ASSESSING GEOTHERMAL ENERGY POTENTIAL

IN UPSTATE NEW YORK

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ABSTRACT

The potential of geothermal energy for future electric power generation in New York State is evaluated using estimates of temperatures of geothermal reservoir rocks. Bottom hole temperatures from over 2000 oil and gas wells in the region were integrated into subsurface maps of the temperatures for specific geothermal reservoirs. The Theresa/ Potsdam formation provides the best potential for extraction of high volumes geothermal fluids. The evaluation of the Theresa/ Potsdam geothermal reservoir in upstate New York suggests that an area 30 miles east of Elmira, New York has the highest temperatures in the reservoir rock. The Theresa/Potsdam reservoir rock should have temperatures about 136 ^{o}C and may have as much as 450 feet of porosity in excess of 8%. Estimates of the volumes of geothermal fluids that can be extracted are provided and environmental considerations for production from a geothermal well is discussed.

Key Words: Geothermal energy, geology, electric power, New York State, environmental impact geothermal.

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SUMMARY

The potential of new sources of energy for electric power must be evaluated many years prior to the actual development of the resource. The recent development of geothermal energy for electric power and for low temperature heating in Japan, France, New Zealand and western US indicates that geothermal energy is economical in some locations and may become in the future an important source of energy for regions such as New York. New York has deep geothermal reservoirs that may someday be economical to extract the hot waters and to convert to electric power.

Upstate New York is underlain locally by sedimentary rocks that dip very gently to the south. From about 900 meters thickness in the northern part of upstate New York the sedimentary rocks increase in thickness to over 3400 meters. The principle geothermal reservoir rock is the Theresa and the Potsdam formations. These formations are inter-layered sandstones and limestones with the total thickness of these units about 1000 feet (315 m) to the south. In local regions, porosity of these formations exceeds 10 percent and large volumes of brine water can be extracted. The combination of thick, high porosity zones and high temperatures in the reservoir rock would be the objective for siting a geothermal power plant.

Previous geothermal studies by Hodge and Fromm (1984) found that there is considerable variation in the heat flux throughout upstate New York. In particular there is a region of high geothermal heat flow that trends roughly north-south and is centered over the Finger Lakes with the northern extremity near Auburn, NY. Heat flow values in western New York are about 50-54 mW/m^2 but rise to as high as 80 mW/m^2 over this north-south trending anomaly in the Finger Lakes. Part of the objective of this study is to evaluate the temperatures and heat flow in more detail than the Hodge and Fromm study and to isolate a region with the highest temperatures for an economic evaluation of the use of geothermal energy in electric power generation

Using bottom hole temperatures (BHT) from oil and gas wells, subsurface temperature maps at specific depths are determined. Because the BHT's are determined at different depths, a model of thermal conductivity for the region is determined in order to project temperatures to a specific depth from the single BHT. The temperature map of the top of the geothermal reservoir (Theresa/Potsdam) shows that temperatures generally increase towards the south. Near Elmira, NY the temperatures at the top of the Theresa reach a

maximum of about 130 °C. The Theresa and Potsdam are deep in this region and the north-south high heat flow crosses this region. This region is chosen as the site to evaluate the economics of the development of a electric power facility using geothermal energy.

Section 1
INTRODUCTION

The potential of new sources of energy for electric power must be evaluated many years prior to the actual development of the resource. The recent development of geothermal energy for electric power and for low temperature heating in Japan, France, New Zealand and western US indicates that geothermal energy is economical in some locations and may become in the future an important source of energy for regions such as New York.

In New York State the electric power utilities have used the available hydroelectric capacity to its maximum, new nuclear power generation has been suspended, and coal generating power plants have substantial environmental problems that must be overcome. In the future, power generation in the State may involve new technologies and the evaluation of these future technologies is important for long range planning. New York State is fortunate to have geologic subsurface conditions that are conducive to the use of geothermal energy. Sedimentary rocks in the southern part of New York State are located deep within the Appalachian basin and these reservoir rocks have the ability to yield large volumes of geothermal fluids. The temperatures of the reservoir fluids and the costs of retrieval of these fluids is the most important consideration for evaluating the potential of use in power generation.

GEOLOGIC SETTING OF SEDIMENTARY ROCKS IN THE APPALACHIAN BASIN

The basic geology of western and central New York State, located in the northern portion of the Appalachian Basin, consists of Cambrian through Devonian sedimentary units that unconformably overlie crystalline Precambrian basement. Regional geologic structure is fairly simple (Figure 1-1): the units dip to the south approximately 10 m/km in the northern region, increasing to 20 m/km in the south of New York State. Overall, stratigraphic thickness also increases from about 900 meters in the north to 3400 meters in the south as the result of erosion of overlying strata in the north and a general thickening of individual stratigraphic units toward the south.

It can be expected that the primary geothermal targets will be at the base of the sedimentary sequence. These targets are primarily the lower Cambrian units, though if connate waters are found, there are potential geothermal reservoirs from the Precambrian through the Middle Ordovician Trenton Group (especially to the south).

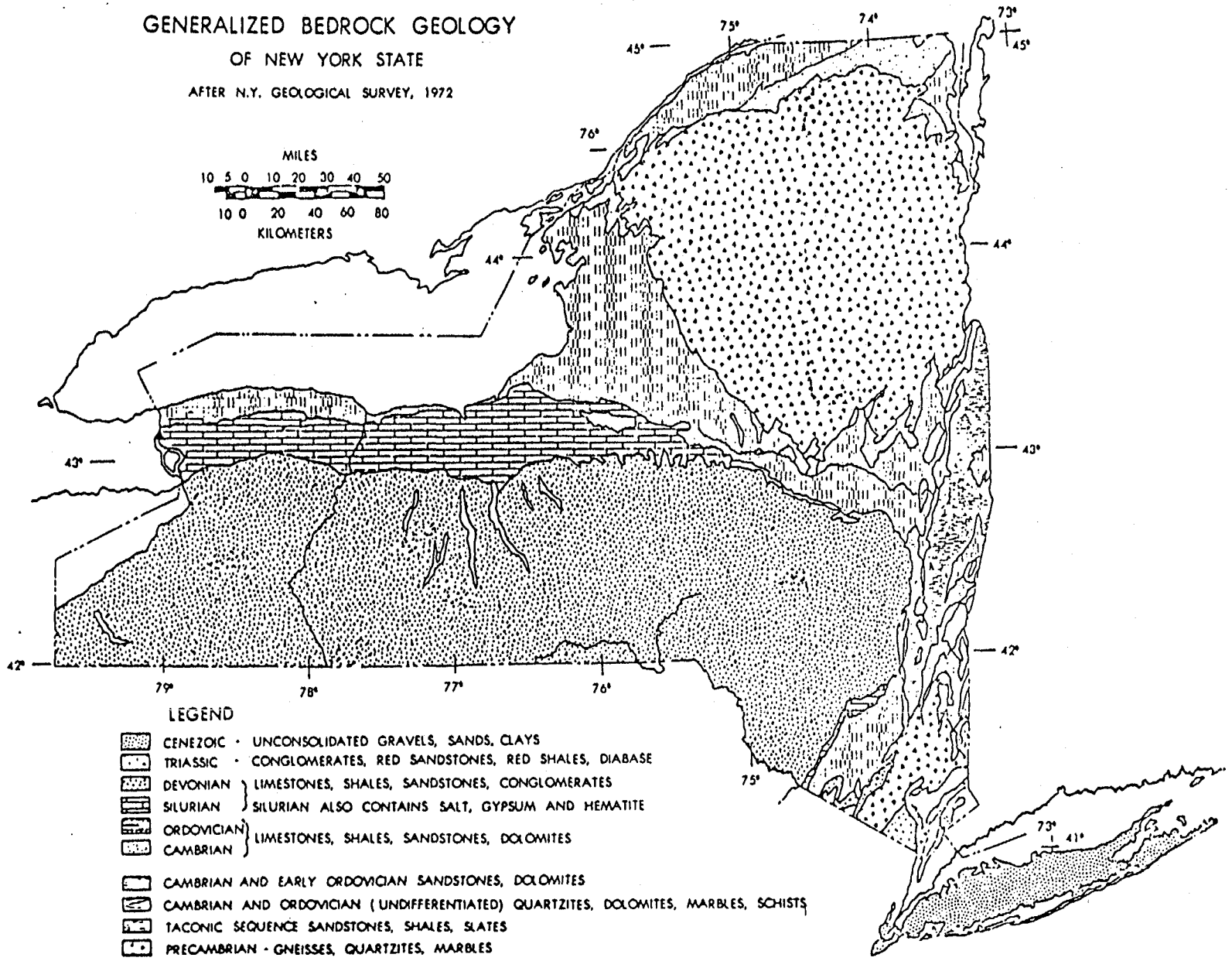


Figure 1-1. General geologic map of New York State.

The lowest unit in the Cambrian stratigraphic sequence is the Potsdam Formation, which consists mainly of sandstone. Though the geologic boundary is not clearly defined, the Theresa (Galway) Formation overlies the Potsdam; there is a gradational increase of quartzose dolostones to dolostones from the basal sandstones. The Theresa is of particular interest for the development of geothermal energy because it is found at considerable depth, which generally ensures the temperatures required for direct-use applications. Connate water is reported in many of the wells that have penetrated the Theresa (Kreidler, 1975) and could provide the heat transport medium when adequate flow rates exist. Above the Theresa is the Little Falls Formation composed primarily of dolostones that are of Late Cambrian to early Ordovician age.

Overlying the Little Falls Formation, except to the north and west, is the Beekmantown Group, which consists of Lower Ordovician quartzose dolostones, dolostones, and dolomitic limestones (Rickard, 1973). The top of the Beekmantown is eroded throughout the area (i.e., the Knox Unconformity) and is overlain by Black River or Trenton Group carbonates. The Black River Group, which overlies the Little Falls Formation to the north and west, is mostly dolostones with some sandstones and shales at its base. Limestones are the predominant lithology toward the top (Rickard, 1973). The Trenton Group is primarily limestone that thins toward the east and changes facies to calcareous shales; overlying shales and sandstones in the east are often included in the Trenton Group (Rickard, 1973).

There is little potential for geothermal reservoirs above the Trenton in western and central New York State. The low permeability of the predominantly shale units of the Upper Ordovician (i.e., Lorraine and Queenston Formations) precludes their utility as reservoirs. The limestones and sandstones that occur in the Lower Silurian would possibly have high enough temperatures in the south of the area, but there is little evidence to indicate the presence of connate water in extractable quantities. The Upper Silurian and Devonian sequences should be rejected as geothermal targets unless a convective system is found.

The exploitation of low-temperature geothermal energy in sedimentary basins with normal temperature gradients has been shown to be economically feasible in several areas of the world. Perhaps the best example is in France where geothermal resources in the Paris Basin have been developed. Five levels within the Paris basin have been found

to be useful geothermal reservoirs. Water at temperatures from 30°C to 50°C is extracted for heating purposes from two levels of Lower Cretaceous sandstones approximately 800 to 900 meters deep. Upper Jurassic limestones and sandstones at about 1200 meters provide water temperatures greater than 60°C and Middle Jurassic limestones at 1800 meters with water temperatures greater than 80°C are also extensively exploited. The deepest level, consisting of Triassic sandstones with water temperatures above 100°C at about 2200 meters depth, is used to a lesser extent (Lejune and Varet, 1981).

The Appalachian Basin in New York State can be compared to the Paris Basin in a general way. It will be shown that the higher gradient areas in the State are in the low to intermediate range of gradients (20° to 50°C/km) found in the Paris Basin. Information on flow rates of formation fluids in New York State is scarce, but recent pump tests at the New York State Energy Research and Development Authority (NYSERDA) geothermal test well in Auburn, New York, produced sustained flow of 100 to 150 gallons per minute (gpm). Spinner logs indicated that one-tenth of this water was from the Black River Formation and the remainder was from the Theresa and Potsdam. Enhancement of reservoir permeability by hydrofracturing or acidification could significantly increase flow rates.

FRACTURE-INDUCED POROSITY AND PERMEABILITY

Highly permeable portions of the Theresa Formation generally occur as the result of fracture-induced porosities [Robinson, 1983]. Thus, the highest flow rates from geothermal wells that intersect the Theresa Formation should be encountered where fracturing is most pervasive. Highly fractured zones within the Paleozoic rocks of the Appalachian Basin seem to be primarily related to the tectonism associated with structures active during the Alleghanian (330-250 my), Acadian (410-380 m.y.) and Taconian (490-440 m.y.) orogenies.

In order to explore the possibility of using geothermal energy for electric power generation NYSERDA and DOE Los Alamos along with several electric power utilities in New York State entered into discussions in order to evaluate the potential of developing electric power from geothermal energy in upstate New York. Through NYSERDA and DOE, the State University of New York at Buffalo and Dyncorp, Inc. were contracted to study the geothermal potential. The evaluation is divided into two parts. SUNY at Buffalo is responsible for the evaluation of the subsurface temperatures in upstate NY

and for the selection of a potential geothermal electric power site. Dyncorp, Inc. is responsible for the design and characterization of the power facility and to provide estimates of the costs and revenues of the potential facility. This report from SUNY at Buffalo describes the heat flow, temperature distributions, possible reservoir characteristics and environmental impact considerations for the development of a geothermal electric power facility.

Section 2

MAJOR STRUCTURES OF CENTRAL AND WESTERN NEW YORK

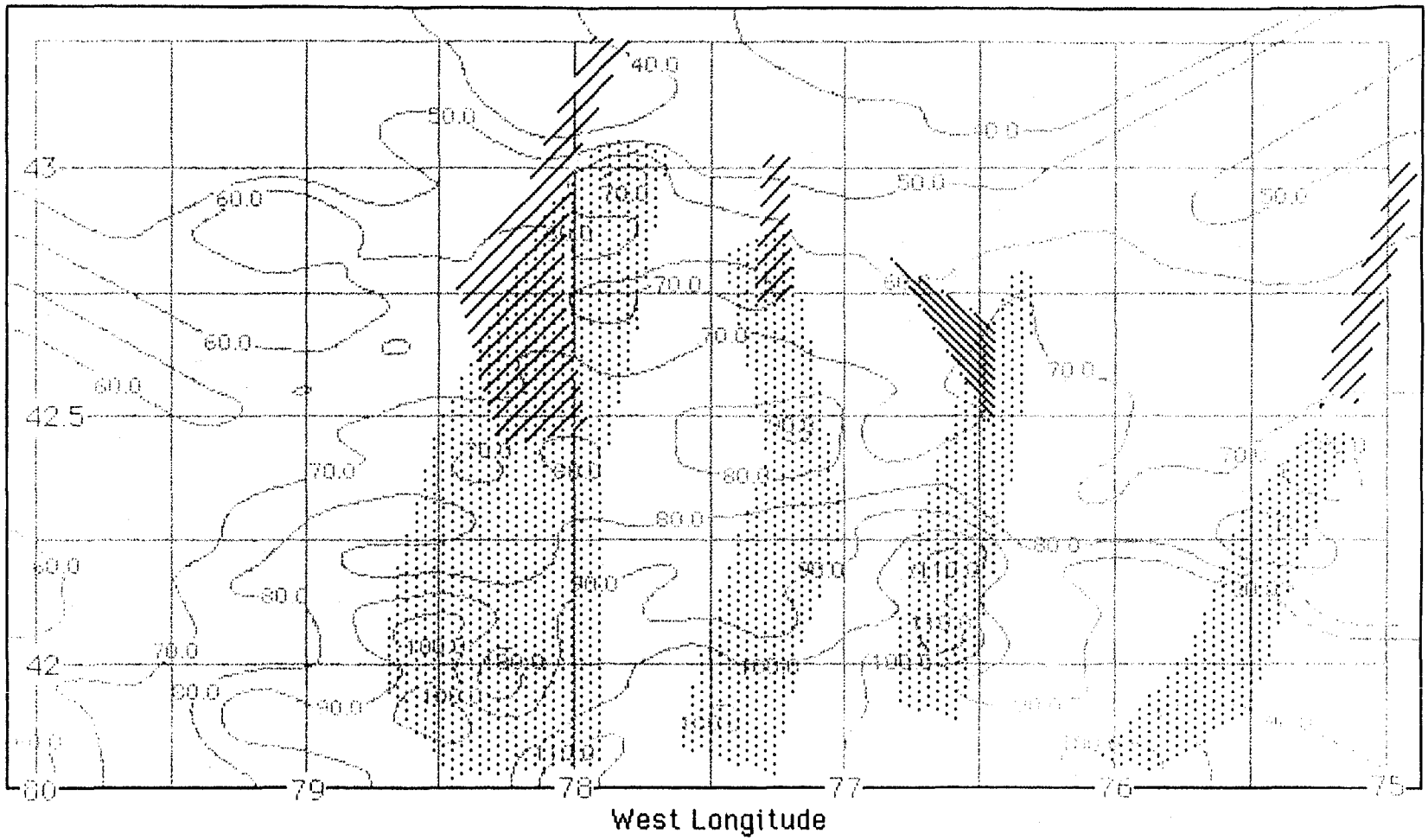
The regional geological structure of western and central New York State is fairly simple, with the Paleozoic sequence generally dipping to the south at 8 m/km in a broadly arched homocline. Although the Devonian rocks (408-360 m.y.) are nearly flat-lying, with only minor gentle folding in a few localities, buried structures in the Cambrian (540-505 m.y.) and Ordovician rocks (505-438 m.y.) are common, especially in south central New York State. These structures, which are typically highly fractured small-amplitude anticlines, are unconformably overlain by the Devonian rocks. They can be located by seismic analysis, and have recently been recognized as exploration targets by the oil and gas industry because the Cambrian and Ordovician rocks within them typically have fracture-enhanced porosity near the fold hinges, and they may act as hydrocarbon traps.

Two major types of faults could be related to enhanced permeability in the Theresa Formation: 1) subvertical faults, and 2) subhorizontal (thrust) faults. Subvertical faults intersect the surface in only one restricted area of western New York State. These faults comprise the Clarendon-Linden Fault System, which runs from Allegany County in the south at least to the Lake Ontario shoreline in western Monroe County [Van Tyne, 1975]. North of Allegany County, the system is relatively well-mapped. To the south, however, there are few data available on the nature of the system, and the extent of the fault in Allegany County is poorly known [Jacobi and Fountain, 1993]. In its central section the fault zone consists of up to six step faults or perhaps monoclinal features with a down-to-the west sense of apparent motion. Other subvertical faults with apparent normal slip offset Theresa strata in the center of the state and are associated with enhanced flow of deep-seated waters [Pferd, 1981]. These faults do not break surficial units and, therefore, cannot be traced further than their known extent, which has been determined by geophysical techniques. Some of the highest groundwater flow rates in the Cambrian section occur along the Clarendon-Linden system [Pferd, 1981], and following the Saguenay earthquake of 1988, deep-seated natural gas was released along its locus [Jacobi and Fountain, 1993]. The other subvertical faults also are associated with particularly strong groundwater shows, and the high flow rates suggest that the subvertical faults could act as important conduits for the introduction of deep-seated geothermal fluids into the Paleozoic section. This hypothesis is supported by the admittedly less well-resolved temperature data for the Theresa Formation. Some of the

highest temperatures in the Cambrian strata occur along the trends or the continuations of the trends of the subvertical faults (Figure 2-1). The occurrence of these temperatures in proximity to the structures suggests that the structures do indeed act as conduits for the upward flow of high temperature waters from within the Precambrian basement.

It is possible that numerous low-angle or bedding plane thrust faults offset the stronger carbonate units of the Paleozoic sequence of western and central New York State [Isachsen et al., 1991]. However, only one possible thrust fault has been identified in the region. The Bass Island Thrust or Structure is a complex faulted antiform that trends southwest in the subsurface through Erie, Cattaraugus, and Chautauqua counties. It does act as a structural trap, and is a target for oil and gas drilling [Isachsen et al., 1991]. There is enhanced groundwater flow near its locus, but no associated strong temperature anomaly, such as those associated with the subvertical structures [Pferd, 1981]. This is consistent with the structure, enhancing permeability through pervasive secondary fracturing but not drawing high-temperature fluids from the basement because of its low angle and lack of penetration into the basement rocks.

The other structural features that may be associated with enhanced groundwater flow or higher temperature within the State are the kimberlite-alnoite dikes of central New York State [Martens, 1924]. Eighty-two of these ultramafic dikes have been identified in the Ithaca region, with strikes generally within 15° of N-S [Foster, 1971]. Since the dikes are 135-145 m.y. old [Zartman et al., 1967], it is highly unlikely that any high temperatures encountered near them could be the result of the thermal anomaly that would have been associated with their emplacement. Nevertheless, the highest temperatures in the Cambrian section occur along the strike of these dikes in the southern tier (Figure 2-1), suggesting that there may be some unknown link between the dikes and modern thermal anomalies.



Contour map of temperatures at the bottom of the Theresa Formation

Subvertical faults; CLF = Clarendon-Linden Fault

Kimberlite-alnoite dikes

Ridges of high temperature anomalies

Figure 2-1. Comparison of structural features and Theresa Formation temperatures.

Section 3

PREVIOUS STUDIES OF TEMPERATURES IN SUBSURFACE

The work of Birch et al. (1968) and Lachenbruch and Sass (1977) has established that the eastern United States is a region of lower heat flow compared to the western United States. Birch et al. (1968) found a linear relation between heat production and heat flow and showed that there are heat flow provinces with distinctly different heat flow from deep sources, and the depth of significant heat production also varies. In the general sense, local variation in heat flow is interpreted to be the result of different heat production within the upper crust (Birch et al., 1968). Using this empirical linear relation, Birch et al. found that the heat flow from deep sources was 33 mW/m^2 for the eastern United States.

Several studies have reported heat flow values in New York State. Birch et al. (1968) gave measured values ranging from 33 to 50 mW/m^2 in eastern New York State and the Adirondacks. Urban (1970) reported a heat flow value of 63 mW/m^2 near Balmat, New York, values of 67 and 80 mW/m^2 in the Finger Lakes region, and heat flow values ranging from 50 to 54 mW/m^2 in western New York State.

Hodge et al. (1979, 1980, 1981, 1984) identified areas of higher-than-normal temperature gradients in western and central New York State using bottom-hole temperatures recorded during logging operations of gas wells. Apparent correlations of thermal conductivity with lithologic stratigraphy were used to model thermal conductivity distributions in the area, and then a heat flow map (Hilfiker, 1981) was produced using calculated temperature gradients.

HEAT FLOW AND TEMPERATURES IN NEW YORK STATE

Heat flow at the earth's surface can be calculated using the equation for the steady-state flow of heat in one-dimension in a thermally conducting, isotropic body.

The heat flow equation is

$$Q = K (\partial T / \partial z) \qquad (1)$$

where Q is the heat flux in units of mW/m^2, K is the thermal conductivity in units of W/m°C, and $\partial T/\partial z$ is the thermal gradient (where z is the distance measured vertically downward and T is temperature) in units of °C/km. If the rocks composing the outer layers of the earth were of a constant conductivity, then heat flow could be calculated simply by measuring the temperature at any two depths and the thermal conductivity of the rock. This simplification is usually not the case.

If the average geothermal gradient ($\overline{G}$) is measured using the temperature obtained at two depths, and this gradient is taken in an area of horizontally layered rocks, the heat flow can then be calculated if the thermal conductivity of each layer is known. Consider the case where there are n discrete layers of conductivity $K_1,\ldots, K_n$ and thickness $t_1,\ldots, t_n$. Then a weighted mean harmonic conductivity (K_{mh}) of the layered section is given by

$$K_{mh} = (t_1 + \ldots + t_n)\left(\frac{t_1}{K_1}+\ldots+\frac{t_n}{K_n}\right)^{-1} \qquad (2)$$

and the heat flow is calculated by

$$Q = K_{mh}\,\overline{G} \qquad (3)$$

When continuous measurements of temperature at depth are available over the section containing constant conductivity layers, the gradient in each layer should be linear (i.e., $\partial T/\partial z$ is constant) and the heat flow calculated from successive layers should be constant. The ratio of one measured layer gradient to another will be inversely proportional to the ratio of their respective thermal conductivities, as required by the assumption of steady-state heat flow.

Heat flow values for upstate New York shown in Figure 3-2 were calculated from temperature logs and conductivity samples for several boreholes in the study area (Figure 3-1) (Hodge and Fromm, 1984). In this area oil and gas wells are typically drilled using air percussion drills for most of their length. This drilling disturbs the actual temperatures by the circulation of air and formation fluid from different levels. Wells are then often cased, plugged at the bottom, and may be left standing for a period of time before they are completed. During this time equilibrium temperatures are reestablished;

logging of these wells was done at least 3 days after drilling and cementing of the casing took place.

Another borehole used was a geothermal test well in Auburn, New York, which was drilled in February 1982. A detailed equilibrium log was finally completed to a depth of 2000 feet. Thermal conductivity of rock chips collected during drilling operations was measured using a needle probe apparatus. Geophysical logs were available for porosity estimation to correct the bulk rock conductivity measured to the actual in situ conductivities. This well yielded a heat flow value of 65 mW/m^2 (Hodge and Fromm, 1984)

The Winspear #1 (#13571) well is located in the Middlebury Township in Wyoming County, New York, (8375' south of 42° 52' 30" latitude and 3330' west of 78° 05' 00" longitude). The temperature-depth data (Table A-1) plotted in Figure 3-3 shows a distinct change in gradient at a depth of 232.5 m. This corresponds to the change in lithology from the shales of the Middle Devonian Hamilton Group to the Middle to Lower Devonian Onondaga Limestone. Below this depth, the least squares gradient is 15.3°C/km, which contrasts sharply with the gradient of 31.2°C/km over 130.6 - 232.5 m and 24.9°C/km over 86.0 - 130.6 m. Thermal conductivity measurements (Table A-2) in smaller intervals selected on the basis of uniformity of lithology show a definite inverse relation to gamma-ray activity and gradient; low conductivity sedimentary rocks, typically shales, display high gamma-ray activity (an indicator of relative shaleness) and relatively high gradients . The values for the gradients, mean harmonic conductivity (K_{mh}), and calculated heat flow (Table A-3) in the major intervals are shown in Figure 3-4. The K_{mh} for the deepest interval is 2.7 W/m°C; and the calculated heat flow is 41.3 mW/m^2. The shale interval directly overlying the Onondaga has a K_{mh} of 1.49 W/m°C and a heat flow value of 46.4 mW/m^2. In the shallowest interval, K_{mh} is 1.84 W/m°C and the heat flow is 45.7 mW/m^2. Therefore, 41.3 mW/m^2 has been chosen as the best value for heat flow measured at this site.

Hodge and Fromm (1984) reported a heat flow of 64 mW/m^2 for well #15529, which is located on the east side of Cayuga Lake at Wells College (Table A-4). This heat flow is above the average of 50-54 mW/m^2 obtained in western New York but similar to the heat flow obtained by Urban(1970) for the Finger Lakes region. The heat flow data and the bottom hole data from Hodge and Fromm (1984) indicate that the Fingerlake district is a region of higher than normal heat flow.

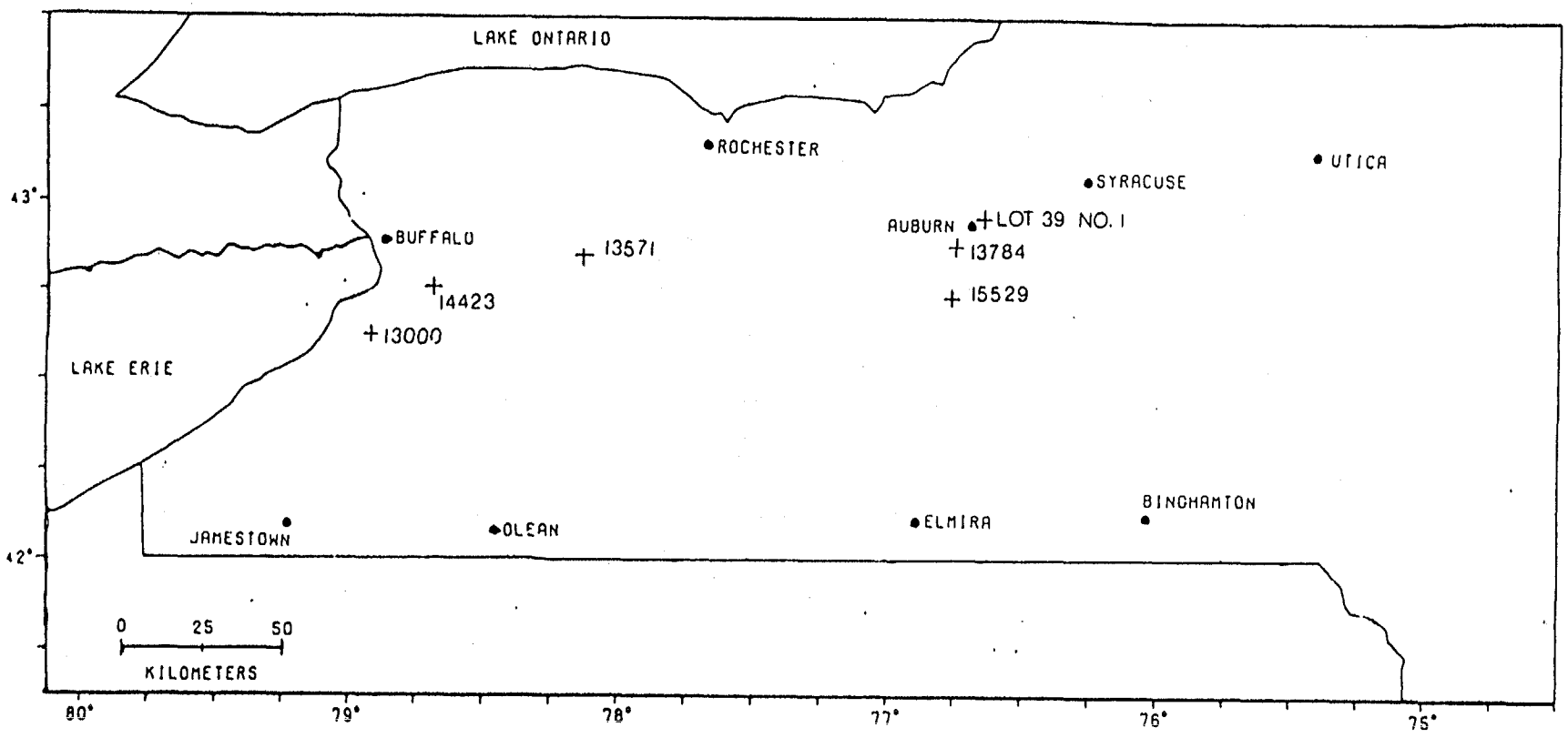


Figure 3-1. Location of wells used for heat flow and conductivity determinations.

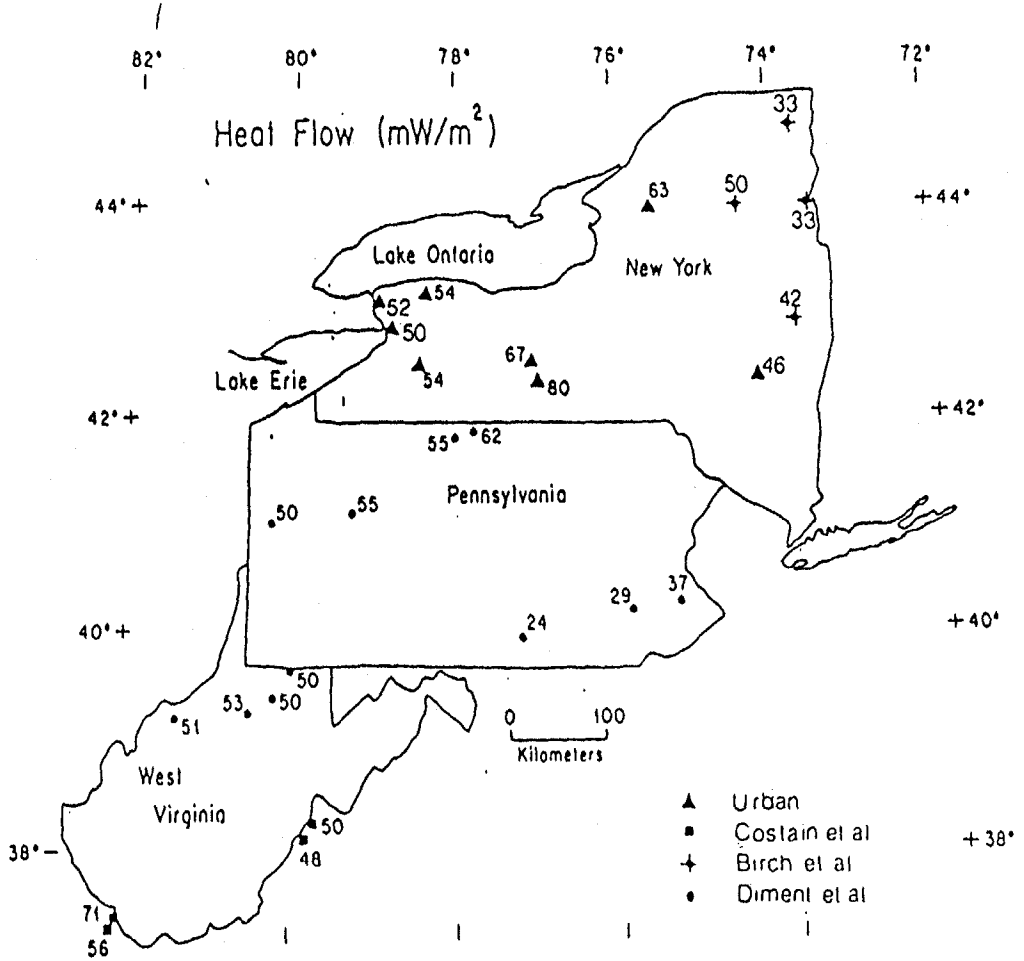


Figure 3-2. Heat flow values (mW/m^2) for upstate New York.

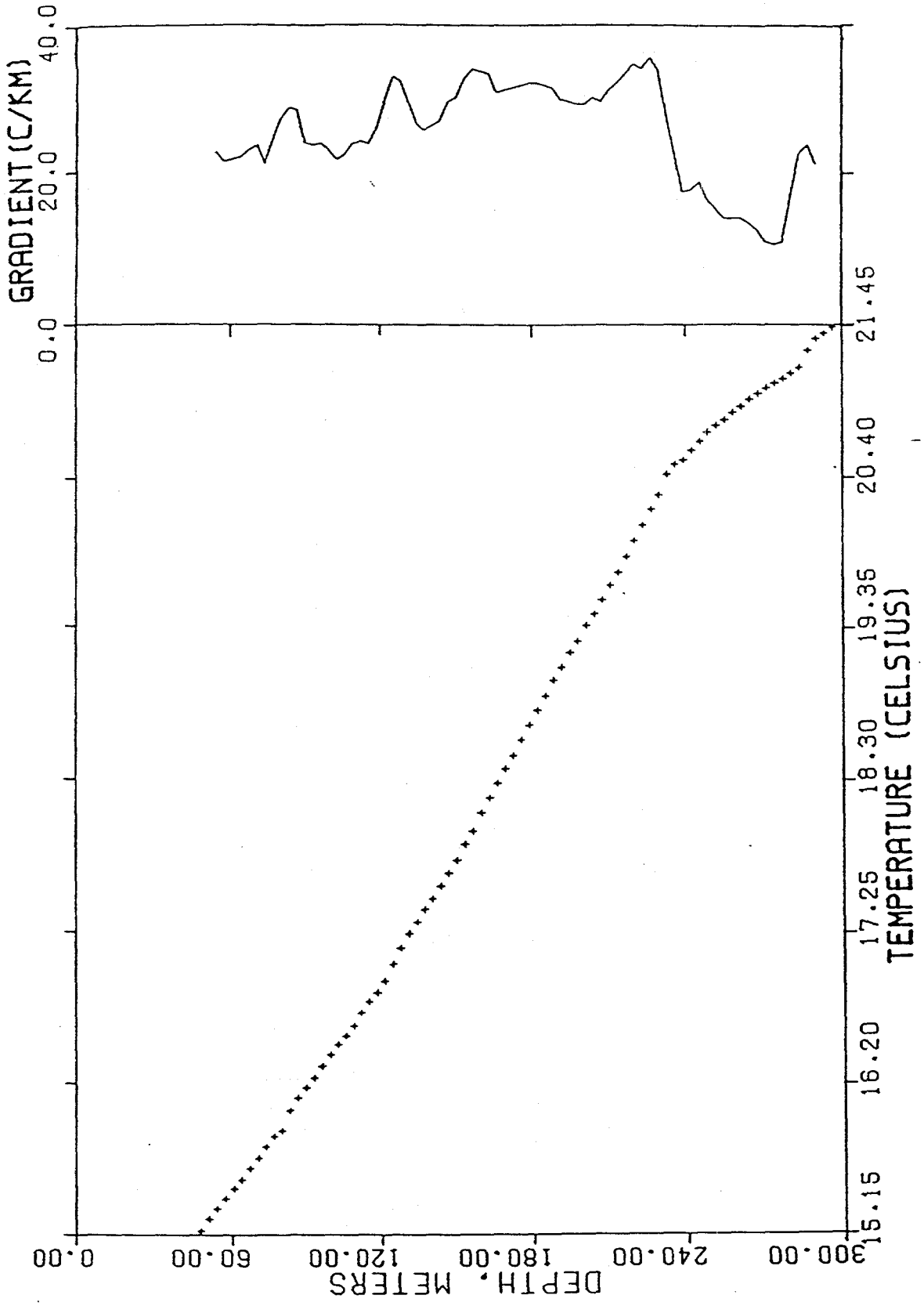


Figure 3-3. Temperature versus depth and gradients for well #13571.

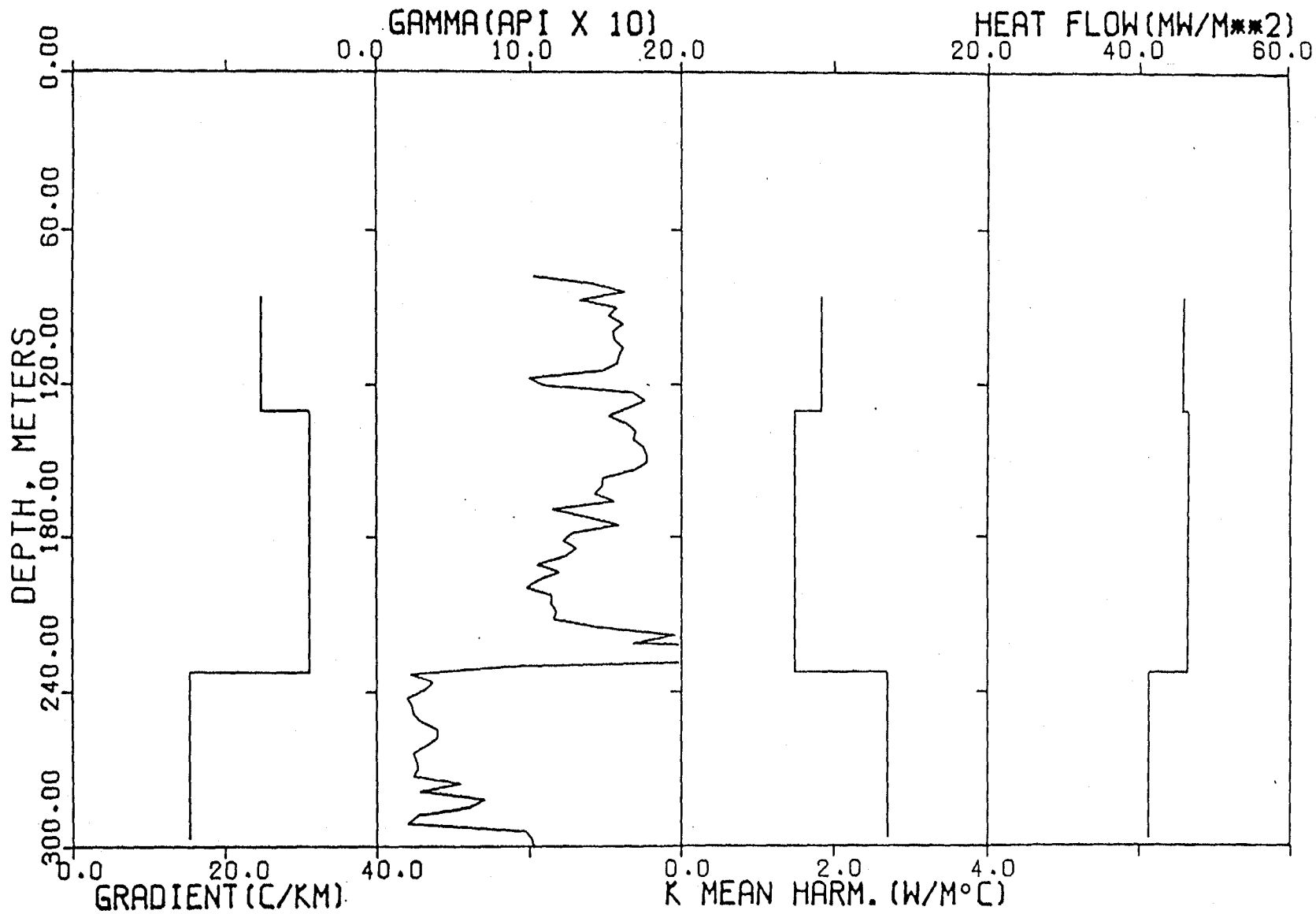


Figure 3-4. Comparison of interval gradients, gamma-ray activity, mean harmonic conductivity, and heat flow for well #13571.

CORRELATION OF THERMAL CONDUCTIVITY AND SEDIMENTARY STRATIGRAPHY

Figure 3-5 shows a distinct change in the geothermal gradient with depth. The stratigraphic layers at this location are shown and the correlation of change in thermal gradients with stratigraphic layers is evident. Hodge and Fromm (1984) measured numerous samples of the stratigraphic units in New York and the average thermal conductivity for the respective units is shown in Table 3-1.

Table 3-1

Thermal conductivity model for western and central New York.

LAYER #	STRATIGRAPHY: LITHOLOGY	CONDUCTIVITY (W/m C)
1	Upper-Middle Devonian: Shale with limestone interbeds	1.67
2	Onondaga Limestone-Medina Group: Limestone with interbedded shale, some sandstone	2.2
3	Queenston Formation-Lorraine Group: Predominantly shales in the west, more sandstone in upper section to the east	Variable 1.64 - 2.65
4	Trenton Group-Little Falls Formation: Interlayered limestone and shale near the top and dolostones toward the base	2.95
5	Theresa Formation-Potsdam Formation: Quartzose dolostones and dolostones near the top and sandstones at the base	4.9
6	Precambrian: Crystalline basement	2.93

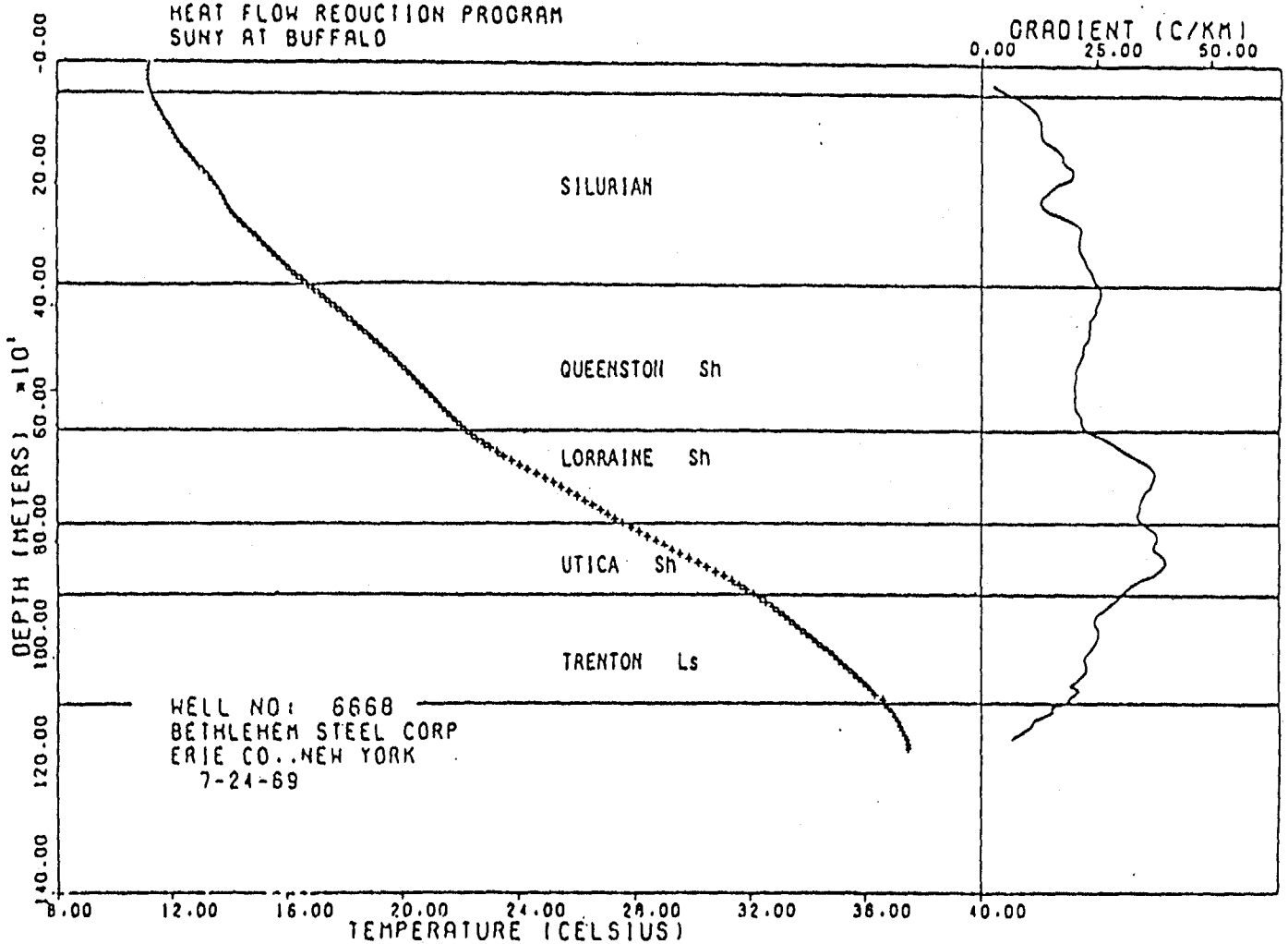


Figure 3-5. Temperature depth plot and correlation of temperature gradients with stratigraphic formations for well #6668.

Section 4
POTENTIAL GEOTHERMAL RESERVOIRS

Due to the limited availability of sites for the direct measurement of heat flow, it is desirable to develop a technique for predicting heat flow based on other data sources. This is necessary if temperature-at-depth distributions are to be determined on a regional scale.

Bottom-hole temperatures (BHT) recorded during routine electrical logging of gas wells comprise the data set used in our geothermal heat flow studies. These can then be used in conjunction with the mean annual surface temperature to estimate average geothermal gradients. However, the presence of stratigraphic layers with differing conductivities precludes the simple projection of the gradient so obtained. The heat flow and the vertical conductivity distribution must be determined if temperatures other than the BHT are desired.

