			
11:20 PM	4920	17.22 *	9.19	10.58	3.08	12.52	1.52	13.50	0.18	14.22	32.80	3.26	195	
11:40 PM	4940	17.11 *	9.08	10.58	3.08	12.54	1.54	13.50	0.18	14.21	32.78			
02/21/97														
12:00 AM	4960	17.82 *	9.79	10.57	3.07	12.55	1.55	13.50	0.19	14.21	32.77			
12:20 AM	4980	16.09 *	8.06	10.58	3.08	12.55	1.55	13.50	0.18	14.20	32.76	3.26	195	
12:40 AM	5000	17.50 *	9.47	10.57	3.07	12.56	1.56	13.50	0.18	14.19	32.75			
01:00 AM	5020	16.68 *	8.65	10.57	3.07	12.57	1.57	13.50	0.18	14.19	32.74			
01:20 AM	5040	17.49 *	9.46	10.57	3.07	12.58	1.58	13.50	0.19	14.19	32.73	3.26	195	
01:40 AM	5060	17.60 *	9.57	10.57	3.07	12.59	1.59	13.50	0.18	14.18	32.71			
02:00 AM	5080	16.75 *	8.72	10.56	3.06	12.58	1.58	13.49	0.18	14.17	32.69			
02:20 AM	5100	16.50 *	8.47	10.56	3.06	12.58	1.58	13.50	0.19	14.16	32.67	3.26	195	
02:40 AM	5120	17.10 *	9.07	10.56	3.06	12.60	1.60	13.50	0.19	14.15	32.65			
03:00 AM	5140	17.37 *	9.34	10.55	3.05	12.59	1.59	13.50	0.19	14.15	32.64			
03:20 AM	5160	17.95 *	9.92	10.55	3.05	12.61	1.61	13.50	0.19	14.15	32.63	3.26	195	
03:40 AM	5180	16.75 *	8.72	10.54	3.04	12.59	1.59	13.50	0.18	14.14	32.62			
04:00 AM	5200	15.92 *	7.89	10.54	3.04	12.60	1.60	13.50	0.19	14.13	32.60			
04:20 AM	5220	17.38 *	9.35	10.53	3.03	12.64	1.64	13.50	0.18	14.12	32.58	3.26	195	
04:40 AM	5240	17.16 *	9.13	10.54	3.04	12.59	1.59	13.50	0.19	14.11	32.56			
05:00 AM	5260	15.98 *	7.95	10.52	3.02	12.61	1.61	13.50	0.19	14.12	32.56			
05:20 AM	5280	16.82 *	8.79	10.52	3.02	12.61	1.60	13.51	0.20	14.11	32.54	3.26	195	
05:40 AM	5300	17.14 *	9.11	10.52	3.02	12.62	1.62	13.50	0.18	14.11	32.54			
06:00 AM	5320	16.44 *	8.41	10.52	3.02	12.62	1.62	13.50	0.19	14.11	32.55			
06:20 AM	5340	16.48 *	8.45	10.52	3.02	12.61	1.61	13.50	0.19	14.11	32.54	3.26	195	
06:40 AM	5360	16.24 *	8.21	10.52	3.02	12.61	1.60	13.50	0.19	14.09	32.51			
07:00 AM	5380	17.30 *	9.27	10.52	3.02	12.61	1.61	13.50	0.19	14.09	32.50			
07:20 AM	5400	16.20 *	8.17	10.51	3.01	12.61	1.61	13.50	0.19	14.08	32.49	3.26	195	
07:40 AM	5420	17.50 *	9.47	10.52	3.02	12.62	1.62	13.50	0.19	14.09	32.51			
08:00 AM	5440	17.49 *	9.46	10.52	3.02	12.64	1.64	13.50	0.19	14.10	32.52			
08:20 AM	5460	17.38 *	9.35	10.51	3.01	12.64	1.64	13.51	0.20	14.09	32.51	3.26	195	
08:40 AM	5480	16.69 *	8.66	10.51	3.01	12.64	1.64	13.50	0.19	14.09	32.51			
09:00 AM	5500	17.70 *	9.67	10.51	3.01	12.65	1.65	13.50	0.19	14.09	32.50			
09:20 AM	5520	17.20 *	9.17	10.51	3.01	12.65	1.65	13.50	0.19	14.09	32.49	3.26	195	
09:40 AM	5540	16.22 *	8.19	10.51	3.01	12.66	1.66	13.51	0.20	14.09	32.51			
10:00 AM	5560	16.24 *	8.21	10.51	3.01	12.67	1.67	13.52	0.21	14.09	32.51			
10:20 AM	5580	17.27 *	9.24	10.51	3.01	12.66	1.66	13.50	0.19	14.09	32.51	3.26	195	
10:40 AM	5600	16.50 *	8.47	10.51	3.01	12.66	1.66	13.51	0.20	14.09	32.51			
11:00 AM	5620	16.88 *	8.85	10.51	3.01	12.66	1.66	13.50	0.19	14.09	32.51			
11:20 AM	5640	16.43 *	8.40	10.50	3.00	12.66	1.66	13.50	0.19	14.09	32.50	3.26	195	
11:40 AM	5660	17.29 *	9.26	10.51	3.01	12.67	1.67	13.52	0.21	14.08	32.48			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96; Depth to water (ft)	Test Well 1-97 Observed drawdown (ft)	Observation Well I (TH 1-96) Depth to water (ft)	Observation Well I Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/21/97														
12:00 PM	5680	16.73 *	8.70	10.50	3.00	12.66	1.66	13.50	0.19	14.08	32.48			
12:20 PM	5700	16.54 *	8.51	10.50	3.00	12.67	1.67	13.51	0.20	14.07	32.46	3.26	195	
12:40 PM	5720	16.99 *	8.96	10.50	3.00	12.66	1.66	13.51	0.20	14.07	32.45			
01:00 PM	5740	17.43 *	9.40	10.50	3.00	12.65	1.65	13.51	0.20	14.06	32.44			
01:20 PM	5760	17.26 *	9.23	10.49	2.99	12.64	1.64	13.52	0.21	14.06	32.44	3.26	195	
01:40 PM	5780	16.87 *	8.84	10.49	2.99	12.63	1.63	13.51	0.20	14.06	32.43			
02:00 PM	5800	16.90 *	8.87	10.49	2.99	12.62	1.62	13.51	0.20	14.06	32.43			
02:20 PM	5820	17.09 *	9.06	10.49	2.99	12.62	1.62	13.51	0.20	14.05	32.42	3.26	195	
02:40 PM	5840	16.84 *	8.81	10.49	2.99	12.62	1.62	13.51	0.20	14.05	32.41			
03:00 PM	5860	16.67 *	8.64	10.49	2.99	12.63	1.63	13.50	0.19	14.05	32.41			
03:20 PM	5880	17.09 *	9.06	10.48	2.98	12.63	1.63	13.50	0.19	14.06	32.42	3.26	195	
03:40 PM	5900	16.65 *	8.62	10.48	2.98	12.63	1.63	13.50	0.19	14.05	32.41			
04:00 PM	5920	16.79 *	8.76	10.48	2.98	12.61	1.61	13.51	0.20	14.05	32.41			
04:20 PM	5940	16.90 *	8.87	10.48	2.98	12.61	1.61	13.50	0.19	14.05	32.41	3.26	195	
04:40 PM	5960	17.18 *	9.15	10.48	2.98	12.61	1.61	13.50	0.19	14.05	32.41			
05:00 PM	5980	16.40 *	8.37	10.48	2.98	12.61	1.61	13.52	0.21	14.04	32.39			
05:20 PM	6000	16.68 *	8.65	10.48	2.98	12.60	1.60	13.50	0.19	14.05	32.40	3.26	195	
05:40 PM	6020	16.52 *	8.49	10.50	3.00	12.59	1.59	13.51	0.20	14.06	32.43			
06:00 PM	6040	16.88 *	8.85	10.48	2.98	12.59	1.59	13.51	0.20	14.07	32.45			
06:20 PM	6060	16.69 *	8.66	10.48	2.98	12.59	1.59	13.50	0.19	14.07	32.46	3.26	195	
06:40 PM	6080	17.19 *	9.16	10.49	2.99	12.60	1.60	13.51	0.20	14.08	32.49			
07:00 PM	6100	16.10 *	8.07	10.48	2.98	12.58	1.58	13.50	0.19	14.10	32.53			
07:20 PM	6120	16.21 *	8.18	10.50	3.00	12.58	1.58	13.50	0.19	14.11	32.56	3.26	195	
07:40 PM	6140	15.90 *	7.87	10.51	3.01	12.58	1.58	13.50	0.19	14.12	32.58			
08:00 PM	6160	16.80 *	8.77	10.51	3.01	12.57	1.57	13.51	0.20	14.13	32.59			
08:20 PM	6180	17.41 *	9.38	10.52	3.02	12.57	1.57	13.50	0.19	14.14	32.61	3.26	195	
08:40 PM	6200	17.24 *	9.21	10.52	3.02	12.57	1.57	13.51	0.20	14.14	32.63			
09:00 PM	6220	17.14 *	9.11	10.52	3.02	12.58	1.58	13.50	0.19	14.16	32.66			
09:20 PM	6240	16.65 *	8.62	10.52	3.02	12.57	1.57	13.51	0.20	14.17	32.68	3.26	195	
09:40 PM	6260	17.13 *	9.10	10.53	3.03	12.57	1.57	13.50	0.19	14.17	32.69			
10:00 PM	6280	17.47 *	9.44	10.53	3.03	12.57	1.57	13.50	0.19	14.18	32.71			
10:20 PM	6300	17.05 *	9.02	10.54	3.04	12.58	1.58	13.50	0.19	14.19	32.74	3.26	195	
10:40 PM	6320	17.13 *	9.10	10.54	3.04	12.58	1.58	13.51	0.20	14.20	32.75			
11:00 PM	6340	17.01 *	8.98	10.54	3.04	12.58	1.58	13.50	0.19	14.20	32.76			
11:20 PM	6360	16.19 *	8.16	10.55	3.05	12.59	1.59	13.50	0.19	14.21	32.78	3.26	195	
11:40 PM	6380	16.41 *	8.38	10.55	3.05	12.58	1.58	13.50	0.19	14.22	32.79			
02/22/97														
12:00 AM	6400	16.50 *	8.47	10.56	3.06	12.60	1.60	13.50	0.19	14.22	32.81			
12:20 AM	6420	17.15 *	9.12	10.56	3.06	12.60	1.60	13.50	0.19	14.23	32.83	3.26	195	
12:40 AM	6440	16.68 *	8.65	10.56	3.06	12.60	1.60	13.50	0.19	14.24	32.85			
01:00 AM	6460	17.38 *	9.35	10.56	3.06	12.60	1.60	13.50	0.19	14.25	32.87			
01:20 AM	6480	16.71 *	8.68	10.56	3.06	12.61	1.60	13.51	0.20	14.26	32.89	3.26	195	
01:40 AM	6500	16.81 *	8.78	10.57	3.07	12.61	1.61	13.50	0.19	14.26	32.90			
02:00 AM	6520	17.79 *	9.76	10.57	3.07	12.61	1.61	13.50	0.19	14.27	32.91			
02:20 AM	6540	16.12 *	8.09	10.57	3.07	12.61	1.61	13.50	0.19	14.27	32.93	3.26	195	

Ground-Water Investigation in Ogden Township for the Village of Homer

Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

		Test Well 1-97 (TH 5-96)		*Observation Well 1 (TH 1-96)*		*Observation Well 2 (TH 4-96)*		*Observation Well 3 (TH 2-96)*		*Approximate barometric pressure*				
Dale/ hour	*Elapsed time (min)*	*Depth to water (ft)*	*Observed drawdown (ft)*	*Depth to water (ft)*	*Observed drawdown (ft)*	*Depth to water (ft)*	*Observed drawdown (ft)*	*Depth to water (ft)*	*Observed drawdown (ft)*	*(psia)*	*(ft of water)*	*Piezometer head (ft)*	*Pumping rate (gpm)*	*Remarks*
02/22/97														
02:40 AM	6560	16.12 *	8.09	10.57	3.07	12.62	1.62	13.50	0.19	14.28	32.94			
03:00 AM	6580	16.90 *	8.87	10.57	3.07	12.62	1.62	13.50	0.19	14.28	32.94			
03:20 AM	6600	17.02 *	8.99	10.57	3.07	12.63	1.63	13.50	0.19	14.28	32.95	3.26	195	
03:40 AM	6620	17.65 *	9.62	10.57	3.07	12.63	1.63	13.50	0.19	14.29	32.96			
04:00 AM	6640	16.51 *	8.48	10.57	3.07	12.63	1.63	13.50	0.19	14.30	32.98			
04:20 AM	6660	17.01 *	8.98	10.57	3.07	12.63	1.63	13.51	0.20	14.30	32.99	3.26	195	
04:40 AM	6680	16.72 *	8.69	10.58	3.08	12.64	1.64	13.50	0.19	14.31	33.00			
05:00 AM	6700	17.34 *	9.31	10.58	3.08	12.64	1.64	13.50	0.19	14.31	33.02			
05:20 AM	6720	16.95 *	8.92	10.58	3.08	12.64	1.64	13.51	0.20	14.32	33.03	3.26	195	
05:40 AM	6740	17.65 *	9.62	10.58	3.08	12.64	1.64	13.50	0.19	14.32	33.04			
06:00 AM	6760	16.34 *	8.31	10.58	3.08	12.65	1.65	13.51	0.20	14.33	33.06			
06:20 AM	6780	16.87 *	8.84	10.58	3.08	12.65	1.65	13.50	0.19	14.33	33.07	3.26	195	
06:40 AM	6800	16.99 *	8.96	10.59	3.09	12.65	1.65	13.51	0.20	14.34	33.08			
07:00 AM	6820	16.37 *	8.34	10.59	3.09	12.65	1.65	13.51	0.20	14.35	33.09			
07:20 AM	6840	16.25 *	8.22	10.59	3.09	12.66	1.66	13.50	0.19	14.35	33.11	3.26	195	
07:40 AM	6860	16.35 *	8.32	10.59	3.09	12.66	1.66	13.51	0.20	14.36	33.13			
08:00 AM	6880	17.36 *	9.33	10.58	3.08	12.66	1.66	13.51	0.20	14.37	33.15			
08:20 AM	6900	17.18 *	9.15	10.59	3.09	12.67	1.67	13.50	0.19	14.37	33.16	3.30	197	Adjusted valve
08:40 AM	6920	16.82 *	8.79	10.59	3.09	12.68	1.68	13.51	0.20	14.38	33.17	3.27	195	
09:00 AM	6940	16.59 *	8.56	10.58	3.08	12.67	1.67	13.51	0.20	14.38	33.18			
09:20 AM	6960	16.24 *	8.21	10.58	3.08	12.69	1.69	13.51	0.20	14.39	33.20	3.27	195	
09:40 AM	6980	17.41 *	9.38	10.59	3.09	12.68	1.68	13.51	0.20	14.39	33.21			
10:00 AM	7000	17.74 *	9.71	10.59	3.09	12.69	1.69	13.51	0.20	14.40	33.22			
10:20 AM	7020	17.50 *	9.47	10.60	3.10	12.70	1.70	13.51	0.20	14.40	33.23	3.26	195	
10:40 AM	7040	17.65 *	9.62	10.59	3.09	12.70	1.70	13.51	0.20	14.41	33.24			
11:00 AM	7060	16.26 *	8.23	10.60	3.10	12.71	1.71	13.51	0.20	14.41	33.25			
11:20 AM	7080	16.99 *	8.96	10.59	3.09	12.71	1.71	13.51	0.20	14.42	33.26	3.26	195	
11:40 AM	7100	16.81 *	8.78	10.59	3.09	12.71	1.71	13.51	0.20	14.42	33.26			
12:00 PM	7120	17.38 *	9.35	10.60	3.10	12.71	1.71	13.51	0.20	14.42	33.27			
12:20 PM	7140	17.91 *	9.88	10.60	3.10	12.72	1.72	13.51	0.20	14.42	33.27	3.26	195	
12:40 PM	7160	16.82 *	8.79	10.60	3.10	12.72	1.72	13.51	0.20	14.42	33.28			
01:00 PM	7180	16.73 *	8.70	10.60	3.10	12.72	1.72	13.51	0.20	14.43	33.28			
01:20 PM	7200	16.48 *	8.45	10.59	3.09	12.72	1.72	13.51	0.20	14.43	33.29	3.26	195	
01:40 PM	7220	16.89 *	8.86	10.60	3.10	12.73	1.73	13.51	0.20	14.43	33.29			
02:00 PM	7240	16.55 *	8.52	10.59	3.09	12.73	1.73	13.51	0.20	14.43	33.30			
02:20 PM	7260	16.44 *	8.41	10.59	3.09	12.73	1.73	13.52	0.21	14.43	33.30	3.26	195	
02:40 PM	7280	17.13 *	9.10	10.60	3.10	12.74	1.74	13.52	0.21	14.44	33.31			
03:00 PM	7300	16.92 *	8.89	10.60	3.10	12.73	1.73	13.52	0.21	14.44	33.31			
03:20 PM	7320	17.02 *	8.99	10.60	3.10	12.74	1.74	13.52	0.21	14.44	33.31	3.26	195	
03:40 PM	7340	16.73 *	8.70	10.59	3.09	12.74	1.74	13.51	0.20	14.44	33.32			
04:00 PM	7360	17.48 *	9.45	10.61	3.11	12.74	1.74	13.52	0.21	14.44	33.31			
04:20 PM	7380	16.90 *	8.87	10.61	3.11	12.75	1.75	13.52	0.21	14.44	33.31	3.26	195	
04:40 PM	7400	17.11 *	9.08	10.61	3.11	12.75	1.75	13.52	0.21	14.43	33.30			
05:00 PM	7420	16.68 *	8.65	10.61	3.11	12.75	1.75	13.52	0.21	14.44	33.30			
05:20 PM	7440	16.33 *	8.30	10.61	3.11	12.75	1.75	13.52	0.21	14.44	33.32	3.26	195	
05:40 PM	7460	17.22 *	9.19	10.61	3.11	12.75	1.75	13.52	0.21	14.44	33.31			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	*Test Welt 1-97 (TH 5-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 1 (TH 1-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 2 (TH 4-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 3 (TH 2-96)* Depth to water (ft)	Observed drawdown (ft)	Approximate barometric pressure (psia)	(ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/22/97														
06:00 PM	7480	17.19 *	9.16	10.61	3.11	12.76	1.76	13.52	0.21	14.44	33.31			
06:20 PM	7500	16.53 *	8.50	10.61	3.11	12.76	1.76	13.51	0.20	14.43	33.30	3.26	195	
06:40 PM	7520	17.43 *	9.40	10.62	3.12	12.76	1.76	13.52	0.21	14.44	33.31			
07:00 PM	7540	16.80 *	8.77	10.62	3.12	12.76	1.76	13.52	0.21	14.44	33.31			
07:20 PM	7560	17.28 *	9.25	10.62	3.12	12.77	1.77	13.52	0.21	14.44	33.31	3.26	195	
07:40 PM	7580	16.75 *	8.72	10.62	3.12	12.77	1.77	13.52	0.21	14.44	33.31			
08:00 PM	7600	17.59 *	9.56	10.62	3.12	12.77	1.77	13.52	0.21	14.44	33.31			
08:20 PM	7620	16.85 *	8.82	10.62	3.12	12.78	1.78	13.52	0.21	14.44	33.31	3.26	195	
08:40 PM	7640	17.43 *	9.40	10.62	3.12	12.78	1.78	13.52	0.21	14.44	33.31			
09:00 PM	7660	16.80 *	8.77	10.62	3.12	12.78	1.78	13.52	0.21	14.44	33.32			
09:20 PM	7680	16.93 *	8.90	10.62	3.12	12.78	1.78	13.52	0.21	14.44	33.32	3.26	195	
09:40 PM	7700	17.31 *	9.28	10.62	3.12	12.78	1.78	13.52	0.21	14.44	33.32			
10:00 PM	7720	16.92 *	8.89	10.62	3.12	12.79	1.79	13.52	0.21	14.44	33.32			
10:20 PM	7740	17.57 *	9.54	10.63	3.13	12.79	1.79	13.52	0.21	14.44	33.32	3.26	195	
10:40 PM	7760	17.84 *	9.81	10.63	3.13	12.79	1.79	13.52	0.21	14.44	33.31			
11:00 PM	7780	17.70 *	9.67	10.63	3.13	12.80	1.80	13.52	0.21	14.44	33.31			
11:20 PM	7800	16.98 *	8.95	10.63	3.13	12.80	1.80	13.52	0.21	14.44	33.32	3.26	195	
11:40 PM	7820	17.72 *	9.69	10.63	3.13	12.80	1.80	13.53	0.22	14.44	33.32			
02/23/97														
12:00 AM	7840	16.39 *	8.36	10.63	3.13	12.80	1.80	13.52	0.21	14.45	33.32			
12:20 AM	7860	17.60 *	9.57	10.64	3.14	12.81	1.81	13.52	0.21	14.44	33.32	3.26	195	
12:40 AM	7880	17.54 *	9.51	10.63	3.13	12.81	1.81	13.52	0.21	14.45	33.33			
01:00 AM	7900	17.26 *	9.23	10.64	3.14	12.81	1.81	13.53	0.22	14.45	33.34			
01:20 AM	7920	17.03 *	9.00	10.63	3.13	12.82	1.82	13.52	0.21	14.45	33.35	3.26	195	
01:40 AM	7940	16.71 *	8.68	10.64	3.14	12.82	1.82	13.53	0.22	14.46	33.35			
02:00 AM	7960	17.01 *	8.98	10.63	3.13	12.82	1.82	13.53	0.22	14.46	33.35			
02:20 AM	7980	16.41 *	8.38	10.63	3.13	12.82	1.82	13.53	0.22	14.46	33.35	3.26	195	
02:40 AM	8000	16.84 *	8.81	10.63	3.13	12.83	1.83	13.53	0.22	14.45	33.34			
03:00 AM	8020	16.78 *	8.75	10.63	3.13	12.83	1.83	13.53	0.22	14.44	33.32			
03:20 AM	8040	18.15 *	10.12	10.63	3.13	12.83	1.83	13.53	0.22	14.45	33.32	3.26	195	
03:40 AM	8060	16.49 *	8.46	10.63	3.13	12.84	1.84	13.53	0.22	14.45	33.32			
04:00 AM	8080	16.84 *	8.81	10.63	3.13	12.84	1.84	13.53	0.22	14.45	33.33			
04:20 AM	8100	16.61 *	8.58	10.63	3.13	12.84	1.84	13.53	0.22	14.45	33.33	3.26	195	
04:40 AM	8120	17.33 *	9.30	10.63	3.13	12.84	1.84	13.53	0.22	14.45	33.34			
05:00 AM	8140	16.90 *	8.87	10.63	3.13	12.84	1.84	13.53	0.22	14.45	33.35			
05:20 AM	8160	17.00 *	8.97	10.63	3.13	12.84	1.84	13.54	0.23	14.46	33.36	3.26	195	
05:40 AM	8180	16.54 *	8.51	10.63	3.13	12.84	1.84	13.53	0.22	14.46	33.37			
06:00 AM	8200	16.44 *	8.41	10.64	3.14	12.85	1.85	13.54	0.23	14.47	33.37			
06:20 AM	8220	16.90 *	8.87	10.63	3.13	12.85	1.85	13.53	0.22	14.46	33.37	3.26	195	
06:40 AM	8240	17.12 *	9.09	10.64	3.14	12.85	1.85	13.53	0.22	14.47	33.38			
07:00 AM	8260	17.18 *	9.15	10.63	3.13	12.86	1.86	13.53	0.22	14.47	33.39			
07:20 AM	8280	16.77 *	8.74	10.64	3.14	12.86	1.86	13.53	0.22	14.48	33.41	3.26	195	
07:40 AM	8300	17.21 *	9.18	10.65	3.15	12.87	1.87	13.54	0.23	14.49	33.42			
08:00 AM	8320	16.56 *	8.53	10.65	3.15	12.86	1.86	13.54	0.23	14.50	33.44			
08:20 AM	8340	16.88 *	8.85	10.65	3.15	12.87	1.87	13.53	0.22	14.50	33.46	3.26	195	