To determine the geothermal gradient at distributed sites across the study area, a data set of 2001 bottom-hole temperatures obtained from the Department of Environmental Conservation (DEC) in Avon and Olean, New York State (Table A-6 and Figure 4-1) along with 41 mean annual surface temperatures recorded at National Oceanographic and Atmospheric Administration (NOAA) weather stations in western and central New York State and northern Pennsylvania (Table 7) was assembled. Trend analysis of the temperature distribution produced a first order equation

$$T_S = 12 - .0098*h \qquad (4)$$

where T_S is the surface temperature in °C and h is the ground elevation in meters, as a best fit model. Mean annual surface temperatures at each well site was then calculated by solving the polynomial for T_S. Average geothermal gradient is then the BHT minus the surface temperature divided by the depth of the BHT.

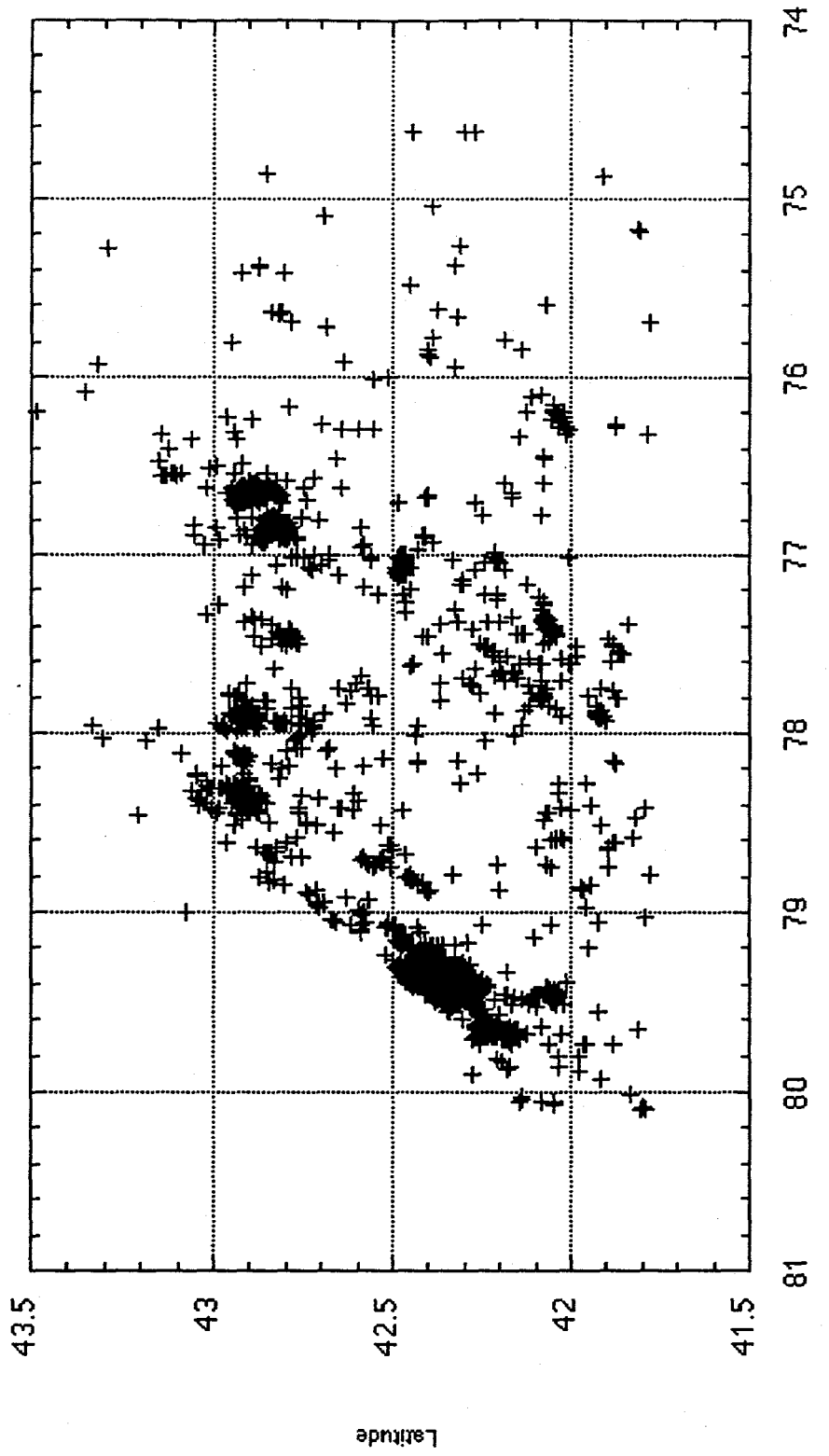


Figure 4-1. Locations of wells with available bottom-hole temperatures.

The presence of distinct changes in gradient, and therefore conductivity, with lithostratigraphic layers, suggests that the vertical distribution of conductivity in the study area can be modeled based on well records of the depths of the layered horizons. If the conductivity and thickness of each layer is known for the location of a gradient estimate, then the mean harmonic conductivity of the interval the gradient passes through can be determined. Heat flow can then be based on this gradient and conductivity. This method is discussed in the following section and is shown schematically in Figure 4-2.

The average geothermal gradient ($\overline{G}$), as described earlier, is calculated by

$$\overline{G} = \frac{T_{BHT} - T_s}{z_{BHT}} \qquad (5)$$

where T_{BHT} is the bottom-hole temperature, T_S is the surface temperature, and z_{BHT} is the depth of the BHT. For the case where there are n discrete layers of conductivity $K_1, \ldots, K_n$ with thicknesses $t_1, \ldots, t_n$, a weighted mean harmonic conductivity (K_{mh}) of the layered section is given by

$$(t_1 + \ldots + t_n)\left(\frac{t_1}{K_1} + \ldots + \frac{t_n}{K_n}\right)^{-1} \qquad (6)$$

If the depth of the BHT is located some depth p below the top of the i^{th} conductivity layer the K_{mh} is given by

$$(t_1 + \ldots + t_{i-1} + p)\left(\frac{t_1}{K_1} + \ldots + \frac{t_{i-1}}{K_{i-1}} + \frac{p}{K_i}\right)^{-1} \qquad (7)$$

where $t_1, \ldots, t_{i-1}$ is the thickness of the overlying conductivity layers and $K_1, \ldots, K_i$ is the conductivity of each layer. The heat flow Q can then be calculated as in equation 3, $Q = K_{mh}\,\overline{G}$. For the i^{th} layer, the gradient is given by

$$\left(\frac{dT}{dz}\right)_i = \frac{Q}{K_i} \qquad (8)$$

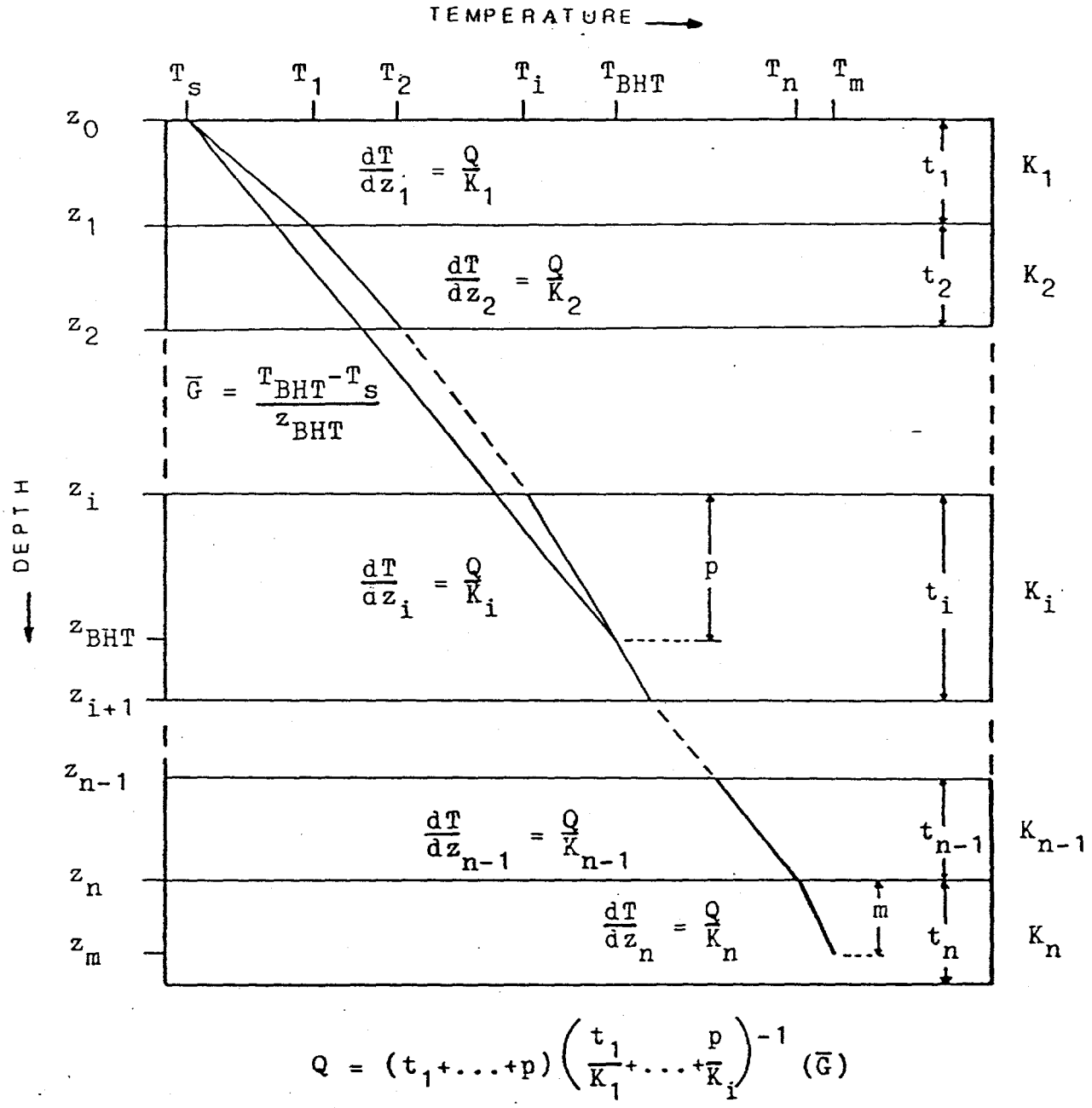


Figure 4-2. Thermal conductivity layer model for heat flow and temperature at depth determinations.

The temperature at the top of the n^{th} layer (T_n) is given by

$$T_n = \sum_{i=1}^{n-1} t_i \left(\frac{dT}{dz}\right)_i + T_s \qquad (9)$$

while the temperature at a depth m below the top of the n^{th} conductivity layer is given by

$$T_m = \sum_{i=1}^{n-1} t_i \left(\frac{dT}{dz}\right)_i + m\left(\frac{dT}{dz}\right)_n + T_s \qquad (10)$$

Finally, the depth (d_X) to a particular temperature (T_X) can be found, provided $T_n \leq T_X \leq T_{n+1}$, by

$$d_x = \sum_{i=1}^{n-1} t_i + \frac{(T_x - T_n)}{\left(dT/dz\right)_n} \qquad (11)$$

A six-layer conductivity model was chosen based on observed major gradient changes in temperature logs that correlate with the tops of stratigraphic units in western and central New York State. These layers are: 1) Devonian shales that outcrop at the surface to the south of approximately 43° latitude; 2) the Onondaga Limestone through the top of the Queenston Formation mostly composed of limestones and dolostones with minor shale beds; 3) the Queenston Formation through the Lorraine Group primarily composed of shales in the west becoming predominantly sandstone in the upper part of the section in the eastern part of the study area; 4) the Trenton Group through the Little Falls Formation, including interlayered limestone and shale near the top and dolostones toward the base; 5) the Theresa Formation through the Potsdam Formation comprising quartzose dolostones and dolostones near the top and sandstones at the base; and 6) the crystalline Precambrian basement.

The thermal conductivity value used for the Devonian shales was based on measurements made at the Winspear #1 well and on the work of Urban (1970). Urban reported a value of 1.67 W/m°C for the Devonian section in Himrod, New York which is intermediate to the values of 1.84 and 1.49 W/m°C obtained at the Winspear #1 well. These values may be greater than the actual in situ conductivity because of anisotropic conduction effects in the chip technique. The value obtained by Urban is a better overall conductivity to assign to this layer because Urban used core samples measured on a divided-bar apparatus.

The thermal conductivity for the Onondaga Formation from the Winspear #1 well is 2.33 W/m°C. However, this value is probably slightly too high to apply to the entire area due to the variability of shale thickness. A value of 2.2 W/m°C was chosen based on the ratio of gradients between the Devonian shales and the Onondaga layer and the Devonian shale value itself.

From the work of Urban, the mean harmonic conductivity of the sequence from the top of the Queenston Formation to the top of the Trenton Group is estimated to be 1.64 W/m°C for well #6668 in western Niagara County. From the Auburn Lot 39 #1 well, the conductivity value is 2.65 W/m°C. The conductivity at the Auburn well is higher because the Queenston Formation contains more sandstones in the eastern than in the western part of New York State. Since evaluating the nature of this facies change would require an extensive study in itself, an average value of 2.15 W/m°C was chosen for this layer.

The thermal conductivity value used for the Trenton Group and Theresa Formation was 2.95 W/m°C and 4.9 W/m°C, respectively. These values were based on measurements of samples from the Auburn well. The variability of the basement prevented the use of using actual thermal conductivity measurements in this case. A value of 2.93 W/m°C, typical of a gneissic rock, was assumed instead. This effect is not significant to the determinations of heat flow since very few of the BHT wells penetrated to this depth.

Data for the tops of the Onondaga, Queenston, Trenton, Theresa, and basement were compiled directly from drilling logs (Table A-8) and from maps previously produced from Hodge and Fromm (1982). A trend surface analysis, using the program Mathematica, was performed on the data set in order to predict the depth of each of the formations

below sea level. The structure contour maps of each formation were produced using Spyglass, a data imaging/contouring program. All contour maps of the depth of formations were made creating a 45 x 45 matrix and kernel smoothing fill method in Spyglass.

A structure contour map of the top of the Onondaga Limestone was computer-generated from 572 data points in the study area (Figures 4-3 and 4-4). Trend surface analysis showed a third order polynomial

$$-20849.1 - 42.6355*y^3 + 71.2848*y^2*x - 39.4924*y*x^2 + 7.29525*x^3 \quad (12)$$

where y is degrees latitude and x is degrees longitude, as a best fit model for this horizon. This defines the base of the Devonian shales and the top of the Onondaga - Medina conductivity layers. Each BHT well to the north of the Onondaga outcrop (approximately 200m above sea level along 43° latitude) was checked individually to make sure the absence of control in the trend surface did not allow for the prediction of a greater Onondaga horizon height than that which actually exists.

The structure contour map of the Queenston Formation was prepared from a data set of 393 points (Figures 4-5 and 4-6). Trend surface analysis again showed a third order polynomial

$$-22307 - 119.464*y^3 + 195.692*y^2*x - 106.635*y*x^2 + 19.3749*x^3 \quad (13)$$

as a best fit model for the top of the Queenston horizon. The Trenton Group structure contour map was prepared from 219 data points (Figures 4-7 and 4-8). A third order polynomial

$$-24787.6 - 5.85183*y^3 + 12.5806*y^2*x - 8.28581*y*x^2 + 1.77546*x^3 \quad (14)$$

was calculated to predict the top of the Trenton Group. A structure contour map of the top of the Theresa Formation was prepared from 132 available data points (Figures 4-9 and 4-10), with trend surface analysis producing a third order polynomial as a best fit model

$$-24745 + 63.2879*y^3 - 99.4326*y^2*x + 52.1758*y*x^2 - 9.09848*x^3 \quad (15)$$

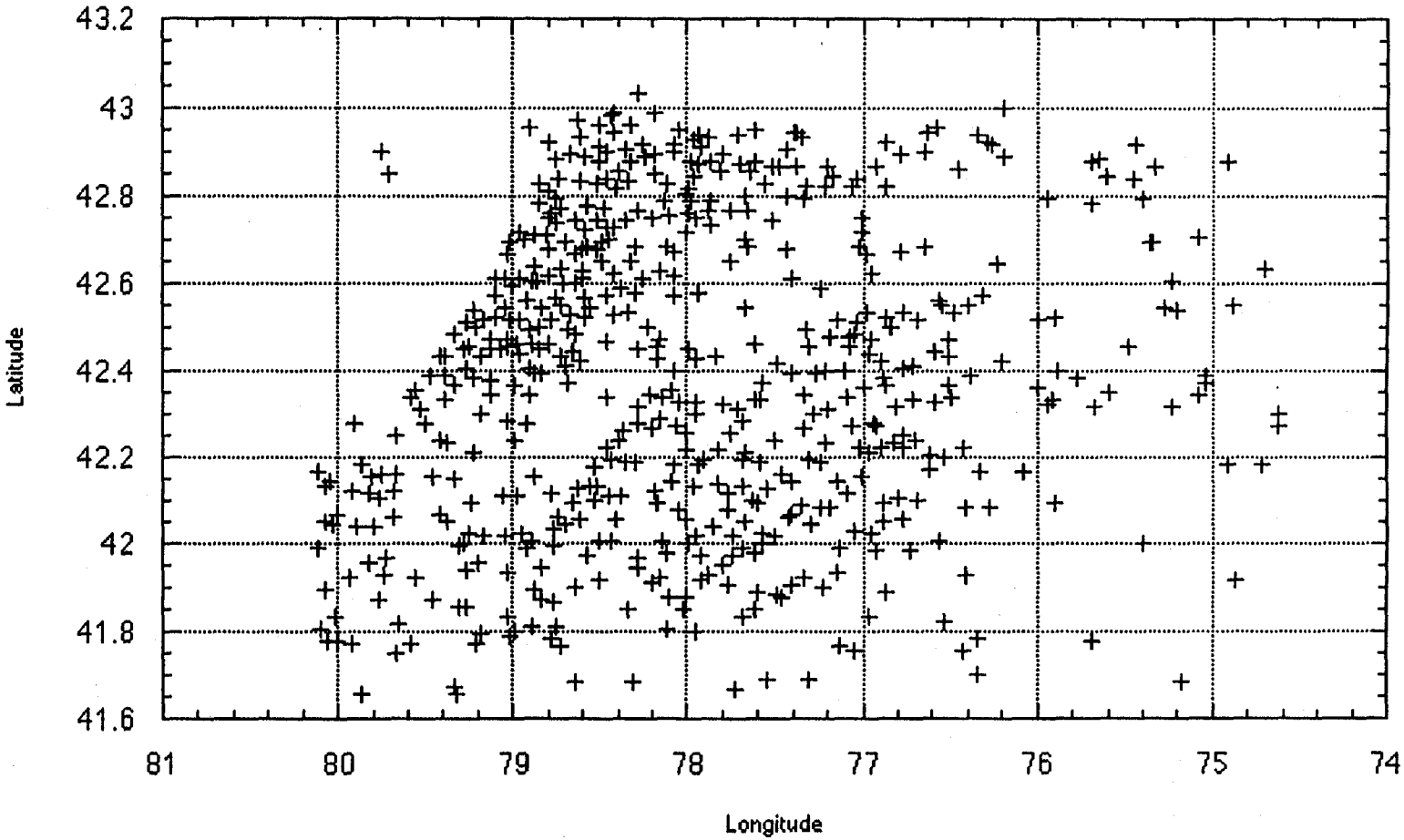


Figure 4-3. Location of wells with depth to the Onondaga that were used for the trend surface analysis.

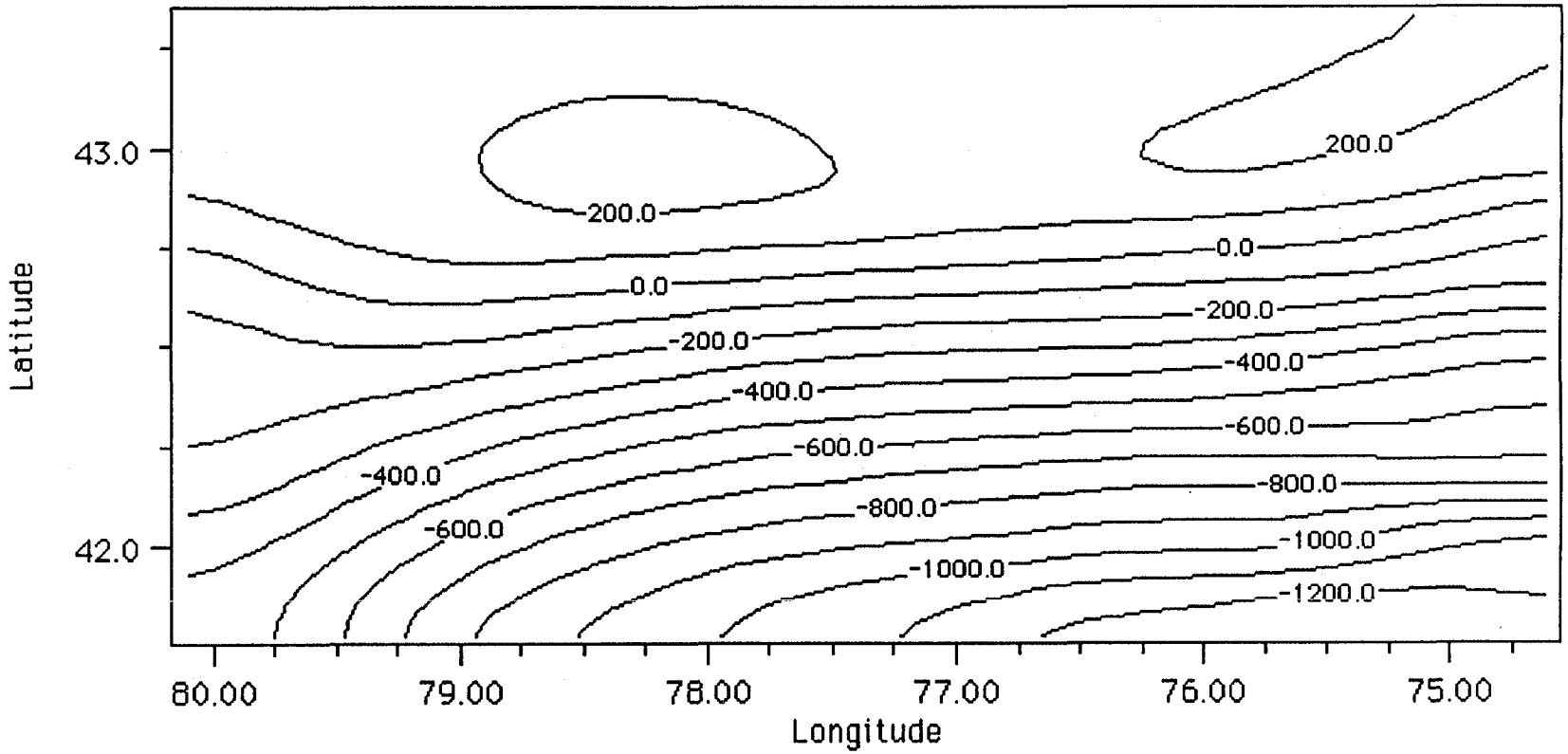


Figure 4-4. Third order trend surface of the depth in meters (sea level datum) to the top of the Onondaga Formation.

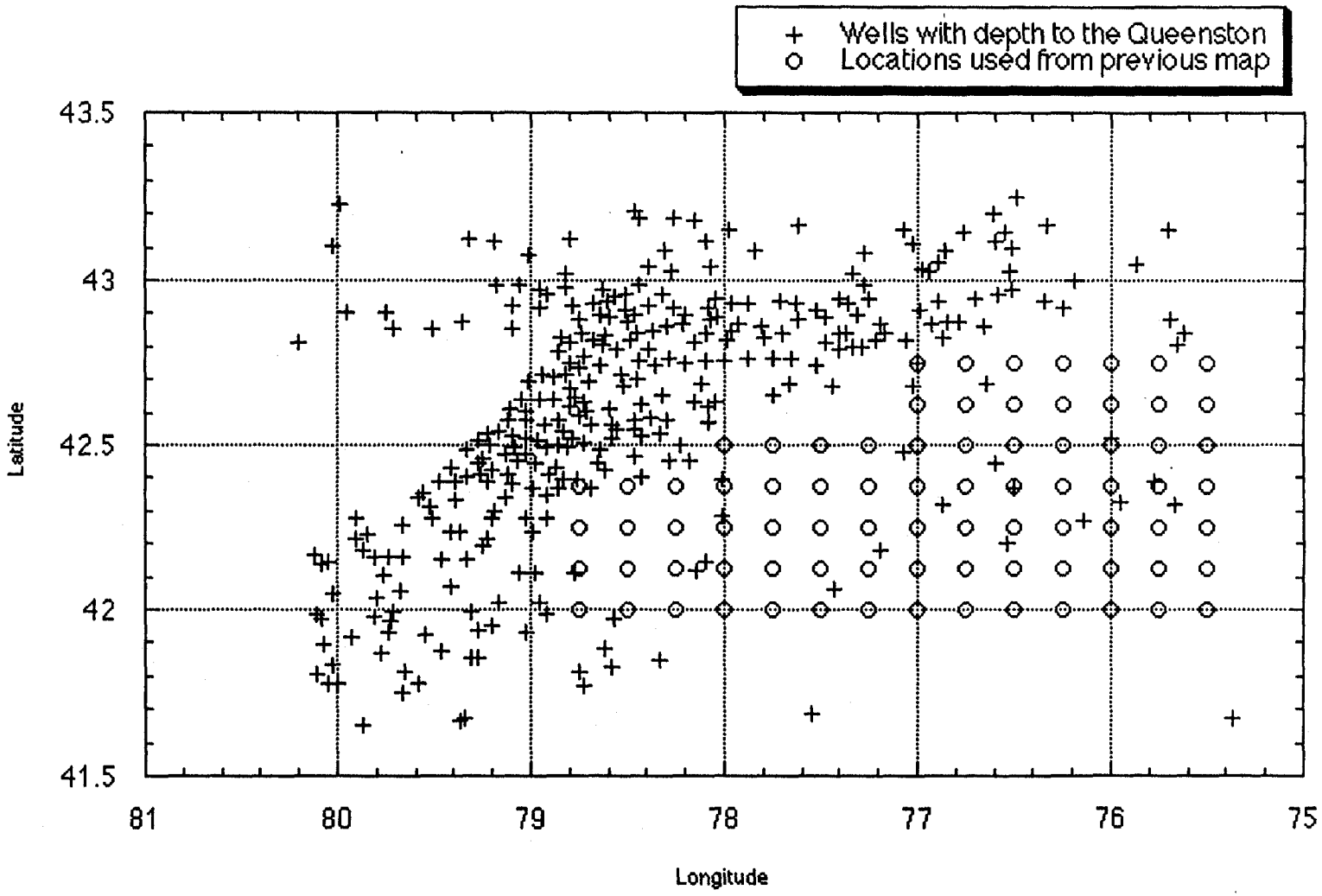


Figure 4-5. Location of wells with depth to the Queenston and location of data points from a previously made map that were used for the trend surface analysis. (Hodge and Fromm, 1982, p. 47)

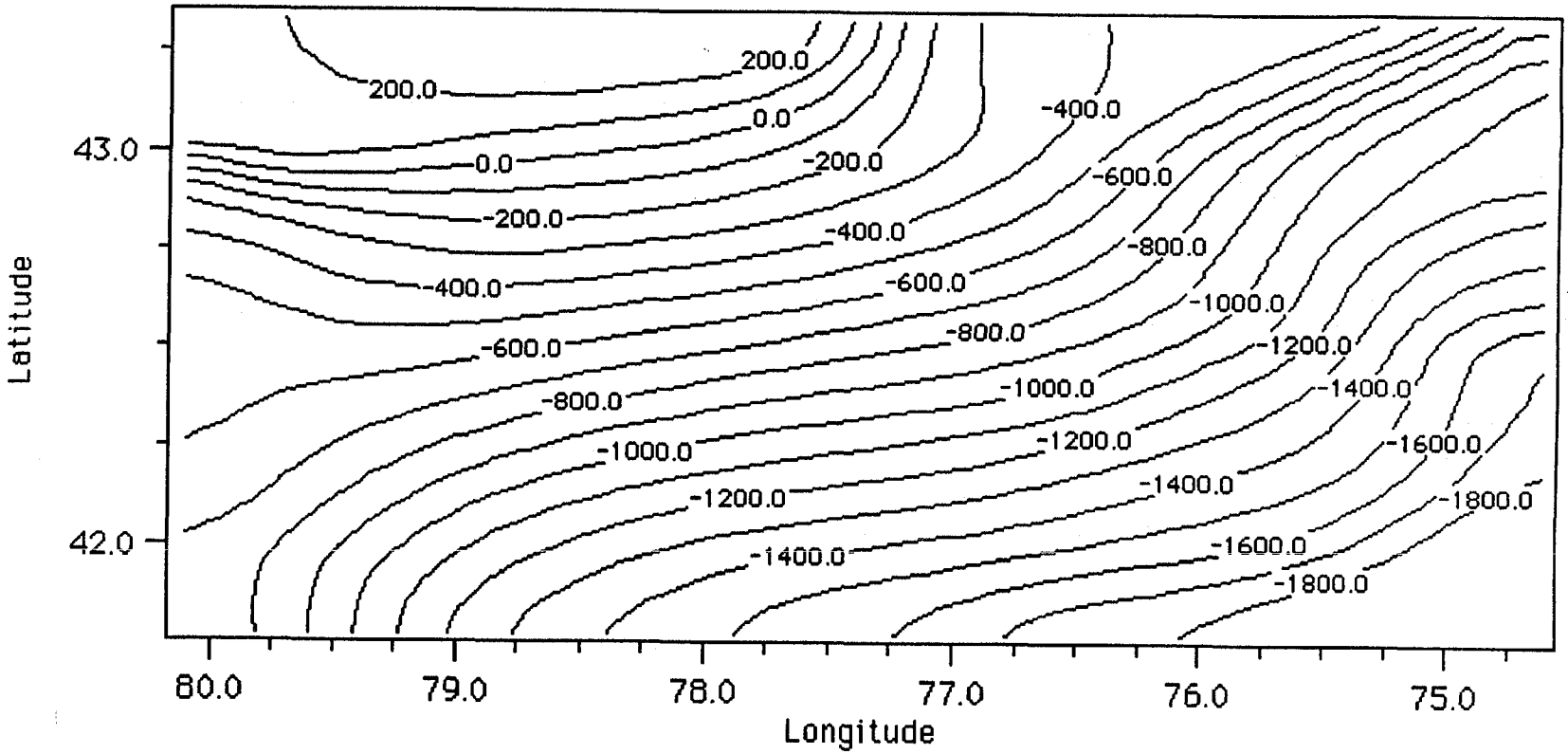


Figure 4-6. Third order trend surface of the depth in meters (sea level datum) to the top of the Queenston Formation.

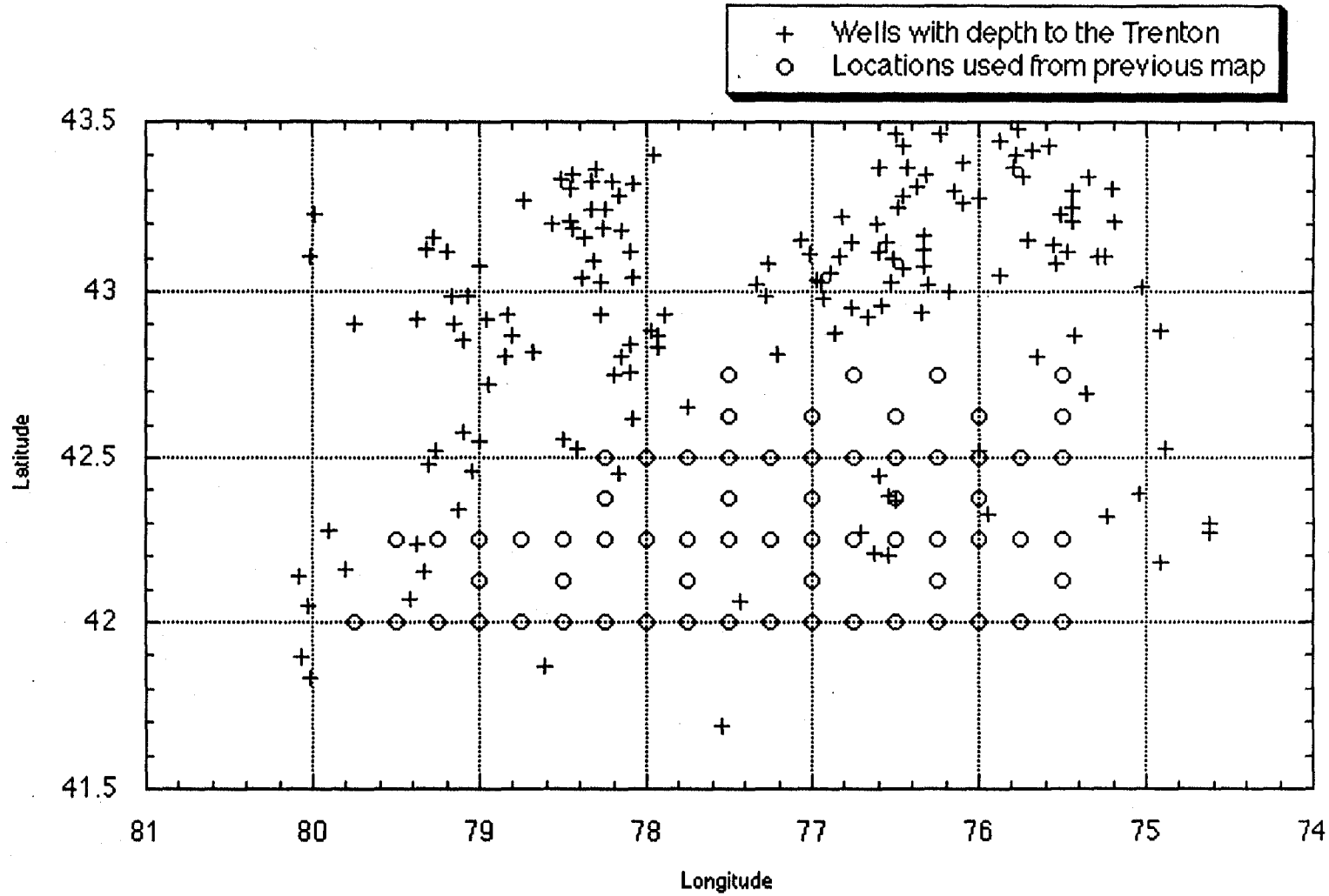


Figure 4-7. Location of wells with depth to the Trenton and location of data points from a previously made map that were used in the trend surface analysis. (Hodge and Fromm, 1982, p. 50)

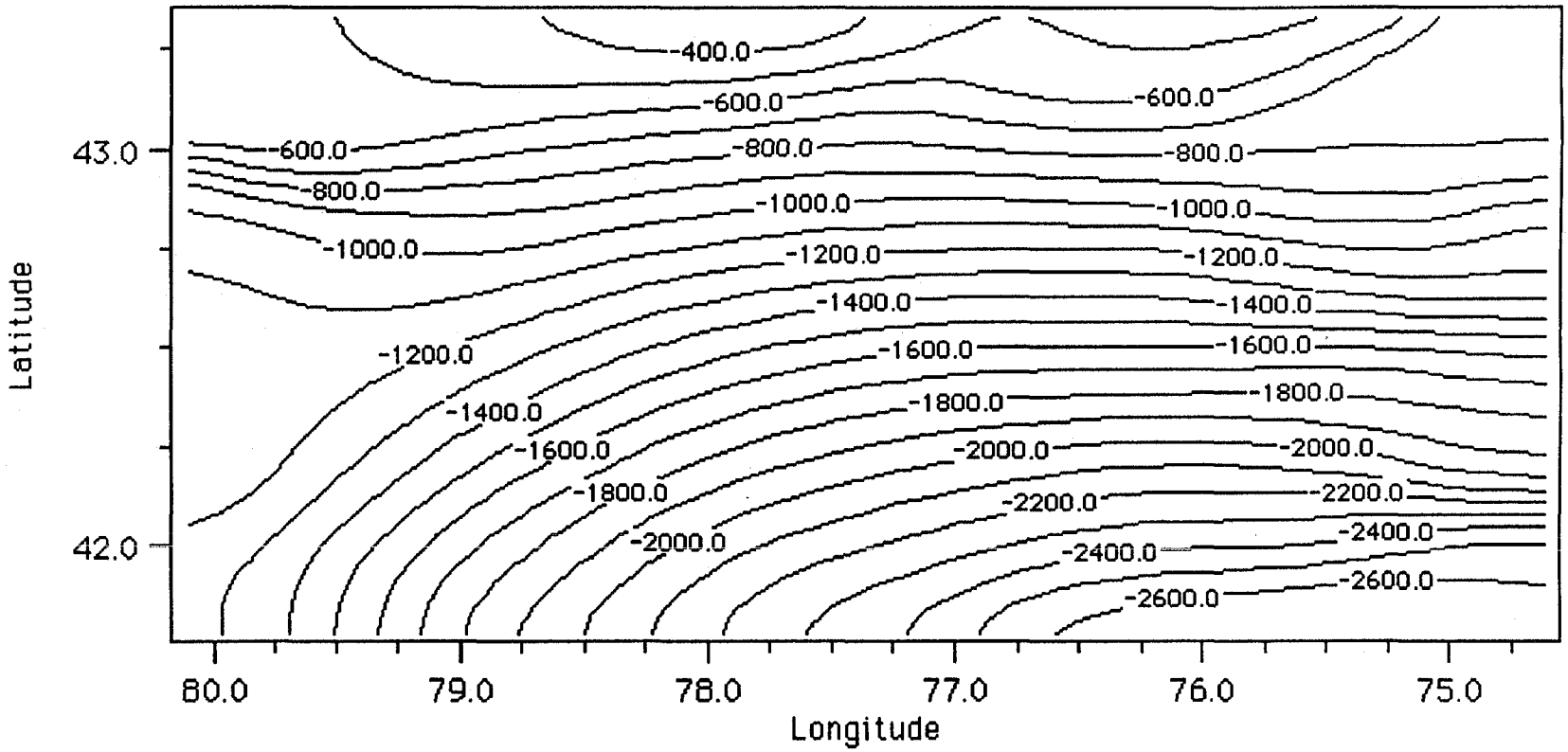


Figure 4-8. Third order trend surface of the depth in meters (sea level datum) to the top of the Trenton Group.

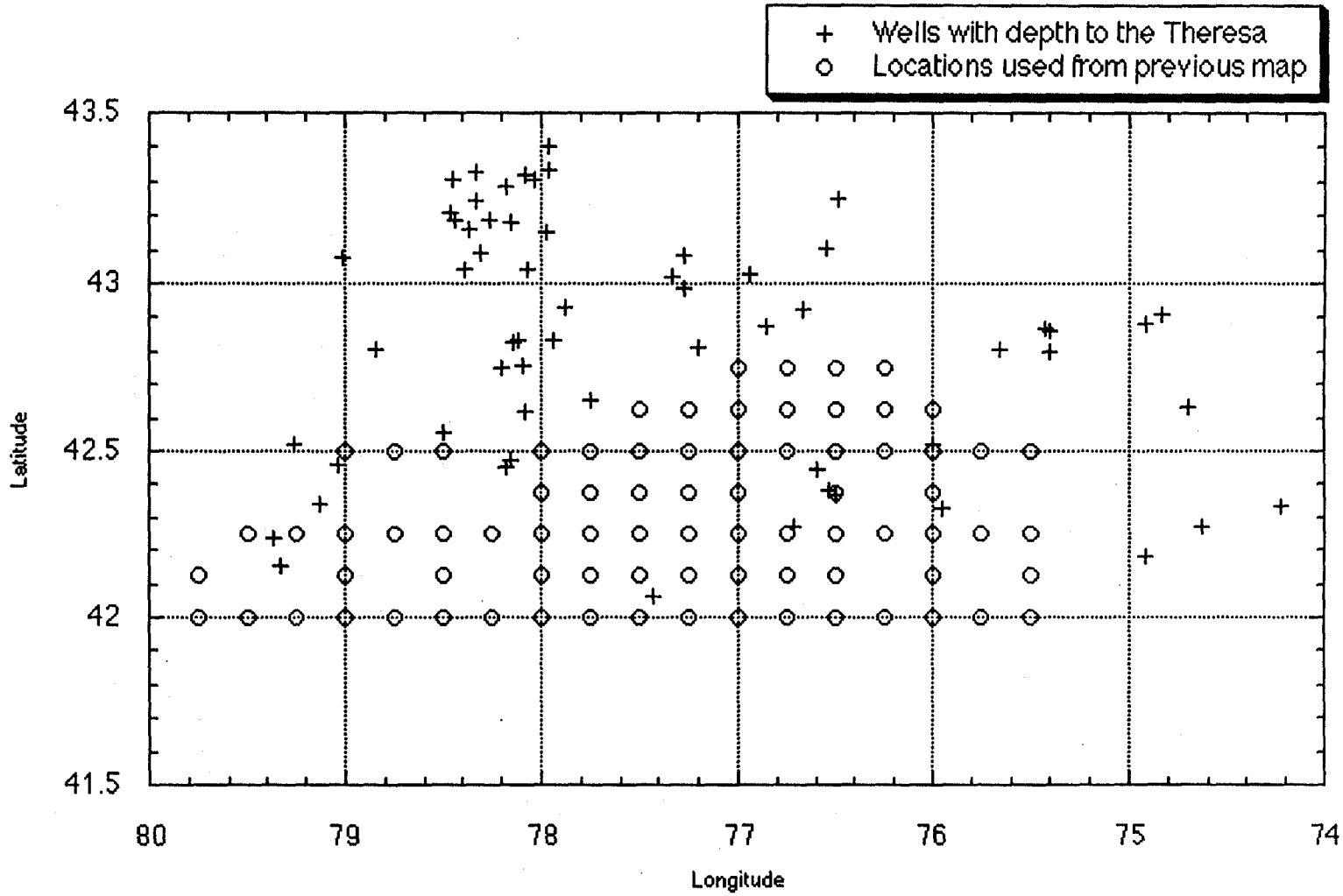


Figure 4-9. Location of wells with depth to the Theresa and location of data points from a previously made map that were used in the trend surface analysis. (Hodge and Fromm, 1982, p. 51)

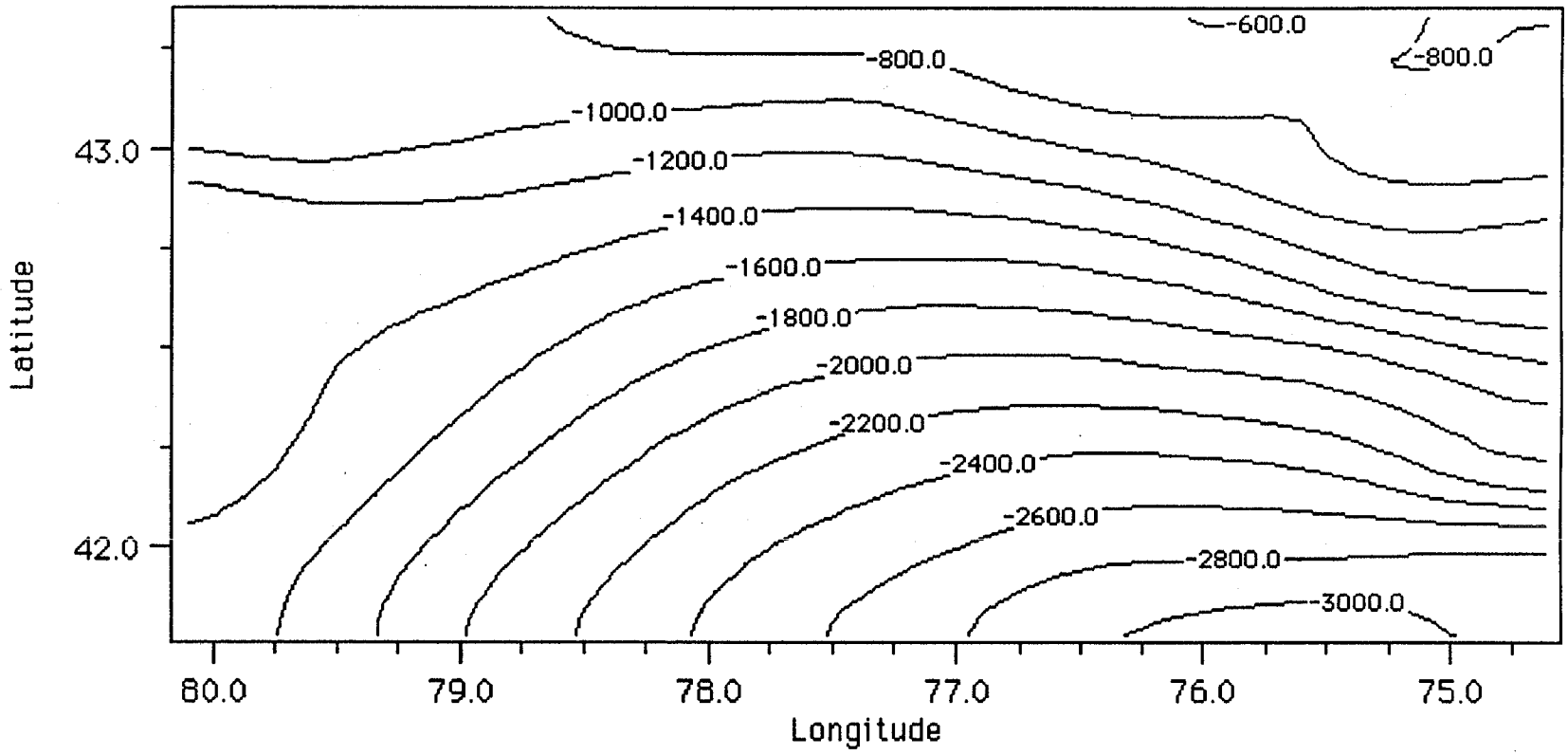


Figure 4-10. Third order trend surface of the depth in meters (sea level datum) to the top of the Theresa Formation.

The structure contour map of the Precambrian basement was prepared from 174 data points (Figures 4-11 and 4-12). A third order trend surface was determined as a best fit model for the basement top

$$-30535.7 - 18.75*y^3 + 34.9889*y^2*x - 21.1673*y*x^2 + 4.23859*x^3 \quad (16)$$

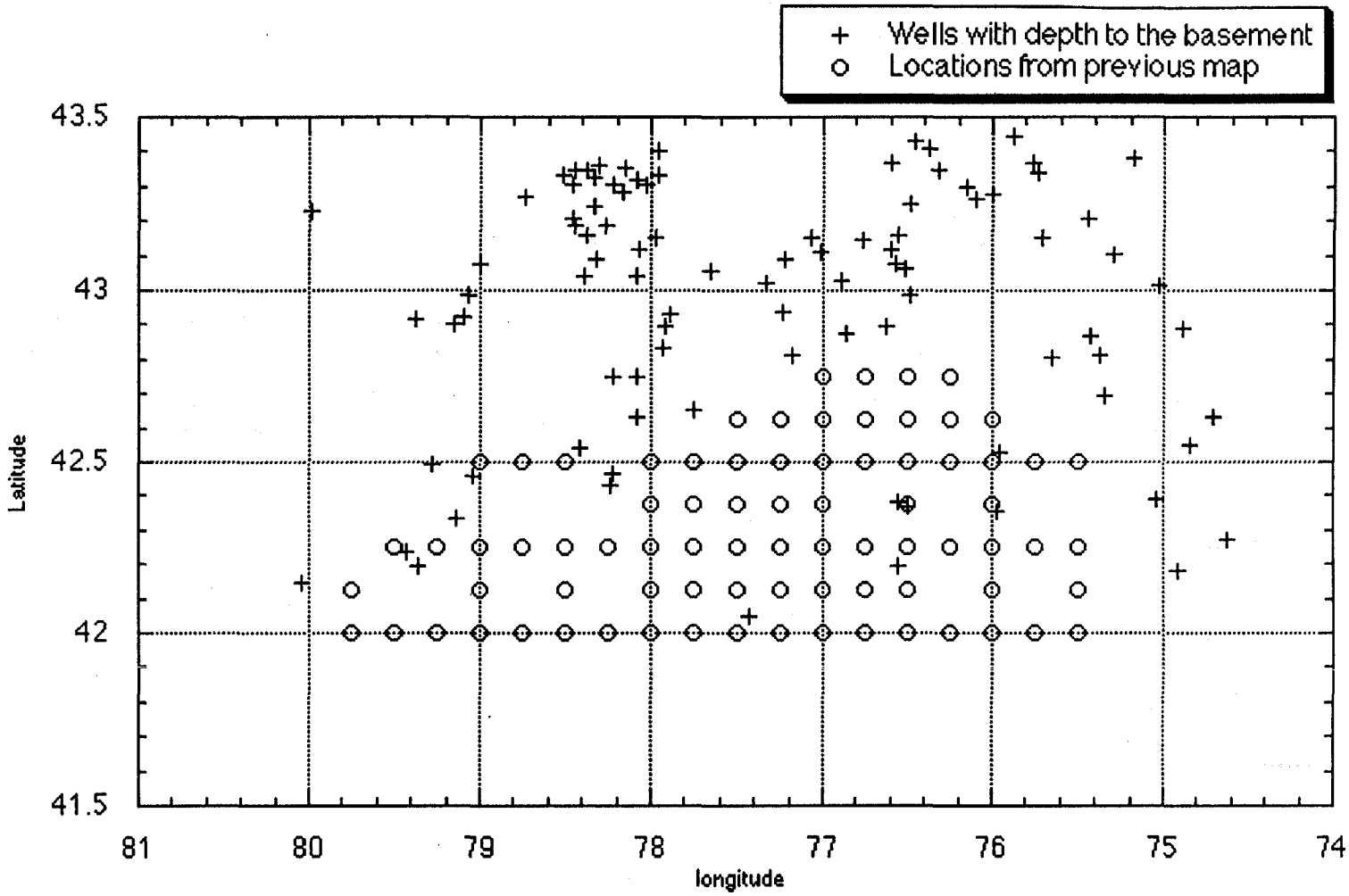


Figure 4-11. Location of wells with depth to the basement and location of data points from a previously made map that were used in the trend surface analysis. (Hodge and Fromm, 1982, p. 56)

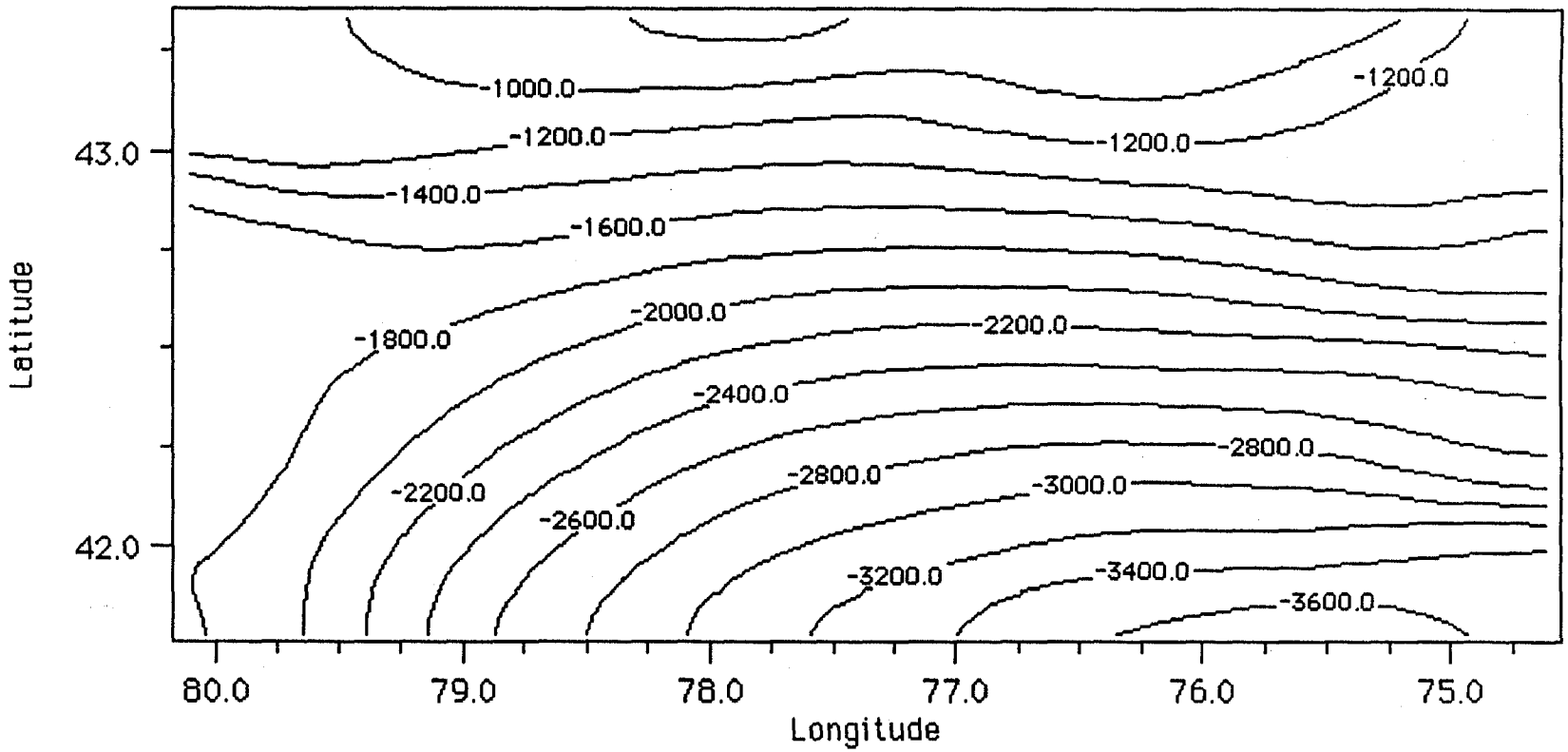


Figure 4-12. Third order trend surface of the depth in meters (sea level datum) to the top of the basement.

Section 5

HEAT FLOW AND SUBSURFACE TEMPERATURE DISTRIBUTION

The mean harmonic conductivity from the surface to total depth for each BHT well was calculated by solving the trend surface equations for the depth to each layer at the well site, determining which layer the BHT is in, and applying this information along with the conductivity data (Table 3-1) to Equation 7. The heat flow is then equal to the average geothermal gradient times the mean harmonic conductivity just obtained. The calculated heat flow was then computer-contoured using the Spyglass contouring program and a 400 x 400 matrix with a kernel smoothing fill technique (Figure 5-1). Values in the region were generally around 50 and 60 mW/m^2, which is typical for the northeastern US. Very little correlation to gravity trends is observed (Figure 5-2).

These heat flow values were then used in conjunction with the conductivity model to extrapolate subsurface temperatures at the top of the Theresa Formation and the basement. (Figure 5-3 and Figure 5-4). These maps were also produced on the Spyglass contouring program using a 400 x 400 matrix and kernel smoothing fill technique. The fact that temperatures in and around wells are perturbed by the drilling process make the determination of temperature at these formations a difficult process. The presence of expanding gas, natural or H_2S, causes very noticeable depressions. Compressed air, formation fluids, water, or sometimes mud are circulated within wells during rotary drilling to cool and lubricate the drill bit and flush the chips from the well. This is responsible for the transference of heat from areas of the borehole where temperatures are greater than the circulated matter to cooler areas and out to the surface.

Because of the possibility of a drilling disturbance depressing the observed bottom-hole temperatures, the temperature distributions were analyzed using a correction factor to bottom-hole temperatures developed by the American Association of Petroleum Geologists (AAPG)

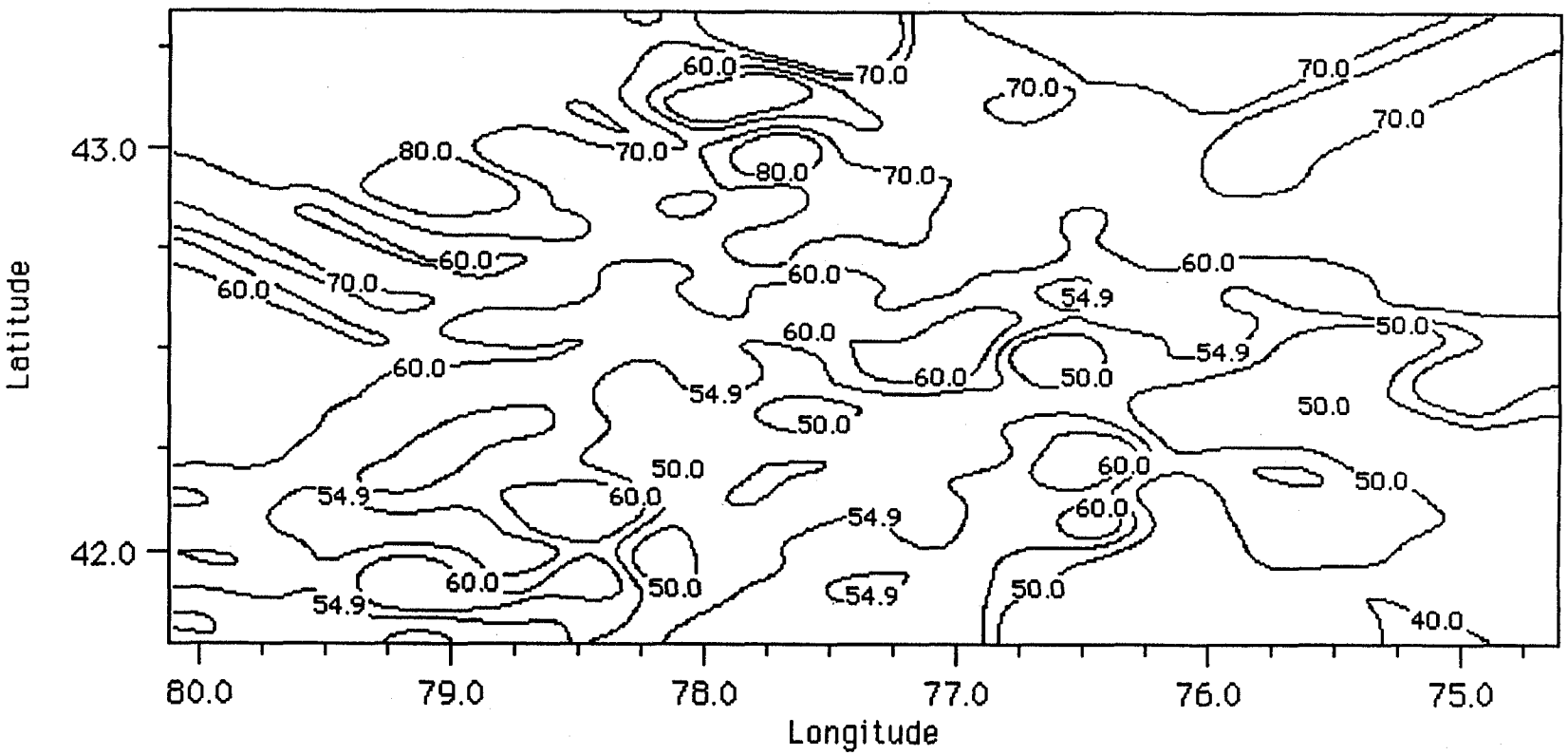


Figure 5-1. Heat flow in New York (mW/m^2) based on average geothermal gradient from surface temperature, BHT, and thermal conductivity model.

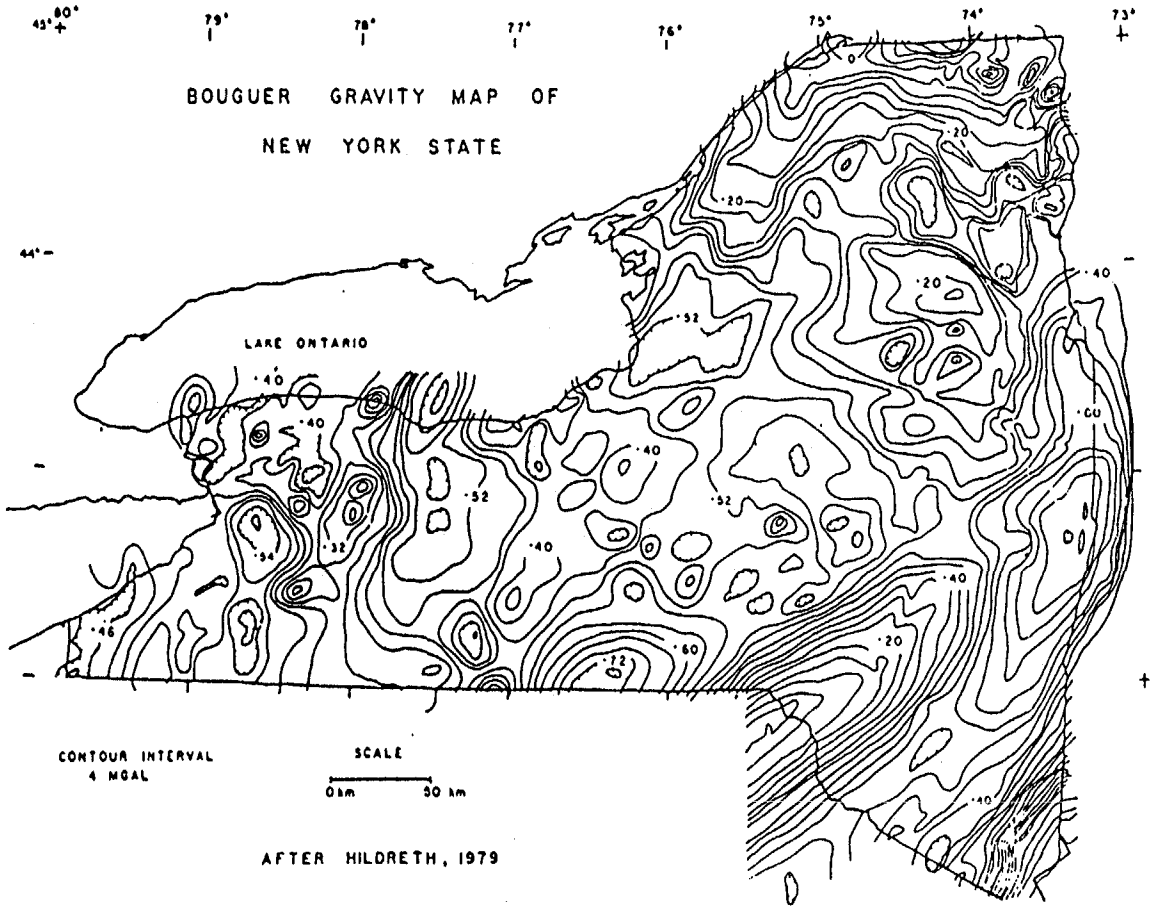


Figure 5-2. Bouger Gravity map of New York State.

during their geothermal survey of North America (AAPG. 1971). Their study statistically derived a correction factor to apply to bottom-hole temperatures that are logged soon after cessation of drilling. The correction was derived from equilibrium temperatures in 602 wells in west Texas and southern Louisiana. The wells were reentered long after the drilling disturbance had dissipated, and the BHT recorded and an empirical relation of the drilling disturbance to the depth of the BHT was established. The equation derived to stimulate the AAPG correction is

$$\begin{aligned} BHTCOR = & -1.055\ (°F) + 0.4485 \times 10^{-2}\ (°F/ft)*d - \\ & 0.1903 \times 10^{-7}\ (°F/ft^2)*d^2 - \\ & 0.9250 \times 10^{-11}\ (°F/ft^3)*d^3 \end{aligned} \qquad (17)$$

where BHTCOR is the correction factor in degrees Fahrenheit and d is the depth to the BHT in feet. The problem with this relation is that it is derived from wells in an area (Texas and Louisiana) where drilling mud is employed for most of the drilling operation. Wells drilled in New York State, except for very deep ones, are drilled primarily with compressed air. The transfer of heat from the borehole cannot be expected to be as effective with air or with mud because the conductivity of air is generally several orders of magnitude less. Therefore, this correction must be considered to overestimate the upper-bound of the correction that should be made. Actual determination of a corrective factor for air-drilled wells would require logging the BHT in many wells at different depths over time. Additionally, much of the information that would be necessary to properly apply a correction (e.g., length of actual drilling time, time after cessation of drilling that the BHT was recorded) is not commonly available. Due to their complexities, a study of a corrective factor for the wells in New York State was not undertaken, and so the AAPG corrective factor was employed.

Temperatures at the top of the Theresa Formation (Figure 5-3) and the top of the basement (Figure 5-4) were calculated based on Equation 9. The depth that the temperature gradients had to be extrapolated in was determined from the trend surface equations developed for each formation. The general character of the maps mimics what is expected. Elevated temperatures are shown in areas of higher heat flow. It can also be seen that the increase in temperature along the horizon toward the south becomes more rapid as a result of increased dip of the horizons in that area.

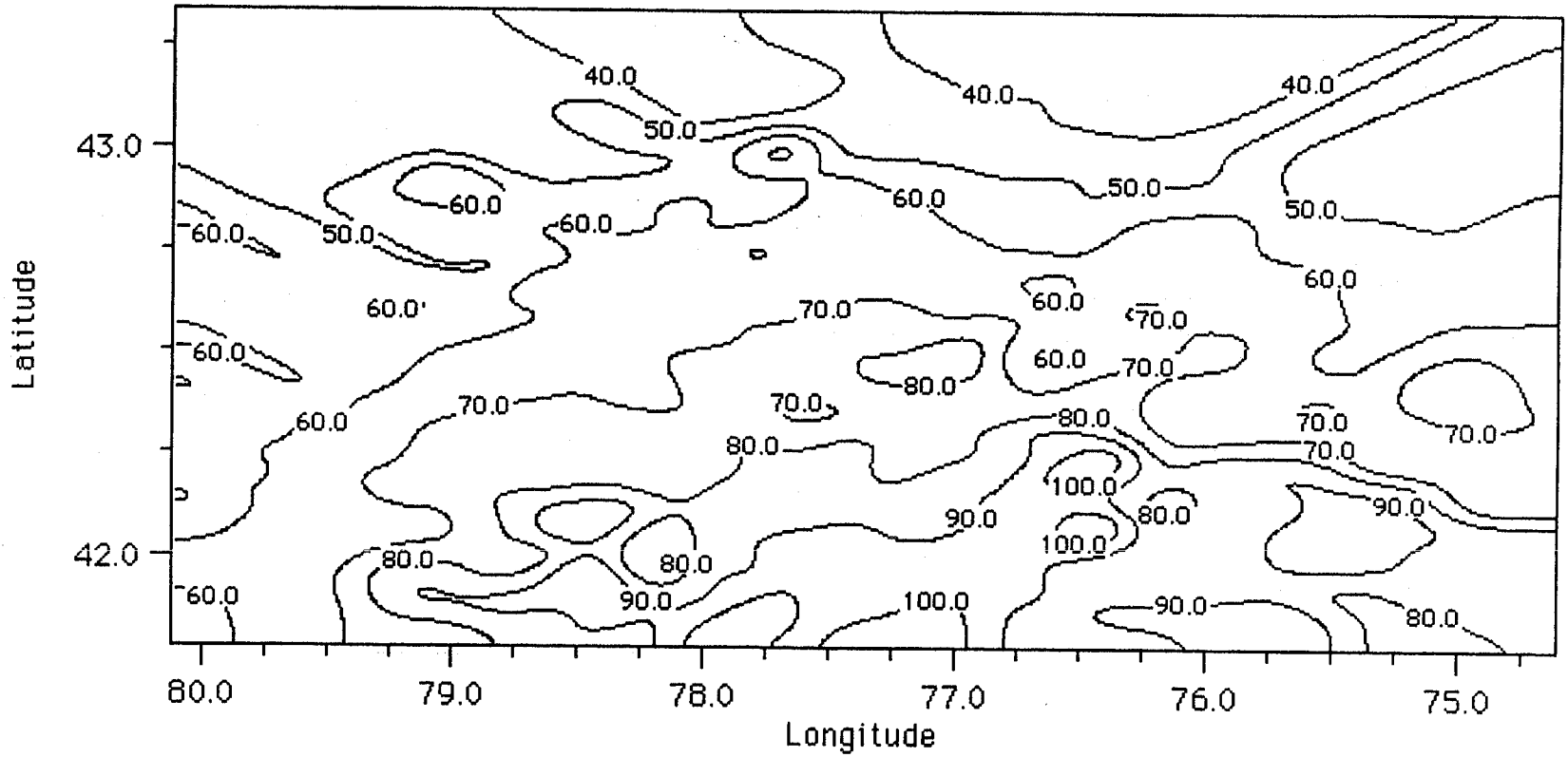


Figure 5-3. Temperature at the top of the Theresa Formation (degrees Celsius), BHT correction applied.

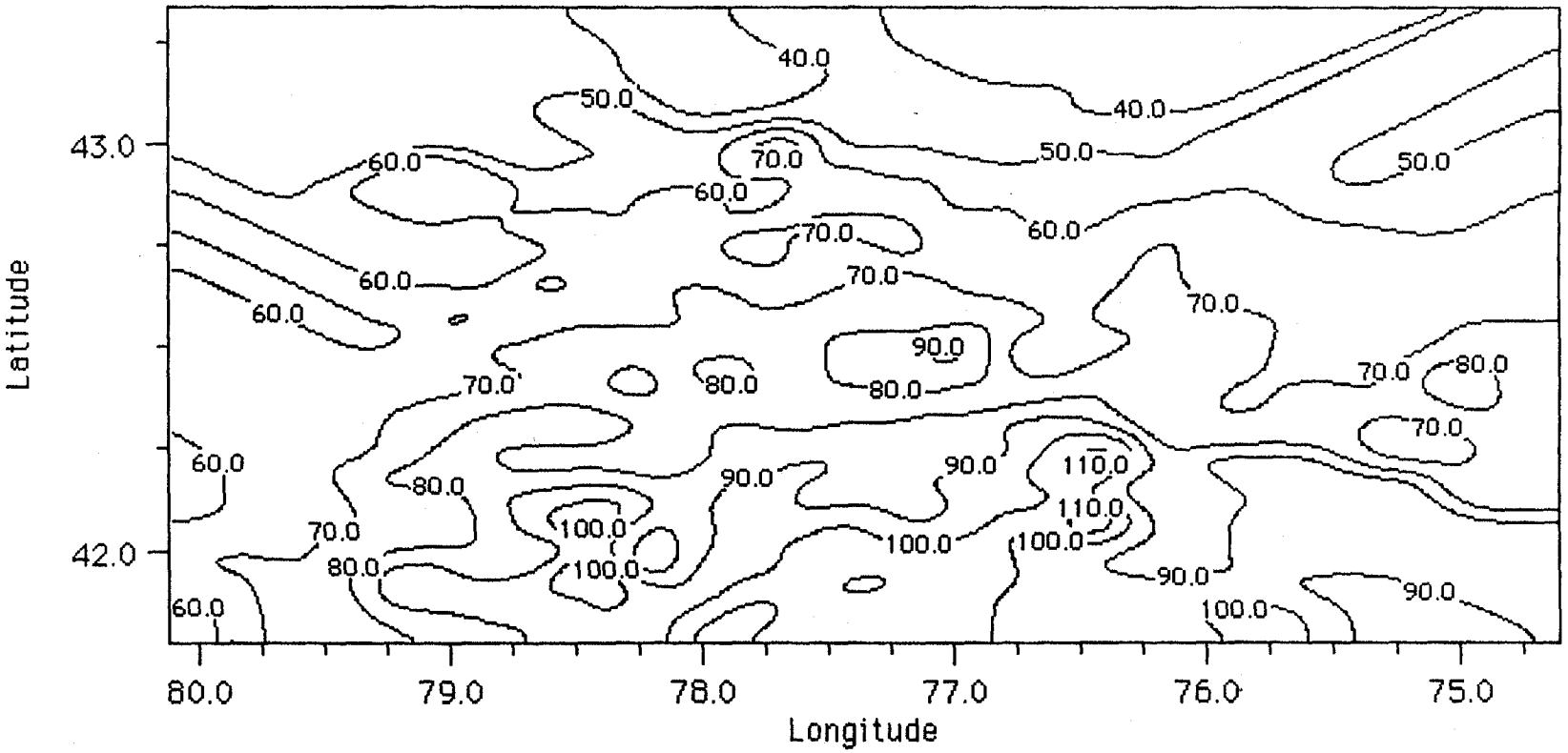


Figure 5-4. Temperature at the top of the basement (degrees Celsius), BHT correction applied.

Evaluating the accuracy of the model that predicts the temperature at depth was done by examining the actual temperature-depth distributions of bottom-hole temperatures in various sub-areas of the study area (Figure 5-5). The BHT versus depth (sea level datum) was plotted and the temperature at the top of each formation was calculated based on Equation 9. Gradient lines which connected the temperatures obtained at each formation were then plotted.

The temperatures encountered at shallower depths generally will follow the demonstrated gradient as they are extrapolated to greater depths. The degree to which they approximate actual temperatures recorded at greater depths, as they follow the changing gradient, is a measure of the accuracy of the model. Testing the model in this fashion is subject to limitations. Generally, temperature data is concentrated at a particular depth because the nature of oil and gas exploration tends to concentrate on a specific formation in an area that has proven resources. These oil and gas target formations are for the most part, at shallower depths than those that are targeted for geothermal use. Deeper temperatures are available and these were analyzed if they were present in the areas investigated.

The plot of BHT versus depth for all the areas is shown in Figures 5-6 - 5-25. When possible, the BHT for each well investigated in a specific area is shown outlined. The average depth to the various formations were obtained from their contour maps and trend surface equations and are noted on the right hand side of the plots as: 1) Onondaga (ON); 2) Queenston (QU); 3) Trenton (TR); 4) Theresa (TH); and 5) Basement (BA). All of the areas plotted gradients show good agreement with the deeper temperature data. This shows that the model used provides a good process for extrapolating temperature at depth for the available BHT data.

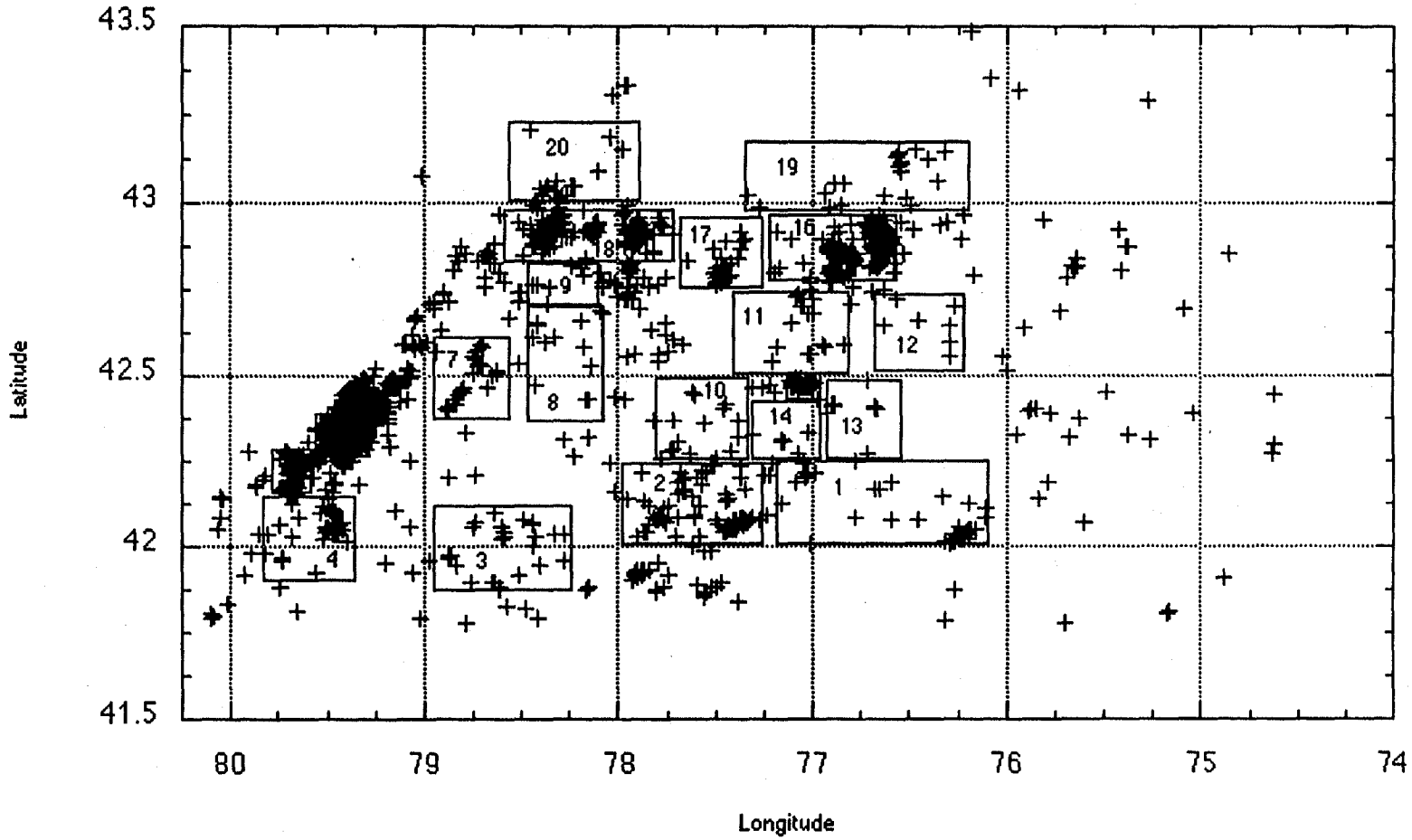


Figure 5-5. Outlines of areas used to examine the accuracy of temperature at depth distributions by plotting BHT versus depth (sea level datum).

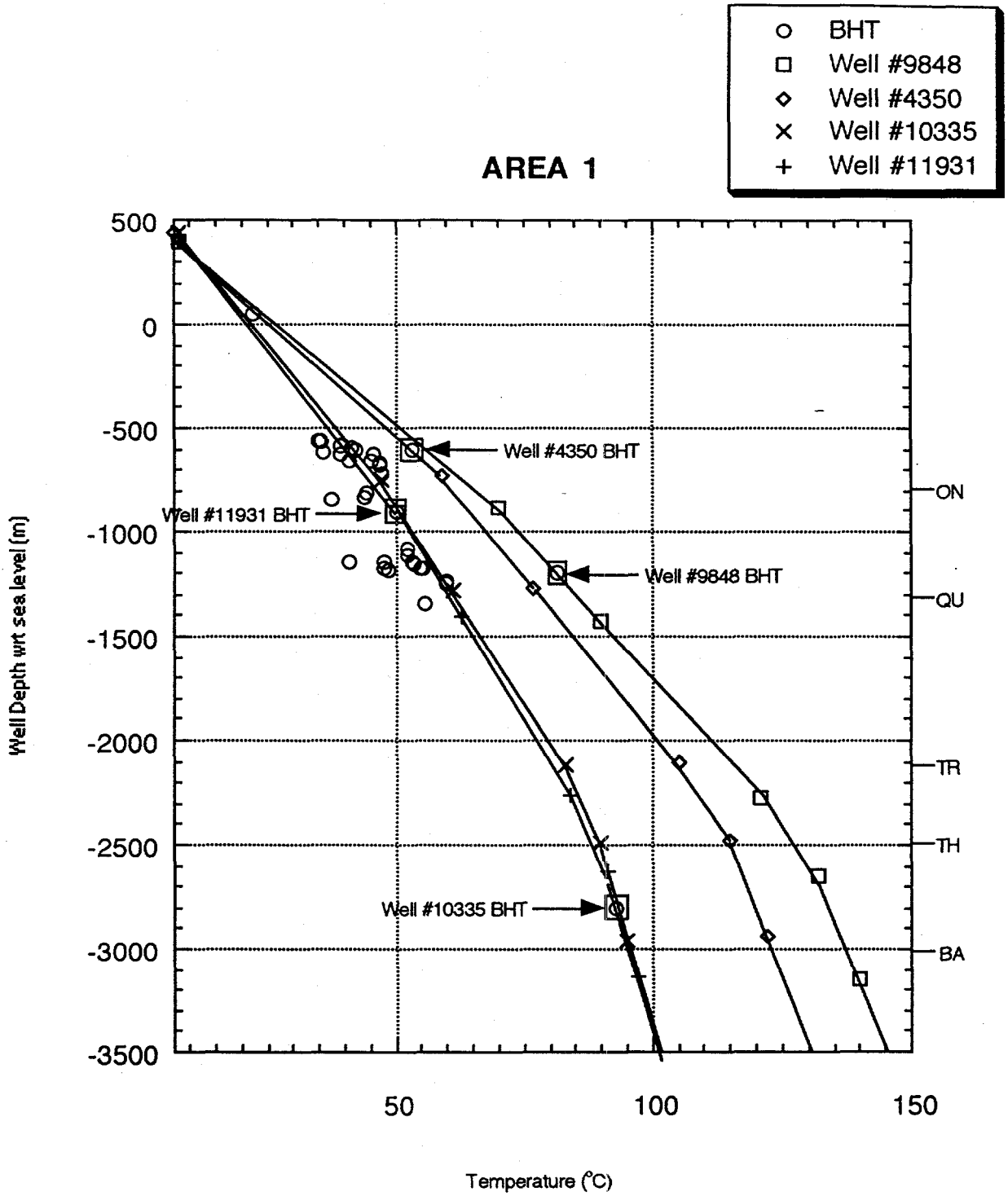


Figure 5-6. BHT data for Area 1.

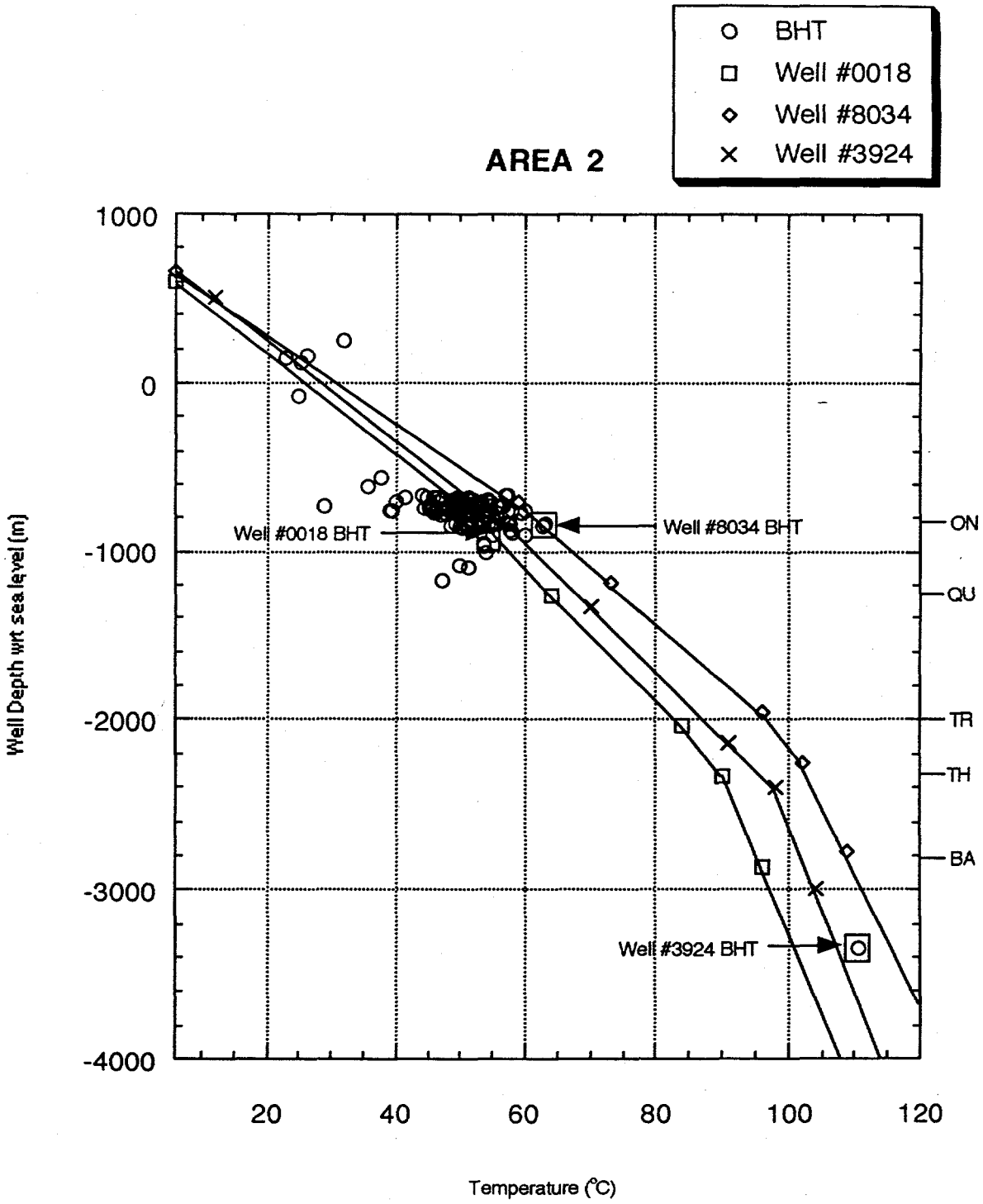


Figure 5-7. BHT data for Area 2.

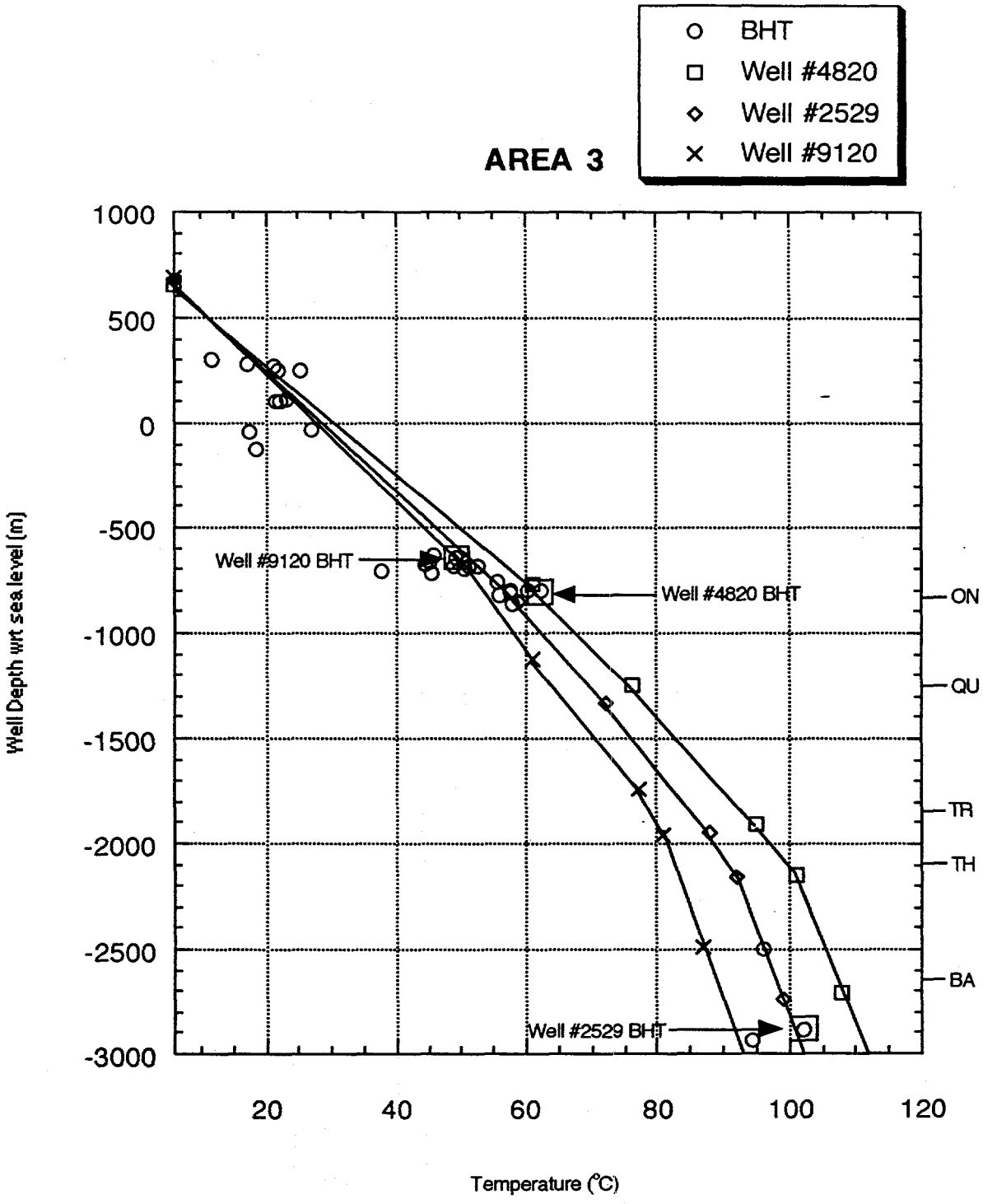


Figure 5-8. BHT data for Area 3.

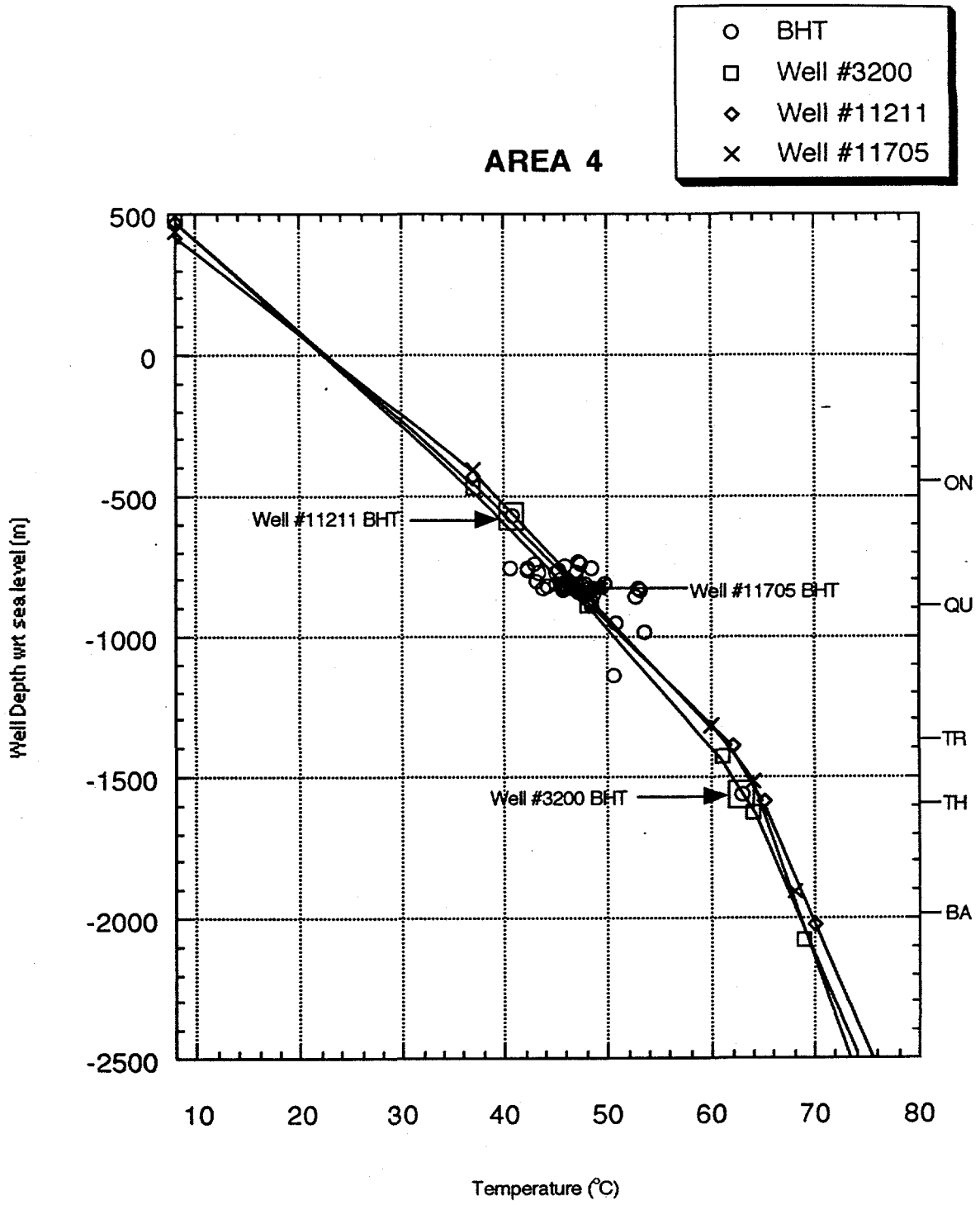


Figure 5-9. BHT data for Area 4.