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observed drawdown (ft)	Approximate barometric pressure (psia)	(ft of water)	Piezometer head (ft)	Pumping rale (gpm)	Remarks
02/23/97														
08:40 AM	8360	17.14 *	9.11	10.66	3.16	12.87	1.87	13.53	0.22	14.51	33.47			
09:00 AM	8380	17.02 *	8.99	10.65	3.15	12.87	1.87	13.53	0.22	14.52	33.49			
09:20 AM	8400	17.55 *	9.52	10.66	3.16	12.88	1.88	13.54	0.23	14.52	33.50	3.26	195	
09:40 AM	8420	17.26 *	9.23	10.66	3.16	12.88	1.88	13.54	0.23	14.53	33.52			
10:00 AM	8440	16.90 *	8.87	10.65	3.15	12.88	1.88	13.54	0.23	14.53	33.53			
10:20 AM	8460	16.94 *	8.91	10.65	3.15	12.88	1.88	13.54	0.23	14.54	33.54	3.26	195	
10:40 AM	8480	17.52 *	9.49	10.66	3.16	12.89	1.89	13.54	0.23	14.54	33.54			
11:00 AM	8500	17.14 *	9.11	10.65	3.15	12.89	1.89	13.54	0.23	14.55	33.56			
11:20 AM	8520	18.60 *	10.57	10.66	3.16	12.89	1.89	13.54	0.23	14.55	33.57	3.26	195	
11:40 AM	8540	17.58 *	9.55	10.67	3.17	12.89	1.89	13.54	0.23	14.55	33.57			
12:00 PM	8560	17.37 *	9.34	10.68	3.18	12.89	1.89	13.54	0.23	14.55	33.57			
12:20 PM	8580	16.27 *	8.24	10.67	3.17	12.90	1.90	13.54	0.23	14.55	33.57	3.26	195	
12:40 PM	8600	17.21 *	9.18	10.68	3.18	12.90	1.90	13.55	0.24	14.55	33.58			
01:00 PM	8620	16.53 *	8.50	10.67	3.17	12.90	1.90	13.55	0.24	14.55	33.58			
01:20 PM	8640	17.79 *	9.76	10.67	3.17	12.90	1.90	13.54	0.23	14.56	33.59	3.26	195	
01:40 PM	8660	16.87 *	8.84	10.66	3.16	12.89	1.89	13.54	0.23	14.56	33.59			
02:00 PM	8680	16.73 *	8.70	10.67	3.17	12.90	1.90	13.54	0.23	14.56	33.59			
02:20 PM	8700	17.13 *	9.10	10.67	3.17	12.91	1.91	13.54	0.23	14.57	33.60	3.26	195	
02:40 PM	8720	17.27 *	9.24	10.67	3.17	12.91	1.91	13.55	0.24	14.56	33.60			
03:00 PM	8740	17.70 *	9.67	10.67	3.17	12.91	1.91	13.55	0.24	14.57	33.60			
03:20 PM	8760	17.49 *	9.46	10.67	3.17	12.91	1.91	13.55	0.24	14.56	33.59	3.26	195	
03:40 PM	8780	17.57 *	9.54	10.67	3.17	12.92	1.92	13.54	0.23	14.56	33.60			
04:00 PM	8800	17.74 *	9.71	10.68	3.18	12.92	1.92	13.54	0.23	14.56	33.60			
04:20 PM	8820	16.92 *	8.89	10.67	3.17	12.92	1.92	13.54	0.23	14.56	33.60	3.26	195	
04:40 PM	8840	16.96 *	8.93	10.67	3.17	12.93	1.93	13.55	0.24	14.55	33.57			
05:00 PM	8860	17.72 *	9.69	10.67	3.17	12.93	1.93	13.55	0.24	14.55	33.58			
05:20 PM	8880	16.68 *	8.65	10.67	3.17	12.93	1.93	13.54	0.23	14.55	33.57	3.26	195	
05:40 PM	8900	17.45 *	9.42	10.67	3.17	12.93	1.93	13.54	0.23	14.55	33.56			
06:00 PM	8920	17.64 *	9.61	10.67	3.17	12.93	1.93	13.54	0.23	14.55	33.57			
06:20 PM	8940	16.39 *	8.36	10.67	3.17	12.93	1.93	13.54	0.23	14.55	33.56	3.26	195	
06:40 PM	8960	17.55 *	9.52	10.68	3.18	12.94	1.94	13.54	0.23	14.55	33.57			
07:00 PM	8980	17.12 *	9.09	10.68	3.18	12.94	1.94	13.54	0.23	14.55	33.58			
07:20 PM	9000	16.84 *	8.81	10.68	3.18	12.94	1.94	13.54	0.23	14.55	33.57	3.26	195	
07:40 PM	9020	15.93 *	7.90	10.68	3.18	12.94	1.94	13.54	0.23	14.55	33.58			
08:00 PM	9040	17.01 *	8.98	10.68	3.18	12.94	1.94	13.54	0.23	14.55	33.58			
08:20 PM	9060	16.89 *	8.86	10.68	3.18	12.95	1.95	13.55	0.24	14.56	33.58	3.26	195	
08:40 PM	9080	16.25 *	8.22	10.68	3.18	12.95	1.95	13.55	0.24	14.56	33.59			
09:00 PM	9100	17.87 *	9.84	10.68	3.18	12.95	1.95	13.55	0.24	14.56	33.58			
09:20 PM	9120	17.60 *	9.57	10.68	3.18	12.95	1.95	13.55	0.24	14.56	33.59	3.26	195	
09:40 PM	9140	16.70 *	8.67	10.69	3.19	12.95	1.95	13.55	0.24	14.56	33.60			
10:00 PM	9160	16.40 *	8.37	10.69	3.19	12.95	1.95	13.55	0.24	14.56	33.60			
10:20 PM	9180	17.26 *	9.23	10.69	3.19	12.96	1.96	13.55	0.24	14.56	33.59	3.26	195	
10:40 PM	9200	17.19 *	9.16	10.69	3.19	12.96	1.96	13.55	0.24	14.56	33.59			
11:00 PM	9220	16.99 *	8.96	10.69	3.19	12.96	1.96	13.55	0.24	14.56	33.59			
11:20 PM	9240	16.44 *	8.41	10.69	3.19	12.96	1.96	13.55	0.24	14.56	33.59	3.26	195	
11:40 PM	9260	16.97 *	8.94	10.69	3.19	12.97	1.97	13.55	0.24	14.56	33.59			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
9280	17.70 *	9.67	10.69	3.19	12.97	1.97	13.55	0.24	14.56	33.59			
9300	17.93 *	9.90	10.69	3.19	12.97	1.97	13.55	0.24	14.56	33.60	3.26	195	
9320	16.90 *	8.87	10.69	3.19	12.97	1.97	13.55	0.24	14.57	33.60			
9340	16.70 *	8.67	10.69	3.19	12.97	1.97	13.55	0.24	14.57	33.61			
9360	16.99 *	8.96	10.68	3.18	12.97	1.97	13.55	0.24	14.57	33.61	3.26	195	
9380	16.91 *	8.88	10.68	3.18	12.98	1.98	13.55	0.24	14.57	33.62			
9400	16.75 *	8.72	10.68	3.18	12.97	1.97	13.55	0.24	14.57	33.61			
9420	16.79 *	8.76	10.68	3.18	12.98	1.98	13.55	0.24	14.57	33.62	3.26	195	
9440	16.95 *	8.92	10.69	3.19	12.98	1.98	13.55	0.24	14.57	33.62			
9460	17.40 *	9.37	10.69	3.19	12.98	1.98	13.56	0.24	14.57	33.62			
9480	17.84 *	9.81	10.70	3.20	12.98	1.98	13.55	0.24	14.57	33.62	3.26	195	
9500	16.10 *	8.07	10.70	3.20	12.98	1.98	13.55	0.24	14.57	33.62			
9520	16.88 *	8.85	10.70	3.20	12.99	1.99	13.56	0.24	14.57	33.62			
9540	17.23 *	9.20	10.69	3.19	12.99	1.99	13.56	0.24	14.57	33.62	3.26	195	
9560	17.25 *	9.22	10.70	3.20	12.99	1.99	13.56	0.24	14.58	33.63			
9580	16.87 *	8.84	10.70	3.20	12.99	1.99	13.55	0.24	14.58	33.63			
9600	16.07 *	8.04	10.71	3.21	12.99	1.99	13.56	0.24	14.58	33.63	3.26	195	
9620	17.47 *	9.44	10.70	3.20	13.00	2.00	13.55	0.24	14.58	33.64			
9640	17.44 *	9.41	10.70	3.20	13.00	2.00	13.56	0.24	14.58	33.64			
9660	16.86 *	8.83	10.70	3.20	13.00	2.00	13.56	0.24	14.58	33.64	3.26	195	
9680	17.18 *	9.15	10.69	3.19	13.00	2.00	13.56	0.24	14.58	33.63			
9700	17.54 *	9.51	10.70	3.20	13.00	2.00	13.56	0.25	14.58	33.63			
9720	17.89 *	9.86	10.70	3.20	13.01	2.01	13.56	0.24	14.58	33.64	3.26	195	
9740	17.14 *	9.11	10.70	3.20	13.01	2.01	13.56	0.24	14.59	33.65			
9760	17.34 *	9.31	10.71	3.21	13.01	2.01	13.56	0.25	14.59	33.67			
9780	17.75 *	9.72	10.72	3.22	13.02	2.02	13.56	0.25	14.61	33.69	3.26	195	
9800	17.65 *	9.62	10.73	3.23	13.02	2.02	13.56	0.25	14.61	33.70			
9820	16.63 *	8.60	10.72	3.22	13.03	2.03	13.56	0.25	14.61	33.71			
9840	16.51 *	8.48	10.73	3.23	13.03	2.03	13.56	0.25	14.62	33.72	3.28	196	
9860	17.16 *	9.13	10.72	3.22	13.04	2.04	13.56	0.25	14.62	33.74			
9880	16.79 *	8.76	10.72	3.22	13.03	2.03	13.56	0.25	14.63	33.74			
9900	17.52 *	9.49	10.72	3.22	13.04	2.04	13.56	0.25	14.63	33.75	3.28	196	
9920	16.99 *	8.96	10.72	3.22	13.04	2.04	13.56	0.25	14.63	33.74			
9940	16.97 *	8.94	10.73	3.23	13.04	2.04	13.57	0.25	14.63	33.75			
9960	17.70 *	9.67	10.73	3.23	13.04	2.04	13.57	0.25	14.63	33.75	3.29	196	
9972			10.79										Solinst dropline
9974	17.26												Solinst dropline
9978					13.02								Solinst dropline
9980	17.15 *	9.12	10.72	3.22	13.04	2.04	13.57	0.25	14.63	33.74			
10000	-	-	-	-	-	-	13.57	0.26	-				Water sample collected;
10020	16.74 *	8.71	10.73	3.23	13.04	2.04	13.57	0.25	14.63	33.74	3.29	196	T = 54.3° F
10030	17.36 *	9.33	10.73	3.23	13.05	2.05	Data missed		14.62	33.74			Pump OFF
0.008	17.52		10.73		13.05		due to		14.63	33.74			Recovery
0.017	15.15		10.73		13.05		programming		14.63	33.74			
0.025	15.38		10.73		13.05		error		14.63	33.75			
0.033	15.17		10.72		13.05				14.63	33.74			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/24/97														
	0.042	14.83		10.72		13.05		Data missed		14.63	33.75			
	0.050	14.23		10.72		13.05		due to		14.63	33.74			
	0.058	13.39		10.71		13.05		programming		14.63	33.74			
	0.067	12.79		10.70		13.05		error		14.62	33.74			
	0.075	12.15		10.70		13.05				14.63	33.74			
	0.083	11.65		10.69		13.05				14.63	33.74			
	0.092	11.26		10.69		13.05				14.63	33.74			
	0.100	10.81		10.68		13.05				14.63	33.74			
	0.108	10.48		10.68		13.05				14.63	33.74			
	0.117	10.36		10.67		13.05				14.63	33.74			
	0.125	10.26		10.66		13.05				14.63	33.74			
	0.133	10.19		10.65		13.05				14.63	33.74			
	0.142	10.17		10.65		13.05				14.63	33.74			
	0.150	10.23		10.64		13.05				14.63	33.74			
	0.158	10.36		10.63		13.05				14.63	33.74			
	0.167	10.46		10.62		13.05				14.63	33.74			
	0.175	10.56		10.62		13.05				14.63	33.74			
	0.183	10.73		10.61		13.05				14.63	33.74			
	0.192	10.87		10.60		13.05				14.63	33.74			
	0.200	11.02		10.59		13.05				14.63	33.74			
	0.208	11.14		10.58		13.05				14.63	33.74			
	0.217	11.21		10.57		13.05				14.63	33.74			
	0.225	11.26		10.57		13.05				14.63	33.74			
	0.233	11.29		10.57		13.05				14.63	33.74			
	0.242	11.29		10.56		13.05				14.63	33.74			
	0.250	11.29		10.55		13.05				14.63	33.74			
	0.258	11.26		10.55		13.05				14.63	33.74			
	0.267	11.21		10.54		13.05				14.63	33.74			
	0.275	11.14		10.54		13.05				14.62	33.74			
	0.283	11.07		10.53		13.05				14.63	33.74			
	0.292	10.97		10.53		13.05				14.63	33.74			
	0.300	10.91		10.53		13.05				14.63	33.74			
	0.308	10.87		10.52		13.05				14.63	33.74			
	0.317	10.82		10.52		13.05				14.62	33.74			
	0.325	10.76		10.52		13.05				14.63	33.74			
	0.333	10.74		10.52		13.05				14.63	33.74			
	0.350	10.73		10.51		13.05				14.63	33.74			
	0.367	10.77		10.50		13.05				14.63	33.74			
	0.383	10.84		10.50		13.05				14.63	33.74			
	0.400	10.91		10.49		13.05				14.63	33.74			
	0.417	10.98		10.48		13.05				14.63	33.74			
	0.433	10.99		10.48		13.05				14.63	33.74			
	0.450	11.01		10.47		13.05				14.62	33.74			
	0.467	10.99		10.47		13.05				14.63	33.74			
	0.483	10.97		10.47		13.05				14.63	33.74			
	0.500	10.93		10.46		13.05				14.62	33.74			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Dale/ hour	*Elapsed time (min)*	*Test Well 1-97 (TH5-96) Depth to water (ft)*	*Test Well 1-97 (TH5-96) Observed drawdown (ft)*	*Observation Well 1 (TH 1-96) Depth to water (ft)*	*Observation Well 1 (TH 1-96) Observed drawdown (ft)*	*Observation Well 2 (TH 4-96) Depth to water (ft)*	*Observation Well 2 (TH 4-96) Observed drawdown (ft)*	*Observation Well 3 (TH 2-96) Depth to water (ft)*	*Observation Well 3 (TH 2-96) Observed drawdown (ft)*	*Approximate barometric pressure (psia)*	*Approximate barometric pressure (ft of water)*	*Piezometer head (ft)*	*Pumping rate (gpm)*	*Remarks*
02/24/97														
	0.517	10.89		10.46		13.05		Data missed		14.63	33.74			
	0.533	10.86		10.46		13.05		due to		14.63	33.74			
	0.550	10.85		10.46		13.05		programming		14.63	33.74			
	0.567	10.85		10.46		13.05		error		14.62	33.74			
	0.583	10.86		10.45		13.05				14.62	33.73			
	0.600	10.87		10.45		13.05				14.63	33.74			
	0.617	10.89		10.45		13.05				14.63	33.74			
	0.633	10.90		10.45		13.05				14.63	33.74			
	0.650	10.92		10.44		13.05				14.62	33.74			
	0.667	10.92		10.44		13.05				14.63	33.74			
	0.683	10.90		10.44		13.05				14.63	33.74			
	0.700	10.89		10.44		13.05				14.62	33.74			
	0.717	10.90		10.43		13.05				14.63	33.74			
	0.733	10.87		10.43		13.05				14.62	33.73			
	0.750	10.87		10.43		13.05				14.62	33.73			
	0.767	10.85		10.43		13.05				14.62	33.74			
	0.783	10.88		10.43		13.05				14.63	33.74			
	0.800	10.87		10.42		13.05				14.63	33.74			
	0.817	10.87		10.42		13.05				14.62	33.74			
	0.833	10.88		10.42		13.05				14.62	33.73			
	0.850	10.89		10.42		13.05				14.62	33.74			
	0.867	10.87		10.42		13.05				14.63	33.74			
	0.883	10.88		10.42		13.05				14.62	33.73			
	0.900	10.88		10.42		13.05				14.63	33.74			
	0.917	10.87		10.41		13.05				14.62	33.74			
	0.933	10.86		10.41		13.05				14.63	33.74			
	0.950	10.87		10.41		13.05				14.62	33.74			
	0.967	10.86		10.41		13.05				14.62	33.73			
	0.983	10.85		10.41		13.05				14.62	33.73			
12:31 PM	1.0	10.87		10.41		13.05				14.63	33.74			
	1.2	10.85		10.39		13.05				14.63	33.74			
	1.4	10.83		10.38		13.05				14.62	33.73			
	1.6	10.82		10.36		13.05				14.63	33.74			
	1.8	10.81		10.35		13.05				14.62	33.73			
12:32 PM	2.0	10.80		10.34		13.05				14.62	33.74			
	2.2	10.79		10.33		13.05				14.62	33.73			
	2.4	10.78		10.32		13.05				14.63	33.74			
	2.6	10.77		10.31		13.05				14.63	33.74			
	2.8	10.77		10.31		13.05				14.62	33.73			
12:33 PM	3.0	10.77		10.30		13.05				14.62	33.73			
	3.2	10.75		10.29		13.05				14.63	33.74			
	3.4	10.75		10.29		13.05				14.63	33.74			
	3.6	10.75		10.28		13.05				14.62	33.74			
	3.8	10.75		10.27		13.05				14.63	33.74			
12:34 PM	4.0	10.72		10.26		13.05				14.63	33.74			
	4.2	10.74		10.26		13.05				14.63	33.74			

Ground-Water Investigation in Ogden Township for the Village of Home
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	*Test Well 1-97 (TH 5-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 1 (TH 1-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 2 (TH 4-96)* Depth to water (ft)	Observed drawdown (ft)	*Observation Well 3 (TH 2-96)* Depth to water (ft)	Observed drawdown (ft)	*Approximate barometric pressure* (psia)	(ft of water)
02/24/97											
	4.4	10.70		10.24		13.05		Data missed		14.62	33.73
	4.6	10.70		10.24		13.05		due to		14.62	33.73
	4.8	10.70		10.24		13.05		programming		14.62	33.74
12:35 PM	5.0	10.70		10.23		13.04		error		14.63	33.74
	5.2	10.69		10.23		13.04				14.62	33.74
	5.4	10.68		10.22		13.04				14.62	33.74
	5.6	10.72		10.22		13.04				14.62	33.74
	5.8	10.70		10.21		13.04				14.63	33.74
12:36 PM	6.0	10.68		10.21		13.04				14.63	33.74
	6.2	10.67		10.20		13.04				14.62	33.74
	6.4	10.67		10.20		13.04				14.62	33.73
	6.6	10.67		10.20		13.04				14.62	33.73
	6.8	10.67		10.19		13.04				14.62	33.73
12:37 PM	7.0	10.65		10.19		13.04				14.62	33.74
	7.2	10.70		10.18		13.05				14.63	33.74
	7.4	10.60		10.18		13.05				14.62	33.74
	7.6	10.57		10.18		13.04				14.63	33.74
	7.8	10.59		10.17		13.04				14.63	33.74
12:38 PM	8.0	10.76		10.17		13.04				14.62	33.74
	8.2	10.51		10.16		13.04				14.63	33.74
	8.4	10.67		10.16		13.05				14.62	33.74
	8.6	10.74		10.16		13.05				14.62	33.73
	8.8	10.71		10.16		13.05				14.62	33.73
12:39 PM	9.0	10.68		10.16		13.05				14.62	33.73
	9.2	10.66		10.15		13.05				14.62	33.74
	9.4	10.65		10.15		13.05				14.62	33.74
	9.6	10.63		10.15		13.05				14.62	33.74
	9.8	10.63		10.14		13.04				14.62	33.73
12:40 PM	10	10.63		10.14		13.05				14.62	33.73
12:42 PM	12	10.60		10.13		13.05		13.56		14.62	33.73
12:44 PM	14	10.57		10.09		13.05		13.56		14.62	33.74
12:46 PM	16	10.54		10.06		13.04		13.56		14.62	33.73
12:48 PM	18	10.53		10.05		13.05		13.56		14.62	33.73
12:50 PM	20	10.51		10.02		13.04		13.56		14.62	33.72
12:52 PM	22	10.49		10.01		13.05		13.56		14.62	33.72
12:54 PM	24	10.47		9.99		13.04		13.57		14.62	33.73
12:56 PM	26	10.46		9.98		13.05		13.56		14.62	33.72
12:58 PM	28	10.44		9.97		13.05		13.56		14.62	33.72
01:00 PM	30	10.43		9.95		13.04		13.56		14.62	33.72
01:02 PM	32	10.42		9.94		13.05		13.56		14.62	33.72
01:04 PM	34	10.40		9.92		13.04		13.56		14.62	33.73
01:06 PM	36	10.38		9.90		13.04		13.56		14.62	33.72
01:08 PM	38	10.38		9.90		13.04				14.62	33.72
01:10PM	40	10.37		9.89		13.05		13.56		14.62	33.72
01:12PM	42	10.36		9.88		13.05		13.56		14.61	33.71
01:14 PM	44	10.34		9.86		13.04		13.57		14.61	33.71