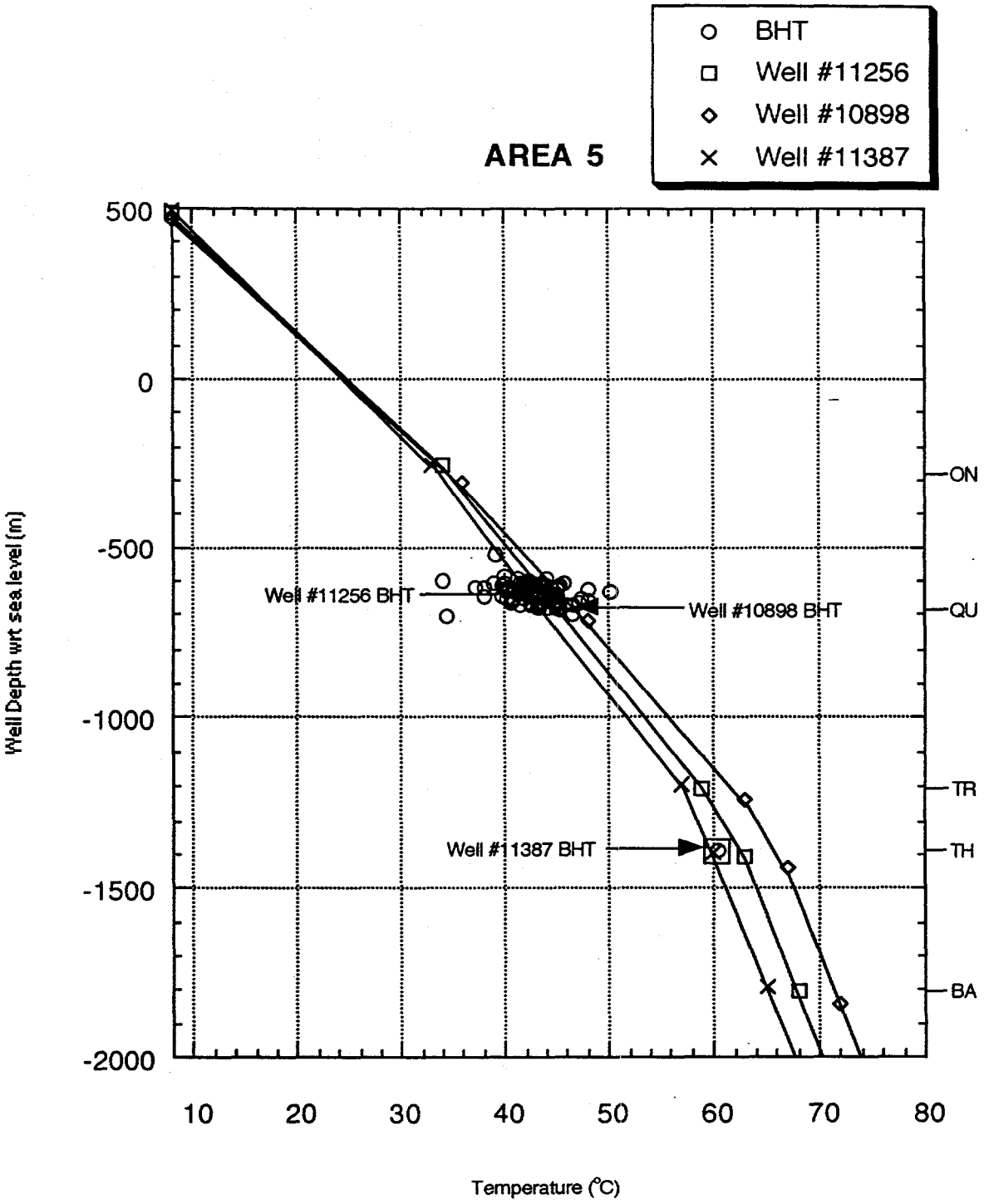


Figure 5-10. BHT data for Area 5.

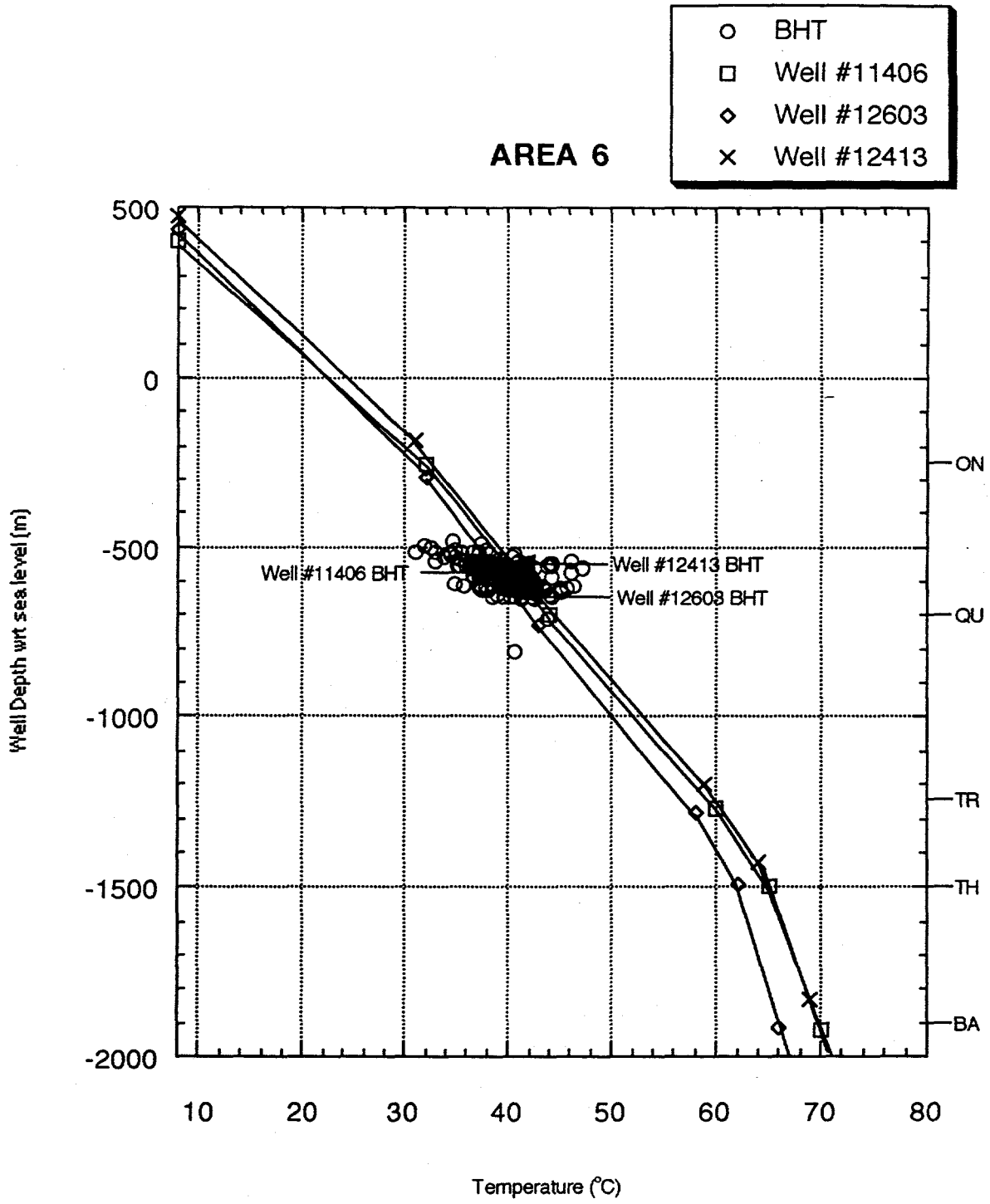


Figure 5-11. BHT data for Area 6.

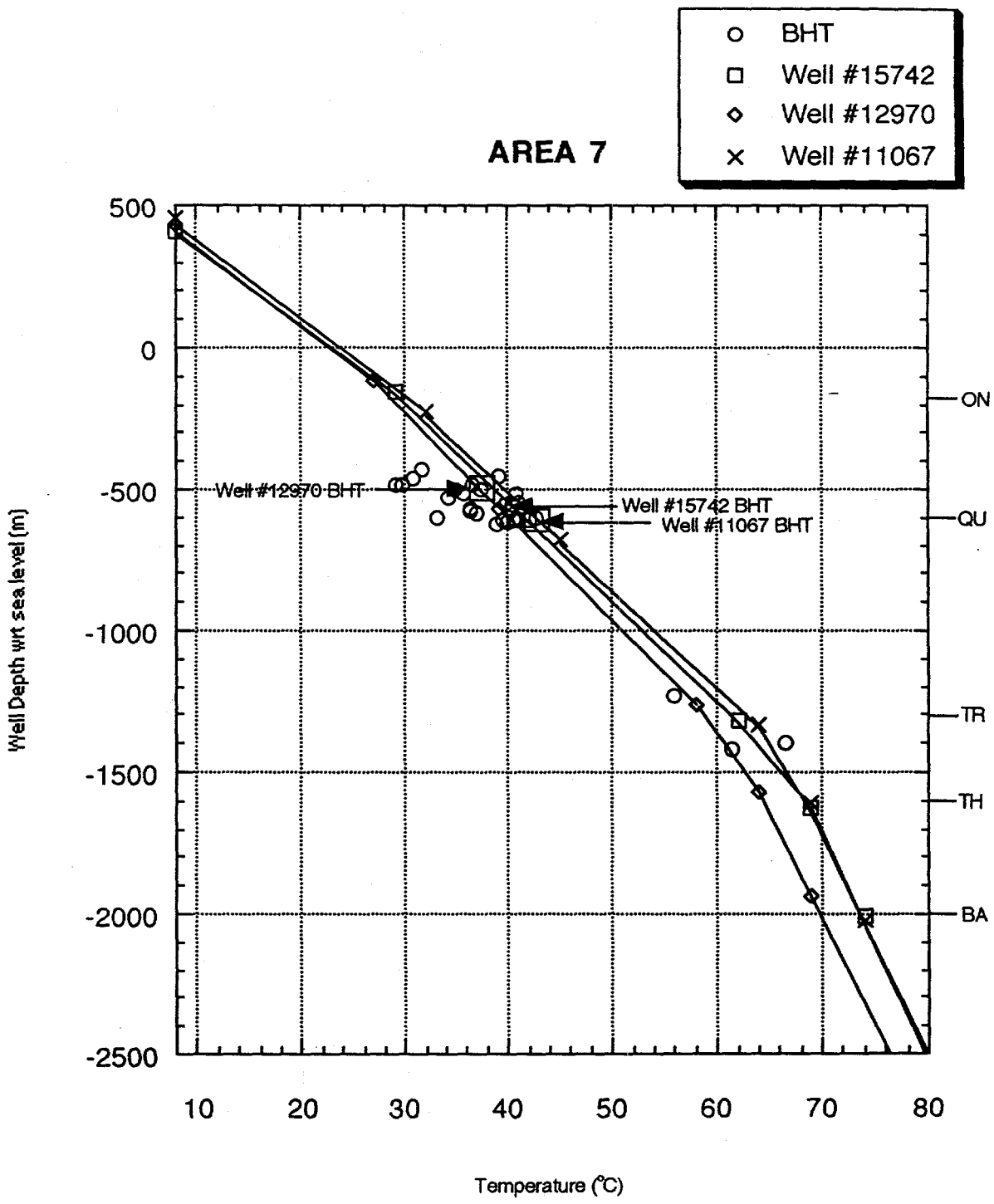


Figure 5-12. BHT data for Area 7.

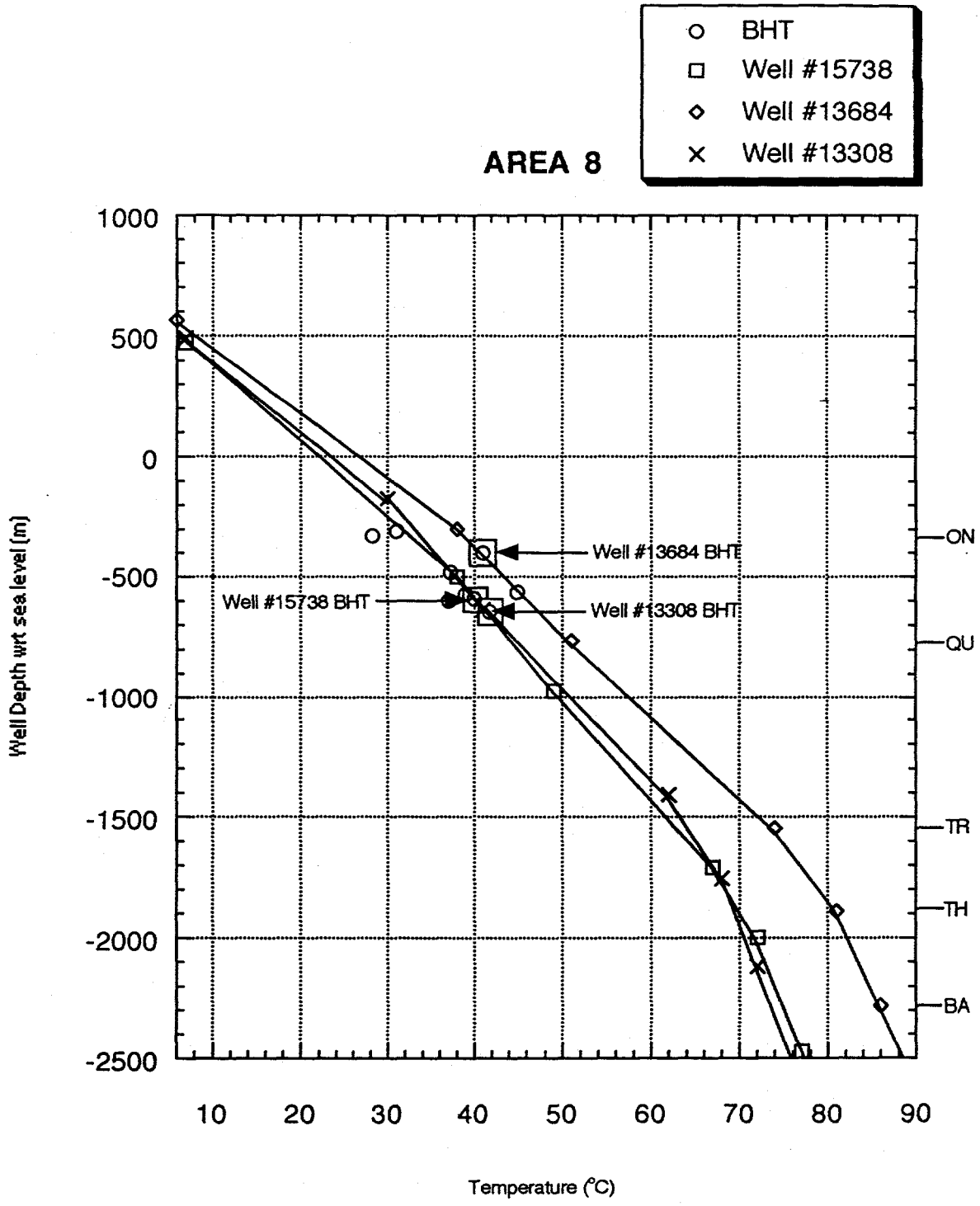


Figure 5-13. BHT data for Area 8.

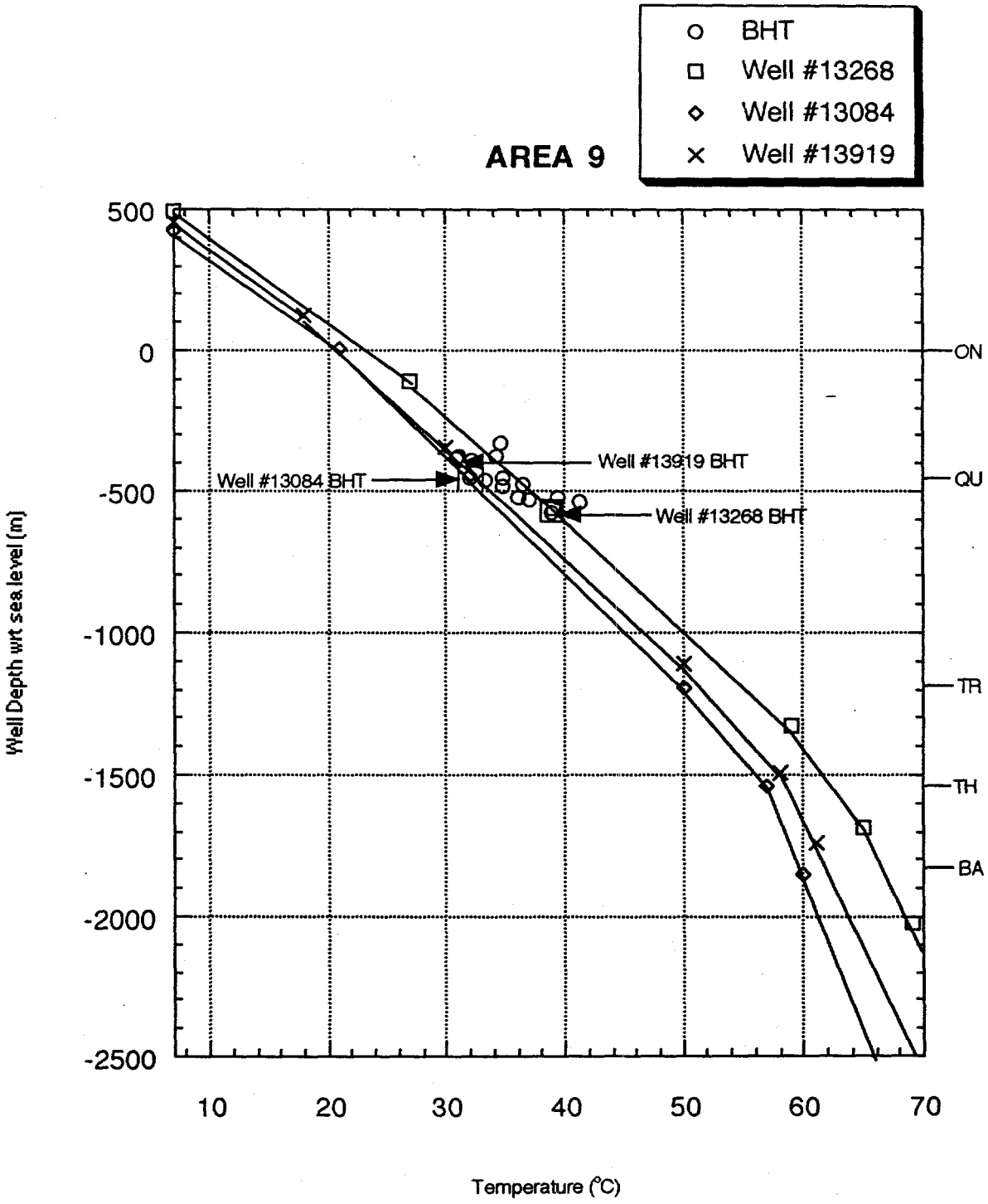


Figure 5-14. BHT data for Area 9.

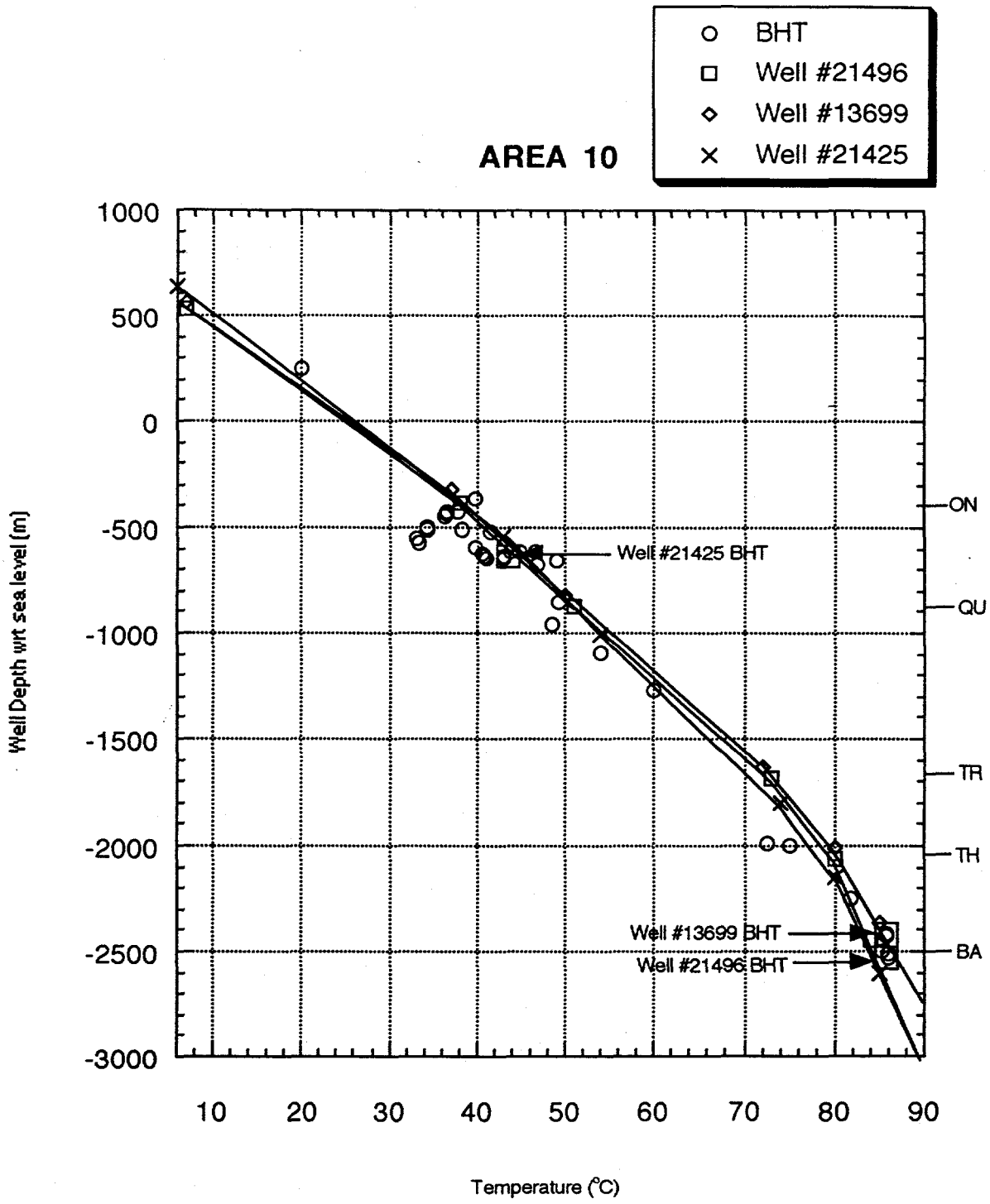


Figure 5-15. BHT data for Area 10.

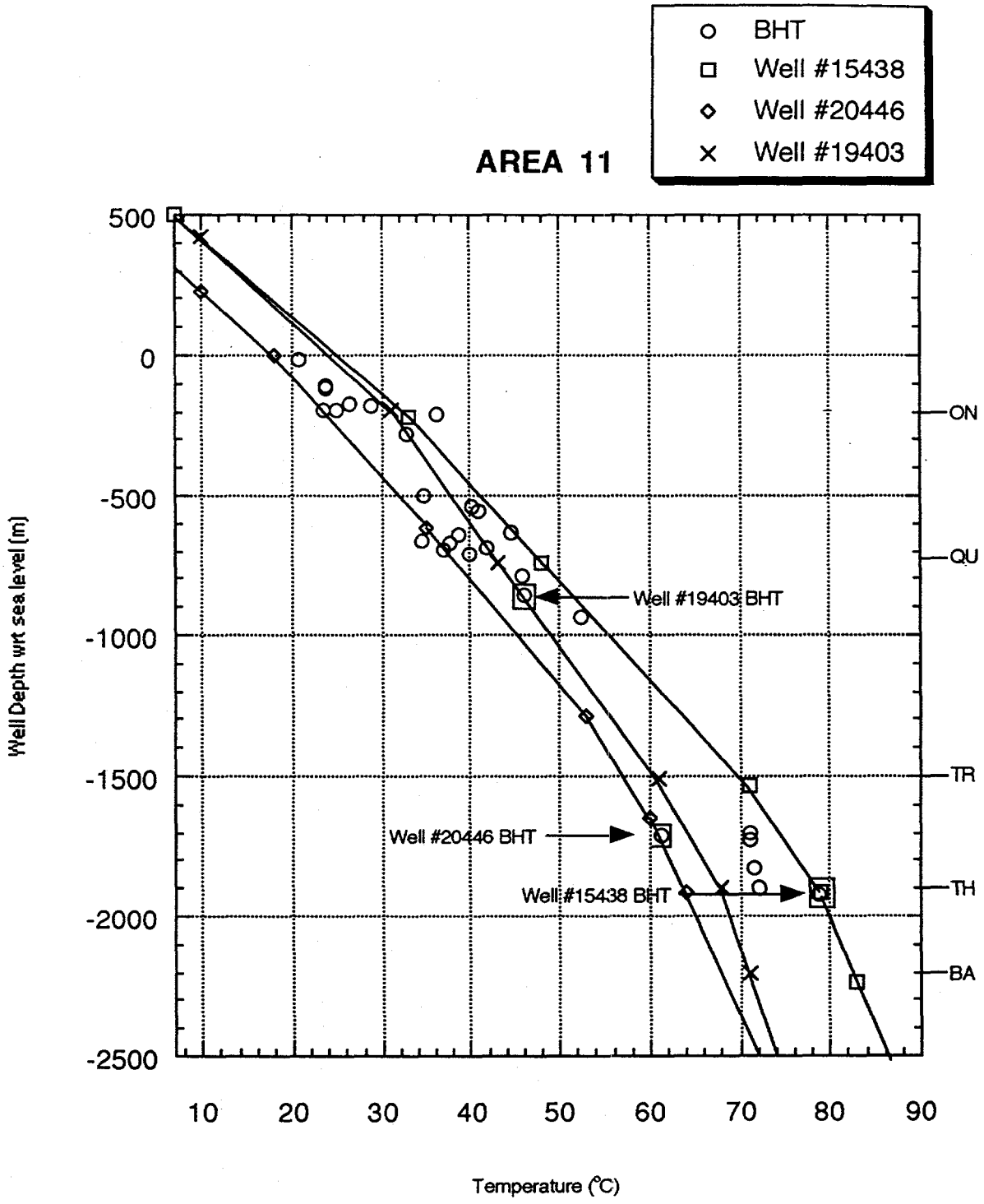


Figure 5-16. BHT data for Area 11.

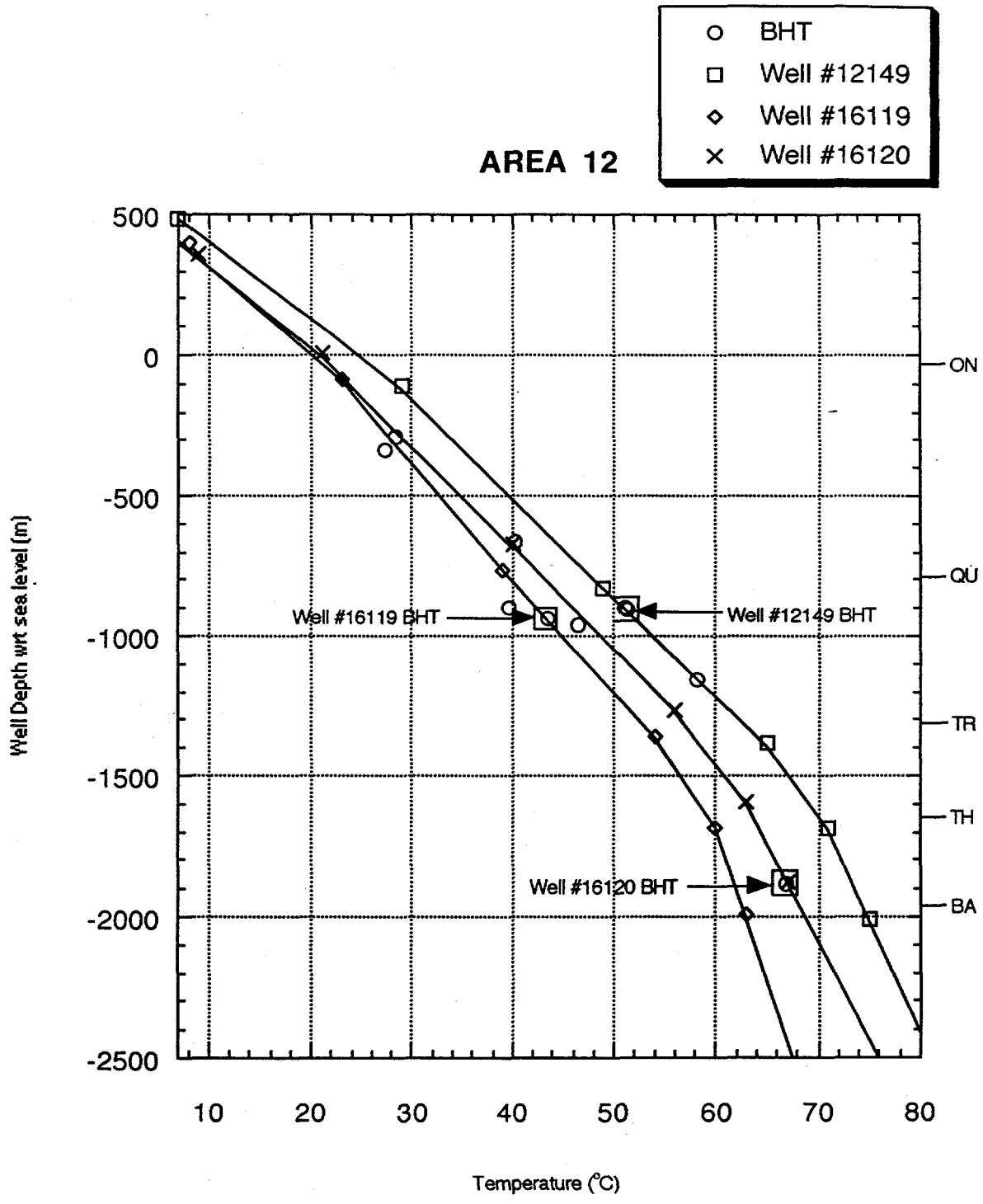


Figure 5-17. BHT data for Area 12.

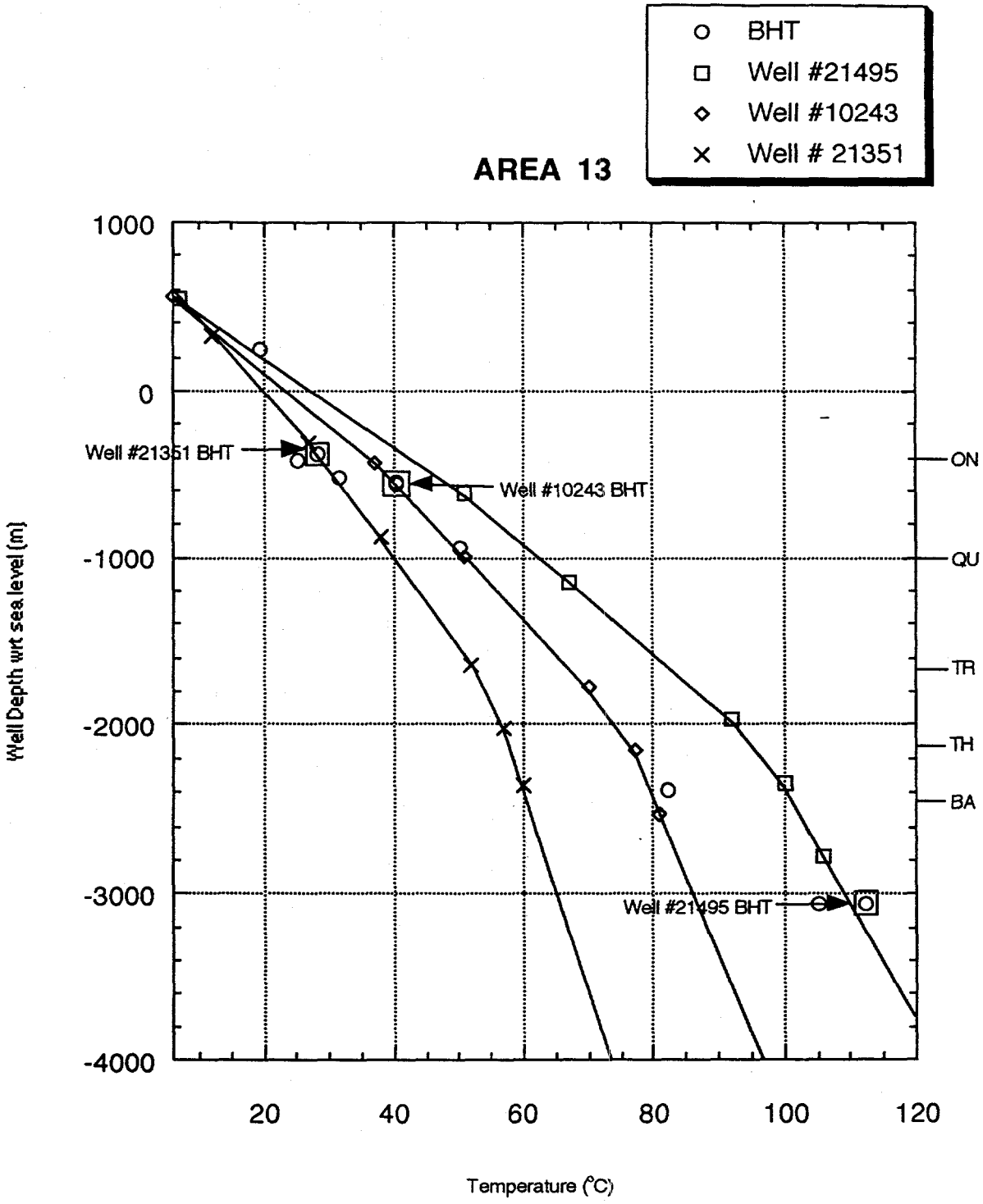


Figure 5-18. BHT data for Area 13.

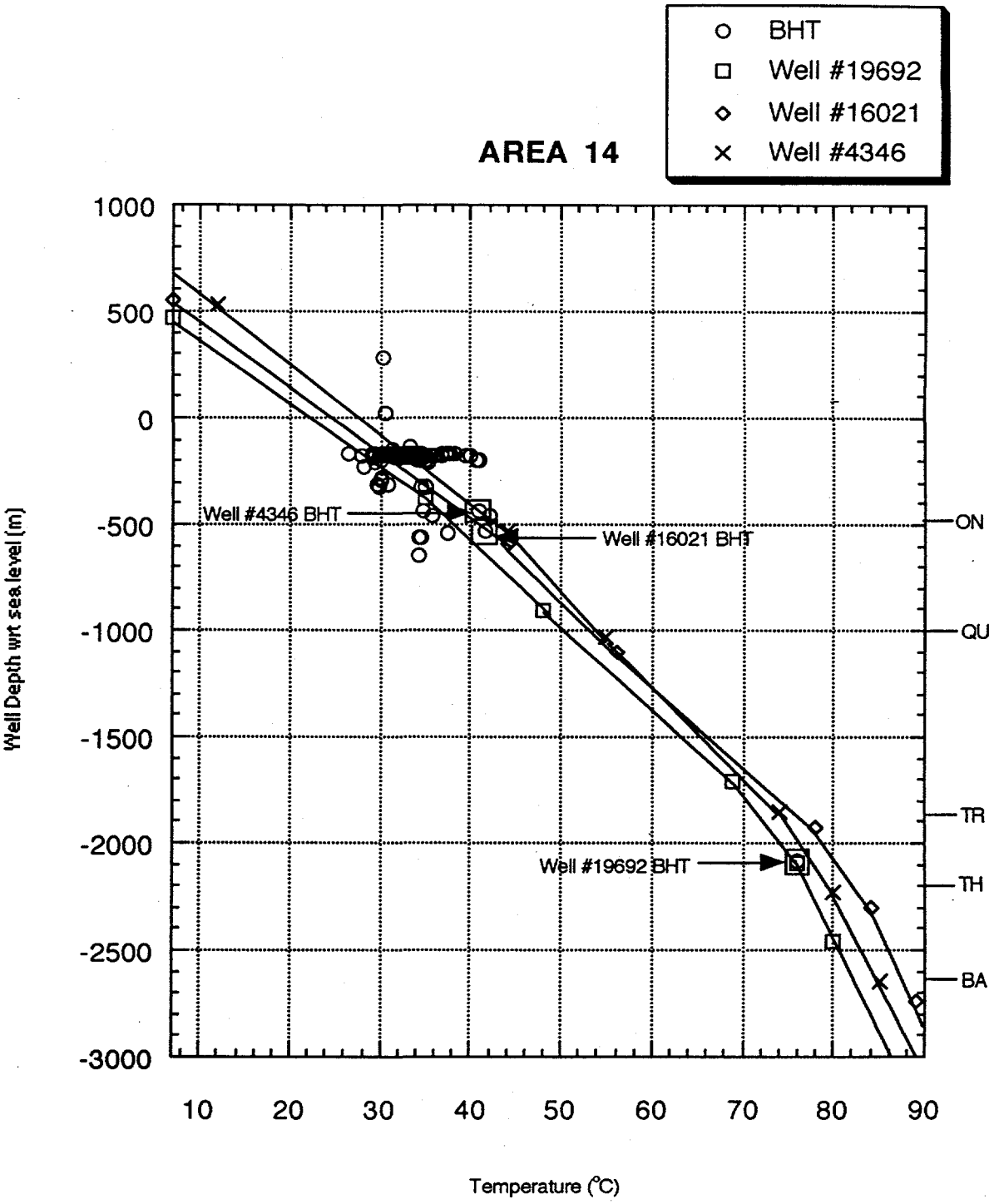


Figure 5-19. BHT data for Area 14.

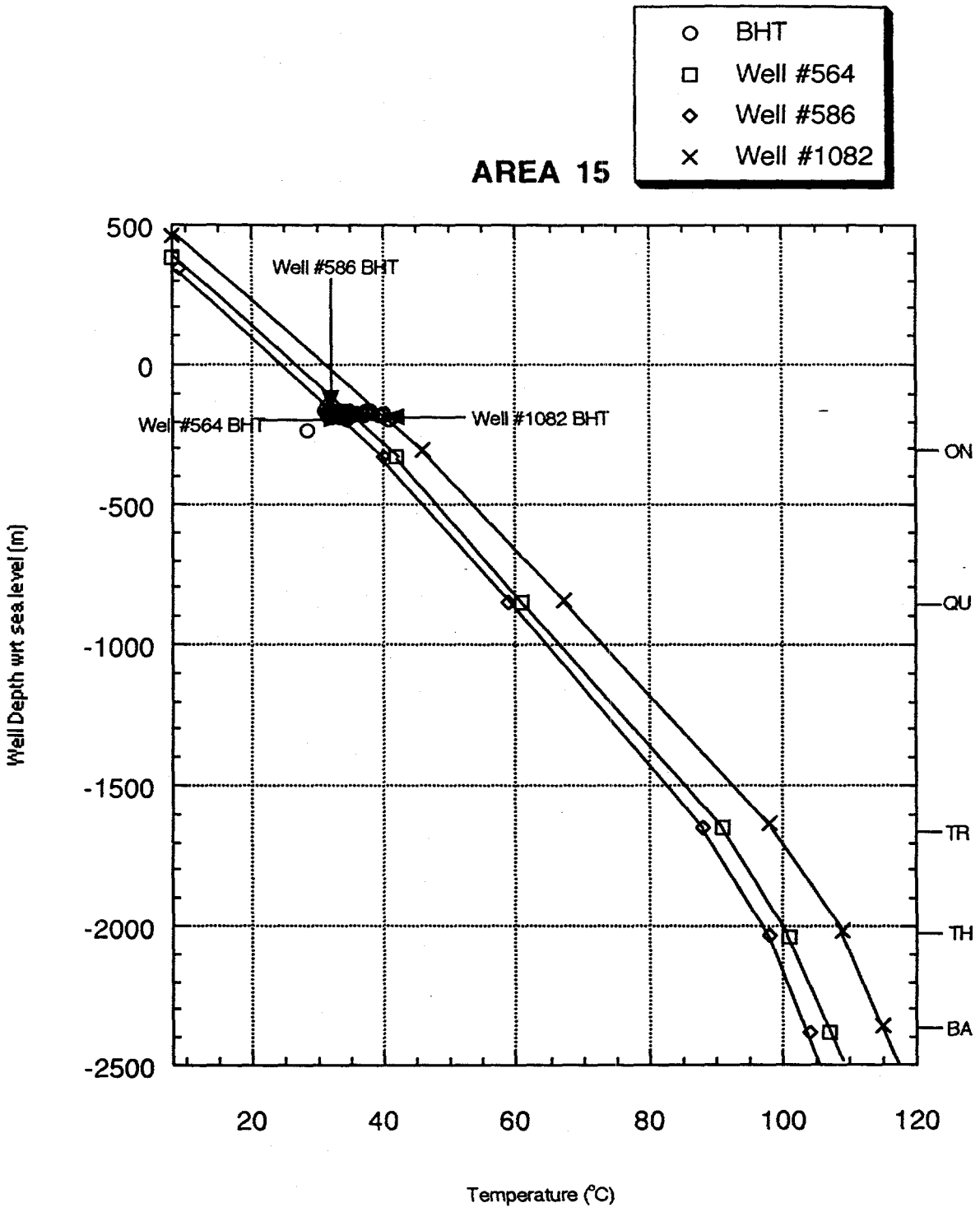


Figure 5-20. BHT data for Area 15.

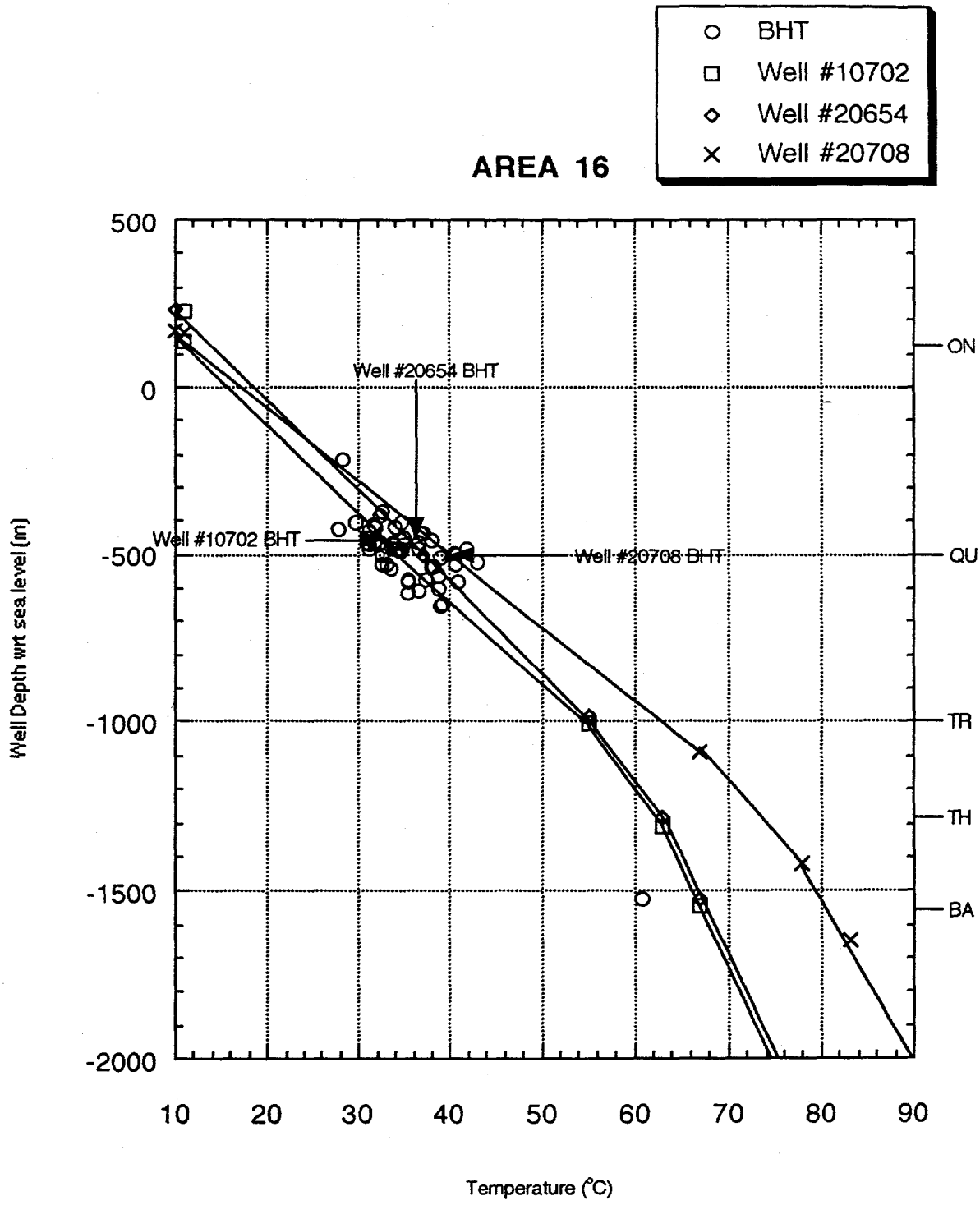


Figure 5-21. BHT data for Area 16.

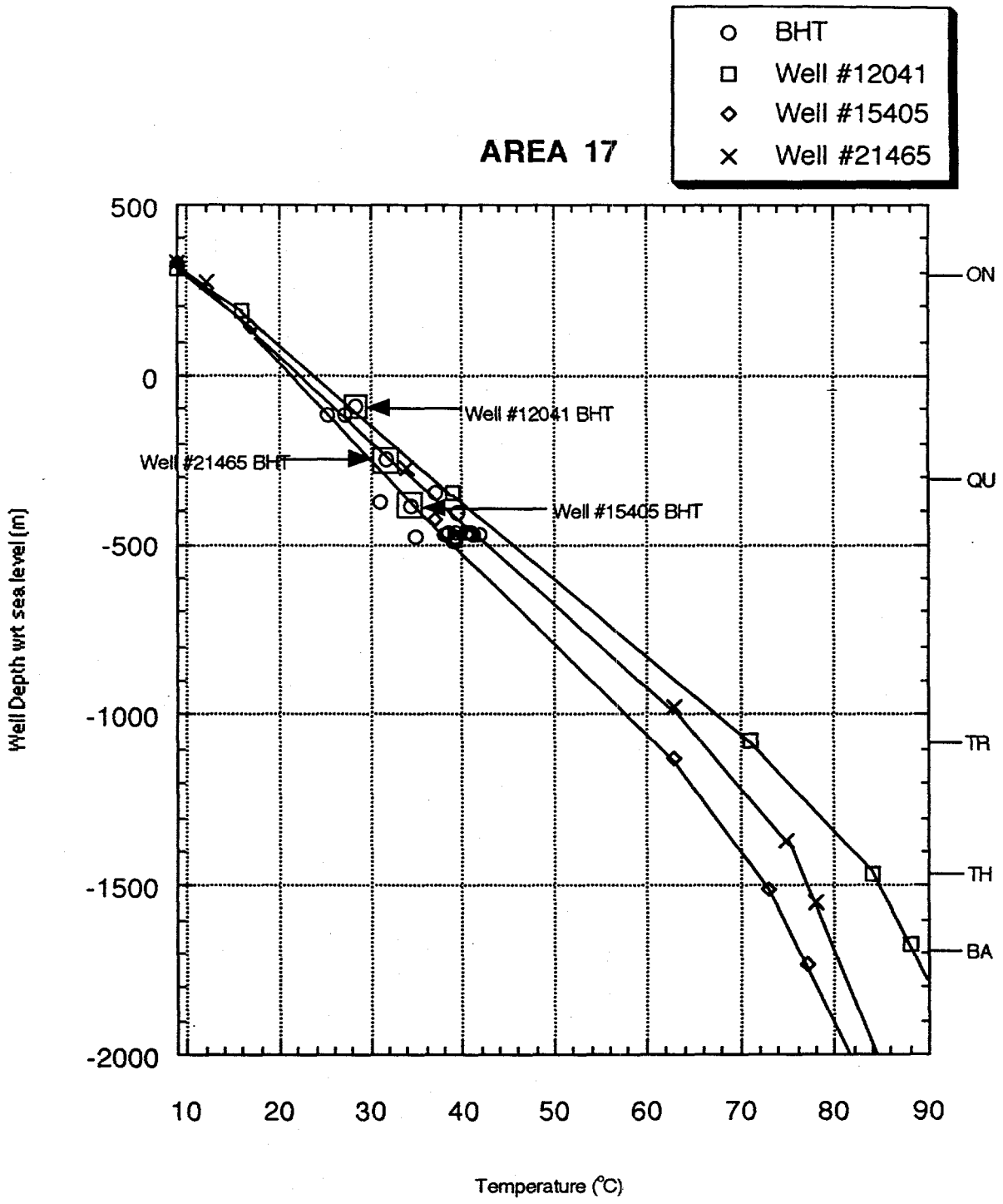


Figure 5-22. BHT data for Area 17.

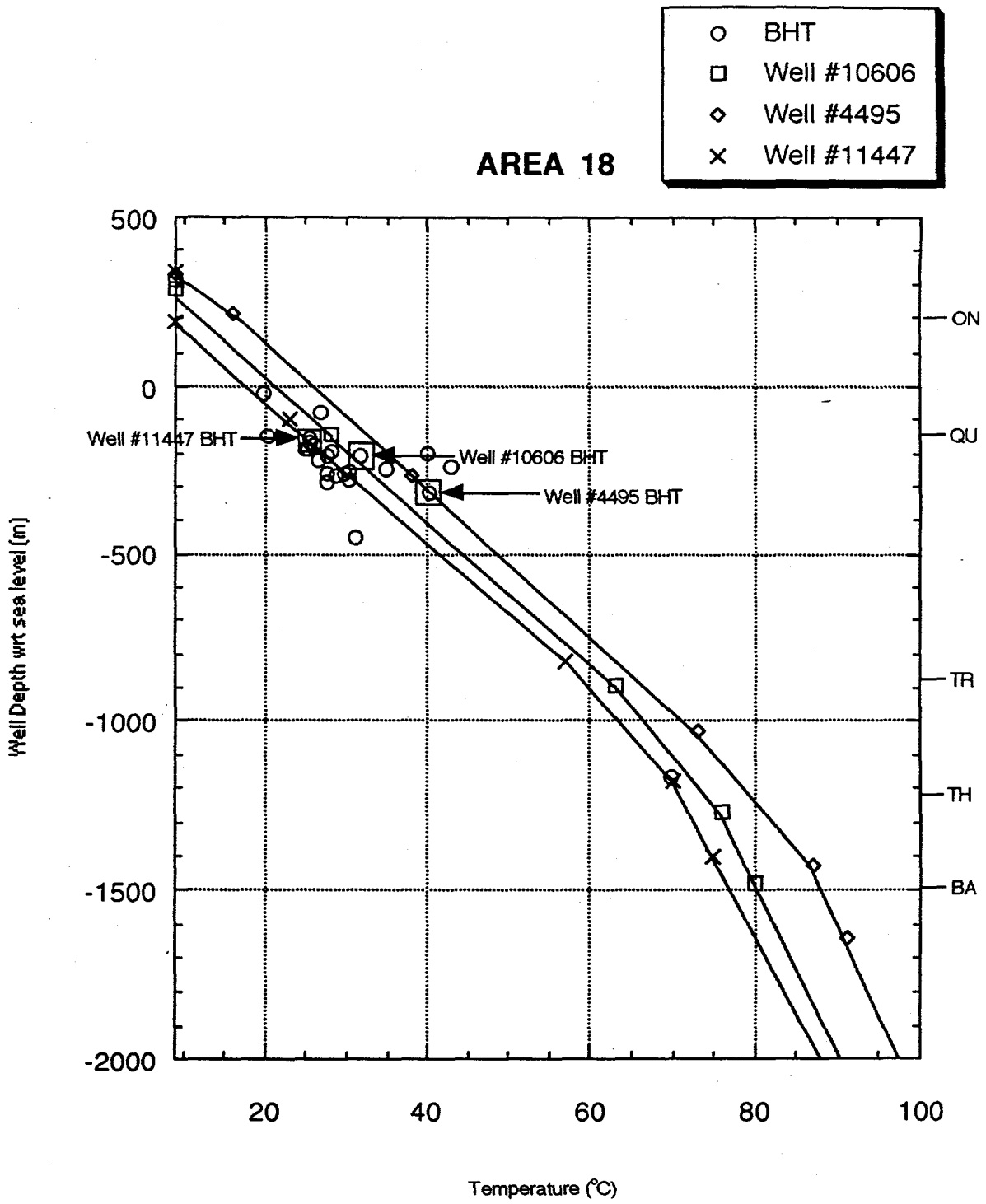


Figure 5-23. BHT data for Area 18.

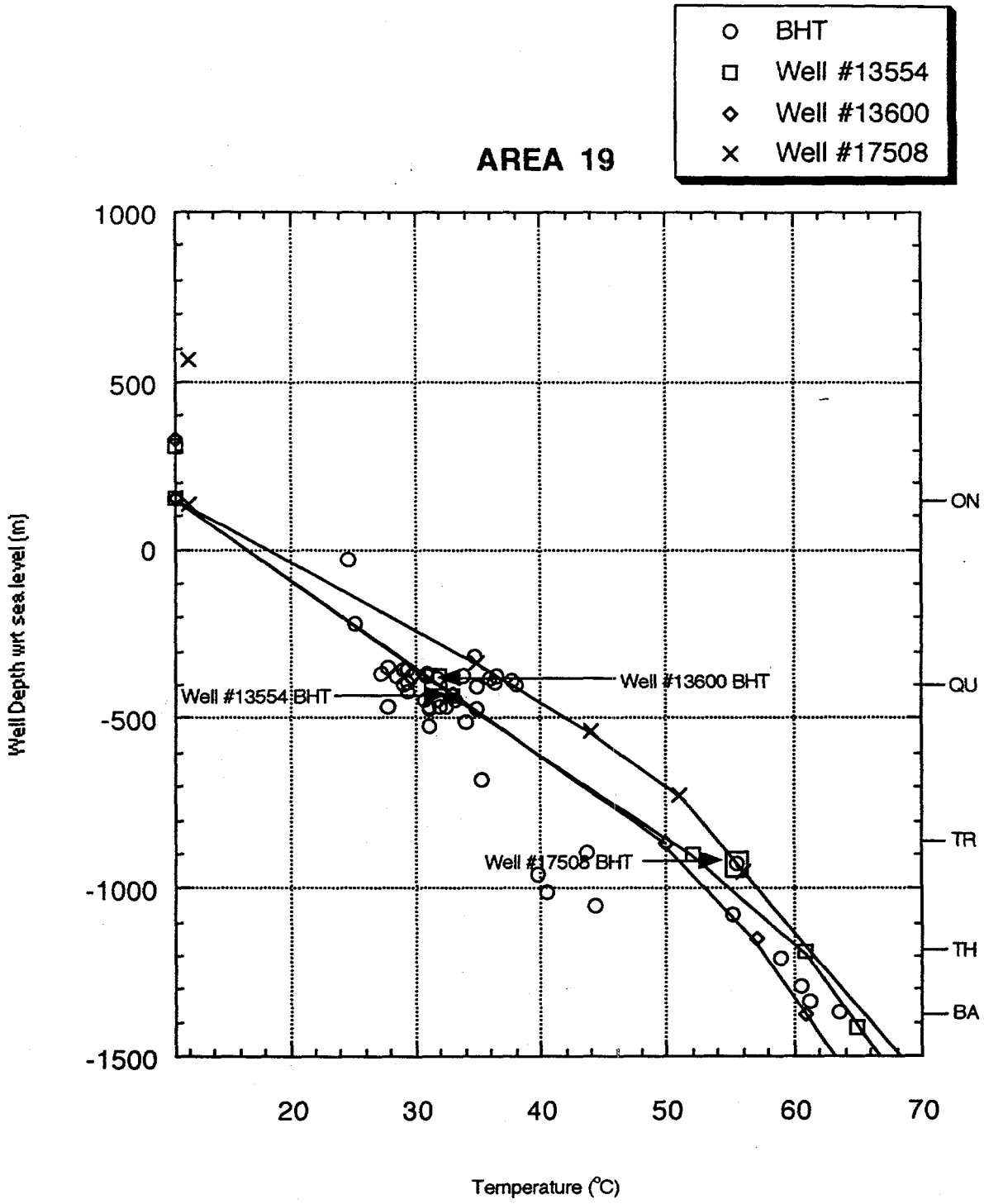


Figure 5-24. BHT data for Area 19.

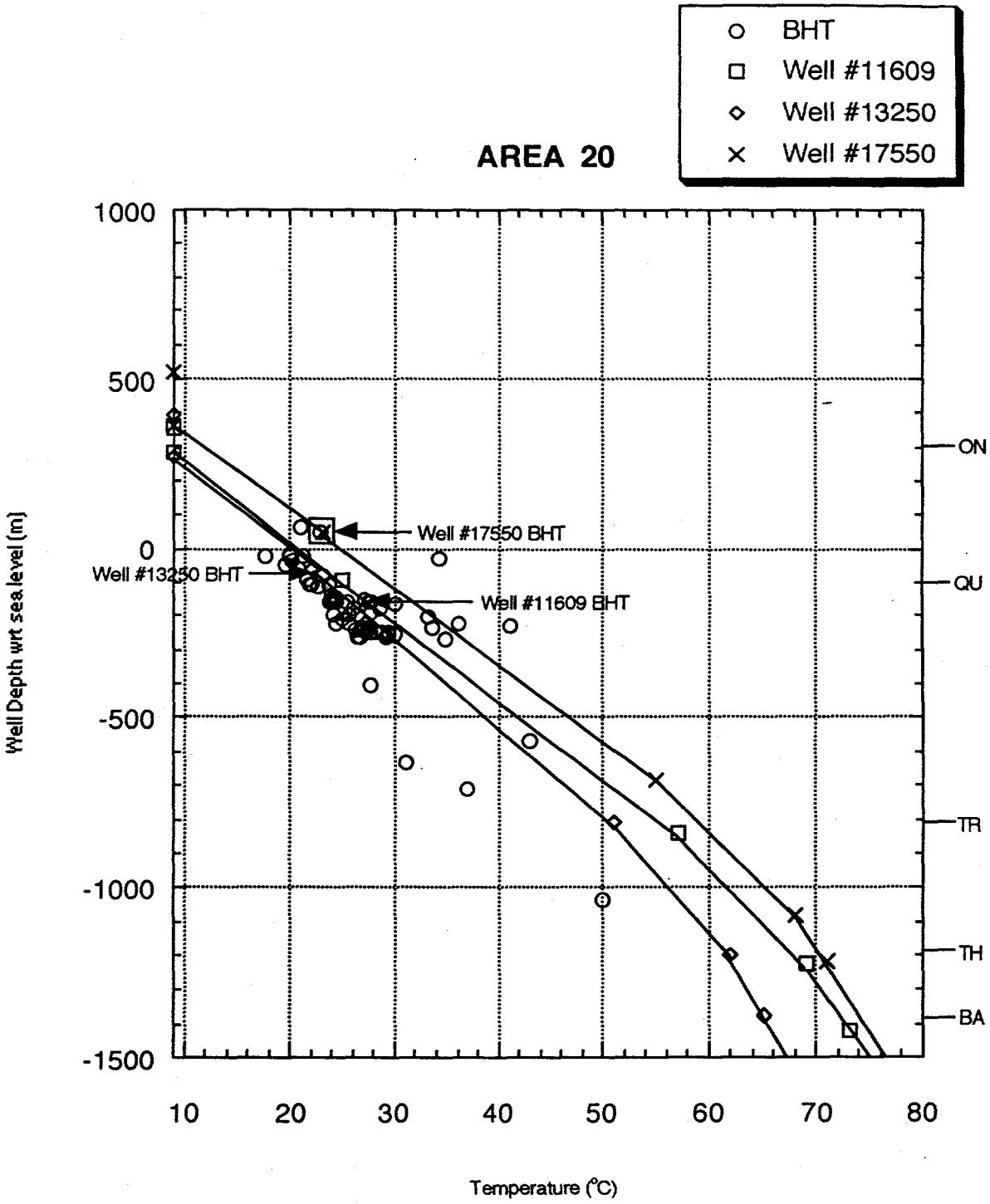


Figure 5-25. BHT data for Area 20.

Section 6

POTENTIAL GEOTHERMAL AREA FOR ELECTRIC POWER

The following guidelines were used in the selection of a geothermal area. The region that had the highest potential for the following combined factors was selected: 1) high temperatures in the Theresa reservoir; and 2) a substantial porous zone in the reservoir. We have chosen an area east and north of Elmira, New York, and in the southern region of the State (see Table 4-1) because of the potential for : 1) obtaining a thick zone of high porosity in the Theresa; and 2) intersecting fracture permeability in the Theresa. A basic assumption in the determination of effective reservoir thickness is that the stratigraphic thickness within the geothermal reservoir that exceeds 8% porosity is the only effective zone for production of geothermal fluids.

The analysis of our data from bottom hole temperatures obtained from oil and gas wells drilled in New York State is the basis of the thermal information used in the selection of an area. The bottom hole temperatures were used to calculate the temperatures in the geothermal reservoir. This temperature of the geothermal fluid is the average temperature throughout the Theresa reservoir. The brine water from the geothermal reservoir will be obtained from a stratigraphically thick unit (650') but the geothermal fluid will be principally produced from thin zones of high porosity that occur throughout the stratigraphic thickness. The temperatures at the bottom of this reservoir (top of the basement) will certainly be considerably higher than this average temperature, but we assumed that the porous zones are distributed throughout the stratigraphic interval of the Theresa. If under optimum conditions most of the geothermal fluids from the reservoir come from production zones at the bottom of the reservoir, then the estimated temperature will be higher.

Table 6-1 Potential site for geothermal power facility geothermal reservoir

Latitude	Longitude	Avg. Temp (°C)	Avg. Pressure (psi)	Depth to top Below SL (m)	Depth to bottom Below SL (m)
42.0759	76.4522	136	4639	-2645	-3146

*Abandoned gas well #9848

Robinson (1983) showed that through the central and western section of the State the Theresa has the highest potential for a thick zone of porosity, and a thick zone could produce substantial amounts of fluids. We have also confirmed this in our analysis of recently drilled wells that were not included in the Robinson study. The one factor that we cannot predict is the contribution of fractures to the overall permeability of the reservoir and thus the potential for a substantial increase in production of geothermal fluids. If a geothermal well were to intersect a zone of fracture permeability in the target production area the production of a well could be 10-100 times the production levels predicted based solely on estimates of productivity from matrix permeability. The area selected has a good probability of intersecting fracture enhanced zones in the target zone.

Our estimates of productivity of the geothermal reservoir rock were based on: 1) a specific wellbore size; 2) matrix permeability ; 3) production zones must exceed 10% porosity ;, and 4) a single well. It is recognized that these restrictions produce the most conservative estimates of productivity from a single well (see appendix B). The calculated productivity for the initial production of a geothermal well is 900 barrels/day (approximately 17 klb/hr). This production obviously is only about 1/40 of that required in an electric power plant, but the fluid requirements are subject to the number and type of wells and the fracture enhanced permeability in the reservoir.

The last restriction for the selection was based on costs of drilling. Drilling costs for wells that are less than 10,000 feet deep are substantially less than wells that exceed this depth. Drilling wells in excess of 10,000 feet usually requires larger drilling rigs, not readily available in the eastern US, and special casing is necessary. These requirements add substantially to the cost of a given well.

In the selection of a potential geothermal site any consideration of a drilling depth limitation was not considered and the selection was based on the highest temperatures in the geothermal reservoir regardless of depth. Using this assumption an area about 30 miles east and north of Elmira, New York was chosen.

Section 7

RESERVOIR CHARACTERISTICS OF A POTENTIAL GEOTHERMAL SITE

The potential geothermal reservoir is the Cambrian formations of the Potsdam and the Theresa. The Potsdam and the Theresa are composed of interlayered sandstones and siltstones with some dolostone units. In the vicinity of the selected geothermal site a deep well has been drilled through the Potsdam and Theresa and the geophysical log shows a considerable thickness of zones with porosity in excess of 8%. Based on estimates of the cumulative thickness of porosity zones in this well, an estimated characteristic reservoir for the selected site is developed. The estimates of permeability in this projected well has been determined by using a common empirical relationship of porosity to permeability (Schlumberger, 1987).

Table 7-1 Estimated volume of geothermal fluids in reservoir.

Geothermal fluid volume recovered per acre	Total geothermal fluid volume recovered for a 40-acre site	Total geothermal fluid volume recovered for a 160-acre site
2,205,321 ft^3/acre	88,212,840 ft^3	352,851,360 ft^3
16,495,801 gal/acre	659,832,040 gal	2,639,328,160 gal
392,757 bbls/acre	15,710,280 bbls	62,841,120 bbls
178,913 klb/acre	7,156,520 klb	28,626,080 klb
62,496 m^3/acre	2,499,829 m^3	9,999,315 m^3

Assumptions to determine Reservoir volume:

Theresa thickness = 900 ft

Volume for 1 acre = 1,112,897 m^3

Volume for 160 acres = 178,063,520 m^3

Volume for 320 acres = 356,127,040 acres

Assumed recovery of 75% of the geothermal fluids in the reservoir.

ESTIMATES OF THE INITIAL PRODUCTION FROM GEOTHERMAL RESERVOIR

The production of geothermal fluids from the Potsdam and Theresa reservoir depends on the volume of brines available for extraction, the permeability of the reservoir rock, the reservoir pressures, and the thickness of the producing zones. All the parameters have to be estimated because there have been no producing geothermal wells in the vicinity of the proposed site. In addition to the reservoir parameters, the configuration of the well influences the amount of production that can be expected. For example, the wellbore size influences the production amounts that can be expected. The assumed parameters and the expected production are listed in Table 7-2. The production from a well can be described by the following equation

$$IP = \frac{(K * h * \Delta P)}{1000\mu} = \text{Initial Production}$$

where K is the hydraulic conductivity, h is the effective thickness of the production zone, Δ P is the pressure difference from the reservoir to the wellbore, and μ is the viscosity of the geothermal brines. There are a number of equations that describe the initial production of a well and this relationship is from Schlumberger, 1987. It should be emphasized that the production is estimated from a single well and that multiple wells might be expected to contribute to the fluid requirements of a power facility.

Table 7-2 Estimates of production from a single producing well.

Delta P (Psi)	IP (bbls/D)	IP (bbls/hr)	IP (klb/hr)	Volume/day (bbls)	Volume/day (ft^3)	Velocity (ft/day)	Velocity (ft/min)
50	7250	302	138	7250	40673	903833	628
100	14500	604	275	14500	81345	1768370	1228
150	21750	906	413	21750	122018	2652554	1842
200	29000	1208	550	29000	162690	3536739	2456
250	36250	1510	688	36250	203363	4420924	3070

wellbore = 8.625 in

Δ P = is the pressure drawdown i.e. P_e-P_w (psi)

P_e = static formation pressure (psi)

P_w = the pressure in the wellbore, such that P_e - P_w is the drawdown pressure (psi)

K = permeability (md) = 100 md

H = vertical extent of productive interval = 435 porosity feet (porosity assumed 10%)

μ = viscosity of the produced fluid (cp) = 0.3 cp

1 klb/hr = 52.7 bbls/D = 92.2 gal/hr

The fluid productivity is for a single well with specific parameters and the fluid production can be changed with addition of other wells or different wellbore configurations.

Section 8

ENVIRONMENTAL IMPACT OF A GEOTHERMAL POWER FACILITY

The extraction of geothermal heat from the subsurface sedimentary layers could be designed to be: 1) an open system; or 2) a closed system. In an open system, the geothermal fluids (heated brine water) is pumped to the surface, heat is extracted, and then the fluid is disposed at the surface. In the closed system, the geothermal fluids are brought to the surface, the heat is extracted, and then the fluids are reinjected into the geothermal reservoir. A geothermal power generating plant requires large volumes of geothermal fluids, thus the disposal of these fluids is a primary environmental concern. The fluids from the geothermal reservoir contain metals, hydrocarbons, and dissolved constituents that are potentially harmful to the surface water and to groundwater. In the following sections we discuss the character of the geothermal fluids and existing methods to dispose of brines.

BRINE QUALITY CHARACTERIZATION

Brine quality data is available from the New York State Department of Environmental Conservation (DEC) publications (1988) and from a recent report from Matsumoto, Atkinson, Bunn and Hodge (1992). Table 8-1 shows the chemical analyses of brines from the major oil and gas producing formations. All the brines in the sedimentary reservoirs in New York State contain very high amounts of dissolved solids. The majority of brine generation comes from oil and gas production in the Medina group but there is a close similarity between the brines of the Medina group, and those from the selected geothermal reservoir, the Theresa/Potsdam formations.

From the metal analysis of the Theresa/Potsdam brines, it is evident that the majority of the solids are sodium and calcium, with concentrations of 76,700 mg/L and 31,250 mg/L, respectively. Magnesium, strontium, and potassium contribute significant amounts to the solids but are an order of magnitude less that the sodium and calcium. Iron concentrations are moderate, around 17 mg/L, but their concentrations are two orders of magnitude less than the magnesium and potassium concentrations. The nickel, lead, zinc, and copper concentrations were low and constitute a very small fraction of the dissolved salts in the brine.

The pH for the Medina well brine was measured by Matsumoto et al (1992) to be between 2.7 and 3.3. The DEC (1988) reported a pH range from 4 to 7.6. There are no reports of pH for the Theresa.

CURRENT BRINE DISPOSAL METHODS OF OIL/GAS PRODUCERS IN NEW YORK

Currently acceptable and available brine disposal alternatives, as stated by the DEC, are: road spreading, discharge to surface waters with or without treatment under a SPDES permit, and underground injection. Oil and gas producers in New York State dispose of brine within New York State using one of the above alternatives, or transport the brine out of the State to either Ohio or Pennsylvania for underground injection, road spreading, or for treatment at SPDES permitted facilities. To transport brine, transporters must obtain a waste transporters permit issued by the NYS DEC, and the Division of Solid and Hazardous Waste (DSHW) under 6 NYCRR Part 364.

Under the current regulatory and economic situation facing oil and gas producers in New York State, the general order of preference for brine disposal is: 1) surface water discharge with no prior treatment, applicable only to very dilute brines generated during waterflooding operations; 2) road spreading with no treatment; 3) surface water discharge with treatment; and 4) underground injection. Preference is primarily based on cost.

TABLE 8-1.

Brine quality data from

New York's gas and oil producing zones.

Parameter (mg/L)	Potsdam/ Theresa	Queenston	Medina	Oriskany	Bass Island	Upper Devonian Oil Zones
Sodium (Na)	76,712	73,500	69,893	45,457	60,750	36,367
Calcium (Ca)	31,256	36,603	37,124	33,684	56,400	16,467
Magnesium (Mg)	4,499	2,887	2,766	5,168	3,160	2,733
Strontium (Sr)	-	0	-	-	-	107
Barium (Ba)	750	0	-	-	-	8
Potassium (K)	3,367	1,124	-	1,307	-	71
Iron (Fe)	17	195	676	215	18	189
Manganese (Mn)	0	-	84	-	0	7
Chloride (Cl)	183,701	187,418	181,298	145,442	203,000	92,167
Bromide (Br)	1,417	1,120	1,721	1,687	-	860
Sulfate (SO4)	18	-	736	57	180	619
Bicarbonate (HCO3)	89	-	25	203	50	0
Iodine (I)	9	11	18	10	-	200
Lithium (Li)	54	-	-	-	-	-
Trace Metals	-	-	-	-	-	0.74
Hydrocarbons	-	-	-	-	-	107.5
Measured TDS	300,763	298,358	292,121	231,836	323,500	152,267
Calculated TDS	299,187	302,869	292,727	232,743	323,558	149,582
IONIC RATIOS						
Na/Ca	2.4	2.01	1.89	1.42	1.08	2.24
Ca/Mg	9.75	12.76	15.9	6.93	34.17	6.04
Mg/K	1.07	2.64	-	4	-	47.03
Cl/Br	142.84	255.07	102.49	104.86	-	104.6
No. of Analyses	9	2	8	4	2	3

(Matsumoto et. al, 1993, p. 2-14)

Due to the varying nature of the chemical composition of brines, not all the disposal options are available for specific brines. Diluted brines from waterflooding operations can be surface discharged without treatment provided that a SPDES permit is obtained. Diluted brines, however, are undesirable for road spreading and are not used. Concentrated brines from deep formations cannot be discharged at the surface unless they are treated by a permitted facility prior to discharge. These concentrated brines are well suited for road spreading purposes, however. Both diluted and concentrated brines can be injected underground.

Of the available disposal alternatives for the highly saline brines, road spreading is the least expensive. The primary cost in road spreading is transportation to the road-spreading site. Surface discharge through a SPDES permitted facility, either a municipal or industrial wastewater treatment plant, or a designed brine treatment facility, is the next most economical disposal alternative. Transportation and treatment/disposal charges are the major costs involved in this disposal alternative. Although the cost of brine disposal by underground injection does not differ significantly from that of surface discharge through a SPDES permitted facility, the oil and gas producers find that the least desirable of the alternatives is underground injection. Regulatory concerns, permit requirements, and the lack of adequate injection wells in the vicinity of the oil/gas producing areas of New York State are the principal reasons .

Road Spreading

Sodium chloride (NaCl) and calcium chloride ($CaCl_2$) are widely used for highway maintenance. Sodium chloride is used more extensively for snow and ice control operations because of its lower costs; while calcium chloride, which is also good for ice control, is used primarily for dust control and as a road stabilization agent.

The chemical characteristics of the more concentrated brines compare favorably to chemical characteristics of commercial road salt, making brine attractive to local highway departments for road maintenance. Additional factors stimulating their use are the relatively low cost of brines (the materials cost to highway departments are free) and the producers' need for a means to properly dispose of these fluids (DEC, 1988a).

Approximately 30 percent of the highly saline brine generated in New York State is disposed by road spreading. The majority of brine used for road spreading is from deep gas well production. Brines from waterflooding oil fields are too dilute for road spreading.

Under current state regulations, a 6 NYCRR Part 364 permit is required from the DEC to spread brines on paved or unpaved roads. Part 364 permit requirements include written approval from the owners of the road spreading site, the local highway superintendent, and minimal monitoring requirements (no visible oil or grease in the brine).

The primary problem with road spreading is its seasonal nature. The imbalance between brine production and use on roads means that brines must either be stored between periods of use or alternative disposal means found (DEC, 1988a).

Environmental concerns stem from the fact that brine is a liquid. If improperly applied, potential runoff and spills may occur polluting underlying groundwater and damaging roadside vegetation. Oil and gas brines contain lower concentrations of calcium chloride than the commercial solutions used in dust control. As a result, additional applications of brine are needed for dust control, increasing the possibility of runoff and spill problems.

Brines are also less desirable than solid salt for road deicing. Refreezing of the liquid brine during snow and ice control may result in slippery and icy surfaces. Solid granules from commercial road salt are thought to be more effective in penetrating through the ice to break the ice bond with the pavement.

Discharge to Surface Waters

Brine may be discharged directly into a receiving water provided that a SPDES permit is obtained. Permit conditions for such discharges include limitations of total dissolved solids (TDS), oil and grease, and any other pollutants of water quality concern as determined by the DEC. At the present time, SPDES permits for direct surface water discharge are confined to brines from waterflooding operations, which comprise the large majority of brines generated in New York State (DEC, 1988a).

Another possible method of disposal for brines is processing at a SPDES permitted municipal or industrial wastewater treatment plant. Brines are blended with the normal wastewater, and co-treated together. The volume of brine treated per unit volume of normal wastewater treated is quite low, less than one gallon of brine per 1,000 gallons of wastewater to provide a high level of dilution for the dissolved solids. The brine goes through the same treatment processes as the normal wastewater. Oil and grease are removed by flotation and biological treatment. Turbidity and heavy metals are removed by bioadsorption and flocculation/sedimentation in the secondary treatment processes.

One major concern for SPDES permitted facility that use biological treatment is the potential disturbance of the biological process. As a precaution, brine must be introduced very slowly to prevent a sudden change in the osmotic pressure. For this

reason, use of existing municipal and industrial wastewater treatment plants as a disposal alternative is unreliable. Such facilities can only be relied on as a short-term alternative for a small volume of high-strength oil and gas brines.

Two wastewater treatment facilities specifically designed and operated to treat brines are located in northwestern Pennsylvania, within 100 to 150 miles of the major brine generating regions in New York State. These facilities treat only oil and gas production fluids and do not employ any biological processes. Both of these facilities are NPDES permitted, with discharge limits on total suspended solids (TSS), pH, oil and grease, and total dissolved solids (TDS). There are additional monitoring requirements for heavy metals, although discharge limits have not been established. DEC policy does not allow them to issue any specific permit levels until an application for a permit is submitted to their office and reviewed at their headquarters in Albany.

Underground Injection

Although underground injection has been widely used in other states to dispose of brine water, use of this technique has been discouraged in New York State. A SPDES permit from the DEC is required for an injection disposal well in New York State, along with a federal underground injection control (UIC) permit.

The federal UIC permit requires certain monitoring requirements. Monitoring injection pressure, rate of injection, annular pressure, and accumulative volumes injected is recorded on a daily basis. In addition, a groundwater monitoring program must be established to ensure that contaminants are not migrating toward potable aquifers.

There are five permitted injection wells in New York State (Table 8-2). Two of the injection wells are located in Chautauqua County; other wells are in Steuben, Livingston, and Wyoming Counties.

The primary environmental consideration for approval of an injection permit application is protection of groundwater resources. If the injected brine were to escape from the well because of mechanical failure, significant environmental impact may occur before detection. Protection is achieved through stringent controls on the casing and cementing of the injection well.

Although it is common to consider the brines as disposed of, they are actually stored in an underground formation. Due to geological changes or mechanical failures, these reserves could cause future environmental problems. Failures within the disposed system are extremely difficult to detect and correct.

The porosity and permeability of the receiving zone is a significant factor for a disposal well. If too high a pressure is necessary to move water into the formation, or if the formation will not accept water quickly enough, the well is undesirable for injection purposes. Most formations in New York State have relatively "low porosity" and do not readily accept injected fluids (DEC, 1988b). This is a primary reason why there are so few underground injection wells in New York. The Theresa formation in the area selected for the geothermal power facility has stratigraphic zones that contain porosity in excess of 10 percent. This porosity suggests that the Theresa formation may be able to accept the reinjected fluids.

Wells require an injection pump as part of the surface equipment. Depending on the depth of the well and the injection pressures, the power requirements may be very substantial.

Not only is deep well injection expensive, the well can quickly be damaged without adequate and proper treatment of the injection fluid. Operation of a disposal well usually follows three steps. The first step is to off-load the brine from a truck into a holding tank. This allows time for any oil to separate and move to the top of the tanks, and any solids to drop to the bottom. The second step of the treatment is filtration. A washable 25-micron filter followed by a 5-micron filter helps protect the injection zone from suspended solids buildup. The last step is chemical treatment. The use of a biocide protects against bacterial activity in the well. Bacterial slime can plug the receiving formation, thus shutting down the well. A corrosion inhibitor is also used to prevent tubing deterioration.

TABLE 8-2.

Permitted brine disposal wells in New York.

Well	Permitted rate, bbls/year	1989 volume injected, bbls
Ewell #1 121-13965, Covington, Wyoming Co.	50,000	2,567
H-229 101-00033, Greenwood, Steuben Co.	219,000	39,800
Marapeg #3 013-16813, Chautauqua, Chautauqua Co.	146,000	57,656
Ranous #1 051-16133, Caledonia, Livingston Co.	146,000	1,957
Tecroney #1 013-18798, Clymer, Chautauqua Co.	730,000	0

(Matsumoto et. al, 1993, p. 2-23)

ENVIRONMENTAL CONCERNS FROM ACCIDENTAL SPILL OF BRINE WATER

It is difficult to predict the extent of the environmental impacts that may result from an accidental spill, leak, or improper disposal of brine water. The environmental impacts will depend on the composition of the brine, volume of the spill or leakage, the flow and quality of the receiving water or the natural attenuating capabilities of the soil, the proximity of sensitive resources, and the success of cleanup operations (DEC, 1988a). Based on chemical analyses of the brines generated in New York State, chlorides, heavy metals, and total dissolved solids (TDS) have been identified as the primary contaminants of concern. Other contaminants found in brines that are of concern are oil and grease, and turbidity. Each of these contaminants is discussed below.

Chlorides

Chloride levels of 200,000 mg/L and higher are not uncommon for brine waters generated by oil and gas production. Fortunately, chloride is a relatively non-toxic chemical. Therefore, the impact of chloride from a single accidental leak or spill of brine water poses little long term threat to ground or surface drinking water quality, assuming ample dilution of the brine with fresh water. However, chloride levels in both ground and surface waters will increase in areas subjected to frequent and prolonged additions of chloride, whether from road salting or chronic contamination by chloride-bearing wastewaters. If chloride concentration increases in an aquifer, little can be done to remediate the situation. There are currently no economically feasible methods to remedy the situation in any reasonable period of time (DEC, 1988a). Dilution of the chloride as a result of groundwater recharge with high quality (low chloride) water, naturally or artificially, is the only means of remediation.

Acute effects of chloride on plants and fish may occur because of a sudden change in osmotic pressure. Excessive concentrations of sodium chloride osmotically inhibit the ability of plants to absorb water (Miller, 1978). Spillage of brine or other waste fluids high in sodium chloride almost always kills vegetation and sterilizes the soil until the salts are flushed from the soil. In the Northeast, however, soil salt toxicity is short lived because of the high rainfall and rapid leaching of the sodium and chloride salts.

Roughly one-third of the freshwater consumed in New York State comes from groundwater supplies. In upstate New York more than 2 million people receive drinking water from small private water wells. Many of the groundwater supplies in the western portion of New York State are located in the same vicinity as oil and gas operations (DEC, 1988a). As a result, the prime concern of the DEC is the protection of groundwater drinking supplies from contamination with brine.

New York State's public drinking water standard for chloride is 250 mg/L, which is the taste threshold of sodium chloride in water (see Table 8-3). Considering the chloride concentration of the brine it is evident that substantial dilution of the brine is necessary to reduce the chloride concentration to the State's drinking water standard.

Heavy metals

Brine has measurable concentrations of several soluble metals including strontium (Sr), lead (Pb), manganese (Mn), copper (Cu), zinc (Zn), iron (Fe), nickel (Ni), cadmium (Cd), and chromium (Cr). Most of these substances are known to pose an environmental threat to humans, animals, and plants if they are present in elevated concentrations in drinking water, surface water, ground water, and/or the soil. Recommended levels for the above constituents in soil and drinking water are listed in Table 8-3.

The environmental impact of heavy metals from brine spilled onto soil depends on a number of factors including soil pH, alkalinity, cation exchange capacity, organic content, degree of water saturation, and other chemicals present. In general, heavy metal mobility and the threat of groundwater contamination increases as the soil pH decreases. In the Northeast, acid rains increase the possibility of heavy metal mobility. In addition, low pH soils increase the likelihood of metal uptake by plants. Plant uptake is a concern because it is the metal's primary route into the animal and human food chains. Cadmium is the most likely metal to pose a threat to human health through plant accumulation. It is particularly dangerous because of its severe effect on the kidneys (DEC, 1988a). Copper, nickel, and zinc are other metals that could pose the serious threats to plant life. Plants require several of these metals in trace amounts for their own growth. However, excessive amounts of metals, particularly zinc or copper, can reduce plant yields or even cause their death.

Total dissolved solids

The high total dissolved solids (TDS) concentration of brine water, >250,000 mg/L, could affect aquatic life significantly if released randomly into a receiving stream. The combined effect of the TDS levels from the dissolved sodium, calcium, magnesium, chloride, and sulfate could result in fish-kills, deformation of fish larvae, and other problems (DEC, 1988a). For this reason, the DEC sets stricter regulations on wells sitting around surface waters and known aquifers to prevent spills.

Oil and grease

Oil and grease are not definitive chemicals, but rather general designations for thousands of organic compounds with varying physical, chemical, and toxilogical properties. They may be volatile or non-volatile, soluble or insoluble, persistent or easily degraded. However, oil and grease found in brines may be generally described as being

primarily made up of long-chain hydrocarbons, which are fairly insoluble and non-volatile.

Aesthetic degradation is the primary concern associated with oils and grease. When released to a surface water, oils and grease float on the surface, giving the water a sheen. In addition, because they are insoluble, oils and greases readily attach to surfaces and will accumulate along the shoreline. The US EPA has established a criterion that surface waters should be virtually free of oils and grease, especially from petroleum products that impart taste.

TABLE 8-3.

Recommended levels for heavy metals in soil and drinking water.

Constituent	Drinking water standard[a], mg/L	Tolerable soil concentration[b], mg/kg
Cadmium	0.010[c]	3
Chromium	0.05[c]	100
Copper	1[d]	100
Iron	0.3[d]	N/A[e]
Manganese	0.05[d]	1,000
Nickel	N/A	50
Lead	0.05[c]	100
Strontium	N/A	N/A
Zinc	5[d]	300

[a]US EPA Drinking Water Standards (40 CFR)

[b]World Health Organization (Alloway, 1990)

[c]Primary standard (health concerns)

[d]Secondary standard (aesthetic concerns)

[e]Not applicable

(Matsumoto et. al, 1993, p.3-3)

Turbidity

Turbidity interferes with recreational use and aesthetic enjoyment of water. The less turbid the water the more desirable it becomes for swimming and other related sports such as fishing.

With regard to environmental and health effects, increased turbidity can adversely affect fish and fish food populations. Turbidity reduces light penetration into the water body, reducing the depth of the photic zone (depth of photosynthetic activity in the water column). This reduces primary production and decreases fish food. Additionally, the near surface waters are heated more because of the greater heat absorbency of the particulate matter associated with the turbidity, which tends to stabilize the water column and prevent vertical mixing. Such mixing reductions decrease the dispersion of dissolved oxygen and nutrients to lower portions of the water body. The US EPA has recommended that the depth of light penetration not be reduced by more than 10 percent as a result of wastewater discharge.

EXISTING BRINE TREATMENT FACILITIES WITH SURFACE WATER DISCHARGES

Two brine water treatment facilities currently operate in Pennsylvania: Cabot Oil and Gas Corp. Franklin Brine Treatment Plant in Franklin; and Environmental Development Corp. Warren Brine Treatment Facility in Warren. Both facilities treat brine generated by oil and gas producers from western Pennsylvania and southwestern New York State. The Franklin Brine Treatment Plant is about 89 miles southwest of Jamestown and the Warren Brine Treatment Facility is 22 miles south of Jamestown.

These facilities use a series of chemical and physical unit processes to treat the brine and discharge their effluent into the Allegheny River. The process is designed to remove oil and grease, turbidity, and heavy metals, and to adjust the pH of the effluent to an acceptable level before discharge. The Franklin Brine Treatment Plant design capacity is 205,000 gallons per day, while the Warren Brine Treatment Facility operates at 150,000 gallons per day. Both facilities currently (1991) charge $0.0325 per gallon ($1.37/bbl) to treat the brine water.

Section 9

SUBSURFACE DISTRIBUTION OF POTENTIAL HDR SITES

A sedimentary layer covers crystalline basement rocks over a large region of central and western New York. Because of this cover and the fact that few wells have penetrated into the basement crystalline rocks, the geology of the basement rock is principally understood through geophysical measurements. The gravity field provides the best technique to determine the mass distributions and the potential for homogeneous crystalline rocks.

One of the primary criterion for the selection of a potential hot dry rock (HDR) geothermal site is for the source reservoir to be homogeneous in rock composition and in structural elements. Ideally the potential source reservoir should be devoid of large fractures or faults and lacking in strong mineralogical banding. A rock type that might have these characteristics is a large granite batholith. Metamorphic rocks generally would not meet these criteria. Since the basement crystalline rocks are buried beneath sedimentary rocks, geophysical techniques are required to identify homogeneous igneous rocks in the basement of New York State. Basement crystalline rocks are exposed in the Adirondack Mountains and in the Canadian Shield north of Lake Ontario. Associated with the occurrence of granite batholiths in these regions are negative broad Bouguer anomalies. Thus, granite batholiths can be identified in the subsurface basement though the analysis of the Bouguer map of the State.

A large negative gravity anomaly is located east of Rochester, New York, and this anomaly trends north-south toward the southern boundary of the State. This anomaly is most likely associated with a large granite batholith. This probably granite batholith is the prime candidate for any HDR potential site. Other granite batholiths may be found in western New York, near East Aurora, but lower heat flow in this region and thinner sedimentary cover make this region a less favorable choice.

CONCLUSIONS

Temperatures measured with respect to depth in oil and gas wells in New York show distinct temperature gradients that correspond to specific stratigraphic layers. The change in temperature gradients is a result of thermal conductivity differences in the stratigraphic layers. Using this correlation, a three dimensional representation of the thermal conductivity in upstate New York is developed. With this representation of thermal conductivity and with observed bottom hole temperatures, extrapolation of temperatures to a specific depth for a given location are made. These predicted temperatures are contoured in order to develop thermal maps of upstate New York for the purpose of understanding the geothermal resource.

The Theresa/Potsdam stratigraphic unit have been identified as the best candidate for extraction of geothermal fluids. In local regions of upstate New York the thickness of the Theresa/Potsdam layers, containing in excess of 10 per cent porosity, may exceed 125 feet(Robinson, 1983). This unit also yields high rates of brine water at specific locations. Thus the combination of thick zones and high temperatures is the target for potential geothermal sites.

Calculated temperatures on the top of the Theresa formation show that the region in southern central New York near Elmira, NY has the highest potential temperatures in the Theresa/Potsdam geothermal reservoir. A site 30 miles to the east of Elmira, NY was selected as a potential site for a electric power geothermal facility. At this location temperatures of about 130 ^{o}C were reported in a abandoned gas well and the geophysical log of this well indicated in excess of 450 feet of 8 per cent porosity. Using data from the abandoned well, estimates of geothermal fluid flow and thermal parameters were made. From these preliminary calculations using only matrix permeability estimates the estimated fluid flows from a single well may reach about 900 barrels per day. Enhanced fluid flow is expected if fracture permeability is encountered at the site. These estimates were given to Dyncorp, Inc. for economic analysis of a electric power facility.

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APPENDIX A: TABLES A1-A8

Table A-1.

Temperature-depth data, well #13571 (Winspear #1).

Depth (M)	Temp. (C)	Depth (M)	Temp. (C)
47.8	15.18	175.2	18.58
51.0	15.26	178.4	18.68
54.2	15.33	181.6	18.78
57.3	15.40	184.7	18.88
60.5	15.47	187.9	18.99
63.7	15.53	191.1	19.08
66.9	15.61	194.3	19.18
70.1	15.68	197.5	19.26
73.3	15.76	200.7	19.37
76.4	15.83	203.9	19.45
79.6	15.87	207.1	19.55
82.8	16.01	210.2	19.65
86.0	16.10	213.4	19.74
89.2	16.17	216.6	19.85
92.4	16.24	219.8	19.96
95.6	16.32	223.0	20.07
98.8	16.40	226.2	20.18
101.9	16.47	229.3	20.28
105.1	16.53	232.5	20.42
108.3	16.60	235.7	20.49
111.5	16.69	238.9	20.52
114.7	16.77	242.1	20.59
117.9	16.83	245.3	20.65
121.0	16.91	248.4	20.71
124.2	17.03	251.6	20.76
127.4	17.14	254.8	20.80
130.6	17.24	258.0	20.85
133.8	17.32	261.2	20.89
137.0	17.41	264.4	20.94
140.1	17.48	267.6	20.98
143.3	17.57	270.8	21.02
146.5	17.66	273.9	21.05
149.7	17.75	277.1	21.08
152.9	17.86	280.3	21.12
156.1	17.95	283.5	21.16
159.3	18.08	286.7	21.28
162.5	18.18	289.9	21.36
165.6	18.28	293.0	21.40
168.8	18.38	296.2	21.44
172.0	18.47		

Table A-2.

Conductivity, temperature, and gradient data for well #13571 (Winspear #1).

Depth Interval (Meters)	Thermal Conductivity K (Bulk) (W/M C)	Porosity	K (In Situ) (W/M C)	Gradient (C/KM)	Temperature Interval Top (C)
86.0-101.9	2.14	0.08	1.93	23.5	16.1
101.9-117.9	1.98	0.08	1.80	23.4	16.5
117.9-130.6	1.94	0.08	1.77	31.9	16.8
130.6-146.5	2.21	0.09	1.96	26.4	17.2
146.5-162.5	1.77	0.08	1.62	33.0	17.7
162.5-178.4	1.73	0.07	1.60	31.3	18.2
178.4-194.3	1.53	0.06	1.45	31.5	18.7
194.3-203.9	1.54	0.05	1.47	28.9	19.2
203.9-223.0	1.27	0.06	1.21	32.3	19.5
223.0-232.5	1.44	0.11	1.31	36.1	20.1
232.5-251.6	3.25	0.01	3.19	17.8	20.4
251.6-267.6	2.69	0.01	2.65	14.0	20.8
267.6-277.1	3.05	0.02	2.95	10.4	21.0
277.1-296.2	2.55	0.07	2.30	20.6	21.1
296.2-313.9	2.35	0.05	2.19	18.9	21.4
313.9-329.2	2.72	0.03	2.60	15.9	21.0
329.2-341.4	3.19	0.02	3.09	13.4	21.3
341.4-359.7	3.25	0.05	2.99	13.8	21.6
359.7-371.9	2.74	0.03	2.61	15.8	22.0
371.9-390.1	3.07	0.06	2.79	14.8	22.2
390.1-405.4	3.25	0.05	2.99	13.8	22.6
405.4-420.6	3.36	0.08	2.93	14.1	22.9
420.6-435.9	2.05	0.08	1.86	22.2	23.3
435.9-451.1	1.79	0.06	1.68	24.6	23.6
451.1-466.3	2.30	0.04	2.18	18.9	23.9
466.3-481.6	2.30	0.04	2.17	19.0	24.2
481.6-496.8	4.39	0.04	4.05	10.2	24.6
496.8-512.1	4.38	0.02	4.21	9.8	24.9
512.1-527.3	3.57	0.02	3.44	12.0	25.2
527.3-542.5	2.68	0.01	2.64	15.6	25.5
542.5-557.8	2.34	0.02	2.28	18.1	25.9
557.8-573.0	2.10	0.04	1.99	20.9	26.2
573.0-588.3	1.89	0.07	1.75	23.6	26.5
588.3-600.5	1.83	0.06	1.71	24.2	26.8
600.5-618.7	2.40	0.05	2.24	18.4	27.1
618.7-634.0	2.21	0.09	1.87	21.0	27.5
634.0-649.2	1.96	0.05	1.85	22.3	27.8
649.2-661.4	2.12	0.05	1.99	20.8	28.2
661.4-667.5	2.35	0.14	1.94	21.3	26.4

Table A-3.

Conductivity and gradient data and heat flow calculations for well #13571 (Winspear #1).

Depth Interval (meters)	# Samples	Porosity	K (W/M C)	Gradient (C/KM)	Heat Flow (MW/M^2)	Lithology
86-130.6	3	0.08	1.84	24.9	45.7	Hamilton Group: Shale, Thin Limestone
130.6-232.5	7	0.07	1.49	31.2	46.4	Hamilton Group: Shale, Thin Limestone
232.5-296.2	4	0.03	2.70	15.3	41.3	Onondaga Limestone

Table A-4.

Conductivity and gradient data and heat flow calculations for well #15529 (Wells College #1).

Depth Interval (Meters)	# Samples	Porosity	K (W/M C)	Gradient (C/KM)	Heat Flow (mW/M^2)	Lithology
130.6-302.6	15	0.03	2.42	26.4	63.8	Onondaga Limestone, Helderberg Group: Limestone, Dolostone

Table A-5.

Thermal conductivity model for western and central New York.