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/24/97														
01:16 PM	46	10.34		9.86		13.04		13.56		14.62	33.72			
01:18 PM	48	10.32		9.84		13.04		13.56		14.62	33.72			
01:20 PM	50	10.31		9.84		13.04		13.57		14.62	33.74			
01:22 PM	52	10.30		9.82		13.04		13.56		14.62	33.73			
01:24 PM	54	10.29		9.82		13.04		13.56		14.62	33.74			
01:26 PM	56	10.28		9.81		13.05		13.56		14.63	33.74			
01:28 PM	58	10.27		9.79		13.04		13.56		14.62	33.74			
01:30 PM	60	10.26		9.78		13.04		13.56		14.62	33.72			
01:32 PM	62	10.26		9.78		13.05		13.56		14.62	33.74			
01:34 PM	64	10.25		9.77		13.04		13.56		14.62	33.74			
01:36 PM	66	10.24		9.75		13.04		13.56		14.62	33.73			
01:38 PM	68	10.23		9.75		13.04		13.56		14.62	33.72			
01:40 PM	70	10.23		9.75		13.04		13.56		14.62	33.73			
01:42 PM	72	10.22		9.74		13.04		13.56		14.62	33.72			
01:44 PM	74	10.21		9.73		13.04		13.56		14.62	33.72			
01:46 PM	76	10.20		9.72		13.04		13.56		14.62	33.72			
01:48 PM	78	10.20		9.72		13.05		13.56		14.62	33.73			
01:50 PM	80	10.19		9.71		13.04		13.56		14.62	33.73			
01:52 PM	82	10.18		9.71		13.04		13.56		14.62	33.73			
01:54 PM	84	10.17		9.70		13.04		13.56		14.62	33.73			
01:56 PM	86	10.17		9.69		13.04		13.56		14.63	33.74			
01:58 PM	88	10.16		9.68		13.04		13.56		14.62	33.74			
02:00 PM	90	10.15		9.67		13.03		13.56		14.62	33.74			
02:02 PM	92	10.14		9.67		13.04		13.56		14.63	33.74			
02:04 PM	94	10.14		9.67		13.04		13.56		14.62	33.74			
02:06 PM	96	10.13		9.65		13.04		13.56		14.63	33.74			
02:08 PM	98	10.13		9.65		13.04		13.56		14.62	33.74			
02:10 PM	100	10.12		9.64		13.04		13.56		14.63	33.74			
02:30 PM	120	10.07		9.59		13.03		13.56		14.63	33.74			
02:50 PM	140	10.01		9.54		13.03		13.56		14.62	33.73			
03:10 PM	160	9.97		9.49		13.03		13.56		14.61	33.71			
03:30 PM	180	9.92		9.45		13.03		13.56		14.61	33.70			
03:50 PM	200	9.88		9.41		13.04		13.56		14.60	33.69			
04:10 PM	220	9.85		9.37		13.03		13.56		14.60	33.69			
04:30 PM	240	9.81		9.33		13.03		13.56		14.60	33.68			
04:50 PM	260	9.77		9.30		13.03		13.56		14.59	33.67			
05:10 PM	280	9.74		9.27		13.03		13.56		14.59	33.66			
05:30 PM	300	9.71		9.24		13.02		13.56		14.58	33.64			
05:50 PM	320	9.68		9.21		13.02		13.57		14.58	33.63			
06:10 PM	340	9.66		9.18		13.02		13.56		14.57	33.62			
06:30 PM	360	9.63		9.15		13.01		13.56		14.57	33.61			
06:50 PM	380	9.60		9.13		13.01		13.56		14.57	33.62			
07:10 PM	400	9.58		9.10		13.01		13.56		14.57	33.62			
07:30 PM	420	9.55		9.08		13.01		13.56		14.57	33.61			
07:50 PM	440	9.53		9.06		13.01		13.57 .		14.57	33.62			
08:10 PM	460	9.51		9.04		13.00		13.57		14.57	33.61			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Dale/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observed drawdown (ft)	Approximate barometric pressure (psia)	(ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/24/97														
08:30 PM	480	9.49		9.01		13.00		13.56		14.56	33.59			
08:50 PM	500	9.46		8.99		13.00		13.56		14.56	33.59			
09:10 PM	520	9.44		8.97		13.00		13.56		14.55	33.57			
09:30 PM	540	9.42		8.95		12.99		13.57		14.55	33.57			
09:50 PM	560	9.41		8.94		12.99		13.57		14.55	33.56			
10:10 PM	580	9.39		8.91		12.99		13.56		14.54	33.55			
10:30 PM	600	9.37		8.90		12.98		13.57		14.55	33.56			
10:50 PM	620	9.36		8.88		12.98		13.57		14.55	33.56			
11:10PM	640	9.34		8.86		12.98		13.57		14.54	33.55			
11:30 PM	660	9.32		8.85		12.97		13.57		14.54	33.55			
11:50 PM	680	9.30		8.83		12.98		13.57		14.54	33.54			
02/25/97														
12:10 AM	700	9.29		8.82		12.97		13.57		14.53	33.53			
12:30 AM	720	9.27		8.80		12.97		13.57		14.54	33.53			
12:50 AM	740	9.25		8.78		12.96		13.57		14.53	33.53			
01:10 AM	760	9.24		8.77		12.96		13.57		14.53	33.53			
01:30 AM	780	9.22		8.75		12.96		13.57		14.53	33.51			
01:50 AM	800	9.21		8.73		12.96		13.57		14.53	33.51			
02:10 AM	820	9.19		8.72		12.95		13.57		14.52	33.50			
02:30 AM	840	9.17		8.70		12.95		13.57		14.52	33.49			
02:50 AM	860	9.16		8.69		12.95		13.57		14.51	33.47			
03:10 AM	880	9.14		8.67		12.94		13.57		14.50	33.45			
03:30 AM	900	9.13		8.66		12.94		13.57		14.50	33.45			
03:50 AM	920	9.12		8.64		12.94		13.57		14.49	33.44			
04:10 AM	940	9.10		8.63		12.94		13.57		14.49	33.43			
04:30 AM	960	9.09		8.62		12.93		13.57		14.49	33.43			
04:50 AM	980	9.07		8.60		12.93		13.57		14.49	33.43			
05:10 AM	1000	9.06		8.59		12.93		13.57		14.49	33.42			
05:30 AM	1020	9.05		8.57		12.93		13.57		14.48	33.41			
05:50 AM	1040	9.03		8.56		12.92		13.57		14.47	33.39			
06:10 AM	1060	9.02		8.55		12.92		13.57		14.47	33.38			
06:30 AM	1080	9.00		8.53		12.92		13.57		14.47	33.38			
06:50 AM	1100	9.00		8.52		12.91		13.57		14.47	33.38			
07:10 AM	1120	8.98		8.51		12.91		13.57		14.48	33.40			
07:30 AM	1140	8.97		8.50		12.92		13.57		14.49	33.43			
07:50 AM	1160	8.96		8.49		12.92		13.57		14.49	33.44			
08:10 AM	1180	8.95		8.48		12.92		13.57		14.51	33.47			
08:30 AM	1200	8.94		8.47		12.92		13.57		14.51	33.48			
08:50 AM	1220	8.93		8.46		12.92		13.57		14.52	33.50			
09:10 AM	1240	8.91		8.45		12.91		13.57		14.53	33.51			
09:30 AM	1260	8.91		8.44		12.91		13.57		14.53	33.52			
09:50 AM	1280	8.90		8.43		12.90		13.57		14.53	33.52			
10:10 AM	1300	8.88		8.41		12.90		13.57		14.53	33.53			
10:30 AM	1320	8.87		8.40		12.90		13.57		14.53	33.52			
10:50 AM	1340	8.85		8.38		12.89		13.57		14.53	33.52			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observed drawdown (ft)	Approximate barometric pressure (psia)	(ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/25/97														
11:10 AM	1360	8.85		8.38		12.89		13.57		14.53	33.52			
11:30 AM	1380	8.84		8.37		12.89		13.57		14.53	33.51			
11:50 AM	1400	8.83		8.36		12.89		13.57		14.52	33.50			
12:10 PM	1420	8.81		8.34		12.88		13.57		14.52	33.49			
12:30 PM	1440	8.80		8.33		12.87		13.57		14.51	33.46			
12:50 PM	1460	8.79		8.32		12.88		13.57		14.50	33.45			
01:10PM	1480	8.78		8.31		12.88		13.57		14.49	33.44			
01:30 PM	1500	8.78		8.30		12.87		13.57		14.48	33.41			
01:50 PM	1520	8.76		8.29		12.87		13.57		14.47	33.39			
02:10 PM	1540	8.74		8.27		12.86		13.57		14.47	33.38			
02:30 PM	1560	8.73		8.26		12.86		13.57		14.46	33.36			
02:50 PM	1580	8.73		8.26		12.86		13.58		14.45	33.35			
03:10 PM	1600	8.70		8.23		12.85		13.57		14.45	33.33			
03:30 PM	1620	8.69		8.22		12.85		13.58		14.44	33.31			
03:50 PM	1640	8.69		8.22		12.85		13.57		14.44	33.30			
04:10 PM	1660	8.68		8.20		12.84		13.57		14.43	33.29			
04:30 PM	1680	8.66		8.19		12.84		13.58		14.42	33.27			
04:50 PM	1700	8.65		8.18		12.84		13.57		14.42	33.26			
05:10 PM	1720	8.64		8.17		12.84		13.57		14.41	33.24			
05:30 PM	1740	8.63		8.16		12.83		13.57		14.40	33.22			
05:50 PM	1760	8.63		8.16		12.83		13.57		14.40	33.21			
06:10 PM	1780	8.61		8.14		12.82		13.57		14.39	33.19			
06:30 PM	1800	8.61		8.13		12.82		13.57		14.38	33.18			
06:50 PM	1820	8.59		8.12		12.82		13.57		14.37	33.16			
07:10 PM	1840	8.59		8.12		12.82		13.57		14.37	33.15			
07:30 PM	1860	8.58		8.11		12.81		13.57		14.37	33.14			
07:50 PM	1880	8.57		8.10		12.81		13.57		14.37	33.15			
08:10 PM	1900	8.56		8.09		12.81		13.57		14.36	33.14			
08:30 PM	1920	8.55		8.08		12.80		13.57		14.36	33.13			
08:50 PM	1940	8.54		8.07		12.80		13.57		14.36	33.12			
09:10 PM	1960	8.54		8.06		12.80		13.57		14.36	33.12			
09:30 PM	1980	8.53		8.06		12.79		13.57		14.36	33.12			
09:50 PM	2000	8.52		8.05		12.79		13.57		14.35	33.11			
10:10PM	2020	8.51		8.04		12.79		13.57		14.35	33.09			
10:30 PM	2040	8.51		8.03		12.78		13.57		14.34	33.09			
10:50 PM	2060	8.49		8.02		12.78		13.57		14.34	33.08			
11:10PM	2080	8.49		8.01		12.78		13.57		14.33	33.07			
11:30 PM	2100	8.47		8.00		12.77		13.57		14.33	33.06			
11:50 PM	2120	8.47		8.00		12.77		13.57		14.32	33.05			
02/26/97														
12:10AM	2140	8.46		7.99		12.77		13.57		14.32	33.04			
12:30 AM	2160	8.46		7.98		12.76		13.57		14.32	33.04			
12:50 AM	2180	8.44		7.97		12.76		13.57		14.32	33.05			
01:10 AM	2200	8.44		7.96		12.76		13.57		14.32	33.04			
01:30 AM	2220	8.44		7.96		12.75		13.57		14.32	33.04			

Ground-Water Investigation in Ogden Township for the Village of Homer
Test Well 1-97 II 7-day Aquifer Test: February 17 - 24, 1997

Date/ hour	Elapsed time (min)	Test Well 1-97 (TH 5-96) Depth to water (ft)	Test Well 1-97 (TH 5-96) Observed drawdown (ft)	Observation Well 1 (TH 1-96) Depth to water (ft)	Observation Well 1 (TH 1-96) Observed drawdown (ft)	Observation Well 2 (TH 4-96) Depth to water (ft)	Observation Well 2 (TH 4-96) Observed drawdown (ft)	Observation Well 3 (TH 2-96) Depth to water (ft)	Observation Well 3 (TH 2-96) Observed drawdown (ft)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	Piezometer head (ft)	Pumping rate (gpm)	Remarks
02/26/97								13.57						
01:50 AM	2240	8.42		7.95		12.75		13.57		14.32	33.03			
02:10 AM	2260	8.41		7.94		12.75		13.57		14.31	33.02			
02:30 AM	2280	8.40		7.93		12.74		13.57		14.31	33.01			
02:50 AM	2300	8.40		7.93		12.74		13.57		14.31	33.01			
03:10 AM	2320	8.39		7.91		12.73		13.57		14.30	32.99			
03:30 AM	2340	8.38		7.91		12.73		13.57		14.30	32.99			
03:50 AM	2360	8.37		7.90		12.73		13.57		14.30	32.99			
04:10 AM	2380	8.36		7.89		12.73		13.57		14.30	32.99			
04:30 AM	2400	8.35		7.88		12.72		13.57		14.30	32.99			
04:50 AM	2420	8.35		7.88		12.72		13.57		14.30	32.99			
05:10 AM	2440	8.34		7.87		12.71		13.57		14.30	32.98			
05:30 AM	2460	8.33		7.86		12.71		13.57		14.29	32.96			
05:50 AM	2480	8.32		7.85		12.71		13.57		14.28	32.95			
06:10 AM	2500	8.31		7.84		12.70		13.57		14.28	32.94			
06:30 AM	2520	8.31		7.84		12.70		13.57		14.28	32.94			
06:50 AM	2540	8.30		7.83		12.69		13.57		14.27	32.92			
07:10 AM	2560	8.29		7.82		12.69		13.57		14.27	32.92			
07:30 AM	2580	8.29		7.81		12.69		13.57		14.27	32.92			
07:50 AM	2600	8.27		7.81		12.68		13.57		14.28	32.93			
08:10 AM	2620	8.27		7.79		12.68		13.64		14.27	32.92			
08:30 AM	2640	8.26		7.79		12.67				14.27	32.91			
08:50 AM	2660	8.25		7.78		12.67				14.27	32.91			
09:10 AM	2680	8.25		7.77		12.66				14.27	32.92			
09:18 AM	2688													Solinst dropline
09:28 AM	2698	8.36												Solinst dropline
09:30 AM	2700			7.82										Solinst dropline
09:30 AM	2700	8.23		7.76		12.65				14.26				End of Test

Notes:
*Measurement erratic, possibly due to electrical interference from pump motor
T = temperature

Appendix I.