LAYER #	STRATIGRAPHY: LITHOLOGY	CONDUCTIVITY (W/m C)
1	Upper-Middle Devonian: Shale with limestone interbeds	1.67
2	Onondaga Limestone-Medina Group: Limestone with interbedded shale, some sandstone	2.2
3	Queenston Formation-Lorraine Group: Predominantly shales in the west, more sandstone in upper section to the east	Variable 1.64 - 2.65
4	Trenton Group-Little Falls Formation: Interlayered limestone and shale near the top and dolostones toward the base	2.95
5	Theresa Formation-Potsdam Formation: Quartzose dolostones and dolostones near the top and sandstones at the base	4.9
6	Precambrian: Crystalline basement	2.93

Table A-6.

NY Bottom hole temperatures (BHT) and average gradients.

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
3-0015	42.0780	77.7925	621.8	1468.2	40.6	5.9	23.6	10.6	30.8
3-0016	42.0787	77.8016	628.2	1504.2	46.7	5.9	27.1	10.8	34.3
3-0017	42.0917	77.7796	659.6	1504.5	38.9	5.6	22.2	10.8	29.4
3-0018	42.0818	77.7796	598.3	1435.9	43.3	6.2	25.9	10.4	33.1
3-0019	42.0902	77.8005	602.9	1435.3	44.4	6.1	26.7	10.4	33.9
3- 412	42.0802	77.8041	599.8	1430.7	43.9	6.2	26.4	10.3	33.6
3- 7948	42.0680	77.7550	683.7	573.6	21.1	5.3	27.5	4.0	34.5
3- 8034	42.1320	77.8713	665.4	1508.8	51.7	5.5	30.6	10.9	37.8
3- 9194	42.4332	77.9652	591.0	1040.0	35.0	5.9	27.9	7.6	35.2
3-9330	42.1197	77.8470	673.6	1509.4	40.6	5.4	23.3	10.9	30.5
3- 9356	42.0422	77.8681	676.0	1503.3	42.8	5.4	24.8	10.8	32.0
3-11762	42.1599	78.0128	615.1	1361.8	36.1	6.0	22.1	9.9	29.4
3-11978	42.3123	78.2814	652.6	1218.3	36.1	5.6	25.1	8.9	32.4
3-12927	42.1368	77.9594	467.9	549.6	21.1	7.4	24.9	3.8	31.9
3-13242	42.3166	78.1554	501.7	983.9	30.0	7.0	23.4	7.2	30.7
3-13549	42.3658	77.8200	564.8	894.3	26.7	6.2	22.8	6.5	30.1
3-13684	42.4410	78.0156	559.6	959.8	33.9	6.2	28.8	7.0	36.1
3-14253	42.4301	78.1501	379.2	688.8	26.1	8.1	26.2	4.9	33.4
3-14485	42.0867	77.7983	660.5	1501.4	52.2	5.6	31.1	10.8	38.3
3-14571	42.0858	77.8175	616.0	1459.4	43.9	6.0	26.0	10.5	33.2
3-14610	42.0894	77.7938	614.5	1518.5	43.9	6.0	25.0	10.9	32.1
3-14665	42.0789	77.8106	600.2	1435.6	38.9	6.2	22.8	10.4	30.0
3-14817	42.0768	77.7733	676.7	538.3	18.9	5.4	25.1	3.8	32.0
3-15054	42.0641	77.8431	641.3	1507.2	39.4	5.8	22.3	10.9	29.5
3-15369	42.0449	77.8601	702.0	1552.3	40.0	5.2	22.4	11.2	29.6
3-15400	42.1089	77.7765	710.2	1535.6	44.4	5.0	25.7	11.0	32.8
3-15738	42.2633	78.2245	471.5	1069.8	32.2	7.4	23.2	7.8	30.5
3-15942	42.0268	77.9014	497.7	1351.2	41.1	7.2	25.1	9.8	32.3
3-16202	42.4276	78.1692	419.7	751.3	22.8	7.7	20.1	5.4	27.3
3-16203	42.2570	77.7839	594.4	1213.1	39.4	6.1	27.5	8.8	34.8
3-16227	42.2417	78.0403	420.3	1019.3	29.4	7.8	21.2	7.4	28.5
3-16239	42.2122	77.8882	594.1	1270.4	36.7	6.1	24.0	9.2	31.3
7- 5087	42.3235	75.9480	307.2	2934.0	55.6	8.5	16.0	17.8	22.1
7- 6636	42.4061	75.8782	442.9	1750.8	40.0	7.1	18.8	12.4	25.9
7- 8342	42.3977	75.8906	448.7	1832.2	40.6	7.0	18.3	12.9	25.3
7-12805	42.0696	75.5966	573.0	1349.0	38.3	6.0	23.9	9.8	31.2
9- 4820	42.0036	78.4348	657.8	1454.8	51.7	5.8	31.5	10.5	38.7

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
9- 6743	42.0969	78.6331	424.6	457.2	23.9	8.1	34.6	3.1	41.4
9- 6762	42.0453	78.5861	540.4	290.2	20.0	7.0	44.9	1.8	51.0
9- 7184	42.0429	78.5913	628.5	381.0	22.8	6.1	43.7	2.5	50.3
9- 8633	42.0528	78.6009	573.9	306.3	19.4	6.6	41.8	1.9	48.0
9- 9120	42.0531	78.7487	686.1	1329.2	39.4	5.6	25.5	9.7	32.7
9- 9151	42.0704	78.7345	682.4	1316.1	36.1	5.6	23.2	9.6	30.4
9- 9829	42.0249	78.4218	558.1	457.5	18.3	6.8	25.3	3.1	32.1
9-10577	42.4113	78.8731	448.1	1045.8	25.6	7.6	17.2	7.6	24.5
9-10855	42.0210	78.6007	559.9	1272.2	28.3	6.8	16.9	9.3	24.2
9-10962	42.4160	78.8353	429.8	1039.4	33.3	7.8	24.6	7.6	31.9
9-11066	42.4032	78.8921	393.2	1001.0	32.2	8.2	24.0	7.3	31.3
9-11067	42.4283	78.8508	454.2	1055.2	35.0	7.5	26.0	7.7	33.3
9-11147	42.4056	78.8784	438.3	1051.0	32.2	7.7	23.3	7.7	30.6
9-11148	42.3985	78.8731	438.3	1050.6	32.8	7.7	23.9	7.7	31.2
9-11478	42.4735	78.4281	534.9	1230.8	35.6	6.5	23.6	9.0	30.9
9-11480	42.2038	78.8767	559.0	1409.7	42.2	6.7	25.2	10.2	32.4
9-11706	42.4500	78.7950	341.4	872.0	27.8	8.6	22.0	6.3	29.3
9-11723	42.4690	78.6804	420.6	1001.6	32.8	7.7	25.0	7.3	32.3
9-11748	41.9458	78.4045	478.5	195.1	16.1	7.6	43.7	1.0	48.9
9-11977	42.2114	78.7330	434.3	920.8	32.2	7.9	26.4	6.7	33.7
9-12461	42.4444	78.8186	350.5	971.1	31.7	8.5	23.9	7.1	31.1
9-12480	42.4507	78.8084	292.6	871.4	30.0	9.1	24.0	6.3	31.3
9-12505	42.4511	78.8168	292.6	864.1	30.0	9.1	24.2	6.3	31.5
9-13537	42.3307	78.7914	529.1	1247.5	41.1	6.9	27.4	9.1	34.7
9-15765	42.0315	78.5876	567.2	1237.2	36.1	6.7	23.8	9.0	31.0
9-16214	42.0759	78.4853	437.4	1121.7	44.4	7.9	32.6	8.2	39.9
9-16232	42.0343	78.3303	533.4	1291.1	46.1	7.0	30.3	9.4	37.6
9-16242	42.0634	78.4421	443.5	333.1	20.0	7.9	36.4	2.1	42.8
9-16245	42.0710	78.4456	438.9	323.7	21.1	7.9	40.8	2.0	47.1
11- 4241	42.9188	76.6418	189.6	561.1	30.0	8.9	37.7	3.9	44.7
11-0001	42.9448	76.5447	219.8	1588.0	52.2	8.5	27.5	11.4	34.7
11- 4380	42.0025	76.6620	156.1	533.1	32.2	9.2	43.1	3.7	50.1
11- 4448	42.9019	76.6785	149.7	538.0	33.9	9.3	45.7	3.8	52.7
11- 4493	42.9222	76.6618	156.7	530.0	27.2	9.2	34.0	3.7	41.0
11- 4497	42.9352	76.6397	168.2	536.8	27.2	9.0	33.9	3.7	40.8
11- 4511	42.9235	76.6296	191.1	585.8	32.2	8.8	39.9	4.1	47.0
11- 4652	42.9468	76.7028	154.8	557.2	31.1	9.2	39.4	3.9	46.4
11- 4715	42.9204	76.6721	157.3	1450.2	50.0	9.2	28.1	10.5	35.4
11- 5000	43.1051	76.5528	132.6	1143.6	32.2	9.0	20.3	8.3	27.6
11- 5011	43.1465	76.5534	123.1	1090.0	26.7	9.0	16.2	8.0	23.5
11- 6780	43.1091	76.5469	140.2	944.3	23.9	8.9	15.8	6.9	23.1
11-10701	42.8763	76.7060	128.3	550.8	23.9	9.6	26.0	3.9	33.0

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
11-10702	42.8766	76.6929	141.4	553.5	27.8	9.4	33.2	3.9	40.2
11-15502	42.9203	76.6908	161.5	611.4	23.3	9.1	23.2	4.3	30.3
11-15703	42.9156	76.7058	158.2	610.8	22.8	9.2	22.3	4.3	29.3
11-15962	42.8604	76.6680	174.3	609.0	32.8	9.1	38.8	4.3	45.9
11-16149	42.9057	76.6669	152.4	527.0	32.8	9.3	44.6	3.7	51.6
13- 1142	42.4860	79.3255	185.9	605.9	26.1	10.2	26.2	4.3	33.3
13- 2655	42.4311	79.0874	421.8	937.9	30.0	7.9	23.6	6.8	30.8
13- 3200	42.0682	79.4156	479.1	2042.2	48.9	7.8	20.1	14.1	27.0
13- 3313	42.4619	79.3739	488.3	1760.5	42.8	7.3	20.2	12.5	27.2
13- 4152	42.1639	79.7370	453.8	1086.6	42.2	8.1	31.4	7.9	38.7
13- 4161	42.2922	79.4927	415.4	988.2	32.8	8.3	24.8	7.2	32.1
13- 4178	42.2887	79.4677	417.6	1004.3	35.0	8.2	26.7	7.3	33.9
13- 4204	42.1609	79.6741	453.2	1105.2	32.8	8.1	22.3	8.1	29.6
13- 4347	42.1601	79.6789	455.4	1103.4	30.0	8.1	19.9	8.1	27.2
13- 4437	42.1843	79.3381	540.4	2339.6	66.7	7.1	25.5	15.6	32.1
13- 4561	42.2400	79.4146	468.5	1127.8	35.6	7.8	24.6	8.2	31.9
13- 4581	42.2393	79.4080	484.6	1121.7	31.7	7.6	21.4	8.2	28.7
13- 4671	42.2398	79.4202	473.4	1101.9	38.3	7.7	27.8	8.0	35.1
13- 4986	42.4106	79.4095	214.3	678.8	27.8	10.1	26.1	4.9	33.3
13- 5129	42.4271	79.4059	194.8	646.8	26.7	10.2	25.4	4.6	32.5
13- 6745	42.3785	79.1880	433.4	981.5	31.7	7.9	24.2	7.2	31.5
13- 7649	42.4071	79.1666	492.3	1005.5	32.8	7.3	25.4	7.3	32.7
13- 8756	42.4131	79.1847	433.4	954.0	33.3	7.8	26.7	7.0	34.0
13- 8757	42.4271	79.1949	381.0	883.0	32.8	8.3	27.7	6.4	34.9
13- 9616	42.3687	79.3400	448.1	988.8	33.9	7.8	26.4	7.2	33.7
13- 9617	42.1694	79.6767	455.1	1090.9	33.3	8.1	23.2	8.0	30.5
13- 9619	42.3767	79.4553	241.4	723.6	29.4	9.9	27.1	5.2	34.3
13- 9620	42.2845	79.5235	427.3	998.2	32.2	8.2	24.1	7.3	31.4
13- 9867	42.2782	79.5312	458.4	1014.7	31.1	7.9	22.9	7.4	30.2
13- 9868	42.2408	79.6654	479.1	1003.7	31.7	7.8	23.8	7.3	31.1
13- 9870	42.3755	79.3176	356.6	910.1	30.0	8.7	23.4	6.6	30.7
13- 9871	42.2475	79.6654	444.7	1055.5	35.6	8.1	26.0	7.7	33.3
13- 9939	42.4158	79.3787	228.6	1523.7	40.0	9.9	19.8	11.0	26.9
13- 9940	42.4065	79.4023	229.2	719.9	26.7	9.9	23.3	5.2	30.4
13- 9941	42.4121	79.3872	228.6	719.6	29.4	9.9	27.1	5.2	34.3
13- 9960	42.2408	79.6654	464.8	1067.7	32.2	7.9	22.8	7.8	30.1
13- 9961	42.3758	79.4460	247.2	733.0	32.2	9.8	30.6	5.3	37.8
13- 9962	42.3687	79.4566	259.7	766.0	29.4	9.7	25.8	5.5	33.0
13- 9963	42.1783	79.6655	448.4	1116.5	37.8	8.1	26.6	8.1	33.9
13- 9964	42.1661	79.6922	464.8	1100.9	33.3	8.0	23.0	8.0	30.3
13-10025	42.3635	79.4736	271.3	779.4	32.2	9.6	29.0	5.6	36.3
13-10028	42.2598	79.6681	391.7	970.8	32.2	8.6	24.3	7.1	31.6

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-10032	42.3723	79.4644	243.8	761.1	30.0	9.8	26.5	5.5	33.7
13-10033	42.3793	79.2979	371.9	923.2	33.3	8.5	26.9	6.7	34.2
13-10065	42.2464	79.6591	454.8	1062.5	31.1	8.0	21.8	7.8	29.1
13-10066	42.1710	79.6696	449.0	1118.3	36.7	8.1	25.5	8.2	32.8
13-10069	42.3780	79.3262	406.0	952.5	33.9	8.2	27.0	6.9	34.3
13-10084	42.3763	79.4750	236.2	730.0	26.7	9.9	23.0	5.2	30.1
13-10086	42.2350	79.6685	477.0	1108.3	32.8	7.8	22.6	8.1	29.9
13-10087	42.2302	79.6614	490.7	1097.6	34.4	7.6	24.4	8.0	31.7
13-10089	42.1546	79.6793	482.2	1148.2	32.2	7.8	21.3	8.4	28.6
13-10090	42.1617	79.6961	469.4	1120.7	35.6	7.9	24.6	8.2	31.9
13-10091	42.3720	79.3519	459.6	1007.1	36.7	7.7	28.8	7.3	36.1
13-10093	42.4247	79.4139	197.8	661.1	26.7	10.2	24.9	4.7	32.0
13-10109	42.3557	79.4545	331.3	875.4	29.4	9.0	23.4	6.4	30.6
13-10110	42.1747	79.6781	460.9	1112.8	39.4	8.0	28.3	8.1	35.6
13-10111	42.3655	79.3682	455.1	1008.6	32.2	7.7	24.3	7.4	31.6
13-10145	42.3649	79.4357	323.7	878.7	29.4	9.1	23.2	6.4	30.5
13-10146	42.3879	79.4628	285.9	805.0	28.3	9.4	23.5	5.8	30.8
13-10173	42.3533	79.3482	483.1	1035.4	36.1	7.5	27.7	7.6	35.0
13-10175	42.2434	79.6783	417.6	1030.5	37.8	8.4	28.6	7.5	35.8
13-10176	42.2508	79.6495	460.2	1040.0	38.3	7.9	29.2	7.6	36.5
13-10177	42.2878	79.4229	469.1	1102.5	34.4	7.7	24.2	8.0	31.5
13-10250	42.1599	79.6696	457.2	1125.6	34.4	8.0	23.5	8.2	30.7
13-10251	42.1823	79.6594	470.3	1138.4	35.0	7.9	23.8	8.3	31.1
13-10252	42.1746	79.6580	447.1	1113.4	36.7	8.1	25.6	8.1	32.9
13-10253	42.3547	79.3632	360.6	905.0	32.2	8.7	26.0	6.6	33.3
13-10254	42.3499	79.3554	477.9	1030.2	36.7	7.5	28.3	7.5	35.6
13-10258	42.2404	79.6939	391.7	984.2	36.7	8.6	28.5	7.2	35.8
13-10278	42.1727	79.6989	463.6	1126.2	88.9	8.0	27.4	8.2	34.7
13-10285	42.3690	79.4791	243.8	766.9	31.7	9.8	28.5	5.5	35.7
13-10286	42.3566	79.4849	264.9	781.8	28.9	9.7	24.6	5.6	31.8
13-10287	42.3504	79.4883	287.1	815.6	27.8	9.4	22.5	5.9	29.7
13-10288	42.3518	79.4650	337.4	852.8	26.7	8.9	20.8	6.2	28.0
13-10289	42.3667	79.4840	234.7	762.0	29.4	9.9	25.6	5.5	32.8
13-10290	42.3622	79.4801	251.5	766.9	31.7	9.8	28.5	5.5	35.8
13-10292	42.2457	79.6718	427.9	1040.3	32.2	8.2	23.0	7.6	30.3
13-10293	42.2480	79.6780	402.6	1003.4	26.7	8.5	18.1	7.3	25.4
13-10298	42.3502	79.3682	472.4	1022.6	36.7	7.6	28.4	7.5	35.7
13-10299	42.3605	79.3320	414.2	961.9	31.7	8.1	24.5	7.0	31.7
13-10316	42.2289	79.6731	475.5	1080.8	37.8	7.8	27.7	7.9	35.0
13-10332	42.1781	79.7044	466.3	1128.7	34.4	8.0	23.5	8.2	30.8
13-10345	42.2455	79.6920	373.4	985.7	34.4	8.8	26.0	7.2	33.3
13-10370	42.1847	79.7062	450.5	1085.1	32.2	8.1	22.2	7.9	29.5

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-10375	42.4235	79.3762	229.5	686.7	30.6	9.9	30.1	4.9	37.3
13-10382	42.1595	79.6576	450.5	1127.8	35.0	8.1	23.8	8.2	31.1
13-10389	42.1546	79.6793	485.2	1147.6	32.2	7.8	21.3	8.4	28.6
13-10407	42.2333	79.6856	424.3	1030.2	33.9	8.3	24.8	7.5	32.1
13-10417	42.4233	79.3151	269.7	728.2	26.7	9.5	23.6	5.2	30.8
13-10448	42.4542	79.3532	202.4	698.6	29.4	10.1	27.7	5.0	34.9
13-10455	42.4134	79.3410	290.8	770.2	29.4	9.3	26.2	5.6	33.4
13-10456	42.3624	79.3756	469.4	1019.6	29.4	7.6	21.4	7.4	28.7
13-10457	42.2284	79.6865	443.2	1059.5	29.4	8.1	20.1	7.7	27.4
13-10458	42.2371	79.6989	392.3	976.9	32.8	8.6	24.7	7.1	32.0
13-10460	42.3624	79.3756	468.8	1016.8	34.4	7.6	26.4	7.4	33.7
13-10461	42.3572	79.3803	475.8	1038.1	35.0	7.6	26.4	7.6	33.7
13-10470	42.2648	79.5165	489.2	1060.4	32.2	7.6	23.2	7.7	30.5
13-10477	42.4115	79.4427	203.0	674.8	26.7	10.2	24.4	4.8	31.6
13-10485	42.2234	79.6583	499.9	1115.9	32.2	7.6	22.1	8.1	29.4
13-10486	42.2295	79.6492	512.1	1131.7	36.7	7.4	25.8	8.3	33.1
13-10489	42.3437	79.4910	315.5	856.5	26.7	9.2	20.4	6.2	27.7
13-10528	42.4075	79.4566	207.6	684.6	29.4	10.1	28.2	4.9	35.3
13-10530	42.3616	79.4412	343.2	883.9	30.0	8.9	23.9	6.4	31.2
13-10531	42.3451	79.3731	413.0	973.8	29.4	8.2	21.8	7.1	29.1
13-10532	42.2250	79.6645	492.9	1107.6	35.6	7.6	25.2	8.1	32.5
13-10534	42.4860	79.3255	185.9	708.4	28.9	10.2	26.4	5.1	33.5
13-10535	42.3818	79.4737	225.9	714.1	29.4	10.0	27.2	5.1	34.4
13-10550	42.2286	79.6517	496.2	1116.5	30.0	7.6	20.1	8.1	27.4
13-10554	42.3363	79.3733	405.4	962.6	28.3	8.3	20.8	7.0	28.1
13-10564	42.3895	79.4749	204.5	697.7	26.7	10.2	23.6	5.0	30.8
13-10566	42.2876	79.5339	434.0	1012.2	28.9	8.1	20.5	7.4	27.8
13-10578	42.4018	79.4445	204.5	686.1	25.6	10.2	22.4	4.9	29.6
13-10579	42.3470	79.4743	342.3	878.7	32.8	8.9	27.2	6.4	34.4
13-10580	42.3324	79.5154	402.3	968.3	26.7	8.3	18.9	7.1	26.2
13-10584	42.3667	79.4918	237.1	753.5	25.6	9.9	20.8	5.4	28.0
13-10585	42.3586	79.4323	340.5	882.4	30.0	8.9	23.9	6.4	31.2
13-10596	42.3380	79.3800	405.7	964.7	29.4	8.3	22.0	7.0	29.2
13-10597	42.2159	79.6577	504.1	1150.3	36.1	7.5	24.8	8.4	32.1
13-10601	42.3876	79.4382	235.0	801.6	29.4	9.9	24.4	5.8	31.6
13-10605	42.3412	79.4439	420.9	981.5	30.0	8.1	22.3	7.2	29.6
13-10655	42.2104	79.6575	504.4	1200.9	37.8	7.5	25.2	8.8	32.5
13-10656	42.3895	79.4494	221.3	712.0	27.8	10.0	24.9	5.1	32.1
13-10658	42.3832	79.4427	241.1	730.0	28.3	9.8	25.3	5.2	32.5
13-10700	42.3552	79.4945	251.2	770.2	28.9	9.8	24.8	5.6	32.0
13-10705	42.1899	79.6604	475.5	1108.6	35.6	7.8	25.0	8.1	32.3
13-10706	42.1932	79.6550	477.9	1119.2	33.9	7.8	23.3	8.2	30.6

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-10757	42.2705	79.5480	423.1	1028.7	35.6	8.2	26.6	7.5	33.9
13-10771	42.1655	79.6659	440.4	1116.8	36.1	8.2	25.0	8.1	32.3
13-10872	42.0539	79.4637	476.4	1312.5	38.9	7.9	23.6	9.5	30.9
13-10873	42.0559	79.0771	443.8	1398.7	37.8	8.1	21.2	10.1	28.5
13-10875	42.1503	79.6860	489.8	1153.7	36.7	7.7	25.1	8.4	32.4
13-10877	42.2953	79.4667	445.9	1004.3	33.3	7.9	25.3	7.3	32.6
13-10878	42.3358	79.4532	463.0	1034.5	34.4	7.7	25.8	7.5	33.1
13-10883	42.3665	79.2975	423.1	993.0	37.2	8.0	29.4	7.2	36.7
13-10884	42.3697	79.4417	279.2	808.6	28.9	9.5	24.0	5.9	31.2
13-10894	42.3366	79.3899	406.9	963.8	32.8	8.3	25.4	7.0	32.7
13-10895	42.3580	79.2991	417.6	996.4	30.0	8.1	22.0	7.3	29.3
13-10896	42.1530	79.6920	491.6	1151.8	36.7	7.7	25.1	8.4	32.4
13-10898	42.1707	79.6457	468.5	1137.2	38.3	7.9	26.7	8.3	34.0
13-10899	42.2178	79.6818	475.2	1112.5	35.6	7.8	24.9	8.1	32.2
13-10900	42.1516	79.6683	482.8	1166.5	36.7	7.8	24.7	8.5	32.0
13-10923	42.3439	79.4620	445.0	985.1	38.9	7.9	31.5	7.2	38.7
13-10931	42.2008	79.5665	491.9	1143.0	35.0	7.6	23.9	8.3	31.2
13-10937	42.3447	79.4007	407.8	980.5	33.3	8.2	25.6	7.1	32.9
13-10943	42.1685	79.6891	458.4	1083.3	37.2	8.0	26.9	7.9	34.2
13-10944	42.3346	79.3983	452.9	979.6	33.3	7.8	26.1	7.1	33.3
13-10945	42.3525	79.3309	410.3	969.3	30.0	8.2	22.5	7.1	29.8
13-10946	42.4278	79.3017	268.2	746.8	23.3	9.5	18.6	5.4	25.8
13-10948	42.1525	79.6572	457.8	1163.7	26.1	8.0	24.1	8.4	31.4
13-10949	42.2244	79.6955	420.0	1040.6	34.4	8.4	25.1	7.6	32.4
13-10955	42.2232	79.6839	462.4	1068.3	35.0	7.9	25.3	7.8	32.6
13-10957	42.3291	79.3926	418.8	995.2	38.9	8.2	30.9	7.3	38.2
13-10967	42.3486	79.4447	416.7	968.3	32.8	8.2	25.4	7.1	32.7
13-10968	42.3678	79.2907	425.2	984.5	34.4	8.0	26.9	7.2	34.1
13-10972	42.3557	79.2507	427.0	999.4	36.1	8.0	28.1	7.3	35.4
13-10973	42.1773	79.7103	442.3	1113.4	33.3	8.2	22.6	8.1	29.9
13-10993	42.3507	79.3780	420.9	975.4	29.4	8.1	21.9	7.1	29.2
13-10999	42.1881	79.6923	478.5	1106.7	40.0	7.8	29.1	8.1	36.4
13-11000	42.1919	79.6863	490.7	1135.4	36.7	7.7	25.5	8.3	32.8
13-11004	42.3422	79.4083	458.1	997.9	32.2	7.8	24.5	7.3	31.8
13-11005	42.3369	79.4051	417.9	1030.2	38.9	8.2	29.8	7.5	37.1
13-11021	42.3366	79.4454	455.7	1019.3	31.1	7.8	22.9	7.4	30.2
13-11022	42.3176	79.3813	404.5	1010.4	35.0	8.3	26.4	7.4	33.7
13-11023	42.1486	79.7101	463.6	1136.6	35.0	8.0	23.7	8.3	31.0
13-11030	42.1776	79.6919	471.8	1114.0	36.7	7.9	25.8	8.1	33.1
13-11031	42.3734	79.4933	220.7	725.1	27.2	10.1	23.7	5.2	30.8
13-11032	42.4097	79.2617	453.5	969.9	33.3	7.7	26.5	7.1	33.7
13-11033	42.3340	79.4833	426.7	981.5	30.6	8.1	22.9	7.2	30.2

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-11036	42.4128	79.2725	397.5	892.8	30.0	8.2	24.4	6.5	31.7
13-11038	42.1024	79.1461	387.7	1264.9	38.9	8.6	23.9	9.2	31.2
13-11040	42.1921	79.6693	*****	1081.7	32.2	1.9	28.0	7.9	35.3
13-11041	42.1941	79.6798	438.9	1073.5	35.0	8.2	25.0	7.8	32.3
13-11042	42.1588	79.6860	506.0	1139.6	35.0	7.6	24.1	8.3	31.4
13-11043	42.1874	79.6781	488.3	1121.1	34.4	7.7	23.8	8.2	31.1
13-11054	42.3610	79.2908	427.0	984.5	32.2	8.0	24.6	7.2	31.9
13-11059	42.3185	79.3682	402.0	1004.3	32.8	8.3	24.4	7.3	31.6
13-11063	42.2482	79.6357	487.4	1089.7	34.4	7.7	24.6	8.0	31.9
13-11069	42.3892	79.1916	424.6	607.2	21.1	8.0	21.7	4.3	28.7
13-11076	42.4161	79.3145	274.6	763.8	24.4	9.4	19.7	5.5	26.9
13-11079	42.1466	79.7028	463.9	1138.4	35.0	8.0	23.7	8.3	31.0
13-11094	42.3223	79.3991	409.0	993.6	31.1	8.3	23.0	7.2	30.3
13-11096	42.1909	79.7008	460.9	1107.0	31.7	8.0	21.4	8.1	28.7
13-11097	42.3255	79.4799	444.4	1000.0	31.1	7.9	23.2	7.3	30.5
13-11098	42.3284	79.4718	438.3	999.7	31.1	8.0	23.1	7.3	30.4
13-11110	42.1565	79.6989	452.0	1107.3	32.8	8.1	22.3	8.1	29.6
13-11111	42.3351	79.4156	416.7	992.4	32.2	8.2	24.2	7.2	31.5
13-11112	42.3430	79.3859	401.1	958.3	32.8	8.3	25.5	7.0	32.8
13-11117	42.1858	79.6676	448.1	1082.0	32.2	8.1	22.3	7.9	29.6
13-11118	42.3403	79.4218	422.5	990.0	32.8	8.1	24.9	7.2	32.2
13-11119	42.3402	79.3958	401.7	969.9	32.8	8.3	25.2	7.1	32.5
13-11120	42.3200	79.3492	472.1	1076.6	32.8	7.6	23.4	7.9	30.7
13-11121	42.4032	79.2937	332.5	853.4	25.6	8.9	19.5	6.2	26.8
13-11130	42.1716	79.7096	442.0	1091.2	32.2	8.2	22.0	8.0	29.3
13-11131	42.1713	79.7188	442.0	1090.6	32.8	8.2	22.5	8.0	29.8
13-11132	42.1647	79.7221	445.3	1095.8	32.8	8.2	22.5	8.0	29.7
13-11133	42.1906	79.7098	450.5	1078.7	32.2	8.1	22.4	7.9	29.7
13-11136	42.1964	79.6974	448.1	1077.8	32.2	8.1	22.4	7.9	29.7
13-11137	42.1971	79.7091	442.9	1077.8	33.9	8.2	23.9	7.9	31.2
13-11138	42.3259	79.3422	507.5	1150.0	31.7	7.3	21.2	8.4	28.5
13-11146	42.3225	79.3756	460.2	1029.3	32.2	7.7	23.8	7.5	31.1
13-11152	42.3395	79.4975	323.4	866.2	30.6	9.1	24.8	6.3	32.0
13-11153	42.3639	79.3113	408.1	962.3	29.4	8.2	22.1	7.0	29.4
13-11154	42.3250	79.3670	402.9	1208.5	31.7	8.3	19.3	8.8	26.6
13-11162	42.2176	79.6389	514.2	1134.2	36.1	7.4	25.3	8.3	32.6
13-11163	42.2229	79.6255	515.4	1132.9	33.3	7.4	22.9	8.3	30.2
13-11165	42.2533	79.6288	483.7	1083.0	32.2	7.7	22.7	7.9	30.0
13-11167	42.2512	79.6209	481.0	1089.7	35.0	7.7	25.0	8.0	32.3
13-11169	42.3283	79.3575	440.7	1026.3	36.7	7.9	28.0	7.5	35.3
13-11170	42.3626	79.4990	237.1	756.2	28.9	9.9	25.1	5.5	32.3
13-11178	42.4373	79.2935	265.2	731.5	24.4	9.5	20.4	5.3	27.6

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-11179	42.2557	79.6389	461.5	1051.0	33.3	7.9	24.2	7.7	31.5
13-11180	42.2295	79.6360	494.4	1105.2	35.6	7.6	25.3	8.1	32.6
13-11181	42.3283	79.3780	423.4	997.6	33.9	8.1	25.8	7.3	33.1
13-11182	42.2561	79.6154	465.7	1079.6	35.0	7.8	25.2	7.9	32.4
13-11192	42.2036	79.6537	484.9	1122.3	36.1	7.7	25.3	8.2	32.6
13-11193	42.3585	79.5036	235.0	752.9	26.7	10.0	22.2	5.4	29.4
13-11197	42.2023	79.6696	474.9	1097.3	32.8	7.8	22.7	8.0	30.0
13-11199	42.2052	79.6273	486.2	1091.8	35.6	7.7	25.5	8.0	32.8
13-11200	42.2467	79.6167	481.6	1092.1	35.6	7.7	25.5	8.0	32.8
13-11205	42.3324	79.3448	513.6	1090.6	33.3	7.2	24.0	8.0	31.3
13-11207	42.3533	79.5081	241.1	772.7	28.3	9.9	23.9	5.6	31.1
13-11208	42.3500	79.5162	240.2	792.8	28.9	9.9	23.9	5.7	31.2
13-11210	42.1004	79.4640	481.9	1244.2	36.1	7.8	22.8	9.1	30.0
13-11211	42.1009	79.4551	470.6	1040.9	33.3	7.9	24.4	7.6	31.7
13-11212	42.0946	79.4635	471.8	1240.5	33.3	7.9	20.5	9.0	27.8
13-11254	42.2278	79.6272	486.2	1103.7	35.6	7.7	25.3	8.1	32.6
13-11255	42.2598	79.6322	473.0	1067.7	35.0	7.8	25.5	7.8	32.8
13-11256	42.2337	79.6241	487.7	1100.9	35.0	7.7	24.8	8.0	32.1
13-11257	42.2643	79.6568	411.5	985.4	31.7	8.4	23.6	7.2	30.9
13-11258	42.2689	79.6491	419.1	992.7	33.3	8.3	25.2	7.2	32.5
13-11262	42.3648	79.5061	218.2	738.2	29.4	10.1	26.2	5.3	33.4
13-11263	42.3589	79.5133	228.6	750.1	29.4	10.0	25.9	5.4	33.1
13-11267	42.3247	79.4507	487.7	1051.6	32.2	7.5	23.5	7.7	30.8
13-11268	42.3195	79.4073	445.0	1028.4	31.1	7.9	22.6	7.5	29.9
13-11269	42.2604	79.6904	299.3	1174.4	31.1	9.5	18.4	8.6	25.7
13-11273	42.3351	79.5033	431.9	895.8	30.6	8.1	25.1	6.5	32.4
13-11274	42.3371	79.5120	296.9	834.8	29.4	9.4	24.0	6.1	31.3
13-11275	42.3451	79.5037	273.1	810.5	30.6	9.6	25.9	5.9	33.1
13-11285	42.1070	79.4583	486.5	1259.1	37.8	7.7	23.9	9.2	31.1
13-11294	42.3207	79.4158	441.4	1020.2	31.7	7.9	23.3	7.4	30.5
13-11295	42.2628	79.6828	313.6	878.7	29.4	9.4	22.9	6.4	30.1
13-11296	42.3146	79.3985	445.0	1034.5	31.1	7.9	22.4	7.5	29.7
13-11297	42.3199	79.3892	408.4	989.1	30.0	8.3	22.0	7.2	29.3
13-11298	42.2668	79.6877	265.8	824.2	31.1	9.8	25.8	6.0	33.1
13-11304	42.3285	79.4442	469.4	1033.9	31.1	7.7	22.7	7.5	30.0
13-11305	42.3240	79.4363	452.0	1016.2	30.0	7.8	21.8	7.4	29.1
13-11314	42.2740	79.6241	445.9	1011.6	29.4	8.0	21.2	7.4	28.5
13-11315	42.3343	79.4924	379.5	930.9	28.3	8.6	21.2	6.8	28.5
13-11316	42.3248	79.4213	426.7	1026.3	35.0	8.1	26.2	7.5	33.5
13-11323	42.3329	79.3835	424.0	999.7	33.3	8.1	25.2	7.3	32.5
13-11337	42.3264	79.4892	439.5	1000.4	40.0	8.0	32.0	7.3	39.3
13-11339	42.3357	79.4296	420.0	982.7	31.7	8.1	23.9	7.2	31.2

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-11340	42.3062	79.3562	396.5	1003.4	31.1	8.4	22.7	7.3	29.9
13-11341	42.2991	79.3542	395.6	1006.4	36.1	8.4	27.5	7.3	34.9
13-11342	42.3149	79.3544	407.8	1002.2	33.3	8.3	25.0	7.3	32.3
13-11349	42.3288	79.5062	356.6	910.1	31.7	8.8	25.1	6.6	32.4
13-11350	42.3241	79.5104	361.5	941.2	32.8	8.8	25.5	6.9	32.8
13-11352	42.3291	79.3329	496.5	1083.6	30.6	7.4	21.4	7.9	28.7
13-11353	42.3241	79.5003	413.9	977.2	30.6	8.2	22.8	7.1	30.1
13-11354	42.3133	79.4953	417.0	982.4	32.8	8.2	25.0	7.2	32.3
13-11355	42.3328	79.4383	447.8	1013.2	33.3	7.9	25.1	7.4	32.4
13-11358	42.4251	79.3482	241.4	723.9	29.4	9.8	27.2	5.2	34.4
13-11362	42.2132	79.7014	428.2	1020.8	33.9	8.3	25.1	7.4	32.4
13-11363	42.2182	79.6982	422.8	1033.9	35.0	8.3	25.8	7.5	33.1
13-11364	42.2733	79.6904	235.3	794.3	28.9	10.1	23.6	5.7	30.9
13-11370	42.4155	79.2924	296.6	780.0	29.4	9.2	25.9	5.6	33.2
13-11372	42.3092	79.3510	413.9	1014.4	31.7	8.2	23.1	7.4	30.4
13-11373	42.3276	79.3230	461.2	1051.0	33.9	7.7	24.9	7.7	32.2
13-11387	42.2214	79.6667	496.2	1886.4	47.2	7.6	21.0	13.2	28.0
13-11388	42.1058	79.4779	469.7	1225.9	33.3	7.9	20.7	8.9	28.0
13-11405	42.3240	79.3156	412.7	1008.0	33.3	8.2	24.9	7.4	32.2
13-11406	42.3195	79.3104	402.0	998.2	33.9	8.3	25.6	7.3	32.9
13-11407	42.2083	79.6943	446.5	1073.2	33.3	8.1	23.5	7.8	30.8
13-11414	42.1971	79.6498	474.0	1116.2	34.4	7.8	23.8	8.1	31.1
13-11415	42.3154	79.3439	493.2	1086.0	33.3	7.4	23.9	7.9	31.2
13-11422	42.3951	79.4096	252.1	746.8	32.2	9.7	30.1	5.4	37.3
13-11423	42.3920	79.3528	369.1	864.4	26.1	8.5	20.3	6.3	27.6
13-11424	42.3125	79.4075	460.6	1051.9	34.4	7.8	25.4	7.7	32.7
13-11427	42.3070	79.3835	443.5	1043.9	32.2	7.9	23.3	7.6	30.6
13-11429	42.2691	79.6424	417.6	978.4	32.2	8.3	24.4	7.1	31.7
13-11430	42.3331	79.5239	275.5	819.0	31.1	9.6	26.3	5.9	33.5
13-11431	42.3094	79.3933	449.9	1042.7	33.9	7.9	25.0	7.6	32.2
13-11448	42.3922	79.3436	379.8	885.4	31.7	8.4	26.2	6.4	33.5
13-11453	42.3925	79.4022	255.4	756.8	24.4	9.7	19.5	5.5	26.7
13-11454	42.4115	79.3551	268.2	761.4	29.4	9.5	26.2	5.5	33.4
13-11455	42.3215	79.4843	432.2	988.2	32.2	8.1	24.5	7.2	31.7
13-11456	42.3251	79.5204	329.5	876.9	30.6	9.1	24.5	6.4	31.8
13-11457	42.3096	79.5063	399.9	962.3	34.4	8.4	27.1	7.0	34.4
13-11459	42.2235	79.6419	523.0	1135.4	35.6	7.3	24.9	8.3	32.2
13-11469	42.4498	79.2961	247.8	699.5	22.2	9.6	18.0	5.0	25.1
13-11470	42.4543	79.3303	234.4	690.4	23.3	9.8	19.6	4.9	26.8
13-11471	42.4526	79.2822	254.5	691.9	25.6	9.6	23.1	5.0	30.3
13-11472	42.4463	79.2889	259.1	711.7	28.3	9.5	26.4	5.1	33.6
13-11473	42.4416	79.2517	359.7	813.5	24.4	8.5	19.5	5.9	26.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-11477	42.2382	79.6276	482.8	1096.4	34.4	7.7	24.4	8.0	31.7
13-11486	42.3191	79.4750	460.9	1021.4	35.0	7.8	26.7	7.5	33.9
13-11487	42.3062	79.3666	397.5	1004.3	33.3	8.4	24.8	7.3	32.1
13-11488	42.3239	79.4671	448.1	1008.6	33.9	7.9	25.8	7.4	33.1
13-11489	42.2988	79.3674	396.8	1004.3	33.3	8.4	24.8	7.3	32.1
13-11499	42.3677	79.2745	453.2	1001.6	31.7	7.7	23.9	7.3	31.2
13-11500	42.2596	79.6986	272.8	853.4	31.1	9.8	25.0	6.2	32.3
13-11501	42.3123	79.3037	401.4	1012.5	32.2	8.3	23.6	7.4	30.9
13-11502	42.3654	79.2666	462.4	1013.5	34.4	7.6	26.4	7.4	33.7
13-11503	42.3605	79.2595	476.4	1030.5	31.7	7.5	23.4	7.5	30.7
13-11504	42.3648	79.2530	477.3	1064.1	32.2	7.5	23.2	7.8	30.5
13-11505	42.3664	79.3176	404.8	965.3	30.6	8.2	23.1	7.0	30.4
13-11511	42.3986	79.3786	286.5	774.2	35.6	9.4	33.8	5.6	41.1
13-11512	42.4380	79.2697	342.6	815.0	28.3	8.7	24.1	5.9	31.3
13-11513	42.3115	79.5141	376.4	933.0	32.2	8.6	25.3	6.8	32.6
13-11524	42.3184	79.5193	374.0	899.5	32.2	8.6	26.2	6.5	33.5
13-11525	42.3281	79.4965	423.4	982.1	31.7	8.1	24.0	7.2	31.2
13-11526	42.3949	79.3645	319.1	823.3	26.7	9.0	21.4	6.0	28.7
13-11530	42.1143	79.4695	523.0	1271.0	36.7	7.4	23.0	9.2	30.3
13-11532	42.3741	79.4341	259.7	780.3	28.9	9.7	24.6	5.6	31.9
13-11536	42.3854	79.3575	401.1	920.5	30.0	8.2	23.6	6.7	30.9
13-11537	42.3873	79.3349	402.3	911.4	31.1	8.2	25.1	6.6	32.4
13-11538	42.3772	79.3578	480.4	994.0	29.4	7.5	22.1	7.2	29.4
13-11552	42.4446	79.2716	309.7	796.4	22.8	9.0	17.3	5.8	24.5
13-11553	42.4203	79.2954	298.7	796.1	26.7	9.2	22.0	5.8	29.2
13-11555	42.4428	79.3432	220.1	670.0	23.3	9.9	20.0	4.8	27.1
13-11557	42.3117	79.4866	438.6	1010.1	33.3	8.0	25.1	7.4	32.4
13-11558	42.3159	79.4623	463.3	1041.8	32.2	7.8	23.5	7.6	30.8
13-11562	42.3683	79.3252	403.3	951.9	32.2	8.2	25.2	6.9	32.5
13-11563	42.3031	79.3470	416.4	1020.2	32.2	8.2	23.6	7.4	30.9
13-11564	42.3097	79.3218	500.8	1110.1	32.2	7.3	22.4	8.1	29.7
13-11568	42.3169	79.3230	517.9	1115.0	34.4	7.2	24.5	8.1	31.8
13-11583	42.4461	79.3142	239.3	706.8	25.6	9.7	22.4	5.1	29.6
13-11584	42.3328	79.4230	423.7	992.4	30.0	8.1	22.1	7.2	29.3
13-11585	42.3143	79.4166	479.1	1066.8	32.2	7.6	23.1	7.8	30.4
13-11586	42.3572	79.2523	513.6	1084.8	32.2	7.1	23.1	7.9	30.4
13-11595	42.3740	79.2678	442.9	983.6	31.7	7.8	24.2	7.2	31.5
13-11596	42.3538	79.3050	409.3	984.2	32.8	8.2	25.0	7.2	32.3
13-11597	42.3586	79.2447	526.7	1085.7	31.1	7.0	22.2	7.9	29.5
13-11599	42.1422	79.4931	491.0	1215.5	36.7	7.7	23.9	8.9	31.1
13-11603	42.3456	79.3002	450.5	1033.9	31.7	7.8	23.1	7.5	30.4
13-11604	42.2934	79.3565	395.6	1006.8	31.1	8.4	22.6	7.3	29.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-11605	42.3188	79.3002	400.5	1001.3	32.2	8.3	23.9	7.3	31.2
13-11606	42.3270	79.3017	403.6	995.8	31.1	8.3	22.9	7.3	30.2
13-11612	42.4429	79.3294	227.1	680.6	26.1	9.9	23.9	4.9	31.0
13-11613	42.4446	79.2652	327.4	818.4	25.6	8.9	20.4	5.9	27.6
13-11614	42.3632	79.4234	319.4	860.1	30.6	9.1	25.0	6.2	32.2
13-11615	42.3701	79.4160	331.3	864.7	28.9	9.0	23.0	6.3	30.3
13-11616	42.3785	79.2799	440.4	985.7	31.7	7.8	24.2	7.2	31.5
13-11617	42.3788	79.2723	426.7	973.8	31.7	8.0	24.3	7.1	31.6
13-11626	42.3969	79.2864	374.9	856.2	36.1	8.5	32.3	6.2	39.5
13-11627	42.4260	79.2952	289.6	771.4	24.4	9.3	19.7	5.6	26.9
13-11634	42.3123	79.4571	499.0	1082.6	28.9	7.4	19.8	7.9	27.1
13-11635	42.3215	79.4285	457.2	1032.1	30.6	7.8	22.1	7.5	29.3
13-11636	42.3159	79.4374	443.8	1058.6	34.4	7.9	25.0	7.7	32.3
13-11637	42.3095	79.4489	505.7	1098.8	33.3	7.3	23.7	8.0	31.0
13-11638	42.3151	79.4278	471.8	1064.7	33.3	7.7	24.1	7.8	31.4
13-11643	42.3807	79.2869	399.0	954.9	31.7	8.2	24.5	7.0	31.8
13-11648	42.3100	79.4404	481.6	1068.9	32.2	7.6	23.1	7.8	30.4
13-11649	42.3040	79.4424	497.1	1089.1	33.9	7.4	24.3	7.9	31.6
13-11650	42.3055	79.4352	479.5	1064.1	32.8	7.6	23.7	7.8	31.0
13-11657	42.3060	79.4926	419.1	992.4	31.1	8.2	23.1	7.2	30.4
13-11659	42.1157	79.4948	503.2	1243.3	33.9	7.6	21.2	9.1	28.4
13-11661	42.0907	79.4731	460.6	1236.0	34.4	8.0	21.4	9.0	28.7
13-11664	42.1696	79.5091	472.7	1179.6	35.6	7.8	23.5	8.6	30.8
13-11667	42.0663	79.7364	433.4	1176.8	38.9	8.4	25.9	8.6	33.2
13-11671	42.3103	79.4237	487.1	1080.5	31.1	7.5	21.8	7.9	29.1
13-11672	42.1615	79.4705	481.3	1196.3	28.9	7.7	17.7	8.7	25.0
13-11678	42.4356	79.3618	210.6	672.7	26.7	10.0	24.7	4.8	31.8
13-11679	42.4539	79.3651	195.4	652.0	28.9	10.2	28.7	4.6	35.8
13-11680	42.4274	79.3712	223.1	706.5	28.3	9.9	26.0	5.1	33.2
13-11681	42.4342	79.3729	211.2	673.0	28.3	10.0	27.2	4.8	34.3
13-11682	42.4302	79.3534	231.6	700.4	32.2	9.8	31.9	5.0	39.1
13-11683	42.4458	79.2327	384.7	857.4	27.2	8.3	22.1	6.2	29.3
13-11684	42.4402	79.2331	405.4	885.1	31.1	8.1	26.0	6.4	33.3
13-11686	42.4417	79.1986	345.9	834.2	28.9	8.7	24.2	6.0	31.5
13-11687	42.4461	79.1936	339.9	848.9	27.8	8.7	22.5	6.2	29.7
13-11691	42.4561	79.2596	280.7	730.6	28.9	9.3	26.8	5.3	34.0
13-11696	42.3041	79.4615	483.7	1066.5	31.7	7.6	22.6	7.8	29.9
13-11697	42.3207	79.4425	489.8	1054.9	31.1	7.5	22.4	7.7	29.7
13-11698	42.3165	79.4475	506.0	1082.3	31.7	7.3	22.5	7.9	29.8
13-11701	42.3745	79.2857	433.7	991.2	30.0	7.9	22.3	7.2	29.6
13-11702	42.3884	79.2948	326.1	851.3	27.2	9.0	21.5	6.2	28.7
13-11705	42.0316	79.6814	439.2	1249.4	37.8	8.3	23.6	9.1	30.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-11710	42.4860	79.3255	185.9	613.0	26.1	10.2	25.9	4.3	33.0
13-11711	42.3593	79.4164	349.0	905.3	29.4	8.8	22.8	6.6	30.1
13-11712	42.3459	79.4237	420.3	975.4	31.1	8.1	23.6	7.1	30.9
13-11713	42.3341	79.3139	398.7	986.9	30.0	8.3	22.0	7.2	29.3
13-11714	42.3679	79.3058	396.2	947.0	31.1	8.3	24.1	6.9	31.4
13-11715	42.2971	79.4039	506.9	1112.8	34.4	7.3	24.4	8.1	31.7
13-11716	42.3033	79.3896	450.8	1056.4	32.2	7.9	23.1	7.7	30.4
13-11717	42.3053	79.3329	466.6	1081.7	31.7	7.7	22.2	7.9	29.5
13-11718	42.2900	79.3474	402.0	1016.2	30.0	8.3	21.3	7.4	28.6
13-11720	42.3544	79.2602	486.8	1075.9	32.8	7.4	23.6	7.9	30.9
13-11724	42.3884	79.3681	371.6	893.4	30.6	8.5	24.6	6.5	31.9
13-11734	42.1161	79.5185	558.1	1293.6	37.8	7.0	23.8	9.4	31.0
13-11751	42.3384	79.3071	406.9	987.9	29.4	8.2	21.5	7.2	28.8
13-11752	42.2944	79.4161	504.7	1106.4	33.9	7.4	24.0	8.1	31.3
13-11753	42.3847	79.3746	395.6	911.4	30.0	8.3	23.8	6.6	31.1
13-11764	42.3807	79.3878	393.5	918.7	30.0	8.3	23.6	6.7	30.9
13-11765	42.2986	79.4424	500.5	1095.1	30.0	7.4	20.6	8.0	27.9
13-11766	42.3036	79.4519	511.1	1097.9	30.6	7.3	21.2	8.0	28.5
13-11774	42.4415	79.3576	208.8	671.2	26.7	10.1	24.7	4.8	31.9
13-11783	42.4816	79.3080	201.2	634.3	28.3	10.1	28.8	4.5	35.9
13-11784	42.4498	79.3490	201.2	668.7	28.9	10.1	28.1	4.8	35.2
13-11786	42.5179	79.2424	207.3	603.5	22.8	9.9	21.3	4.3	28.4
13-11788	42.4240	79.3371	249.9	719.3	24.4	9.7	20.5	5.2	27.7
13-11793	42.3062	79.4606	432.2	1008.6	30.6	8.1	22.3	7.4	29.6
13-11800	42.4636	79.3170	211.8	662.3	23.9	10.0	21.0	4.7	28.1
13-11702	42.4661	79.3025	219.2	665.1	22.8	9.9	19.4	4.7	26.5
13-11803	42.3828	79.2782	420.9	871.1	34.4	8.0	30.3	6.3	37.0
13-11804	42.3896	79.2782	408.7	938.2	33.9	8.1	27.4	6.8	34.7
13-11806	42.4872	79.2965	202.7	625.1	30.6	10.0	32.8	4.4	39.9
13-11807	42.4811	79.2954	207.6	630.6	25.6	10.0	24.7	4.5	31.8
13-11808	42.4542	79.3532	199.3	654.1	27.8	10.1	27.0	4.7	34.1
13-11809	42.4456	79.3536	213.4	673.6	29.4	10.0	28.9	4.8	36.0
13-11810	42.4331	79.3438	240.2	713.2	28.9	9.8	26.8	5.1	34.0
13-11811	42.4426	79.4139	189.6	641.0	28.3	10.3	28.2	4.6	35.3
13-11812	42.4456	79.4056	186.2	637.6	25.0	10.3	23.1	4.5	30.2
13-11866	42.2913	79.4471	504.1	1092.4	33.9	7.4	24.3	8.0	31.6
13-11867	42.2878	79.4411	493.2	1094.2	31.7	7.5	22.1	8.0	29.4
13-11868	42.2871	79.4308	474.9	1102.8	30.0	7.7	20.3	8.0	27.6
13-11869	42.2818	79.4300	472.4	1089.4	35.6	7.7	25.6	7.9	32.9
13-11870	42.2751	79.4284	448.1	1067.7	35.0	7.9	25.3	7.8	32.6
13-11871	42.2807	79.4478	493.2	1202.1	35.0	7.6	22.9	8.8	30.2
13-11872	42.2813	79.4637	434.9	1046.4	32.2	8.1	23.1	7.6	30.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-11873	42.2779	79.4704	412.4	1018.3	34.4	8.3	25.7	7.4	33.0
13-11874	42.2727	79.4728	408.4	1019.9	32.8	8.3	24.0	7.4	31.3
13-11875	42.2725	79.4641	444.7	1054.9	33.3	8.0	24.0	7.7	31.3
13-11876	42.2683	79.4693	412.4	1016.5	33.3	8.3	24.6	7.4	31.9
13-11877	42.2656	79.4602	451.7	1069.5	33.9	7.9	24.3	7.8	31.6
13-11879	42.2753	79.4525	474.9	1085.7	33.9	7.7	24.1	7.9	31.4
13-11880	42.2587	79.4507	469.4	1097.3	35.6	7.8	25.3	8.0	32.6
13-11882	42.2690	79.4290	428.5	1051.3	32.2	8.1	22.9	7.7	30.2
13-11883	42.2583	79.4348	416.7	1064.7	31.7	8.3	22.0	7.8	29.3
13-11884	42.2640	79.4312	423.1	1054.6	33.3	8.2	23.8	7.7	31.1
13-11885	42.2757	79.4209	455.1	1058.9	33.9	7.9	24.6	7.7	31.9
13-11886	42.2878	79.4229	469.1	1077.5	32.8	7.7	23.3	7.9	30.6
13-11887	42.2885	79.3969	525.2	1153.7	36.7	7.2	25.6	8.4	32.9
13-11888	42.2830	79.3936	518.8	1137.8	33.9	7.2	23.4	8.3	30.7
13-11889	42.2878	79.3846	474.9	1092.4	33.9	7.6	24.0	8.0	31.3
13-11890	42.2903	79.3776	443.8	1060.4	33.3	7.9	23.9	7.7	31.2
13-11891	42.2818	79.3982	486.8	1116.5	34.4	7.5	24.1	8.1	31.4
13-11893	42.2890	79.3952	397.8	1015.6	33.3	8.4	24.5	7.4	31.8
13-11894	42.2807	79.3904	397.2	1029.9	33.9	8.4	24.7	7.5	32.0
13-11895	42.2869	79.3526	393.8	1011.0	35.0	8.4	26.3	7.4	33.6
13-11896	42.2844	79.3420	398.7	1021.4	34.4	8.4	25.5	7.5	32.8
13-11897	42.2517	79.3707	433.4	1052.5	29.4	8.1	20.3	7.7	27.6
13-11900	42.2915	79.3157	398.1	1024.1	30.0	8.4	21.1	7.5	28.4
13-11901	42.2957	79.3225	431.9	1048.5	32.8	8.0	23.6	7.7	30.9
13-11902	42.3010	79.3252	444.7	1057.4	33.9	7.9	24.6	7.7	31.9
13-11903	42.3038	79.3101	402.0	1012.9	32.2	8.3	23.6	7.4	30.9
13-11904	42.2968	79.3126	401.4	1018.0	32.8	8.3	24.0	7.4	31.3
13-11905	42.3099	79.3104	404.5	1018.9	28.3	8.3	19.7	7.4	27.0
13-11907	42.2871	79.2985	401.1	1026.6	33.3	8.3	24.3	7.5	31.6
13-11909	42.3294	79.2895	413.3	1000.0	32.2	8.2	24.1	7.3	31.3
13-11910	42.3269	79.2806	453.5	1042.7	32.8	7.8	24.0	7.6	31.3
13-11911	42.3225	79.2898	410.6	998.5	33.9	8.2	25.7	7.3	33.0
13-11912	42.3165	79.2874	413.9	1020.5	32.2	8.2	23.6	7.4	30.9
13-11913	42.3089	79.2849	439.5	1048.8	33.3	7.9	24.2	7.7	31.5
13-11914	42.3115	79.2910	423.4	1033.9	31.7	8.1	22.8	7.5	30.1
13-11916	42.3063	79.2755	470.0	1079.9	33.9	7.6	24.3	7.9	31.6
13-11920	42.4516	79.3103	233.2	691.9	28.3	9.8	26.8	5.0	34.0
13-11922	42.4419	79.3707	200.6	661.7	30.6	10.1	30.8	4.7	38.0
13-11923	42.4405	79.2232	411.5	899.2	30.0	8.0	24.4	6.5	31.7
13-11928	42.4656	79.3553	199.6	638.3	27.8	10.1	27.7	4.5	34.8
13-11929	42.4654	79.3638	185.9	630.9	28.3	10.3	28.7	4.5	35.8
13-11934	42.3003	79.5027	409.3	986.3	32.2	8.3	24.2	7.2	31.5