Test Well 1-97
Chemical Analyses of Water Samples, February 1997

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

Illinois State Water Survey

Main Office • 2204 Griffith Drive • Champaign. IL 61820-7495 • *Tel (217) 333-2210* • *Fax (217) 333-6540*
Peoria Office • P.O. Box 697 • Peoria. IL 61652-0697 • *Tel (309) 671-3196- Fax (309) 671-3106*

SWS

March 17, 1997

Mr. Andrew Kieser
Sodemann and Associates, Inc.
340 N. Neil St.
P.O. Box 557
Champaign, IL 61824-0557

Dear Mr. Kieser:

We are enclosing a copy of each of the partial analyses made on samples of untreated water collected February 17 and 24, 1997, from the 140 foot deep Test Well No. 1-97, owned by the Village of Homer in Champaign County.

The analyses show the samples to be moderately mineralized and hard. The hardness in these samples is sufficient to cause the formation of a large amount of soft scale in boilers and hot water heaters and to consume a large amount of soap if used for washing or laundry. The iron and manganese contents of the water are at a level which can result in the staining of porcelain and laundry.

None of the parameters tested appear unusual for Illinois ground water.

If we can be of further assistance, please let us hear from you.

Very truly yours,

Brian W Kaiser

Brian W. Kaiser
Associate Chemist
217/333-9234

Enclosures as stated

cc: Mr. Ernest Wienke, Mayor of Homer
Mr. Ellis Sanderson, ISWS

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

Illinois State Water Survey

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Peoria Office • P.O. Box 697 • Peoria, IL 61652-0697 • *Tel (309) 671-3196' Fax (309) 671-3106*

SWS

WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 229936

SOURCE: TEST WELL NO. 1-97
OWNER: VILLAGE OF HOMER
LOCATION: NORTH OF HOMER
COUNTY: CHAMPAIGN TOWNSHIP: 19N RANGE: 14W SECTION: 18.4C
DATE COLLECTED: 02/17/1997 DATE RECEIVED: 02/18/1997
WELL DEPTH (Ft.): 140.0 TEMPERATURE REPORTED (F): 54.3
TREATMENT: NONE
COMMENTS: SAMPLE COLLECTED AFTER PUMPING AT RATE OF 195 GPM FOR 2 HOURS.

PARAMETER:	mg/L	PARAMETER:	mg/L
Iron (Total Fe):	2.12	Fluoride (F):	0.4
Manganese (Mn):	0.09	Chloride (Cl):	4.1
Calcium (Ca):	83.0	Sulfate (SO4):	0.5
Magnesium (Mg):	33.6	Nitrate (NO3-N):	< 0.08
Sodium (Na):	20.6		
Barium (Ba):	0.20		
Beryllium (Be):	< 0.003		
Boron (B):	< 0.13		
Chromium (Cr):	< 0.007		
Copper (Cu):	< 0.01		
Nickel (Ni):	< 0.031		
Zinc (Zn):	< 0.02		
Turbidity(Lab, NTU):	8.64	Alkalinity (CaC03):	403
Color (PCU):	10	Hardness (as CaC03):	345
pH (Lab):	7.6	Total Dissolved Minerals:	369
Odor:	NONE		

< = Below detection limit (i.e. <1.0 = less than 1.0 mg/L)
mg/L = milligrams per liter mg/L x 0.0584 = grains per gallon
uS/cm = microsiemens per centimeter
ND = Not determined/Information not available

IEPA Certified Environmental Laboratory, Number 100202

Lauren F. Sievers [signature]
Daniel L. Webb [signature]

Analysts: Lauren F. Sievers
Associate Chemist

Daniel L. Webb
Associate Chemist

Printe. ed paper

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Illinois State Water Survey

Main Office • 2204 Griffith Drive • Champaign. IL 61820-7495 • *Tel (217) 333-2210* • *Fax (217) 333-6540*
Peoria Office • P.O. Box 697 • Peoria. IL 61652-0697 • *Tel (309) 671-3196* • *Fax (309) 671-3106*

SWS

WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 229937

SOURCE: TEST WELL NO. 1-97
OWNER: VILLAGE OF HOMER
LOCATION: NORTH OF HOMER
COUNTY: CHAMPAIGN TOWNSHIP: 19N RANGE: 14W SECTION: 18.4C
DATE COLLECTED: 02/24/1997 DATE RECEIVED: 02/24/1997
WELL DEPTH (Ft.): 140.0 TEMPERATURE REPORTED (F): 54.3
TREATMENT: NONE
COMMENTS: SAMPLE COLLECTED AFTER PUMPING AT RATE OF 195 GPM FOR 166 HOURS 40 MINUTES.

PARAMETER:	mg/L	PARAMETER:	mg/L
Iron (Total Fe):	1.96	Fluoride (F):	0.4
Manganese (Mn):	0.07	Chloride (Cl):	4.4
Calcium (Ca):	73.9	Sulfate (SO4):	0.4
Magnesium (Mg):	30.0	Nitrate (NO3-N):	< 0.08
Sodium (Na):	19.4		
Barium (Ba):	0.19		
Beryllium (Be):	< 0.003		
Boron (B):	< 0.13		
Chromium (Cr):	< 0.007		
Copper (Cu):	< 0.01		
Nickel (Ni):	< 0.031		
Zinc (Zn):	< 0.02		
Turbidity(Lab, NTU):	12.7	Alkalinity (CaC03):	394
Color (PCU):	20	Hardness (as CaC03):	308
pH (Lab):	7.3	Total Dissolved Minerals:	376
Odor:	NONE		

< = Below detection limit (i.e. <1.0 = less than 1.0 mg/L)
mg/L = milligrams per liter mg/L x 0.0584 = grains per gallon
uS/cm = microsiemens per centimeter
ND = Not determined/Information not available

IEPA Certified Environmental Laboratory, Number 100202

Lauren F. Sievers (signature) BLW

Daniel L. Webb (signature)

Analysts: Lauren F. Sievers
Associate Chemist

Daniel L. Webb
Associate Chemist

Printed ed paper

STATE OF ILLINOIS
DEPARTMENT OF NUCLEAR SAFETY
1035 OUTER PARK DRIVE
SPRINGFIELD, ILLINOIS 62704
217-785-9900
217-782-6133 (TDD)

Jim Edgar
Governor

Thomas W. Ortciger
Director

June 30, 1997

Mr. John Stayton
Member, Homer Water Committee
c/o Village Clerk
101 North Main Street
Homer, IL 61849

Ref: Letter of March 3 from Ellis W. Sanderson to James R. Noyce

Dear Mr. Stayton:

This letter and attachment provide the results of our analyses on a water sample from Test Well 1-97 that was drilled for the Village of Homer. The results for gross alpha and gross beta radioactivity are given on the attached Analysis Report. We also performed high-resolution spectrometry for gamma-ray-emitting nuclides, and none were found. I suggest that you include this letter and attachment when you correspond with the Illinois Environmental Protection Agency about water from this well.

Sincerely,

James R. Noyce

James R. Noyce
Nuclear Safety Scientist II
Drinking Water Program
Division of Radiochemistry

cc: Mr. Andrew Kieser
Mr. Ellis W. Sanderson

recyclable

Illinois Department of Nuclear Safety

Division of Radiochemistry

Analysis Report

Laboratory Number..: 977891 Report date: 27-jun-1997

User Identification: 0190300T00-X
Site Identification: HOMER-0-0190300
Analysis Date......: 11-jun-1997
Collection Date. ...: 24-feb-1997 12.-00:00

Nuclide	Activity	1.96s	Units
Gross Beta	< 4		pCi/1
Gross Alpha	< 6		pCi/1

Comments:
Gross alpha implies unknown alpha source and calibration with Thorium-230.
Gross beta implies unknown beta source and calibration with Cesium-137.

Analyst: ZUEHLKE Reviewer: NOYC [signature] Release Date: JUN 30 1997

Appendix J.

Ground-Water Levels and Barometric Pressure Data, February 26 - March 12, 1997

Ground-Water Investigation in Ogden Township for the Village of Homer
Ground-Water Levels and Barometric Pressure Data,
February 26 - March 12, 1997

Date/ hour	*Elapsed time (min)*	*Approximate barometric pressure (psia)*	*Approximate barometric pressure (ft of water)*	*OW 2 (TH 4-96) Depth to water (ft)*	*OW 2 (TH 4-96) Approximate water elevation (ft msl)*
02/26/97					
10:00 AM	0	14.25	32.87	* 12.61	*661.49
11:00 AM	60	14.25	32.86	12.58	661.52
12:00 PM	120	14.22	32.79	12.55	661.55
01:00 PM	180	14.18	32.70	12.52	661.58
02:00 PM	240	14.17	32.69	12.50	661.60
03:00 PM	300	14.17	32.68	12.48	661.63
04:00 PM	360	14.15	32.64	12.45	661.65
05:00 PM	420	14.15	32.63	12.42	661.68
06:00 PM	480	14.14	32.60	12.40	661.70
07:00 PM	540	14.11	32.55	12.37	661.73
08:00 PM	600	14.09	32.49	12.34	661.76
09:00 PM	660	14.08	32.47	12.30	661.80
10:00 PM	720	14.07	32.46	12.28	661.82
11:00 PM	780	14.03	32.35	12.24	661.86
02/27/97					
12:00 AM	840	14.02	32.33	12.21	661.89
01:00 AM	900	14.01	32.31	12.19	661.91
02:00 AM	960	14.03	32.36	12.19	661.92
03:00 AM	1020	14.05	32.40	12.18	661.92
04:00 AM	1080	14.08	32.47	12.18	661.92
05:00 AM	1140	14.10	32.52	12.16	661.94
06:00 AM	1200	14.13	32.58	12.16	661.94
07:00 AM	1260	14.16	32.66	12.12	661.98
08:00 AM	1320	14.20	32.75	12.11	661.99
09:00 AM	1380	14.22	32.80	12.11	661.99
10:00 AM	1440	14.24	32.84	12.09	662.01
11:00 AM	1500	14.26	32.90	12.07	662.03
12:00 PM	1560	14.28	32.93	12.06	662.04
01:00 PM	1620	14.28	32.94	12.05	662.05
02:00 PM	1680	14.29	32.96	12.04	662.06
03:00 PM	1740	14.31	33.00	12.02	662.08
04:00 PM	1800	14.31	33.02	12.01	662.09
05:00 PM	1860	14.32	33.04	12.00	662.10
06:00 PM	1920	14.33	33.05	11.99	662.11
07:00 PM	1980	14.34	33.08	11.98	662.12
08:00 PM	2040	14.34	33.08	11.97	662.13
09:00 PM	2100	14.34	33.08	11.96	662.15
10:00 PM	2160	14.34	33.08	11.94	662.16
11:00 PM	2220	14.35	33.11	11.93	662.17
02/28/97					
12:00 AM	2280	14.36	33.11	11.92	662.18
01:00 AM	2340	14.35	33.11	11.91	662.19
02:00 AM	2400	14.36	33.11	11.89	662.21
03:00 AM	2460	14.36	33.11	11.88	662.22
04:00 AM	2520	14.36	33.12	11.87	662.23
05:00 AM	2580	14.36	33.12	11.86	662.24
06:00 AM	2640	14.36	33.13	11.85	662.25
07:00 AM	2700	14.37	33.14	11.84	662.27
08:00 AM	2760	14.38	33.16	11.82	662.28
09:00 AM	2820	14.39	33.18	11.81	662.29
10:00 AM	2880	14.39	33.20	11.80	662.30
11:00 AM	2940	14.39	33.20	11.79	662.31
12:00 PM	3000	14.40	33.21	11.78	662.32
01:00 PM	3060	14.39	33.18	11.77	662.33
02:00 PM	3120	14.37	33.15	11.75	662.35
03:00 PM	3180	14.36	33.12	11.74	662.36
04:00 PM	3240	14.34	33.09	11.73	662.38
05:00 PM	3300	14.32	33.04	11.71	662.39
06:00 PM	3360	14.33	33.04	11.70	662.40

Ground-Water Investigation in Ogden Township for the Village of Homer
Ground-Water Levels and Barometric Pressure Data,
February 26 - March 12, 1997

Date/ hour	Elapsed time (min)	Approximate barometric pressure (psia)	Approximate barometric pressure (ft of water)	OW 2 (TH 4-96) Depth to water (ft)	OW 2 (TH 4-96) Approximate water elevation (ft msl)
07:00 PM	3420	14.32	33.04	11.69	662.41
08:00 PM	3480	14.31	33.00	11.68	662.42
09:00 PM	3540	14.28	32.95	11.67	662.43
10:00 PM	3600	14.28	32.93	11.66	662.44
11:00 PM	3660	14.27	32.90	11.64	662.46
03/01/97					
12:00 AM	3720	14.25	32.88	11.63	662.47
01:00 AM	3780	14.25	32.87	11.62	662.49
02:00 AM	3840	14.25	32.86	11.61	662.50
03:00 AM	3900	14.24	32.85	11.59	662.51
04:00 AM	3960	14.25	32.87	11.58	662.52
05:00 AM	4020	14.25	32.88	11.57	662.53
06:00 AM	4080	14.27	32.91	11.55	662.55
07:00 AM	4140	14.26	32.90	11.54	662.56
08:00 AM	4200	14.28	32.93	11.53	662.57
09:00 AM	4260	14.28	32.95	11.51	662.59
10:00 AM	4320	14.29	32.96	11.51	662.59
11:00 AM	4380	14.29	32.97	11.50	662.61
12:00 PM	4440	14.29	32.96	11.48	662.62
01:00 PM	4500	14.28	32.94	11.47	662.63
02:00 PM	4560	14.26	32.89	11.45	662.65
03:00 PM	4620	14.26	32.90	11.44	662.66
04:00 PM	4680	14.26	32.89	11.43	662.67
05:00 PM	4740	14.26	32.89	11.42	662.68
06:00 PM	4800	14.26	32.90	11.41	662.69
07:00 PM	4860	14.28	32.93	11.39	662.71
08:00 PM	4920	14.25	32.87	11.38	662.73
09:00 PM	4980	14.24	32.86	11.36	662.74
10:00 PM	5040	14.28	32.93	11.36	662.74
11:00 PM	5100	14.27	32.92	11.34	662.76
03/02/97					
12:00 AM	5160	14.27	32.92	11.33	662.78
01:00 AM	5220	14.28	32.94	11.31	662.79
02:00 AM	5280	14.29	32.95	11.30	662.80
03:00 AM	5340	14.30	32.98	11.29	662.81
04:00 AM	5400	14.31	33.01	11.27	662.83
05:00 AM	5460	14.31	33.02	11.26	662.84
06:00 AM	5520	14.32	33.02	11.25	662.85
07:00 AM	5580	14.33	33.05	11.25	662.85
08:00 AM	5640	14.34	33.08	11.23	662.87
09:00 AM	5700	14.36	33.11	11.22	662.88
10:00 AM	5760	14.36	33.12	11.21	662.90
11:00 AM	5820	14.37	33.14	11.20	662.90
12:00 PM	5880	14.37	33.15	11.19	662.91
01:00 PM	5940	14.37	33.15	11.18	662.92
02:00 PM	6000	14.36	33.12	11.16	662.94
03:00 PM	6060	14.37	33.15	11.15	662.95
04:00 PM	6120	14.37	33.14	11.14	662.96
05:00 PM	6180	14.38	33.17	11.13	662.97
06:00 PM	6240	14.38	33.17	11.11	662.99
07:00 PM	6300	14.37	33.14	11.10	663.00
08:00 PM	6360	14.37	33.15	11.09	663.01
09:00 PM	6420	14.36	33.13	11.08	663.02
10:00 PM	6480	14.35	33.10	11.06	663.04
11:00 PM	6540	14.33	33.06	11.05	663.05
03/03/97					
12:00 AM	6600	14.32	33.03	11.04	663.06
01:00 AM	6660	14.31	33.01	11.03	663.07
02:00 AM	6720	14.31	33.00	11.03	663.08

Ground-Water Investigation in Ogden Township for the Village of Homer
Ground-Water Levels and Barometric Pressure Data,
February 26 - March 12, 1997

Date/ hour	*Elapsed time (min)*	*Approximate barometric pressure (psia)*	*Approximate barometric pressure (ft of water)*	*OW 2 (TH 4-96) Depth to water (ft)*	*OW 2 (TH 4-96) Approximate water elevation (ft msl)*
03:00 AM	6780	14.29	32.96	11.01	663.09
04:00 AM	6840	14.28	32.93	10.99	663.11
05:00 AM	6900	14.28	32.93	10.98	663.12
06:00 AM	6960	14.27	32.92	10.98	663.12
07:00 AM	7020	14.27	32.91	10.97	663.13
08:00 AM	7080	14.28	32.93	10.96	663.14
09:00 AM	7140	14.28	32.95	10.94	663.16
10:00 AM	7200	14.29	32.95	10.93	663.17
11:00 AM	7260	14.29	32.96	10.93	663.18
12:00 PM	7320	14.30	32.98	10.91	663.19
01:00 PM	7380	14.29	32.97	10.91	663.19
02:00 PM	7440	14.29	32.95	10.89	663.21
03:00 PM	7500	14.29	32.96	10.88	663.22
04:00 PM	7560	14.28	32.95	10.88	663.22
05:00 PM	7620	14.29	32.95	10.87	663.24
06:00 PM	7680	14.28	32.95	10.85	663.25
07:00 PM	7740	14.29	32.96	10.84	663.26
08:00 PM	7800	14.29	32.97	10.83	663.27
09:00 PM	7860	14.29	32.97	10.82	663.28
10:00 PM	7920	14.30	32.98	10.81	663.29
11:00 PM	7980	14.30	32.98	10.80	663.30
03/04/97					
12:00 AM	8040	14.30	32.98	10.79	663.31
01:00 AM	8100	14.29	32.96	10.78	663.32
02:00 AM	8160	14.28	32.93	10.77	663.33
03:00 AM	8220	14.28	32.94	10.76	663.34
04:00 AM	8280	14.29	32.97	10.75	663.35
05:00 AM	8340	14.29	32.96	10.75	663.36
06:00 AM	8400	14.30	32.98	10.73	663.37
07:00 AM	8460	14.31	33.00	10.73	663.37
08:00 AM	8520	14.32	33.03	10.71	663.39
09:00 AM	8580	14.34	33.07	10.70	663.40
10:00 AM	8640	14.34	33.09	10.70	663.40
11:00 AM	8700	14.35	33,10	10.69	663.41
12:00 PM	8760	14.36	33.12	10.69	663.42
01:00 PM	8820	14.36	33.12	10.67	663.43
02:00 PM	8880	14.36	33.12	10.66	663.44
03:00 PM	8940	14.36	33.11	10.65	663.45
04:00 PM	9000	14.35	33.10	10.64	663.46
05:00 PM	9060	14.35	33.11	10.63	663.47
06:00 PM	9120	14.36	33.12	10.62	663.48
07:00 PM	9180	14.36	33.12	10.61	663.49
08:00 PM	9240	14.36	33.12	10.60	663.50
09:00 PM	9300	14.36	33.12	10.59	663.51
10:00 PM	9360	14.37	33.14	10.58	663.52
11:00 PM	9420	14.36	33.13	10.58	663.53
03/05/97					
12:00 AM	9480	14.35	33.10	10.56	663.54
01:00 AM	9540	14.34	33.08	10.54	663.56
02:00 AM	9600	14.34	33.07	10.53	663.58
03:00 AM	9660	14.33	33.05	10.50	663.60
04:00 AM	9720	14.32	33.02	10.49	663.61
05:00 AM	9780	14.31	33.01	10.48	663.62
06:00 AM	9840	14.31	33.01	10.47	663.63
07:00 AM	9900	14.32	33.03	10.47	663.63
08:00 AM	9960	14.34	33.08	10.46	663.65
09:00 AM	10020	14.34	33.08	10.45	663.65
10:00 AM	10080	14.33	33.06	10.44	663.66
11:00 AM	10140	14.30	32.99	10.43	663.67
12:00 PM	10200	14.30	32.99	10.41	663.69

Ground-Water Investigation in Ogden Township for the Village of Homer
Ground-Water Levels and Barometric Pressure Data,
February 26 - March 12, 1997

Date/ hour	*Elapsed time (min)*	*Approximate barometric pressure (psia)*	*Approximate barometric pressure (ft of water)*	*OW 2 (TH 4-96) Depth to water (ft)*	*OW 2 (TH 4-96) Approximate water elevation (ft msl)*
01:00 PM	10260	14.31	33.00	10.41	663.69
02:00 PM	10320	14.31	33.01	10.40	663.70
03:00 PM	10380	14.32	33.02	10.40	663.70
04:00 PM	10440	14.32	33.04	10.39	663.71
05:00 PM	10500	14.33	33.06	10.38	663.72
06:00 PM	10560	14.35	33.09	10.38	663.72
07:00 PM	10620	14.36	33.13	10.37	663.73
08:00 PM	10680	14.37	33.15	10.36	663.74
09:00 PM	10740	14.38	33.18	10.35	663.75
10:00 PM	10800	14.39	33.20	10.35	663.75
11:00 PM	10860	14.39	33.20	10.34	663.77
03/06/97					
12:00 AM	10920	14.39	33.19	10.33	663.77
01:00 AM	10980	14.39	33.20	10.32	663.78
02:00 AM	11040	14.39	33.19	10.31	663.79
03:00 AM	11100	14.39	33.19	10.30	663.80
04:00 AM	11160	14.39	33.19	10.30	663.81
05:00 AM	11220	14.39	33.20	10.29	663.82
06:00 AM	11280	14.39	33.20	10.28	663.82
07:00 AM	11340	14.40	33.22	10.28	663.82
08:00 AM	11400	14.42	33.27	10.27	663.83
09:00 AM	11460	14.43	33.28	10.27	663.83
10:00 AM	11520	14.44	33.31	10.27	663.83
11:00 AM	11580	14.45	33.34	10.25	663.85
12:00 PM	11640	14.46	33.35	10.25	663.85
01:00 PM	11700	14.45	33.34	10.24	663.86
02:00 PM	11760	14.46	33.35	10.24	663.86
03:00 PM	11820	14.46	33.36	10.23	663.87
04:00 PM	11880	14.47	33.37	10.22	663.88
05:00 PM	11940	14.47	33.37	10.22	663.88
06:00 PM	12000	14.47	33.38	10.21	663.89
07:00 PM	12060	14.48	33.39	10.20	663.90
08:00 PM	12120	14.48	33.41	10.20	663.90
09:00 PM	12180	14.48	33.41	10.19	663.91
10:00 PM	12240	14.49	33.41	10.18	663.92
11:00 PM	12300	14.49	33.41	10.18	663.92
03/07/97					
12:00 AM	12360	14.48	33.40	10.17	663.94
01:00 AM	12420	14.47	33.39	10.16	663.94
02:00 AM	12480	14.47	33.37	10.16	663.94
03:00 AM	12540	14.46	33.35	10.15	663.95
04:00 AM	12600	14.47	33.37	10.15	663.95
05:00 AM	12660	14.47	33.37	10.15	663.95
06:00 AM	12720	14.47	33.38	10.14	663.96
07:00 AM	12780	14.47	33.38	10.13	663.97
08:00 AM	12840	14.48	33.40	10.13	663.97
09:00 AM	12900	14.48	33.39	10.13	663.97
10:00 AM	12960	14.47	33.39	10.13	663.97
11:00 AM	13020	14.46	33.36	10.12	663.98
12:00 PM	13080	14.45	33.33	10.11	663.99
01:00 PM	13140	14.44	33.30	10.11	663.99
02:00 PM	13200	14.42	33.27	10.11	663.99
03:00 PM	13260	14.41	33.24	10.09	664.01
04:00 PM	13320	14.40	33.21	10.08	664.02
05:00 PM	13380	14.38	33.17	10.09	664.01
06:00 PM	13440	14.38	33.16	10.08	664.02
07:00 PM	13500	14.37	33.14	10.07	664.03
08:00 PM	13560	14.36	33.13	10.06	664.04
09:00 PM	13620	14.36	33.12	10.06	664.04

Ground-Water Investigation in Ogden Township for the Village of Homer
Ground-Water Levels and Barometric Pressure Data,
February 26 - March 12, 1997

Date/ hour	*Elapsed time (min)*	*Approximate barometric pressure (psia)*	*Approximate barometric pressure (ft of water)*	*OW 2 (TH 4-96) Depth to water (ft)*	*OW 2 (TH 4-96) Approximate water elevation (ft msl)*
10:00 PM	13680	14.36	33.11	10.06	664.05
11:00 PM	13740	14.35	33.10	10.05	664.05
03/08/97					
12:00 AM	13800	14.35	33.09	10.05	664.05
01:00 AM	13860	14.35	33.09	10.04	664.06
02:00 AM	13920	14.35	33.09	10.03	664.07
03:00 AM	13980	14.35	33.11	10.03	664.07
04:00 AM	14040	14.36	33.13	10.02	664.08
05:00 AM	14100	14.39	33.18	10.01	664.09
06:00 AM	14160	14.40	33.23	10.01	664.09
07:00 AM	14220	14.42	33.26	10.01	664.10
08:00 AM	14280	14.45	33.32	10.00	664.10
09:00 AM	14340	14.47	33.37	9.99	664.11
10:00 AM	14400	14.49	33.41	9.99	664.11
11:00 AM	14460	14.49	33.42	9.99	664.11
12:00 PM	14520	14.51	33.47	9.98	664.12
01:00 PM	14580	14.51	33.47	9.98	664.12
02:00 PM	14640	14.51	33.47	9.98	664.12
03:00 PM	14700	14.51	33.47	9.97	664.13
04:00 PM	14760	14.51	33.47	9.96	664.14
05:00 PM	14820	14.51	33.47	9.96	664.14
06:00 PM	14880	14.50	33.45	9.95	664.15
07:00 PM	14940	14.49	33.43	9.95	664.15
08:00 PM	15000	14.48	33.41	9.95	664.16
09:00 PM	15060	14.48	33.40	9.95	664.16
10:00 PM	15120	14.47	33.38	9.94	664.16
11:00 PM	15180	14.46	33.36	9.94	664.17
03/09/97					
12:00 AM	15240	14.45	33.34	9.93	664.17
01:00 AM	15300	14.44	33.31	9.93	664.17
02:00 AM	15360	14.43	33.27	9.92	664.18
03:00 AM	15420	14.41	33.23	9.92	664.18
04:00 AM	15480	14.40	33.22	9.92	664.18
05:00 AM	15540	14.40	33.21	9.92	664.18
06:00 AM	15600	14.39	33.19	9.91	664.19
07:00 AM	15660	14.37	33.15	9.90	664.20
08:00 AM	15720	14.34	33.08	9.90	664.20
09:00 AM	15780	14.33	33.05	9.89	664.21
10:00 AM	15840	14.34	33.07	9.88	664.22
11:00 AM	15900	14.33	33.05	9.88	664.22
12:00 PM	15960	14.31	33.01	9.87	664.23
01:00 PM	16020	14.30	32.97	9.85	664.25
02:00 PM	16080	14.30	32.97	9.84	664.26
03:00 PM	16140	14.31	33.01	9.84	664.26
04:00 PM	16200	14.33	33.05	9.84	664.26
05:00 PM	16260	14.35	33.09	9.84	664.27
06:00 PM	16320	14.37	33.15	9.83	664.27
07:00 PM	16380	14.39	33.19	9.82	664.28
08:00 PM	16440	14.39	33.20	9.82	664.28
09:00 PM	16500	14.40	33.21	9.81	664.29
10:00 PM	16560	14.40	33.22	9.81	664.29
11:00 PM	16620	14.40	33.22	9.81	664.29
03/10/97					
12:00 AM	16680	14.40	33.21	9.80	664.30
01:00 AM	16740	14.39	33.20	9.79	664.31
02:00 AM	16800	14.39	33.20	9.79	664.31
03:00 AM	16860	14.39	33.19	9.79	664.31
04:00 AM	16920	14.39	33.18	9.78	664.32
05:00 AM	16980	14.39	33.19	9.78	664.32

Ground-Water Investigation in Ogden Township for the Village of Homer
Ground-Water Levels and Barometric Pressure Data,
February 26 - March 12, 1997