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-11939	42.2057	79.6178	515.4	1165.6	33.3	7.4	22.2	8.5	29.5
13-11940	42.3010	79.4709	417.6	1000.7	30.0	8.2	21.8	7.3	29.1
13-11941	42.2937	79.4806	411.8	989.7	33.9	8.3	25.9	7.2	33.2
13-11952	42.4484	79.3043	240.8	707.4	28.3	9.7	26.3	5.1	33.5
13-11956	42.5031	79.2593	204.2	601.7	21.1	10.0	18.5	4.3	25.6
13-11961	42.4490	79.3697	196.3	661.4	30.6	10.2	30.8	4.7	37.9
13-11984	42.4567	79.3594	194.8	634.0	27.8	10.2	27.8	4.5	34.9
13-11985	42.4606	79.3543	193.2	637.6	25.6	10.2	24.1	4.5	31.2
13-12001	42.1362	79.4887	512.4	1226.8	34.4	7.5	22.0	8.9	29.3
13-12045	42.4342	79.3315	234.7	706.5	27.2	9.8	24.7	5.1	31.8
13-12077	42.4880	79.1713	257.9	707.7	30.6	9.5	29.8	5.1	37.0
13-12078	42.4891	79.1624	253.9	711.1	27.8	9.5	25.7	5.1	32.9
13-12090	42.4836	79.1654	261.2	716.6	31.1	9.4	30.3	5.1	37.4
13-12091	42.4846	79.1563	264.9	723.9	27.8	9.4	25.4	5.2	32.6
13-12093	42.4786	79.1533	316.4	783.3	28.3	8.9	24.8	5.7	32.0
13-12094	42.4786	79.1842	296.3	746.2	31.7	9.1	30.3	5.4	37.5
13-12095	42.4772	79.1923	297.2	733.0	27.8	9.1	25.5	5.3	32.7
13-12096	42.4732	79.1862	321.6	781.2	30.0	8.9	27.1	5.6	34.3
13-12099	42.4556	79.1828	327.1	810.5	31.7	8.8	28.2	5.9	35.4
13-12100	42.4502	79.1887	300.8	799.8	28.3	9.1	24.1	5.8	31.3
13-12101	42.4496	79.1793	365.8	858.6	31.1	8.5	26.4	6.2	33.6
13-12102	42.3617	79.1837	362.1	866.2	31.7	8.6	26.6	6.3	33.9
13-12103	42.4652	79.1485	369.7	853.7	30.0	8.4	25.3	6.2	32.6
13-12105	42.4732	79.1498	341.4	816.3	30.6	8.7	26.8	5.9	34.1
13-12106	42.4734	79.1572	320.6	791.6	28.9	8.9	25.3	5.7	32.5
13-12130	42.3865	79.4064	297.5	807.7	31.7	9.3	27.7	5.8	35.0
13-12131	42.3836	79.4977	282.2	796.7	36.1	9.5	33.5	5.8	40.7
13-12132	42.3893	79.4167	250.9	768.1	28.3	9.7	24.2	5.5	31.4
13-12133	42.3849	79.4222	246.3	769.0	28.3	9.8	24.1	5.6	33.3
13-12134	42.4848	79.3021	609.9	623.6	26.1	6.1	32.2	4.4	39.3
13-12151	42.0413	79.4684	499.0	1312.2	35.6	7.7	21.3	9.5	28.5
13-12152	42.4565	79.3170	217.6	669.6	26.1	9.9	24.2	4.8	31.3
13-12167	42.4630	79.3832	185.9	623.9	26.7	10.3	26.3	4.4	33.4
13-12168	42.4628	79.3748	189.0	641.6	26.7	10.2	25.6	4.6	32.7
13-12169	42.4591	79.3890	185.9	635.8	26.7	10.3	25.8	4.5	32.9
13-12171	42.4584	79.3696	191.4	640.4	26.7	10.2	25.7	4.6	32.8
13-12173	42.4723	79.3557	190.5	625.8	27.2	10.2	27.2	4.4	34.3
13-12174	42.4661	79.3415	197.8	643.1	26.7	10.1	25.7	4.6	32.8
13-12175	42.4638	79.3478	198.1	650.4	27.8	10.1	27.1	4.6	34.3
13-12186	42.5130	79.0891	266.1	725.7	29.4	9.3	27.7	5.2	34.9
13-12188	42.5203	79.0839	270.7	732.1	30.0	9.3	28.3	5.3	35.5
13-12189	42.5169	79.0630	271.6	723.3	28.3	9.2	26.4	5.2	33.6

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-12297	42.4347	79.2329	433.7	933.0	27.8	7.8	21.4	6.8	28.7
13-12298	42.4295	79.2276	447.4	939.4	29.4	7.7	23.2	6.8	30.4
13-12299	42.4339	79.2184	526.4	905.3	28.9	6.9	24.3	6.6	31.6
13-12300	42.4301	79.2380	475.5	961.6	27.2	7.4	20.6	7.0	27.9
13-12301	42.4202	79.2682	456.3	930.9	28.9	7.6	22.8	6.8	30.1
13-12302	42.4186	79.2769	369.7	882.4	29.4	8.5	23.8	6.4	31.0
13-12305	42.4879	79.1486	278.9	736.4	30.0	9.2	28.2	5.3	35.4
13-12306	42.4819	79.1466	316.4	785.2	29.4	8.9	26.2	5.7	33.4
13-12307	42.4774	79.1412	342.0	822.4	30.6	8.6	26.7	6.0	33.9
13-12309	42.4754	79.1332	356.6	841.9	31.7	8.5	27.5	6.1	34.8
13-12310	42.4800	79.1279	346.3	820.8	28.3	8.6	24.1	5.9	31.3
13-12329	42.5000	79.0683	295.4	773.3	28.9	9.0	25.7	5.6	32.9
13-12332	42.0478	79.4992	536.4	1358.2	37.8	7.3	22.4	9.9	29.7
13-12339	42.4162	79.2838	334.7	855.6	29.4	8.8	24.1	6.2	31.3
13-12351	42.4139	79.2554	490.7	997.0	28.3	7.3	21.1	7.3	28.4
13-12366	42.3943	79.1826	423.1	972.6	29.4	8.0	22.1	7.1	29.4
13-12367	42.3893	79.1845	425.2	981.8	30.0	7.9	22.5	7.2	29.8
13-12385	42.4032	79.2410	512.7	1026.9	29.4	7.1	21.8	7.5	29.1
13-12386	42.3954	79.2295	535.8	1067.7	32.8	6.9	24.3	7.8	31.6
13-12387	42.3970	79.2414	523.0	1053.4	26.7	7.0	18.7	7.7	26.0
13-12388	42.3918	79.2364	545.6	1083.6	31.7	6.8	23.0	7.9	30.3
13-12390	42.3902	79.2434	517.9	1061.9	32.2	7.1	23.7	7.7	31.0
13-12391	42.3861	79.2388	507.8	1045.5	32.2	7.2	24.0	7.6	31.3
13-12397	42.4616	79.3383	202.7	656.8	27.8	10.1	26.9	4.7	34.1
13-12411	42.3903	79.4243	240.8	748.9	28.3	9.8	24.7	5.4	31.9
13-12413	42.3770	79.3666	471.8	995.2	33.3	7.6	25.9	7.3	33.2
13-12414	42.3713	79.3630	469.4	1012.9	30.6	7.6	22.7	7.4	30.0
13-12418	42.4628	79.1687	324.0	792.5	23.9	8.8	19.0	5.7	26.2
13-12419	42.4255	79.1177	190.8	553.2	25.6	10.2	27.8	3.9	34.8
13-12421	42.3819	79.2343	494.1	1027.8	32.8	7.3	24.8	7.5	32.1
13-12423	42.4024	79.2241	487.4	1020.8	30.6	7.3	22.7	7.4	30.0
13-12426	42.4325	79.2852	309.4	803.8	26.7	9.1	21.9	5.8	29.1
13-12427	42.4251	79.2175	404.2	964.1	30.6	8.1	23.3	7.0	30.6
13-12445	42.3902	79.2597	466.6	996.1	31.7	7.6	24.2	7.3	31.5
13-12458	42.2893	79.4138	481.3	1069.8	29.4	7.6	20.4	7.8	27.7
13-12481	42.2889	79.4039	510.8	1115.3	26.7	7.3	17.4	8.1	24.7
13-12482	42.2748	79.3541	397.8	1024.4	32.8	8.4	23.8	7.5	31.1
13-12550	42.4008	79.2881	362.4	892.5	31.7	8.6	25.9	6.5	33.1
13-12578	42.0548	79.4891	536.4	1359.7	37.2	7.3	22.0	9.9	29.3
13-12579	42.0497	79.4918	518.5	1342.6	36.1	7.5	21.3	9.7	28.6
13-12580	42.0548	79.4891	527.6	1347.8	36.7	7.4	21.7	9.8	29.0
13-12581	42.0541	79.4960	518.5	1340.5	36.1	7.5	21.4	9.7	28.6

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-12582	42.0424	79.4632	526.1	1350.0	38.9	7.4	23.3	9.8	30.6
13-12583	42.0449	79.5114	533.7	1358.5	38.3	7.3	22.8	9.9	30.1
13-12584	42.0580	79.5058	553.5	1360.0	33.3	7.1	19.3	9.9	26.5
13-12585	42.0530	79.4657	531.3	1342.6	36.7	7.3	21.8	9.7	29.1
13-12587	42.0594	79.4995	530.7	1341.1	36.1	7.4	21.4	9.7	28.7
13-12588	42.0474	79.4624	483.4	1318.6	36.1	7.8	21.5	9.6	28.7
13-12589	42.0338	79.4477	535.2	1387.1	37.8	7.3	22.0	10.0	29.2
13-12591	42.0350	79.4677	500.2	1352.4	38.9	7.7	23.1	9.8	30.3
13-12592	42.0408	79.4478	521.5	1331.4	40.0	7.4	24.5	9.7	31.7
13-12593	42.0464	79.4525	511.8	1335.9	43.3	7.5	26.8	9.7	34.1
13-12594	42.0345	79.4597	524.6	1399.6	38.3	7.4	22.1	10.1	29.3
13-12597	42.2755	79.5456	390.1	1012.9	31.7	8.5	22.8	7.4	30.1
13-12598	42.2788	79.4400	502.3	1112.5	32.8	7.4	22.8	8.1	30.1
13-12599	42.2630	79.4667	419.1	1039.7	31.7	8.2	22.5	7.6	29.8
13-12600	42.2528	79.4460	441.0	1092.4	33.3	8.0	23.2	8.0	30.5
13-12601	42.2508	79.4377	411.2	1054.6	32.8	8.3	23.2	7.7	30.5
13-12602	42.2592	79.4274	426.4	1066.8	31.1	8.2	21.5	7.8	28.8
13-12603	42.2531	79.4276	434.6	1078.1	33.3	8.1	23.4	7.9	30.7
13-12604	42.2585	79.4189	453.2	1097.6	33.3	7.9	23.2	8.0	30.5
13-12605	42.2661	79.4192	453.8	1079.0	32.2	7.9	22.6	7.9	29.9
13-12606	42.2649	79.4108	467.9	1098.2	33.3	7.7	23.3	8.0	30.6
13-12607	42.2627	79.4037	501.1	1137.2	35.6	7.4	24.7	8.3	32.0
13-12609	42.2701	79.3601	526.4	1150.0	33.3	7.2	22.8	8.4	30.1
13-12610	42.2673	79.3993	503.8	1135.7	36.7	7.4	25.8	8.3	33.1
13-12611	42.2634	79.3935	525.5	1147.3	37.2	7.2	26.2	8.4	33.5
13-12612	42.2579	79.3945	518.8	1164.9	33.9	7.3	22.9	8.5	30.2
13-12614	42.2517	79.3933	524.3	1169.2	30.0	7.2	19.5	8.5	26.8
13-12615	42.2524	79.4150	474.3	1121.4	36.1	7.7	25.3	8.2	32.6
13-12616	42.2512	79.3860	533.4	1182.9	33.9	7.1	22.6	8.6	29.9
13-12623	42.3955	79.2135	468.8	1029.3	31.1	7.5	22.9	7.5	30.2
13-12624	42.3707	79.2559	453.8	1001.0	30.6	7.7	22.8	7.3	30.1
13-12625	42.3679	79.2631	478.5	1024.7	31.1	7.5	23.1	7.5	30.4
13-12654	42.4945	79.3045	192.3	615.1	26.1	10.1	26.0	4.4	33.1
13-12676	42.3434	79.5521	215.8	740.4	27.2	10.2	23.0	5.3	30.2
13-12677	42.3498	79.5524	208.5	731.8	26.1	10.2	21.7	5.3	28.9
13-12703	42.1233	79.6791	457.2	1226.8	36.1	8.1	22.8	8.9	30.1
13-12731	42.4179	79.3230	276.8	773.3	32.2	9.4	29.5	5.6	36.7
13-12837	42.4701	79.3218	205.7	651.7	27.2	10.0	26.4	4.6	33.5
13-12944	42.0160	79.3912	502.3	1391.4	38.3	7.6	22.1	10.1	29.3
13-12973	42.0578	79.4746	460.6	1283.8	36.7	8.0	22.3	9.3	29.6
13-12974	42.0559	79.4462	499.9	1308.8	38.3	7.6	23.5	9.5	30.7
13-12975	42.0622	79.4544	466.0	1289.6	34.4	8.0	20.5	9.4	27.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13-12982	42.0472	79.4739	467.0	1312.5	37.8	8.0	22.7	9.5	30.0
13-13043	42.0577	79.4626	458.1	1274.1	35.0	8.0	21.2	9.3	28.4
13-13050	42.4201	79.3488	245.1	736.1	30.0	9.7	27.5	5.3	34.7
13-13058	42.4750	79.3242	201.5	648.3	26.1	10.1	24.7	4.6	31.9
13-13545	42.0634	79.4301	509.3	1353.0	37.8	7.5	22.4	9.8	29.6
13-13546	42.2596	79.7369	213.4	786.4	38.9	10.4	36.3	5.7	43.5
13-13550	42.0618	79.4385	501.1	1324.4	36.1	7.6	21.5	9.6	28.8
13-13552	42.0708	79.4579	474.3	1274.1	36.1	7.9	22.2	9.3	29.4
13-13573	42.4180	79.3897	222.5	702.9	28.3	10.0	26.1	5.0	33.3
13-13576	42.0669	79.4455	474.3	1300.3	36.7	7.9	22.1	9.5	29.4
13-13577	42.0507	79.4247	450.8	1307.0	43.3	8.1	26.9	9.5	34.2
13-13603	42.2930	79.1669	647.7	1306.4	38.9	5.9	25.3	9.5	32.5
13-13604	42.3277	79.1882	632.2	1249.7	38.3	6.0	25.9	9.1	33.2
13-13642	42.4152	79.2262	484.0	1009.2	33.3	7.4	25.7	7.4	33.0
13-13673	42.0219	79.5177	469.1	1289.9	38.3	8.0	23.5	9.4	30.8
13-13755	42.1819	79.4581	407.5	1106.4	35.6	8.4	24.5	8.1	31.8
13-13757	42.2597	79.5447	422.1	1028.7	33.9	8.2	24.9	7.5	32.2
13-13758	42.2626	79.5535	457.2	1053.4	30.6	7.9	21.5	7.7	28.8
13-13760	42.2675	79.5646	426.7	1015.0	30.6	8.2	22.0	7.4	29.3
13-13762	42.2485	79.5697	432.8	1037.5	33.9	8.2	24.8	7.6	32.1
13-13765	42.2509	79.5369	411.5	1030.2	31.1	8.4	22.1	7.5	29.4
13-13778	42.2560	79.5574	435.9	1038.8	31.1	8.1	22.1	7.6	29.4
13-13782	42.2468	79.5470	451.1	1073.2	32.2	8.0	22.6	7.8	29.9
13-13854	42.1905	79.4556	403.9	1098.2	35.6	8.5	24.7	8.0	32.0
13-13862	42.1858	79.4545	402.9	1101.2	35.0	8.5	24.1	8.0	31.4
13-13887	42.2147	79.4818	413.0	1085.7	35.0	8.4	24.5	7.9	31.8
13-13893	42.1844	79.4639	408.4	1099.7	38.9	8.4	27.7	8.0	35.0
13-13907	42.3080	79.5960	230.1	784.6	35.6	10.1	32.5	5.7	39.7
13-13983	42.2747	79.7124	208.2	763.2	32.2	10.4	28.6	5.5	35.8
13-14250	42.2786	79.7056	207.0	761.7	28.3	10.4	23.6	5.5	30.8
13-16053	42.2473	79.6000	517.9	1179.0	39.4	7.3	27.2	8.6	34.5
13-16094	42.2492	79.0671	423.7	1156.1	41.1	8.1	28.6	8.4	35.9
13-16220	42.2837	79.4009	512.1	1131.7	36.7	7.3	26.0	8.3	33.3
13-16224	42.1005	79.5261	543.5	1300.3	38.9	7.2	24.4	9.5	31.6
15-04350	42.1864	76.5913	440.1	1039.4	45.6	7.4	36.7	7.6	44.0
15-10335	42.1690	76.6744	437.1	1678.8	47.8	7.5	24.0	12.0	31.1
15-11931	42.0748	76.5941	396.5	1297.2	40.6	7.9	25.2	9.4	32.4
17-10607	42.4512	75.4851	528.8	1611.2	32.8	6.1	16.5	11.5	23.7
17-10608	42.3172	75.6714	431.3	2008.6	43.3	7.3	18.0	13.9	24.9
23-04714	42.5163	76.0017	484.3	2521.0	57.2	6.5	20.1	16.4	26.6
25-04364	42.3163	75.2678	509.3	2355.5	43.3	6.5	15.7	15.7	22.3
25-04379	42.2736	74.6278	563.0	2753.9	50.6	5.9	16.2	17.3	22.5

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
25-4455	42.3905	75.0445	456.6	2417.7	62.2	6.9	22.9	15.9	29.5
25-8578	41.9111	74.8758	554.4	3043.7	63.9	6.2	18.9	18.1	24.9
25-10227	42.3000	74.6250	613.6	2055.3	46.1	5.4	19.8	14.2	26.7
25-10263	42.4424	74.6200	642.5	1304.5	37.2	5.0	24.7	9.5	32.0
25-10838	42.3290	75.3750	370.3	1778.5	39.4	7.8	17.8	12.6	24.9
29-6668	42.8031	78.8444	180.7	1314.6	40.0	9.6	23.1	9.6	30.4
29-6718	42.7094	78.9438	213.4	453.5	23.3	9.5	30.5	3.1	37.3
29-6918	42.6982	78.9518	214.0	445.9	18.3	9.5	19.8	3.0	26.6
29-6925	42.7119	78.9698	194.2	419.1	17.8	9.7	19.3	2.8	26.0
29-8862	42.6605	79.0540	178.9	470.6	21.1	9.9	23.8	3.2	30.6
29-8881	42.7383	78.8982	212.4	459.9	16.1	9.4	14.5	3.1	21.3
29-8882	42.6747	79.0400	180.4	459.3	20.0	9.9	22.0	3.1	28.8
29-9196	42.6661	79.0487	178.6	469.1	22.2	9.9	26.2	3.2	33.0
29-9938	42.7412	78.8946	209.1	438.0	21.7	9.5	27.9	3.0	34.6
29-9958	42.8454	78.8350	177.7	329.5	18.3	9.6	26.6	2.1	33.0
29-10836	42.6650	78.5609	322.5	666.9	31.1	8.4	34.1	4.8	41.2
29-10960	42.8566	78.7847	160.0	609.6	26.7	9.7	27.8	4.3	34.9
29-11002	42.5575	78.7441	512.7	1909.6	53.3	6.7	24.4	13.3	31.4
29-11114	42.5976	78.9843	246.9	1469.7	39.4	9.3	20.5	10.6	27.7
29-11183	42.8456	78.8332	176.8	347.8	23.3	9.6	39.6	2.2	46.0
29-11447	42.8783	78.8107	185.6	339.5	23.3	9.4	41.0	2.2	47.4
29-11510	42.5869	78.7002	328.6	790.7	25.0	8.5	20.9	5.7	28.1
29-11645	42.5867	79.0067	228.6	615.1	20.6	9.5	17.9	4.4	25.0
29-11728	42.5695	78.7346	509.6	962.3	32.2	6.7	26.5	7.0	33.8
29-11730	42.7142	78.5180	431.9	1688.9	42.8	7.2	21.1	12.0	28.2
29-11951	42.5511	78.7330	465.7	950.1	22.8	7.2	16.4	6.9	23.7
29-11975	42.5578	78.7436	451.1	932.4	22.2	7.3	16.0	6.8	23.2
29-12287	42.5929	79.1057	191.4	556.0	25.6	9.9	28.1	3.9	35.1
29-12288	42.5921	79.0973	192.9	558.1	26.7	9.9	30.0	3.9	37.0
29-12289	42.5884	79.1137	183.2	554.4	26.7	10.0	30.0	3.9	37.0
29-12290	42.5870	79.0540	204.5	574.9	24.4	9.8	25.5	4.0	32.5
29-12292	42.5929	79.0650	199.3	586.7	25.6	9.8	26.8	4.1	33.8
29-12350	42.5910	78.7153	330.7	763.5	26.1	8.5	23.1	5.5	30.3
29-12359	42.7160	78.8787	234.7	506.0	18.3	9.2	18.0	3.5	24.9
29-12383	42.8273	78.6392	249.9	460.6	17.2	8.8	18.2	3.1	25.0
29-12403	42.5354	78.5109	427.0	980.5	33.3	7.5	26.3	7.1	33.6
29-12450	42.7405	78.5181	359.1	678.2	25.6	7.9	26.1	4.8	33.2
29-12452	42.7406	78.5043	326.1	659.9	26.7	8.2	28.0	4.7	35.1
29-12459	42.4564	78.8099	293.2	876.3	30.6	9.0	24.5	6.4	31.8
29-12465	42.5740	79.0521	198.1	585.5	21.1	9.9	19.2	4.1	26.2
29-12641	42.8348	78.7206	220.1	394.7	23.3	9.1	36.0	2.6	42.6
29-12719	42.8458	78.6708	227.1	421.5	16.1	9.0	16.8	2.8	23.5

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
29-12745	42.5792	78.7203	444.4	1679.8	43.9	7.4	21.7	12.0	28.9
29-12778	42.8451	78.6839	227.1	424.9	17.8	9.0	20.6	2.9	27.3
29-12782	42.8528	78.6614	231.6	424.3	17.8	9.0	20.8	2.8	27.5
29-12783	42.8591	78.6713	213.4	394.1	16.7	9.1	19.1	2.6	25.7
29-12784	42.8432	78.6615	228.6	424.6	18.3	9.0	22.0	2.9	28.7
29-12800	42.9639	78.6154	228.6	340.8	15.6	8.8	19.9	2.2	26.3
29-12806	42.5718	78.9308	349.0	767.2	23.3	8.4	19.5	5.5	26.7
29-12819	42.8822	78.6390	180.1	338.3	17.8	9.4	24.7	2.2	31.1
29-12910	42.4665	78.8036	353.6	1777.6	48.9	8.4	22.8	12.6	29.8
29-12970	42.5282	78.7288	429.8	909.5	30.0	7.6	24.6	6.6	31.9
29-12983	42.5376	78.7195	470.9	967.1	27.8	7.2	21.3	7.0	28.6
29-12985	42.5327	78.7146	457.2	953.7	30.6	7.3	24.4	6.9	31.7
29-13000	42.6304	78.9151	260.9	618.7	25.0	9.1	25.6	4.4	32.7
29-13113	42.5875	79.0205	228.6	611.4	22.2	9.6	20.7	4.3	27.8
29-13271	42.9471	78.5119	277.7	392.6	20.0	8.3	29.8	2.6	36.4
29-13316	42.9240	78.4861	256.0	409.3	16.7	8.5	19.8	2.7	26.5
29-13625	42.5079	78.7548	426.7	938.8	33.9	7.6	27.9	6.8	35.2
29-13702	42.8359	78.8233	179.8	329.5	15.6	9.5	18.2	2.1	24.6
29-13707	42.6186	79.0640	185.9	532.5	29.4	9.9	36.6	3.7	43.6
29-13812	42.7983	78.6152	275.8	525.8	31.1	8.6	42.8	3.7	49.7
29-13859	42.8288	78.6624	239.3	448.1	18.3	8.9	21.0	3.0	27.8
29-15388	42.7870	78.6906	271.3	523.6	26.7	8.7	34.3	3.6	41.2
29-15742	42.5053	78.6314	408.1	963.8	33.3	7.8	26.5	7.0	33.8
29-15761	42.5008	78.6483	408.4	965.9	32.8	7.8	25.8	7.0	33.1
29-15808	42.5170	78.6291	430.7	975.4	33.9	7.6	27.0	7.1	34.3
29-15831	42.7565	78.6910	298.7	553.8	18.3	8.5	17.8	3.9	24.8
29-15916	42.5278	78.6957	499.9	1011.9	28.3	6.9	21.2	7.4	28.5
29-15957	42.7694	78.5891	308.5	580.3	18.9	8.3	18.2	4.1	25.2
37- 9343	43.0417	78.4002	239.9	259.1	16.1	8.4	29.6	1.5	35.5
37- 9344	43.0407	78.3802	263.0	275.8	18.3	8.2	36.7	1.7	42.7
37- 9345	43.0407	78.3705	261.2	283.8	19.4	8.2	39.6	1.7	45.6
37- 9346	43.0478	78.3607	271.3	284.7	18.3	8.1	35.9	1.7	42.0
37-11609	42.9112	78.4341	283.5	438.9	24.4	8.3	36.8	3.0	43.6
37-11610	43.0174	78.3101	267.6	341.1	13.3	8.2	15.1	2.2	21.5
37-11621	42.8991	78.4193	286.5	463.9	20.0	8.3	25.3	3.2	32.1
37-11623	42.8919	78.4091	300.2	484.0	14.4	8.2	13.0	3.3	19.9
37-11699	42.8784	78.4250	291.4	511.5	21.1	8.3	25.1	3.5	32.0
37-11742	42.8870	78.4210	321.9	501.4	20.0	8.0	24.0	3.5	30.9
37-11776	42.8968	78.4076	295.7	488.3	21.7	8.2	27.6	3.4	34.5
37-11777	42.9007	78.4035	304.5	490.1	13.9	8.1	11.8	3.4	18.7
37-11778	42.8992	78.3973	295.7	504.4	13.3	8.2	10.2	3.5	17.1
37-11932	42.9398	78.3222	289.0	417.9	17.2	8.1	21.7	2.8	28.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
37-12059	42.9318	78.3224	282.2	430.1	16.1	8.2	18.3	2.9	25.1
37-12135	42.9452	78.3224	279.5	409.7	15.0	8.2	16.5	2.7	23.2
37-12408	42.9613	78.3167	284.1	396.2	13.9	8.2	14.5	2.6	21.1
37-12564	42.8445	78.4944	309.7	534.6	22.8	8.2	27.3	3.7	34.3
37-12848	42.8959	78.3903	285.6	483.1	18.9	8.3	21.9	3.3	28.8
37-12891	42.9468	78.3149	280.7	408.7	15.0	8.2	16.6	2.7	23.3
37-12892	42.9391	78.3160	286.8	417.6	15.0	8.2	16.4	2.8	23.0
37-12893	42.9306	78.3333	281.6	417.6	16.7	8.2	20.2	2.8	26.9
37-12894	42.9390	78.3358	288.3	417.6	13.9	8.2	13.7	2.8	20.4
37-12895	42.9548	78.3172	276.8	394.1	16.7	8.2	21.4	2.6	28.0
37-13248	42.9383	78.3417	280.4	386.8	16.1	8.2	20.4	2.5	26.9
37-13249	42.9458	78.3337	277.4	386.5	19.4	8.3	29.0	2.5	35.5
37-13250	42.9448	78.3427	273.1	379.2	21.1	8.3	33.8	2.5	40.4
37-13672	42.9936	77.9518	243.8	1281.1	40.6	8.4	25.1	9.3	32.4
37-15896	42.9038	78.4266	286.5	449.6	16.1	8.3	17.4	3.0	24.2
51- 4138	42.8090	77.9518	298.1	634.0	17.8	8.2	15.1	4.5	22.2
51- 4363	42.8618	77.8151	188.4	489.2	17.8	9.2	17.6	3.4	24.5
51- 4630	42.6505	77.7562	186.5	1943.4	47.2	9.5	19.4	13.5	26.4
51- 5061	42.8534	77.8169	185.6	514.2	17.2	9.2	15.6	3.6	22.5
51-11403	42.7259	77.9529	337.4	791.6	30.0	8.0	27.8	5.7	35.0
51-12706	42.7865	77.8685	177.4	199.9	18.9	9.4	47.3	1.0	52.5
51-13700	42.6972	77.8919	271.3	1942.8	47.8	8.7	20.1	13.5	27.1
51-13841	42.7350	77.9529	326.1	804.7	29.4	8.1	26.5	5.8	33.8
51-14178	42.7239	77.9724	332.5	788.8	26.1	8.0	22.9	5.7	30.1
53- 4500	42.8130	75.6439	511.5	1024.7	33.9	5.8	27.4	7.5	34.7
53- 9578	42.9511	75.8079	417.6	1492.3	44.4	6.5	25.4	10.8	32.6
55- 4502	43.3309	77.9649	95.1	666.0	38.3	9.1	43.9	4.8	51.1
55- 9540	43.1890	78.0387	185.0	874.8	25.6	8.6	19.4	6.4	26.7
63- 6667	43.2076	78.4561	167.6	878.7	30.6	8.8	24.8	6.4	32.1
63- 6669	43.0799	79.0068	174.3	935.7	31.7	9.1	24.1	6.8	31.4
65-11950	43.2929	75.2747	266.4	222.2	14.4	7.2	32.6	1.2	38.1
65-16018	42.9235	75.4223	409.7	545.6	21.1	6.6	26.6	3.8	33.6
67-11654	42.8984	76.2386	420.3	931.5	28.9	6.6	23.9	6.8	31.2
67-11655	42.9450	76.3079	347.5	794.6	26.7	7.2	24.5	5.7	31.7
67-11946	42.9642	76.2260	293.8	707.7	24.4	7.7	23.6	5.1	30.8
67-12148	42.7894	76.1736	559.6	1268.9	38.9	5.4	26.4	9.2	33.7
67-12163	42.9369	76.3459	306.6	1274.4	37.2	7.6	23.2	9.3	30.5
69- 3859	42.7917	77.4570	431.0	901.3	34.4	6.9	30.6	6.6	37.9
69- 3929	42.7743	77.4728	318.5	809.2	33.3	8.0	31.3	5.9	38.6
69- 3930	42.7889	77.4744	364.2	843.4	27.2	7.5	23.4	6.1	30.6
69- 3931	42.7806	77.4654	417.9	891.5	31.7	7.0	27.7	6.5	34.9
69- 3945	42.8430	77.4717	354.5	823.0	32.2	7.5	30.0	6.0	37.3

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
69- 3947	42.7878	77.4841	307.5	788.2	28.3	8.1	25.7	5.7	32.9
69- 3964	42.7670	77.4946	324.9	410.0	18.9	7.9	26.7	2.7	33.4
69- 3971	42.7851	77.4931	285.9	765.0	29.4	8.3	27.6	5.5	34.9
69- 3976	42.7971	77.4548	452.3	915.0	33.9	6.6	29.8	6.7	37.1
69- 3978	42.8136	77.4632	443.8	904.3	33.9	6.7	30.1	6.6	37.3
69- 3985	42.7946	77.4714	423.1	889.1	32.8	6.9	29.1	6.5	36.3
69- 3991	42.7762	77.4563	405.7	886.7	32.8	7.1	28.9	6.4	36.2
69- 3997	42.7985	77.5086	296.9	703.5	34.4	8.2	37.3	5.0	44.5
69- 4005	42.8015	77.4935	335.9	791.0	28.9	7.8	26.7	5.7	33.9
69- 4023	42.7990	77.4849	351.1	807.7	29.4	7.6	27.0	5.8	34.2
69- 4027	42.7917	77.4212	466.3	937.6	35.0	6.5	30.4	6.8	37.7
69- 4036	42.8095	77.4946	312.4	752.2	26.7	8.0	24.8	5.4	32.0
69- 4040	42.8012	77.4752	394.4	848.6	30.0	7.2	26.9	6.2	34.1
69-11428	42.8972	77.1139	245.1	646.5	30.0	8.4	33.4	4.6	40.5
69-12393	42.7715	77.4957	322.8	347.2	17.8	8.0	28.3	2.2	34.7
73- 5086	43.3080	78.0340	115.8	746.8	25.6	8.9	22.3	5.4	29.5
75- 9540	43.1890	78.0387	185.0	874.8	25.6	8.6	19.4	6.4	26.7
77-12398	43.4868	76.1890	119.8	556.0	23.3	8.2	27.3	3.9	34.3
77-12399	43.5087	76.1958	103.6	544.1	18.3	8.3	18.5	3.8	25.5
77-12406	43.5019	76.2001	100.6	546.5	22.8	8.3	26.5	3.8	33.4
79-10138	42.6935	75.0950	499.9	830.0	28.9	6.1	27.5	6.0	34.7
97-11921	42.3328	77.0291	449.9	882.4	28.3	7.2	23.9	6.4	31.2
97-12859	42.4088	76.8977	248.4	896.7	27.8	9.1	20.8	6.5	28.1
97-13796	42.3888	76.9325	426.1	740.7	24.4	7.4	23.0	5.3	30.2
99- 4158	42.9177	76.8626	152.4	492.9	17.8	9.3	17.3	3.4	24.2
99- 4203	42.8763	76.8590	165.5	1689.8	48.9	9.2	23.5	12.0	30.6
99- 4544	42.8689	76.9264	152.1	632.2	37.2	9.4	44.1	4.5	51.2
99- 4590	42.8564	76.8826	165.8	626.7	32.2	9.2	36.7	4.4	43.8
99- 4600	42.8744	76.9223	152.4	631.9	26.7	9.4	27.4	4.5	34.5
99- 4814	42.8947	76.7875	144.8	565.1	30.0	9.4	36.5	4.0	43.5
99-11666	42.8452	76.7874	176.2	641.3	27.8	9.2	29.0	4.6	36.2
99-11708	42.8386	76.7790	178.3	661.4	30.0	9.1	31.5	4.7	38.7
99-12051	42.8481	76.8079	167.3	814.4	33.3	9.2	29.6	5.9	36.8
99-12052	42.8545	76.7945	240.2	683.1	25.6	8.5	25.0	4.9	32.1
99-12053	42.8580	76.8018	170.4	675.7	24.4	9.2	22.6	4.8	29.7
99-13676	42.8555	76.8374	164.9	699.5	23.3	9.3	20.1	5.0	27.3
99-13689	42.8484	76.8473	178.0	719.9	28.3	9.1	26.7	5.2	33.8
101- 291	42.0039	77.6173	631.9	1531.9	48.9	5.8	28.1	11.0	35.3
101- 5123	42.1158	77.5806	687.9	1448.7	28.9	5.2	16.3	10.5	23.6
101- 8318	42.2303	77.5155	650.1	1338.7	40.0	5.5	25.8	9.7	33.1
101- 8348	42.2778	77.4176	500.2	1156.7	40.6	6.9	29.1	8.4	36.4
101- 9582	42.2779	77.4222	546.9	1184.1	34.4	6.4	23.7	8.6	31.0