				OW 2 (TH 4-96)	
Date/ hour	*Elapsed time (min)*	*Approximate barometric pressure (psia)*	*Approximate barometric pressure (ft of water)*	*Depth to water (ft)*	*Approximate water elevation (ft msl)*
06:00 AM	17040	14.38	33.18	9.77	664.33
07:00 AM	17100	14.38	33.17	9.77	664.33
08:00 AM	17160	14.39	33.20	9.77	664.33
09:00 AM	17220	14.40	33.22	9.77	664.33
10:00 AM	17280	14.41	33.23	9.76	664.34
11:00 AM	17340	14.40	33.22	9.76	664.34
12:00 PM	17400	14.40	33.22	9.76	664.34
01:00 PM	17460	14.38	33.17	9.76	664.34
02:00 PM	17520	14.37	33.14	9.75	664.35
03:00 PM	17580	14.36	33.12	9.75	664.35
04:00 PM	17640	14.34	33.08	9.74	664.36
05:00 PM	17700	14.33	33.05	9.74	664.36
06:00 PM	17760	14.32	33.02	9.73	664.37
07:00 PM	17820	14.31	33.02	9.72	664.38
08:00 PM	17880	14.32	33.02	9.72	664.38
09:00 PM	17940	14.31	33.00	9.72	664.39
10:00 PM	18000	14.29	32.96	9.72	664.38
11:00 PM	18060	14.29	32.96	9.71	664.39
03/11/97					
12:00 AM	18120	14.29	32.96	9.71	664.40
01:00 AM	18180	14.29	32.96	9.71	664.40
02:00 AM	18240	14.28	32.93	9.70	664.40
03:00 AM	18300	14.28	32.93	9.70	664.40
04:00 AM	18360	14.29	32.96	9.69	664.41
05:00 AM	18420	14.30	32.99	9.69	664.41
06:00 AM	18480	14.31	33.01	9.68	664.42
07:00 AM	18540	14.34	33.07	9.68	664.42
08:00 AM	18600	14.36	33.12	9.68	664.42
09:00 AM	18660	14.38	33.17	9.67	664.43
10:00 AM	18720	14.40	33.22	9.67	664.43
11:00 AM	18780	14.42	33.26	9.66	664.44
12:00 PM	18840	14.43	33.28	9.66	664.44
01:00 PM	18900	14.43	33.28	9.66	664.44
02:00 PM	18960	14.43	33.29	9.66	664.44
03:00 PM	19020	14.44	33.31	9.66	664.45
04:00 PM	19080	14.44	33.31	9.65	664.45
05:00 PM	19140	14.44	33.32	9.65	664.45
06:00 PM	19200	14.44	33.32	9.64	664.46
07:00 PM	19260	14.45	33.32	9.64	664.46
08:00 PM	19320	14.45	33.32	9.63	664.47
09:00 PM	19380	14.45	33.32	9.63	664.47
10:00 PM	19440	14.45	33.33	9.62	664.48
11:00 PM	19500	14.44	33.32	9.62	664.48
03/12/97					
12:00 AM	19560	14.44	33.30	9.62	664.48
01:00 AM	19620	14.44	33.31	9.62	664.48
02:00 AM	19680	14.45	33.33	9.62	664.48
03:00 AM	19740	14.45	33.34	9.61	664.49
04:00 AM	19800	14.45	33.33	9.61	664.49
05:00 AM	19860	14.46	33.35	9.61	664.50
06:00 AM	19920	14.46	33.35	9.61	664.50
07:00 AM	19980	14.47	33.37	9.61	664.49
08:00 AM	20040	14.48	33.39	9.61	664.50

Notes:

*Ground-water levels recovering from aquifer test

Appendix K.

Correspondence:

Illinois State Geological Survey:
Description of Aquifer Samples for Test Hole 1-96, January 22, 1997

Illinois State Water Survey:
Summary of Results of the Aquifer Test, April 15, 1997

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

ILLINOIS STATE GEOLOGICAL SURVEY

Natural Resources Building
615 East Peabody Drive
Champaign, IL 61820-6964
217/333-4747
FAX 217/244-7004

January 22, 1997

Mr. Andy Keiser
Sodemann & Associates
340 N. Main St.
Champaign, IL 61820

Re: Homer Test Hole #1-96

Dear Mr. Keiser:

At your request, a sieve analysis has been run on selected rotary drill samples from the Village of Homer Test Hole #1-96 and the results of this analysis are reported below and on the enclosed data sheets and graphics. This test hole is located approximately 3975 feet from the north line and about 2200 feet from the west line of Section 18, T. 19N., R.14W., Champaign County, Illinois. Drilling was done by Layne Western Company. Inc. (Aurora) on December 17, 1996.

The Homer 7-1/2 minute topographic quadrangle map reports an elevation of 669 feet above mean sea level where the property boundary immediately to the south intersects the road a few tens of feet southwest of the test site.

The driller's log reports sand and/or gravel with some thin clay lenses from 46 to 147 feet. Bedrock was encountered at 147 feet in this test that was drilled to 170 feet. The geophysical logs run by Mr. Tim Young of the Geological Survey on December 26, 1996, show coarse-grained material below a depth of about 45 feet along with several interbedded horizons of finer-grained materials.

A summary of the analysis results is given on the first enclosure item. The results are reported as cumulative percent of sample retained on me designated mesh sieves. Invoice #134 is enclosed to cover the cost of running the analysis of 6 samples in the ISGS Geotechnicai Laboratory. The analysis results have been directed to the State Water Survey for preparation of a design recommendation for the proposed test well.

Sieve Analysis Results							
Homer Test Hole #1-96 (proposed site of test well) -3975 ft N.L., -2200 ft W.L. Section 18, T.19N., R.14W., Champaign County							
Job No. 953							
File No.		10935	10936	10937	10937	10938	10939
Sample Interval		90-100'	100-105'	110-115'	125-130'	135-140'	140-145'
Sieve Mesh Size							
Inch	mm						
0.792	8.00	-			0.0%	0.7%	-
0.223	5.66	-			14.6	3.7	11.7%
0.157	4.00	11.0%	15.4%	2.2	54.4	15.3	38.8
0.111	2.83	23.5	27.4	4.8	84.6	36.7	68.2
0.079	2.00	38.4	41.5	11.1	95.1	60.5	83.1
0.055	1.41	54.4	57.9	25.1	98.1	88.7	94.9
0.039	1.00	63.6	67.4	36.5	98.6	96.6	97.6
0.028	0.707	69.9	71.8	45.0	98.8	98.3	98.2
0.020	0.500	74.8	76.2	56.7		-	98.4
0.014	0.354	83.3	84.1	72.3	99.1	99.2	98.6
0.010	0.250	-	-			-	-
0.007	0.177	96.2	97.3	96.1		-	-
PAN		100.0	99.9	99.9	99.9	99.9	99.9

Sample intervals were selected to characterize the coarse-grained materials found below a depth of 90 feet. A visual description of each sample below 90 feet is included below for comparison of the sieved and non sieved samples.

<u>Sample description</u>	<u>sample depth interval</u> (in feet)
Split spoon samples and washed sample from same interval are composed of fine to medium sand, some coarse sand, trace very coarse sand, occasional gravel pebble, some to abundant very fine sand; grain size appears to increase somewhat downward	74 & 76 74 - 76
Very coarse sand to fine gravel, abundant medium to coarse sand, some/little medium gravel, trace coarse gravel; analysis indicates median grain size of 0.065 inch	90 - 100

Very coarse sand to fine gravel (greater amount of fine gravel than above), some medium gravel; trace coarse gravel, some medium to coarse sand; median grain size estimated at 0.075 to 0.085 inch	100 - 105
Very coarse sand to fine gravel, abundant medium to coarse sand, some medium gravel, trace coarse gravel; analysis indicates median grain size of 0.069 inch	105 - 110
Medium to very coarse sand, little fine gravel, trace medium gravel, little fine sand; analysis indicates median grain size of 0.025 inch	110-115
no sample	115 - 120
Fine to medium gravel, bare trace coarse gravel, trace very coarse sand; a few fragments of gravel embedded in silt and fine sand; median grain size estimated at 0.175 to 0.185 inch	120- 125
Fine to medium gravel, trace very coarse sand; analysis indicates median grain size of 0.170 inch	125 - 130
Fine to medium gravel, some very coarse sand, trace coarse sand, bare trace coarse gravel; median grain size estimated at 150 to 160 inch	130 - 135
Very coarse sand to fine gravel, some medium gravel, trace coarse sand; analysis indicates median grain size of 0.097 inch	135 - 140
Fine to medium gravel, some very coarse sand, little/trace coarse sand, bare trace coarse gravel; analysis indicates median grain size of 0.143 inch	140 - 145.

A broad range of colors (grayish white, gray, light browns, and dark gray to black colors) and predominantiy sedimentary rock types were noted in the coarser fractions of samples from depths greater than 90 feet. The finer sand fractions are mainly light brown to brownish-gray in color. Grain shapes are mostly subangular to subrounded with a few clasts having angular edges. The few fragments with very sharp edges were probably broken by the drill bit. Heavy washing of these samples during drilling may have removed a significant amount of fines.

The plotted data curves for samples above 115 feet exhibit a somewhat bimodal pattern, suggesting the presence of interbedding of finer and coarser-grained materials. The sample with the smallest median grain size of the samples examined came from the 110 to 115-foot interval. The geophysical logs and driller's description suggest the finest-grained interval below 90 feet is in the 115 to 120-foot interval. This interval probably includes material similar in size to that found in the overlying 110 to 115-foot interval, a fine to very sand horizon overlying a thin silt or clay, and a basal zone of much coarser-grained material, the upper part of an older cycle of sedimentation that extends to the bedrock surface.

In brief summary, the geophysical logs suggest the presence of an upper interval of fairly uniform but relatively fine-grained sand from 45 feet to 93 feet and a lower interval of gravel and sand and gravel from 93 feet to the bedrock surface at 147 feet. The increase in variability below 93 feet is related to interbedded layers of coarser and finer grained materials. The greatest contrast in grain size appears to be present in the 110 to 120-foot interval where the finer-grained intervals are more dominant. A very coarse sand with some fine gravel at the top is separated from a thin basal layer of fine gravel and abundant very coarse sand by an intermediate interval of relatively fine-grained sand overlying a silt or clay horizon. The fine-grained character of the sediment in the lower part of this interval should be given careful consideration in the design of the well. The finest-grained interval below 120 feet is found from 135 to 140 feet.

Please feel free to call if there are any questions related to the analysis results or to the geologic conditions affecting completion of the proposed test well for the village.

Sincerely,

Ross D. Brower
Staff Geologist

Enclosures

cc: E. W. Sanderson, SWS
IEPA-PWS (2)
T. Young

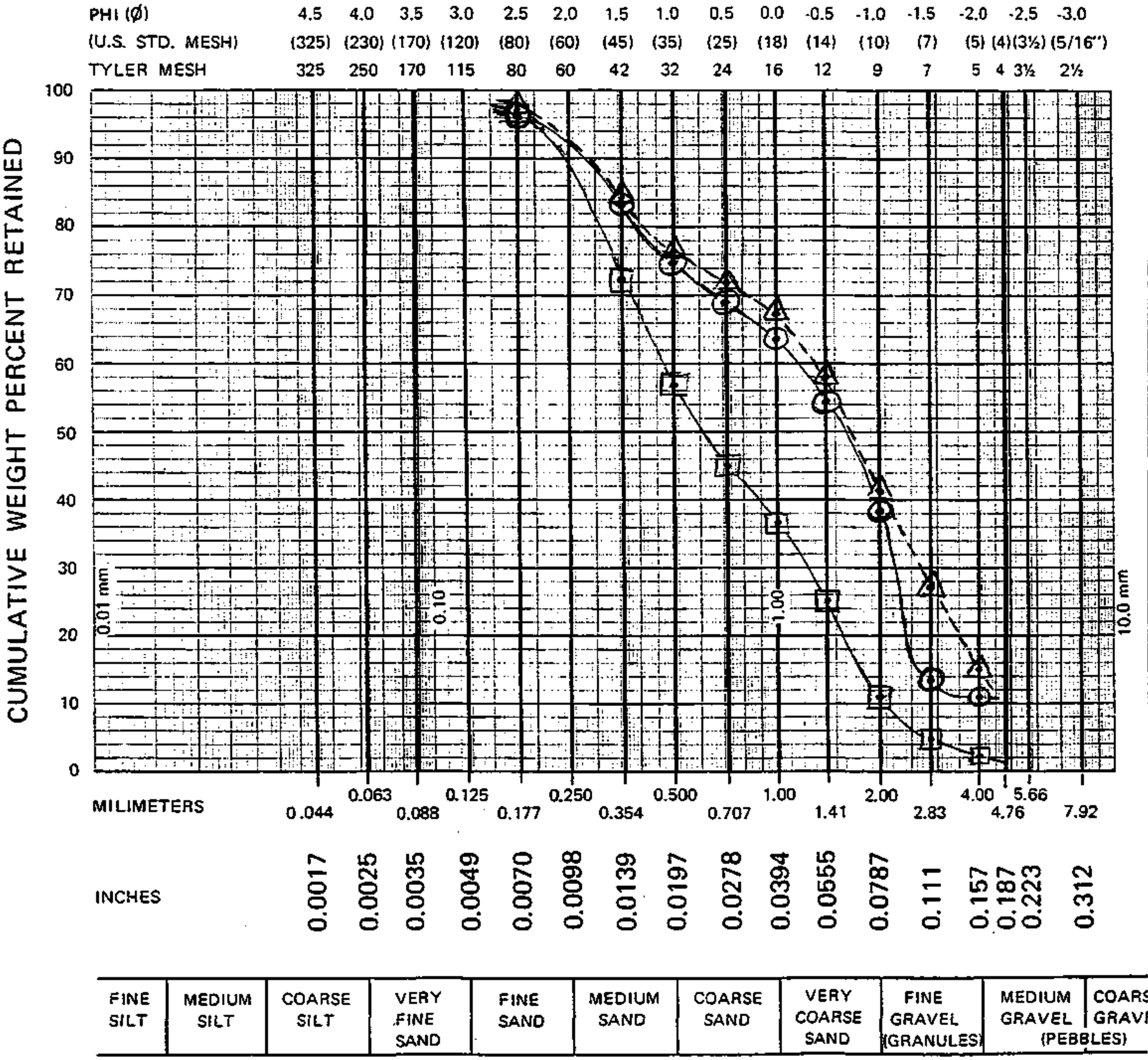
CUMULATIVE FREQUENCY PLOT

ILLINOIS STATE GEOLOGICAL SURVEY

COUNTY CHAMPAIGN
LOC. 3975 N.L. 3?? W.L. 18-19N-14W
PROJECT
WELL No.
S.S. No.
DATE 1/15/97
BY RDB

HOMER TEST HOLE # 1-96

pg 1



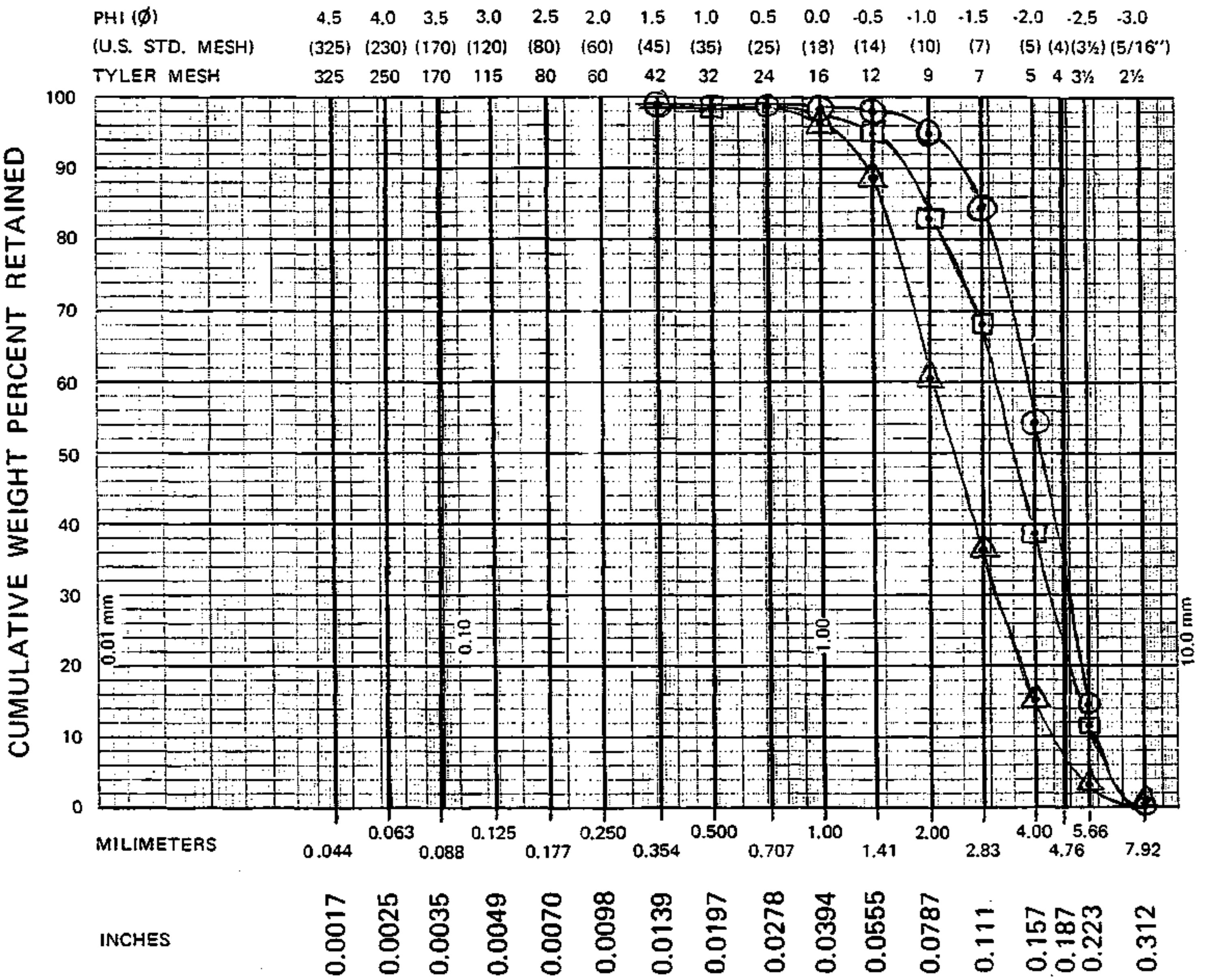
—⊙— 90-100'   - - -Δ- - - 105-110'   —□— 110-115'

CUMULATIVE FREQUENCY PLOT

ILLINOIS STATE GEOLOGICAL SURVEY

COUNTY CHAMPAIGN
LOC. ~398' SNL, 30' WL, 18-19N-14W
PROJECT
WELL No.
S.S. No.
DATE 1/16/97
BY RDB

HOMER TEST HOLE #1-96
Pg 2



FINE SILT	MEDIUM SILT	COARSE SILT	VERY FINE SAND	FINE SAND	MEDIUM SAND	COARSE SAND	VERY COARSE SAND	FINE GRAVEL (GRANULES)	MEDIUM GRAVEL	COARSE GRAVE
									(PEBBLES)	

—⊙— 125-130' —△— 135-140' —□— 140-145'

ISGS GEOTECHNICAL LABORATORY
PARTICLE SIZE CALCULATION WORKSHEET

Sample Name = Homer TH #1-96

Location = ~3975' N.L.,~30' W.L.
Sec. 18 - T19N - R14W (CHM)

Depth = 90-100 ft

Test Date = 12/24/96

Job/Lab Number = J953/10935

Sample Weight = 140.13

Screen Tare Wt	Screen Gross Wt	Screen (mm)	Weight Retained	Cum. Weight	Cum. % Retained	Percent Finer
426.97	442.41	4.00	15.44	15.44	11.02	88.98
496.62	514.08	2.80	17.46	32.90	23.48	76.52
351.33	372.17	2.00	20.84	53.74	38.35	61.65
371.53	393.95	1.40	22.42	76.16	54.35	45.65
360.86	373.80	1.00	12.94	89.10	63.58	36.42
334.72	342.29	.710	7.57	96.67	68.99	31.01
300.95	309.12	.500	8.17	104.84	74.82	25.18
293.26	305.15	.355	11.89	116.73	83.30	16.70
266.23	284.36	.180	18.13	134.86	96.24	3.76
257.18	262.50	pan	5.32	140.18	100.04	-0.04

Grams Retained=	140.18
Grams loss/gain=	0.05
Percent loss/gain=	0.04

NOTE: All weights are grams

COMMENTS:

4.00mm - .71 Oum/Angular - subrounded
.500um/Rounded - well rounded, light quartz
.355um/Dark material ~5%,clear quartz
.180um/Dark material increases ~10%,clear quartz

ISGS GEOTECHNICAL LABORATORY
PARTICLE SIZE CALCULATION WORKSHEET

Sample Name = Homer TH #1-96

Location = ~3975' N.L.,~30' W.L.
Sec. 18 - T19N - R14W (CHM)

Depth = 105-110'

Test Date = 12/24/96

Job/Lab Number = J953/10936

Sample Weight = 136.32

Screen Tare Wt	Screen Gross Wt	Screen (mm)	Weight Retained	Cum. Weight	Cum. % Retained	Percent Finer
426.98	447.93	4.00	20.95	20.95	15.37	84.63
496.64	512.97	2.80	16.33	37.28	27.35	72.65
351.31	370.57	2.00	19.26	56.54	41.48	58.52
371.56	393.93	1.40	22.37	78.91	57.89	42.11
360.86	373.79	1.00	12.93	91.84	67.37	32.63
334.72	340.79	.710	6.07	97.91	71.82	28.18
300.98	L306.95	.500	5.97	103.88	76.20	23.80
293.27	304.04	.355	10.77	114.65	84.10	15.90
266.24	284.17	.180	17.93	132.58	97.26	2.74
257.19	260.76	pan	3.57	136.15	99.88	0.12

Grams Retained=	136.15
Grams loss/gain=	-0.17
Percent loss/gain=	-0.12

NOTE: All weights are grams

Comments:

4.00 - 1.40mm/Angular
1.00mm/Angular - subrounded
.710um - .500um/Subrounded clear quartz
.355um - pan/Dark material,Rounded - well rounded quartz

ISGS GEOTECHNICAL LABORATORY
PARTICLE SIZE CALCULATION WORKSHEET

Sample Name = Homer TH #1-96

Location = ~3975' N.L.,~30' W.L.
Sec. 18 - T19N - R14W (CHM)

Depth= 110-115 ft

Test Date = 12/24/96

Job/Lab Number = J953/10937

Sample Weight = 131.50

Screen Tare Wt	Screen Gross Wt	Screen (mm)	Weight Retained	Cum. Weight	Cum. % Retained	Percent Finer
426.98	429.83	4.00	2.85	2.85	2.17	97.83
496.67	500.19	2.80	3.52	6.37	4.84	95.16
351.32	359.56	2.00	8.24	14.61	11.11	88.89
371.54	389.99	1.40	18.45	33.06	25.14	74.86
360.86	375.83	1.00	14.97	48.03	36.52	63.48
334.69	345.89	.710	11.20	59.23	45.04	54.96
300.98	316.32	.500	15.34	74.57	56.71	43.29
293.27	313.82	.355	20.55	95.12	72.33	27.67
266.22	297.53	.180	31.31	126.43	96.14	3.86
257.18	262.19	pan	5.01	131.44	99.95	0.05

Grams Retained=	131.44
Grams loss/gain=	-0.06
Percent loss/gain=	-0.05

NOTE: All weights are grams

COMMENTS:

4.00 -1.00mm/Angular - subrounded
.710 - .500um/Light quartz, rounded - well rounded
.355um/Dark material ~5%
.180um/Dark material ~10%, well rounded quartz

ISGS GEOTECHNICAL LABORATORY
PARTICLE SIZE CALCULATION WORKSHEET

Sample Name = Homer TH #1-96

Location = ~3975' N.L.,~30' W.L.
Sec. 18 - T19N - R14W (CHM)

Depth= 125-130 ft

Test Date = 12/24/96

Job/Lab Number = J953/10938

Sample Weight = 131.26

Screen Tare Wt	Screen Gross Wt	Screen (mm)	Weight Retained	Cum. Weight	Cum. % Retained	Percent Finer
529.52	529.52	8.00	0.00	0.00	0.00	100.00
432.81	452.00	5.66	19.19	19.19	14.62	85.38
418.49	470.74	4.00	52.25	71.44	54.43	45.57
496.64	536.18	2.80	39.54	110.98	84.55	15.45
399.63	413.50	2.00	13.87	124.85	95.12	4.88
371.55	375.41	1.40	3.86	128.71	98.06	1.94
360.86	361.52	1.00	0.66	129.37	98.56	1.44
333.62	333.93	.710	0.31	129.68	98.80	1.20
294.44	294.82	.355	0.38	130.06	99.09	0.91
300.30	301.37	pan	1.07	131.13	99.90	0.10

Grams Retained=	131.13
Grams loss/gain=	-0.13
Percent loss/gain=	-0.10

NOTE: All weights are grams

COMMENTS:

8.00 - 2.80mm/Subanguiar - rounded
2.00mm - .710um/Subrounded - rounded
.355um/Rounded - well rounded

ISGS GEOTECHNICAL LABORATORY
PARTICLE SIZE CALCULATION WORKSHEET

Sample Name = Homer TH #1-96

Location = ~3975' N.L.,~30' W.L.
Sec. 18 - T19N - R14W (CHM)

Depth= 135-140 ft

Test Date = 12/24/96

Job/Lab Number = J953/10939

Sample Weight = 135.06

Screen Tare Wt	Screen Gross Wt	Screen (mm)	Weight Retained	Cum. Weight	Cum. % Retained	Percent Finer
529.52	530.45	8.00	0.93	0.93	0.69	99.31
432.81	436.84	5.66	4.03	4.96	3.67	96.33
418.49	434.22	4.00	15.73	20.69	15.32	84.68
496.58	525.46	2.80	28.88	49.57	36.70	63.30
399.62	431.73	2.00	32.11	81.68	60.48	39.52
371.55	409.71	1.40	38.16	119.84	88.73	11.27
360.85	371.42	1.00	10.57	130.41	96.56	3.44
333.61	336.00	.710	2.39	132.80	98.33	1.67
294.42	295.54	.355	1.12	133.92	99.16	0.84
300.30	301.25	pan	0.95	134.87	99.86	0.14

Grams Retained=	134.87
Grams loss/gain=	-0.19
Percent loss/gain=	-0.14

NOTE: All weights are grams

COMMENTS:

8.00 - 2.00mm/Subrounded - rounded
1.40 - .710um/Subrounded - well rounded
.355um - pan/ Well rounded

ISGS GEOTECHNICAL LABORATORY
PARTICLE SIZE CALCULATION WORKSHEET

Sample Name = Homer TH #1-96

Location = ~3975' N.L,~30' W.L.
Sec. 18 - T19N - R14W (CHM)

Depth = 140-145 ft

Test Date = 12/24/96

Job/Lab Number = J953/10940

Sample Weight = 143.48

Screen Tare Wt	Screen Gross Wt	Screen (mm)	Weight Retained	Cum. Weight	Cum. % Retained	Percent Finer
432.80	449.53	5.66	16.73	16.73	11.66	88.34
426.98	465.85	4.00	38.87	55.60	38.75	61.25
496.63	538.84	2.80	42.21	97.81	68.17	31.83
351.32	372.67	2.00	21.35	119.16	83.05	16.95
371.54	388.52	1.40	16.98	136.14	94.88	5.12
360.84	364.72	1.00	3.88	140.02	97.59	2.41
334.68	335.47	.710	0.79	140.81	98.14	1.86
300.99	301.36	.500	0.37	141.18	98.40	1.60
293.29	293.58	.355	0.29	141.47	98.60	1.40
257.19	259.06	pan	1.87	143.34	99.90	0.10

Grams Retained=	143.34
Grams loss/gain=	-0.14
Percent loss/gain=	-0.10

NOTE: All weights are grams

COMMENTS:

5.66 - 2.00mm/Angular & Subrounded

1.40mm - .710um/Subangular & Rounded

.500um - pan/Few subangular~1%, rounded - well rounded quartz

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

Illinois State Water Survey

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SWS

Hydrology Division • *Tel (217) 333-4300* • *Fax (217) 244-0777*

April 15, 1997

Mr. Andrew Kieser
Sodemann and Associates, Inc.
340 North Neil Street
P.O. Box 557
Champaign, IL 61824-0557

Dear Mr. Kieser:

We have completed our analysis of data collected by the State Water Survey and the Village of Homer during the aquifer test conducted February 17-24, 1997, on the Village of Homer Test Well 1-97, located approximately 1340 ft N. and 2550 ft W. of the SE corner, Section 18, T.19N., R.14W., Champaign County.

Test Well 1-97 was pumped for approximately 10,000 minutes at a continuous rate of 195 gallons per minute (gpm). During the test water levels were monitored in the pumped well and in observation wells located 53.7 feet west, 263.4 feet northeast, and 1290 feet north of TW 1-97. At the end of the test the specific capacity (yield per foot of drawdown) of TW 1 -97 was 21.2 gpm/ft.

Drillers logs show that a considerable thickness of sand and gravel material is present at TW 1-97, which is very unusual for that location in east-central Illinois. Water-level data from the test, on the other hand, revealed the presence of numerous hydrologic barrier boundaries, indicating that the aquifer is of limited areal extent. While the pumping rate during the test was impressive for this location, on a long-term basis the barrier boundaries might limit the sustained yield of a production well at the site by causing excessive drawdowns.

It is our understanding that a long-term yield of approximately 100 gpm is desired from this site. Based on the test data, it appears that a 100 gpm yield is feasible on a sustained basis from either one or two wells. We would suggest that a production well be constructed at the site of TW 1-97, since that location would seem to have the greatest thickness of aquifer material. The well screen should be placed near the bottom of the aquifer, in order to take maximum advantage of the available drawdown. In view of the limited areal extent of the aquifer, we suggest that water levels in an observation well and in the production well(s) be monitored periodically during the first few years of operation.

The chemical analysis of water samples collected from TW 1-97 during the test was sent to you under separate cover. If you have any questions regarding our data analysis, please call us.

Sincerely,

Adrian P. Visocky, Director
Office of Ground-Water Resource
Evaluation and Management
Phone:(217)333-1724

apv/psl

c: Mr. John Stayton
IEPA
Ellis Sanderson

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