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
101-10024	42.4430	77.6059	626.7	1051.0	30.0	5.5	23.3	7.7	30.6
101-10246	42.2014	77.6554	642.5	1406.3	41.7	5.6	25.6	10.2	32.9
101-10259	42.2442	77.2167	325.8	887.3	28.9	8.6	22.9	6.5	30.2
101-11027	42.4634	77.3172	447.1	811.7	33.9	7.2	32.9	5.9	40.2
101-11105	42.2203	77.5426	649.8	1375.6	43.3	5.5	27.5	10.0	34.8
101-11126	42.2706	77.6400	477.0	1118.6	32.8	7.2	22.9	8.2	30.2
101-11462	42.2069	77.2508	462.1	1079.6	27.8	7.3	19.0	7.9	26.3
101-11561	42.4499	77.1976	360.9	679.7	30.0	8.0	32.4	4.9	39.5
101-11570	42.4753	77.2189	417.0	698.9	25.0	7.4	25.1	5.0	32.3
101-11754	42.3668	77.7256	548.9	1056.1	30.6	6.4	22.9	7.7	30.2
101-11781	42.3056	77.1636	536.8	991.8	35.0	6.4	28.8	7.2	36.1
101-11983	42.2235	77.5685	444.7	1147.3	31.7	7.5	21.1	8.4	28.4
101-12075	42.4494	77.6259	535.8	974.1	29.4	6.4	23.7	7.1	31.0
101-12179	42.2545	77.5033	540.4	1216.2	37.8	6.5	25.7	8.9	33.0
101-12402	42.3167	77.3822	525.2	1791.6	47.2	6.6	22.7	12.7	29.7
101-12765	42.1980	77.6656	670.6	1417.6	37.8	5.3	22.9	10.3	30.1
101-12960	42.3711	77.3893	407.8	911.0	27.8	7.7	22.1	6.6	29.3
101-12972	42.2341	77.3689	590.1	1271.6	35.6	6.0	23.2	9.3	30.5
101-13011	42.0266	77.5871	557.2	1516.7	42.8	6.6	23.9	10.9	31.1
101-13578	42.1551	77.6962	702.3	1497.2	43.3	5.1	25.6	10.8	32.8
101-13690	42.0867	77.6140	701.3	1534.7	46.1	5.1	26.7	11.0	33.9
101-13699	42.4662	77.2654	571.5	2989.5	67.8	5.9	20.7	18.0	26.7
101-14570	42.0762	77.5024	662.6	1493.8	40.0	5.5	23.1	10.8	30.3
107- 9557	42.1461	76.3373	457.8	1567.0	41.1	7.2	21.6	11.2	28.8
107- 9848	42.0759	76.4522	399.0	1593.5	70.0	7.9	39.0	11.4	46.2
109-10243	42.4010	76.6685	566.0	1119.8	32.2	6.0	23.4	8.2	30.7
109-12149	42.5978	76.2951	486.8	1386.8	41.1	6.4	25.0	10.0	32.2
117- 5032	43.0592	76.8405	146.6	1194.2	35.6	9.0	22.2	8.7	29.5
121- 4408	42.9278	76.8869	153.0	498.3	24.4	9.2	30.5	3.4	37.4
121- 7278	42.7975	78.0912	323.4	1516.4	45.6	8.0	24.7	10.9	31.9
121- 9524	42.8167	78.2442	287.1	1247.2	32.2	8.4	19.1	9.1	26.4
121-10917	42.7612	78.4439	480.7	681.5	35.0	6.6	41.6	4.9	48.8
121-10939	42.7668	78.4179	460.6	1652.0	42.2	6.8	21.4	11.8	28.6
121-11311	42.7552	78.3473	542.5	872.0	28.3	6.0	25.6	6.3	32.9
121-11312	42.8119	78.1936	501.4	815.3	18.9	6.3	15.5	5.9	22.7
121-11989	42.6775	78.0794	477.9	1015.0	33.9	6.7	26.8	7.4	34.1
121-12178	42.7908	78.1753	461.2	1625.2	58.3	6.7	31.8	11.6	38.9
121-12721	42.8421	78.1717	342.3	422.5	23.9	7.8	38.1	2.8	44.8
121-12724	42.8432	78.1690	350.8	424.3	19.4	7.7	27.7	2.8	34.4
121-13082	42.7059	78.3668	493.8	876.0	24.4	6.6	20.4	6.4	27.7
121-13083	42.6124	78.4346	464.8	950.7	27.8	7.0	21.8	6.9	29.1
121-13084	42.6510	78.4193	419.1	868.7	25.6	7.4	20.9	6.3	28.1

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
121-13085	42.6107	78.3293	536.4	1058.3	28.3	6.3	20.8	7.7	28.1
121-13241	42.6571	78.1939	524.0	1048.5	31.7	6.3	24.2	7.7	31.5
121-13268	42.5814	78.1805	494.1	1070.2	31.1	6.7	22.8	7.8	30.1
121-13308	42.5279	78.1414	485.5	1133.2	33.3	6.9	23.3	8.3	30.6
121-13662	42.7708	78.0863	448.4	826.6	25.0	6.9	22.0	6.0	29.2
121-13664	42.7687	78.0235	450.5	816.6	28.9	6.8	27.0	5.9	34.3
121-13666	42.7610	78.0142	443.5	835.2	26.1	6.9	23.0	6.1	30.3
121-13725	42.6462	78.4157	437.4	887.0	28.3	7.2	23.8	6.4	31.0
121-13790	42.5988	78.3792	515.4	1043.0	29.4	6.5	22.0	7.6	29.2
121-13891	42.7797	78.0482	463.3	818.7	26.7	6.7	24.4	5.9	31.7
121-13892	42.7587	78.0845	451.7	822.7	28.3	6.8	26.1	6.0	33.4
121-13919	42.7587	78.0772	456.3	830.9	25.0	6.8	21.9	6.0	29.2
121-15545	42.6893	78.0917	450.2	909.2	26.7	7.0	21.7	6.6	28.9
121-15933	42.7278	78.0010	419.4	894.0	30.0	7.2	25.5	6.5	32.8
121-16016	42.8574	78.3902	366.7	565.7	21.1	7.6	23.9	4.0	31.0
123-12812	42.5839	76.9422	225.9	419.7	22.2	9.1	31.2	2.8	37.9
123-12813	42.5884	76.9539	244.1	437.1	20.6	8.9	26.6	2.9	33.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
15- 2	41.7838	76.3252	420.6	2012.9	42.8	7.7	17.4	13.9	24.3
15- 7	41.8725	76.2655	407.2	1402.1	40.6	7.8	23.3	10.2	30.6
15- 41	41.7839	76.3258	417.9	2012.9	46.1	7.8	19.0	13.9	26.0
15- 42	41.8764	76.2725	403.3	1402.1	36.7	7.9	20.5	10.2	27.8
39- 429	41.8335	80.0188	415.7	1314.9	33.3	8.8	18.7	9.6	25.9
39-20466	41.8160	79.6533	550.5	1593.5	43.3	7.4	22.6	11.4	29.7
39-20500	41.8069	80.1026	357.8	1241.1	36.7	9.4	22.0	9.0	29.2
39-20501	41.7910	80.1042	381.6	1272.5	36.1	9.2	21.2	9.3	28.4
39-20502	41.8019	80.0909	362.7	1254.6	35.0	9.4	20.4	9.1	27.7
49- 49	[illegible]	79.8997	184.1	1445.1	45.6	10.7	24.1	10.4	31.4
49- 61	[illegible]	79.8643	303.0	900.1	35.0	9.6	28.2	6.5	35.5
49- 67	41.9822	79.8130	465.7	1259.4	43.3	8.2	27.9	9.2	35.2
49- 68	42.0353	79.8551	468.8	1204.3	35.0	8.1	22.3	8.8	29.6
49- 78	42.0372	79.7999	474.9	1221.6	34.4	8.0	21.6	8.9	28.9
49- 103	42.1840	79.8704	273.1	865.6	29.4	9.9	22.6	6.3	29.8
49- 109	42.1481	80.0528	191.7	1820.3	42.2	10.8	17.3	12.8	24.3
49- 110	42.1425	80.0478	198.1	1820.3	42.2	10.7	17.3	12.8	24.3
49- 116	42.0468	80.0608	387.4	742.5	28.9	9.0	26.8	5.3	34.0
49- 172	41.9644	79.7331	224.0	1361.8	40.6	10.5	22.1	9.9	29.3
49- 176	42.1961	79.8303	242.9	378.0	20.0	10.2	26.0	2.5	32.6
49- 177	41.9789	79.8883	465.7	1260.3	43.3	8.2	27.9	9.2	35.2
49- 326	42.0514	80.0650	382.8	726.0	28.9	9.0	27.4	5.2	34.6
49- 1612	41.9619	79.7330	528.8	1361.8	43.3	7.5	26.3	9.9	33.6
49-20163	41.8803	79.7396	509.6	1496.3	42.8	7.8	23.4	10.8	30.6
49-20367	42.2069	79.8222	266.1	869.0	31.1	9.9	24.4	6.3	31.6
49-20415	41.9204	79.9329	378.0	1203.7	36.7	9.1	22.9	8.8	30.2
49-20419	42.0843	80.0573	292.6	946.7	33.9	9.9	25.4	6.9	32.7
49-20437	42.1392	80.0337	213.4	794.0	23.3	10.6	16.1	5.7	23.3
65- 487	41.9208	79.0605	411.8	2164.1	74.4	8.5	30.5	14.7	37.3
83- 267	41.8950	78.6378	467.6	1264.9	48.3	7.8	32.1	9.2	39.3
83- 268	41.8739	78.6106	678.8	3618.0	75.6	5.7	19.3	18.9	24.5
83- 269	41.9156	78.5139	536.4	1399.0	47.8	7.1	29.1	10.1	36.3
83- 273	41.8994	78.7564	635.8	1438.4	50.0	6.2	30.5	10.4	37.7
83- 275	41.9733	78.8697	452.9	1140.0	42.8	8.0	30.5	8.3	37.8
83- 277	41.9644	78.8742	530.7	1219.5	40.0	7.2	26.9	8.9	34.2
83- 280	41.8231	78.4769	620.3	585.2	23.9	6.3	30.1	4.1	37.2
83- 2503	41.8988	78.6512	467.3	1280.2	48.3	7.8	31.7	9.3	38.9
83- 2529	41.8819	78.6154	679.4	3566.2	83.3	5.7	21.8	18.9	27.1
83- 3173	41.9449	78.8428	640.4	1359.7	35.6	6.1	21.6	9.9	28.9
83- 3273	41.9161	78.5103	537.1	1356.4	46.1	7.1	28.8	9.8	36.0

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
83- 9158	41.9698	78.8592	478.5	1158.2	36.1	7.7	24.5	8.4	31.8
83- 9441	41.9739	78.8710	453.5	152.4	11.1	8.0	20.7	0.7	25.0
83- 9639	41.7809	78.7886	441.7	1659.9	47.8	8.1	23.9	11.8	31.0
83-10629	41.8278	78.5807	669.6	2127.2	50.0	5.8	20.8	14.5	27.6
83-31744	41.8722	78.6183	687.9	3191.3	77.8	5.6	22.6	18.4	28.4
83-33110	41.7942	78.4177	467.6	1492.0	43.9	7.8	24.2	10.8	31.4
83-10598	41.9648	78.8703	534.9	1219.5	40.0	7.2	26.9	8.9	34.2
105- 296	41.8811	78.1578	740.1	1740.1	46.7	5.0	24.0	12.3	31.0
105- 303	41.8658	77.8019	731.8	1566.7	52.2	5.0	30.2	11.2	37.3
105- 304	41.8850	77.7683	715.4	1633.7	47.8	5.1	26.1	11.7	33.3
105- 305	41.8750	77.8089	734.9	1600.2	54.4	4.9	30.9	11.5	38.1
105- 306	41.9300	77.8847	638.3	1608.7	47.2	5.9	25.7	11.5	32.9
105- 307	41.9103	77.9089	611.4	1565.1	46.1	6.2	25.5	11.2	32.7
105- 308	41.9294	77.8464	605.0	1575.8	40.6	6.2	21.8	11.3	29.0
105- 303	41.9116	77.9104	615.4	1564.8	46.1	6.1	25.6	11.2	32.7
105- 304	41.8999	77.9349	669.0	1634.6	41.1	5.6	21.7	11.7	28.9
105- 317	41.9282	77.9019	618.7	1593.8	45.0	6.1	24.4	11.4	31.6
105- 315	41.9217	77.8719	666.6	1631.0	48.9	5.6	26.5	11.7	33.7
105- 300	41.9332	77.8757	682.8	1652.0	49.4	5.4	26.6	11.8	33.8
105- 302	41.9509	77.7965	598.3	1569.7	40.0	6.2	21.5	11.3	28.7
105-20478	41.8784	78.1626	740.1	1739.8	46.7	5.0	24.0	12.3	31.0
105- 148	41.9167	77.7500	731.8	1584.0	51.7	4.9	29.5	11.4	36.7
105- 296	41.9221	77.9148	657.8	1630.4	48.3	5.7	26.1	11.7	33.3
105- 301	41.9299	77.8835	917.4	1599.6	47.2	3.1	27.6	11.5	34.7
105- 297	41.9171	77.9084	658.1	1617.0	47.8	5.7	26.0	11.6	33.2
105- 305	41.9230	77.9041	614.8	1582.2	43.9	6.1	23.9	11.3	31.0
105- 299	41.9174	77.8807	654.7	1613.0	46.1	5.7	25.0	11.5	32.2
105- 316	41.9142	77.9204	655.3	1622.8	40.6	5.7	21.5	11.6	28.6
115- 6	41.7778	75.6979	380.4	2591.1	60.0	8.0	20.1	16.7	26.5
117- 19	41.8876	77.5988	509.6	1581.0	52.2	7.1	28.5	11.3	35.7
117- 22	41.8832	77.5166	533.7	1417.9	45.6	6.8	27.3	10.3	34.5
117- 23	41.8846	77.4954	495.3	1310.6	41.7	7.2	26.3	9.5	33.6
117- 26	41.8566	77.5630	603.5	1416.4	40.6	6.2	24.3	10.2	31.5
117- 30	41.8719	77.5427	610.8	1492.3	49.4	6.1	29.0	10.8	36.3
117- 31	41.8638	77.5569	594.7	1452.4	38.3	6.3	22.1	10.5	29.3
117- 43	41.9863	77.5644	568.1	1681.0	52.2	6.5	27.2	12.0	34.3
117- 329	41.8964	77.4778	528.8	1387.8	38.3	6.9	22.7	10.1	29.9
117- 330	41.8892	77.6028	506.3	1584.0	52.2	7.1	28.5	11.4	35.6
117- 331	41.9867	77.5189	564.8	1681.0	52.2	6.5	27.2	12.0	34.3
123- 609	41.9539	79.2014	497.7	2471.6	73.9	7.6	26.8	16.2	33.4
123-24704	41.9207	79.5535	468.2	1418.2	40.6	8.1	22.9	10.3	30.1
123- 2693	41.7886	79.0225	597.1	1730.3	43.3	6.7	21.2	12.3	28.3

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
123- 346	41.9608	78.9722	514.8	1209.1	41.7	7.4	28.3	8.8	35.6
123- 349	41.9544	79.2000	493.8	2478.0	73.9	7.7	26.7	16.2	33.3
123- 3313	42.4619	79.3739	488.3	1760.5	42.8	7.3	20.2	12.5	27.2
127- 2	41.8121	75.1647	328.3	1524.0	32.8	8.5	15.9	11.0	23.1
127- 364	41.8069	75.1775	328.3	1521.0	32.8	8.5	16.0	10.9	23.2

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
26	42.1598	77.6742	714.8	1444.8	45.6	5.0	23.2	10.4	30.5
26	42.1598	77.6742	714.8	1474.6	47.2	5.0	23.9	10.6	31.1
33	42.1649	77.6674	549.9	1319.8	46.1	6.6	25.8	9.6	33.1
36	42.1568	77.6686	690.4	1454.5	48.9	5.2	30.0	10.5	37.2
36	42.1568	77.6686	690.4	1451.5	46.7	5.2	23.9	10.5	31.1
120	42.1600	77.6602	508.1	1272.2	36.7	7.0	23.3	9.3	30.6
163	42.0776	77.2702	314.9	1160.1	40.0	8.9	24.1	8.5	31.4
170	42.0772	77.2787	345.6	1177.4	40.6	8.6	24.3	8.6	31.5
176	42.0784	77.4151	571.5	1269.2	42.8	6.4	28.7	9.2	35.9
176	42.0481	77.4151	571.5	1342.9	37.8	6.4	19.2	9.7	26.5
176	42.0481	77.4151	571.5	1306.1	41.7	6.4	22.7	9.5	30.0
176	42.0481	77.4151	571.5	1265.5	37.8	6.4	20.4	9.2	27.6
176	42.0481	77.4151	571.5	1342.9	37.8	6.4	19.2	9.7	26.5
177	42.0706	77.4014	444.1	1183.5	38.9	7.6	26.4	8.6	33.7
178	42.0761	77.3964	398.4	1152.1	45.0	8.1	32.0	8.4	39.3
179	42.0600	77.3915	539.5	1258.8	41.1	6.7	27.3	9.2	34.6
180	42.0529	77.4371	486.5	1188.7	44.4	7.2	31.3	8.7	38.6
182	42.0521	77.4024	559.3	1271.3	42.2	6.5	28.1	9.2	35.4
183	42.0510	77.4136	571.2	1262.8	45.0	6.4	30.6	9.2	37.8
184	42.0680	77.4036	499.6	1227.4	40.0	7.1	26.8	8.9	34.1
185	42.0674	77.4080	524.3	1250.0	41.7	6.9	27.8	9.1	35.1
186	42.0591	77.4166	522.7	1220.1	40.6	6.9	27.6	8.9	34.9
186	42.0591	77.4166	522.7	1198.8	32.8	6.9	21.6	8.7	28.9
186	42.0591	77.4166	522.7	1269.8	37.8	6.9	24.3	9.2	31.6
187	42.0619	77.3884	498.7	1217.1	40.0	7.1	27.0	8.9	34.3
188	42.0493	77.4397	465.4	1166.8	41.1	7.4	28.9	8.5	36.2
190	42.0482	77.4345	534.0	1226.2	40.0	6.8	27.1	8.9	34.4
191	42.0669	77.4139	484.9	1211.9	40.6	7.2	27.5	8.8	34.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
192	42.0615	77.3973	551.4	1267.4	41.1	6.6	27.2	9.2	34.5
194	42.0422	77.4575	550.8	1283.8	47.2	6.6	31.6	9.3	38.9
195	42.0685	77.4084	501.1	1228.6	46.7	7.1	32.2	8.9	39.5
196	42.0644	77.4832	540.4	1250.3	45.6	6.7	31.1	9.1	38.4
198	42.0548	77.4139	550.2	1232.3	42.2	6.6	28.9	9.0	36.2
201	42.0784	77.3280	354.2	1099.4	42.2	8.5	30.6	8.0	37.9
203	42.0820	77.3795	425.8	1193.0	42.2	7.8	28.8	8.7	36.1
204	42.0801	77.3645	375.5	1126.8	41.1	8.3	29.1	8.2	36.4
205	42.0806	77.3667	389.5	1146.4	40.6	8.2	28.2	8.4	35.5
207	42.0850	77.3697	423.7	1189.0	41.1	7.8	28.0	8.7	35.3
208	42.0425	77.4493	486.5	1195.1	45.6	7.2	32.1	8.7	39.4
209	42.0537	77.4427	485.5	1221.0	40.0	7.2	26.8	8.9	34.1
210	42.0838	77.3599	380.7	1139.3	43.9	8.3	31.3	8.3	38.6
212	42.0679	77.3550	532.2	1290.5	36.1	6.8	22.7	9.4	30.0
213	42.0812	77.3100	345.3	1111.9	44.4	8.6	32.2	8.1	39.5
216	42.0688	77.4110	468.2	1207.0	40.0	7.4	27.0	8.8	34.3
217	42.0802	77.3501	420.0	1175.9	42.8	7.9	29.7	8.6	37.0
219	42.0696	77.3504	535.8	1275.9	37.8	6.7	24.3	9.3	31.6
220	42.0726	77.3415	468.5	1204.6	40.0	7.4	27.1	8.8	34.3
224	42.0530	77.4175	532.2	1217.1	40.6	6.8	27.7	8.9	35.0
226	42.0649	77.4103	510.8	1226.8	40.6	7.0	27.4	8.9	34.6
226	42.0649	77.4103	510.8	1270.4	40.6	7.0	22.5	9.2	29.8
226	42.0649	77.4103	510.8	1286.6	40.6	7.0	22.2	9.4	29.5
226	42.0649	77.4103	510.8	1270.4	40.6	7.0	22.5	9.2	29.8
228	42.0641	77.4124	484.6	1204.3	40.6	7.3	27.7	8.8	34.9
229	42.0672	77.4089	490.7	1230.5	40.0	7.2	26.7	9.0	33.9
230	42.0669	77.4069	488.3	1223.5	41.1	7.2	27.7	8.9	35.0
269	42.4745	77.0126	439.5	618.1	26.7	7.7	30.7	4.4	37.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
291	42.0029	77.6168	627.3	1531.9	48.9	5.9	24.1	11.0	31.3
300	42.4735	77.0363	466.3	634.9	29.3	7.4	27.3	4.5	34.4
309	42.0658	77.3593	531.9	1264.0	40.0	6.8	26.3	9.2	33.6
373	42.4710	77.0368	457.5	629.1	30.6	7.5	36.6	4.5	43.7
378	42.4702	77.0168	408.4	587.7	23.7	8.0	19.9	4.1	26.9
448	42.4654	77.0135	428.9	604.1	29.0	7.8	35.1	4.3	42.2
449	42.4714	77.0415	436.2	606.2	28.4	7.7	34.2	4.3	41.2
450	42.4697	77.0415	437.1	611.7	23.4	7.7	18.7	4.3	25.8
538	42.4686	76.9997	463.6	667.2	30.6	7.5	27.8	4.8	35.0
540	42.4735	76.9997	465.1	655.6	29.7	7.4	34.0	4.7	41.1
559	42.4684	77.0344	462.4	636.1	30.0	7.5	35.4	4.5	42.5
560	42.4773	77.0819	389.2	554.1	30.0	8.2	39.4	3.9	46.4
561	42.4806	77.0777	380.4	550.5	27.5	8.3	34.9	3.8	41.9
562	42.4768	77.0122	445.6	628.8	28.3	7.6	26.0	4.5	33.1
564	42.4664	77.0470	387.1	558.1	30.9	8.2	40.7	3.9	47.7
564	42.4664	77.0470	378.0	527.3	27.7	8.3	36.7	3.7	43.7
567	42.4847	77.0756	392.0	570.9	28.1	8.2	34.9	4.0	41.9
569	42.4723	77.1085	356.0	527.6	25.6	8.5	32.4	3.7	39.4
571	42.4882	77.1221	343.2	512.7	29.7	8.6	34.6	3.6	41.5
572	42.4721	77.0267	464.5	638.3	23.2	7.4	24.7	4.5	31.8
575	42.4817	77.1093	356.3	530.4	27.1	8.5	35.0	3.7	41.9
575	42.4817	77.1093	356.3	518.2	22.8	8.5	27.5	3.6	34.5
576	42.4771	77.1096	360.3	529.4	26.7	8.5	34.4	3.7	41.3
578	42.4767	77.1078	341.1	536.1	26.4	8.7	26.8	3.7	33.8
583	42.4686	77.1067	357.5	524.0	28.0	8.5	30.5	3.6	37.5
586	42.4652	77.0991	341.7	527.6	29.7	8.7	39.9	3.7	46.9
628	42.4957	77.0913	436.8	630.6	29.8	7.7	28.3	4.5	35.4
633	42.4921	77.0684	490.4	668.7	29.1	7.2	32.7	4.8	39.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
637	42.4856	77.0211	435.9	630.3	36.1	7.7	45.0	4.5	52.1
638	42.4551	77.0745	446.2	642.5	30.4	7.6	28.6	4.6	35.7
640	42.4782	77.0714	402.6	581.3	28.4	8.1	35.1	4.1	42.1
641	42.4720	77.0773	417.6	581.9	33.7	7.9	44.4	4.1	51.4
643	42.4698	77.0259	459.6	636.7	30.3	7.5	35.8	4.5	42.9
1024	42.4734	77.0702	404.8	571.8	26.8	8.0	25.8	4.0	32.9
1074	42.4742	77.0180	437.1	612.0	28.1	7.7	33.2	4.3	40.3
1075	42.4738	77.1052	217.9	531.9	27.2	9.9	32.6	3.7	39.6
1076	42.4651	77.0285	468.8	653.5	30.0	7.4	34.6	4.7	41.7
1078	42.4642	77.0152	399.6	597.4	29.8	8.1	36.4	4.2	43.5
1079	42.4774	77.0245	458.4	636.7	30.3	7.5	28.7	4.5	35.8
1080	42.4773	77.0307	472.4	658.1	29.6	7.4	33.8	4.7	40.9
1080	42.4773	77.0307	473.4	675.4	24.4	7.4	25.3	4.8	32.4
1081	42.4729	77.0057	482.2	669.0	29.2	7.3	32.7	4.8	39.9
1082	42.4820	77.0052	458.1	654.7	36.0	7.5	43.5	4.7	50.6
1083	42.4754	77.0333	468.8	643.7	30.2	7.4	28.2	4.6	35.3
1083	42.4754	77.0333	468.8	660.2	24.4	7.4	25.8	4.7	32.9
1084	42.4727	77.0389	453.8	623.0	28.7	7.6	34.0	4.4	41.1
1085	42.4779	77.0396	462.4	640.7	29.8	7.5	34.9	4.6	42.0
1086	42.4672	77.0389	456.6	631.5	26.8	7.5	30.5	4.5	37.6
1087	42.4839	77.0174	446.2	638.6	36.4	7.6	45.0	4.5	52.2
1089	42.4685	77.0075	349.6	667.5	29.7	8.6	31.6	4.8	38.7
1090	42.4650	77.0495	373.7	544.4	25.3	8.3	31.2	3.8	38.2
1091	42.4699	77.0512	373.4	542.5	25.5	8.3	31.6	3.8	38.6
1092	42.4680	77.0593	392.6	561.7	27.5	8.2	34.4	3.9	41.5
1093	42.4706	77.0745	411.5	580.9	34.1	8.0	45.0	4.1	52.0
1094	42.4897	77.0658	419.7	595.6	30.0	7.9	37.1	4.2	44.2
1095	42.4821	77.0870	431.6	600.2	28.6	7.8	34.7	4.2	41.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
1096	42.4853	77.0876	450.2	621.2	28.9	7.6	34.3	4.4	41.4
1099	42.4864	77.0893	453.2	623.6	27.8	7.6	32.4	4.4	39.5
1101	42.4800	77.1022	381.3	546.2	26.4	8.3	26.3	3.8	33.3
1102	42.4805	77.1063	370.3	536.4	28.3	8.4	37.2	3.7	44.2
1104	42.4841	77.1096	349.0	526.7	33.2	8.6	46.7	3.7	53.6
1105	42.4756	77.1085	364.2	532.2	27.4	8.4	35.6	3.7	42.6
1111	42.4709	77.0987	340.8	512.4	25.6	8.7	33.0	3.5	39.9
1112	42.4677	77.0989	339.9	514.8	26.7	8.7	35.0	3.6	41.9
1113	42.4734	77.0469	354.2	523.6	30.0	8.5	34.4	3.6	41.3
1115	42.4736	77.1008	360.9	527.3	30.9	8.5	42.6	3.7	49.6
1117	42.4758	77.1059	372.5	536.8	27.8	8.3	36.2	3.7	43.2
1118	42.4775	77.1056	373.1	537.1	27.0	8.3	34.7	3.7	41.7
1121	42.4745	77.0993	363.3	527.0	27.2	8.4	28.9	3.7	35.8
1127	42.4726	77.1048	360.3	529.1	26.7	8.5	34.4	3.7	41.3
1132	42.4698	77.1046	348.4	520.0	30.6	8.6	42.3	3.6	49.2
1133	42.4708	77.1019	346.9	521.5	26.4	8.6	34.1	3.6	41.1
1135	42.4704	77.1089	353.0	528.8	27.4	8.5	35.6	3.7	42.6
1142	42.4677	77.1146	358.1	542.5	28.1	8.5	36.2	3.8	43.1
1144	42.4672	77.1061	339.9	528.8	27.8	8.7	36.1	3.7	43.1
1191	42.0729	77.4138	426.1	1177.1	42.2	7.8	29.2	8.6	36.5
1196	42.4716	77.0196	429.5	603.2	30.3	7.8	37.3	4.3	44.3
1282	42.4691	77.0139	429.5	613.3	28.6	7.8	27.1	4.3	34.2
1810	42.4682	77.0971	410.9	597.1	30.0	8.0	36.9	4.2	43.9
1811	42.4698	77.0185	421.2	603.5	28.3	7.9	27.1	4.3	34.1
1812	42.4723	77.0335	463.9	630.6	28.3	7.5	25.9	4.5	33.0
1813	42.4751	77.0383	466.0	638.9	26.9	7.4	23.3	4.5	30.4
2357	42.1596	77.6712	701.6	1457.6	49.3	5.1	30.3	10.5	37.6
2398	43.1463	76.3236	112.8	794.3	29.4	10.9	22.0	5.7	29.2

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
2643	42.4694	77.0096	464.8	655.3	29.3	7.4	33.4	4.7	40.5
2644	42.4742	77.0076	464.8	652.3	28.6	7.4	32.5	4.6	39.6
2645	42.4762	77.0104	460.2	639.2	27.7	7.5	24.6	4.5	31.7
2646	42.4683	77.0311	457.2	641.0	29.7	7.5	27.6	4.6	34.7
2647	42.4707	77.0303	464.8	640.1	29.6	7.4	27.5	4.6	34.6
2962	42.4892	77.0885	451.4	626.7	30.3	7.6	29.2	4.4	36.3
2970	42.4699	77.0633	394.7	561.4	27.8	8.1	28.1	3.9	35.1
3859	42.7918	77.4568	430.4	901.3	34.4	7.8	29.6	6.6	36.9
3878	42.7854	77.4408	433.1	914.4	24.6	7.8	13.7	6.7	21.0
3888	42.4199	76.8924	145.7	376.1	25.7	10.6	36.5	2.5	43.0
3894	42.0486	77.4266	524.0	1259.4	47.2	6.9	32.0	9.2	39.3
3924	42.0630	77.4308	501.4	3851.8	91.7	7.1	20.7	18.8	25.6
3929	42.7827	77.4810	318.2	809.2	33.1	8.9	29.9	5.9	37.1
3930	42.7891	77.4743	363.9	843.4	27.1	8.4	22.1	6.1	29.3
3931	42.7891	77.4655	417.3	891.5	31.6	7.9	26.5	6.5	33.8
3931	42.7891	77.4655	417.3	891.5	31.6	7.9	26.5	6.5	33.8
3945	42.7931	77.4799	353.9	823.0	32.0	8.5	28.5	6.0	35.8
3947	42.7880	77.4840	307.2	788.2	28.3	9.0	24.5	5.7	31.8
3964	42.7685	77.4944	324.6	410.0	18.6	8.8	23.9	2.7	30.6
3971	42.7852	77.4929	285.3	765.0	29.4	9.2	26.5	5.5	33.7
3976	42.7972	77.4545	452.0	915.0	34.1	7.6	29.0	6.7	36.3
3978	42.8137	77.4632	443.5	904.3	34.1	7.7	29.2	6.6	36.5
3985	42.7947	77.4714	422.8	889.1	32.7	7.9	27.9	6.5	35.2
3991	42.7847	77.4560	405.4	886.7	32.5	8.0	27.6	6.4	34.9
3997	42.7986	77.5086	226.5	703.5	34.2	9.8	34.7	5.0	41.9
4002	42.8170	75.6588	516.3	854.0	35.6	6.9	27.6	6.2	34.8
4005	42.8016	77.4932	335.3	791.0	29.1	8.7	25.7	5.7	32.9
4023	42.7991	77.4847	350.8	807.7	29.2	8.6	25.5	5.8	32.7

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
4027	42.7918	77.4212	466.0	937.6	35.0	7.4	29.4	6.8	36.7
4036	42.8096	77.4943	312.1	752.2	26.7	8.9	23.6	5.4	30.8
4040	42.8013	77.4751	394.1	848.6	29.7	8.1	25.4	6.2	32.7
4041	42.7880	77.4330	479.8	958.3	33.1	7.3	26.9	7.0	34.2
4048	42.8225	75.6362	472.4	892.8	21.1	7.4	15.4	6.5	22.7
4060	42.7828	77.4479	422.5	906.8	23.9	7.9	13.1	6.6	20.4
4069	42.8717	77.9322	268.5	1385.6	40.8	9.4	20.8	10.0	28.1
4089	42.8030	77.9456	289.9	642.2	10.0	9.2	1.3	4.6	8.4
4129	42.8072	77.9352	279.2	615.7	15.6	9.3	10.2	4.4	17.3
4129	42.8072	77.9352	279.2	613.3	19.3	9.3	12.0	4.3	19.0
4151	42.8133	77.9422	291.7	632.5	21.7	9.1	19.8	4.5	26.9
4166	42.7962	77.9407	282.5	635.8	21.5	9.2	19.3	4.5	26.4
4186	42.8212	77.9402	303.3	628.5	20.0	9.0	17.5	4.5	24.6
4346	42.3139	77.1646	530.0	970.5	33.9	6.8	22.6	7.1	29.8
4391	42.8277	77.9356	298.7	633.2	18.9	9.1	15.5	4.5	22.6
4495	42.8270	77.9508	332.8	651.4	35.6	8.7	41.2	4.6	48.3
4714	42.5163	76.0017	478.2	2521.0	57.2	7.3	19.8	16.4	26.3
4724	43.1514	77.9752	196.0	1017.4	25.0	10.1	14.7	7.4	22.0
4760	42.9893	77.2789	181.7	1312.2	39.4	10.2	22.3	9.5	29.5
4796	42.6839	77.0219	292.9	928.3	37.8	9.1	30.9	6.8	38.1
4863	42.2523	76.7788	465.1	1009.2	30.0	7.4	22.4	7.4	29.6
4871	43.0216	77.3354	169.5	1326.8	33.9	10.3	17.7	9.6	25.0
4947	42.8716	77.3676	321.6	813.2	26.7	8.8	21.9	5.9	29.2
5000	43.1051	76.5527	130.1	1143.6	31.9	10.7	18.6	8.3	25.8
5011	43.1465	76.5527	120.4	1090.0	26.7	10.8	14.5	8.0	21.8
5032	43.0592	76.8960	143.9	1194.2	35.6	10.6	20.9	8.7	28.2
5086	43.3081	78.0334	114.3	746.8	25.6	10.9	19.7	5.4	26.9

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
5087	42.3235	75.9481	303.4	2180.2	41.1	9.0	14.7	14.8	21.5
5087	42.3235	75.9481	303.4	2891.0	54.4	9.0	15.7	17.7	21.8
5123	42.1157	77.5807	687.0	1448.7	28.6	5.3	16.1	10.5	23.3
5344	42.3904	75.7735	470.0	1871.5	32.8	7.4	11.1	13.1	18.1
6636	42.4063	75.8776	442.6	1750.8	40.2	7.7	16.1	12.4	23.2
6719	43.0293	76.9439	119.4	1234.4	34.4	10.8	19.1	9.0	26.4
6780	43.1091	76.5470	137.5	944.3	23.6	10.7	13.7	6.9	21.0
6782	42.7861	75.6897	465.1	1055.5	34.4	7.4	25.6	7.7	32.9
8318	42.2363	77.5156	646.8	1338.7	40.0	5.7	25.7	9.7	32.9
8342	42.3978	75.8907	448.1	1832.2	40.7	7.6	18.0	12.9	25.1
8348	42.2778	77.4177	496.8	1156.7	40.6	7.1	28.9	8.4	36.2
9380	42.4740	77.0400	443.2	617.8	26.4	7.7	23.4	4.4	30.5
9381	42.4709	77.0383	451.1	590.1	29.2	7.6	29.1	4.2	36.1
9382	42.4726	77.0030	475.5	663.5	27.6	7.3	23.5	4.7	30.7
9383	42.4751	77.0276	464.8	637.9	30.2	7.4	35.7	4.5	42.8
9385	42.4704	77.0454	393.2	565.4	28.6	8.1	29.3	4.0	36.3
9386	42.4747	77.0963	363.3	529.1	27.3	8.4	35.7	3.7	42.7
9387	42.4749	77.0904	357.2	521.2	33.9	8.5	48.8	3.6	55.8
9388	42.4814	77.0893	434.9	614.2	25.6	7.7	29.0	4.3	36.1
9388	42.4814	77.0893	434.9	607.2	27.2	7.7	25.1	4.3	32.1
9389	42.4719	77.0963	344.7	511.1	33.8	8.6	49.2	3.5	56.1
9390	42.4847	77.0822	411.8	582.8	28.6	8.0	35.4	4.1	42.5
9391	42.4726	77.0915	363.0	528.2	33.7	8.4	47.9	3.7	54.8
9392	42.4795	77.0802	373.4	541.9	29.4	8.3	38.9	3.8	45.9
9393	42.4770	77.0878	370.9	536.1	28.0	8.4	36.6	3.7	43.6
9395	42.4792	77.0733	399.9	573.0	27.3	8.1	33.5	4.0	40.5
9396	42.4733	77.0557	380.1	551.1	27.8	8.3	35.4	3.9	42.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
9397	42.4756	77.0670	402.3	119.5	30.0	8.1	150.7	0.4	153.9
9400	42.4773	77.0915	566.0	547.1	26.7	6.5	26.8	3.8	33.8
9403	42.4762	77.0735	413.0	580.6	28.2	8.0	27.8	4.1	34.9
9404	42.4675	77.0620	401.1	570.0	26.8	8.1	32.9	4.0	39.9
9405	42.4646	77.0422	459.9	637.6	35.2	7.5	43.5	4.5	50.6
9406	42.4696	77.0934	361.5	531.6	33.6	8.5	47.2	3.7	54.2
9407	42.4687	77.0261	457.8	637.6	34.9	7.5	42.9	4.5	50.0
9409	42.4659	77.0322	478.8	656.2	30.3	7.3	35.0	4.7	42.1
9410	42.4771	77.0163	434.6	611.7	31.1	7.7	38.2	4.3	45.3
9412	42.4656	77.0541	378.9	549.2	32.8	8.3	44.6	3.8	51.6
9413	42.4767	77.0209	455.1	626.7	31.6	7.5	38.3	4.4	45.4
9414	42.4642	77.0795	429.2	602.9	35.6	7.8	46.0	4.3	53.1
9415	42.4734	77.0809	397.8	562.1	29.2	8.1	37.5	3.9	44.5
9416	42.4712	77.0215	448.7	624.5	26.9	7.6	30.9	4.4	38.0
9419	42.4718	77.0100	462.4	644.0	29.4	7.5	34.1	4.6	41.2
9420	42.4718	77.0442	419.1	590.1	28.1	7.9	27.2	4.2	34.3
9421	42.4678	77.0170	407.2	589.2	28.6	8.0	28.2	4.2	35.2
9424	42.4762	76.9939	445.3	636.7	28.5	7.6	32.8	4.5	39.9
9524	42.9002	78.2439	283.2	1247.5	32.2	9.2	18.4	9.1	25.7
9540	43.1890	78.0381	180.7	874.8	25.6	10.2	17.5	6.4	24.8
9557	42.1460	76.3374	452.6	1539.2	41.1	7.6	21.8	11.1	29.0
9557	42.1460	76.3374	452.6	1563.9	41.1	7.6	21.5	11.2	28.6
9563	43.0877	78.1096	198.1	1030.2	23.9	10.1	13.4	7.5	20.7
9578	42.9513	75.8078	413.9	811.7	32.2	7.9	29.9	5.9	37.2
9578	42.9513	75.8078	413.9	1492.3	44.4	7.9	24.5	10.8	31.7
9582	42.2780	77.4223	542.5	1184.1	34.4	6.7	23.4	8.6	30.7
9582	42.2780	77.4223	542.5	1184.5	34.4	6.7	23.4	8.6	30.7

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
10606	42.8779	78.4332	286.5	493.2	28.1	9.2	38.2	3.4	45.1
10607	42.4511	75.4853	523.3	1611.2	32.8	6.9	16.1	11.5	23.2
10608	42.3173	75.6714	426.7	2008.6	43.3	7.8	17.7	13.9	24.6
10609	42.3769	75.6227	426.7	1958.9	51.1	7.8	22.1	13.6	29.1
10649	42.2388	77.5203	658.1	1335.0	36.7	5.6	23.3	9.7	30.6
10701	42.8764	76.7057	125.3	550.8	23.7	10.8	23.4	3.9	30.4
10702	42.8767	76.6927	138.4	553.5	27.9	10.6	31.2	3.9	38.2
10776	42.9206	78.1674	313.9	1321.3	38.9	8.9	20.4	9.6	27.6
10920	42.7860	77.7531	329.8	766.6	29.4	8.8	27.0	5.5	34.2
10921	43.3334	77.9578	99.1	670.6	21.1	11.0	15.0	4.8	22.2
10922	42.8350	77.6448	324.3	709.0	29.4	8.8	29.1	5.1	36.3
10960	42.8567	76.7844	159.1	609.6	26.7	10.4	26.6	4.3	33.7
11027	42.4635	77.3171	443.5	811.7	33.9	7.7	32.3	5.9	39.6
11105	42.2170	77.5427	646.2	1375.6	43.3	5.7	27.4	10.0	34.6
11126	42.2706	77.6401	473.4	1109.5	32.8	7.4	22.9	8.1	30.2
11129	43.1206	76.5475	123.4	931.2	29.4	10.8	18.7	6.8	26.0
11135	42.4539	77.6223	538.6	970.5	29.4	6.7	23.4	7.1	30.7
11135	42.4539	77.6223	538.6	969.6	29.4	6.7	18.0	7.1	25.3
11221	42.4843	77.0993	398.1	571.8	31.1	8.1	40.2	4.0	47.3
11402	42.6317	77.8273	297.5	882.4	34.4	9.1	28.7	6.4	36.0
11402	42.6317	77.8273	297.5	955.5	35.6	9.1	24.7	7.0	31.9
11403	42.7259	77.9528	334.1	791.6	30.0	8.7	26.9	5.7	34.1
11428	42.8973	77.1135	242.3	646.5	30.0	9.6	31.5	4.6	38.6
11462	42.2069	77.2509	462.1	1079.6	27.8	7.5	18.8	7.9	26.1
11543	42.4002	75.8491	424.9	1769.7	42.2	7.8	17.1	12.5	24.2
11561	42.4499	77.1976	357.8	679.7	30.0	8.5	31.6	4.9	38.8
11570	42.4753	77.2189	413.6	699.2	25.0	7.9	24.4	5.0	31.6

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
11609	42.9114	78.4340	283.5	438.9	24.7	9.2	35.2	3.0	41.9
11621	42.8992	78.4193	285.0	463.9	19.8	9.2	22.9	3.2	29.7
11624	42.8953	78.4145	291.1	468.7	17.8	9.1	18.4	3.2	25.2
11654	42.8985	76.2383	417.6	931.5	28.9	7.9	22.5	6.8	29.8
11655	42.9449	76.3073	344.4	794.6	26.7	8.6	22.7	5.7	29.9
11666	42.8453	76.7872	172.8	641.3	27.6	10.3	26.9	4.6	34.0
11699	42.8785	78.4250	289.6	511.5	21.1	9.2	23.4	3.5	30.3
11708	42.8387	76.7788	175.0	661.4	29.8	10.3	29.5	4.7	36.6
11754	42.3669	77.7257	545.6	1056.1	30.6	6.7	22.6	7.7	29.9
11776	42.8970	78.4073	295.7	488.3	21.7	9.1	25.7	3.4	32.6
11781	42.3056	77.1635	533.4	991.8	35.0	6.8	28.5	7.2	35.8
11921	42.3328	77.0290	446.5	882.4	28.3	7.6	23.5	6.4	30.7
11931	42.0748	76.5942	393.2	1297.2	40.6	8.1	25.0	9.4	32.3
11932	42.9400	78.3219	287.4	417.9	16.9	9.2	18.6	2.8	25.3
11939	42.2058	79.6179	512.1	1165.6	33.3	7.0	22.6	8.5	29.9
11946	42.9641	76.2258	291.1	707.7	24.4	9.1	21.6	5.1	28.8
11983	42.2235	77.5686	442.0	1147.3	31.7	7.7	20.9	8.4	28.2
12016	42.1453	77.6186	701.6	1506.3	41.7	5.1	24.3	10.8	31.5
12038	42.8896	77.3675	268.2	646.8	26.7	9.4	22.7	4.6	29.8
12041	42.8284	77.4262	313.9	408.1	25.6	8.9	40.8	2.7	47.4
12041	42.8284	77.4262	313.9	749.2	28.9	8.9	22.5	5.4	29.7
12042	42.8416	77.3904	347.8	464.2	23.9	8.6	33.0	3.2	39.8
12042	42.8416	77.3904	347.8	761.7	29.4	8.6	22.9	5.5	30.1
12051	42.8482	76.8079	164.0	814.4	33.1	10.4	27.8	5.9	35.1
12052	42.8546	76.7947	175.9	683.1	25.6	10.3	22.4	4.9	29.5
12053	42.8581	76.8019	167.0	675.7	24.4	10.4	20.8	4.8	28.0
12075	42.4495	77.6260	531.9	974.1	29.2	6.8	23.0	7.1	30.3

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
12148	42.7897	76.1735	556.9	1271.3	38.9	6.5	25.4	9.2	32.7
12149	42.6480	76.2949	483.1	1386.8	41.1	7.3	24.4	10.0	31.7
12039	42.8167	77.4505	417.6	862.6	29.4	7.9	25.0	6.3	32.2
12163	42.9371	76.3458	303.9	1274.4	37.2	9.0	22.1	9.3	29.4
12179	42.0087	77.0117	536.8	1216.2	37.8	6.7	25.5	8.9	32.8
12195	42.8686	77.5086	276.8	397.5	22.8	9.3	27.1	2.6	33.7
12195	42.8686	77.5086	276.8	647.7	25.0	9.3	20.1	4.6	27.2
12393	42.7716	77.4955	320.0	347.2	17.7	8.9	25.4	2.2	31.8
12398	43.4869	76.1886	119.2	554.4	23.3	10.8	22.5	3.9	29.5
12399	43.5088	76.1952	103.0	544.1	18.3	11.0	13.5	3.8	20.5
12402	42.3168	77.3823	521.5	1791.6	47.2	6.9	22.5	12.7	29.6
12406	43.5019	76.1995	100.0	547.1	22.8	11.0	21.5	3.8	28.5
12765	42.1981	77.6657	668.1	1417.6	37.5	5.5	22.6	10.3	29.8
12812	42.5839	76.9423	223.4	331.9	21.7	9.8	35.7	2.1	42.1
12812	42.5839	76.9423	223.4	419.7	22.2	9.8	24.4	2.8	31.1
12813	42.5884	76.9539	241.7	437.1	20.6	9.6	25.0	3.0	31.7
12848	42.8960	78.3902	304.8	483.1	18.9	9.0	14.3	3.3	21.1

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
12859	42.4089	76.8978	252.7	897.6	27.8	9.5	17.6	6.5	24.9
12893	42.9307	78.3328	279.8	417.6	16.6	9.3	17.5	2.8	24.2
12895	42.9549	78.3169	276.8	394.1	16.4	9.3	18.0	2.6	24.6
12931	42.2180	76.9893	489.5	1113.0	37.5	7.2	27.2	8.1	34.5
12960	42.3712	77.3893	404.2	911.0	27.8	8.0	21.7	6.6	28.9
12972	42.2341	77.3690	586.7	1271.6	35.6	6.2	23.0	9.3	30.3
13011	42.0265	77.5872	564.2	1516.7	42.8	6.5	23.9	10.9	31.1
13011	42.0265	77.5872	564.2	1563.6	42.8	6.5	23.2	11.2	30.4
13243	42.1876	77.0824	427.3	1078.4	37.2	7.8	27.3	7.9	34.6
13243	42.1876	77.0824	427.3	1091.8	38.9	7.8	28.5	8.0	35.8
13248	42.9384	78.3416	280.4	386.8	16.3	9.3	18.1	2.5	24.7
13249	42.9460	78.3337	277.4	386.5	19.4	9.3	26.3	2.5	32.9
13250	42.9449	78.3427	273.1	379.2	21.1	9.3	31.1	2.5	37.6
13271	42.9472	78.3035	277.7	392.6	20.0	9.3	20.4	2.6	27.0
13554	42.9358	76.6902	152.2	624.5	30.6	10.5	32.1	4.4	39.2
13555	43.0237	76.6320	148.1	595.0	25.6	10.5	25.2	4.2	32.3
13555	43.0237	76.6320	148.1	502.9	25.6	10.5	29.8	3.5	36.7
13563	42.9686	76.6514	153.9	612.6	22.8	10.5	20.1	4.3	27.1
13569	42.8862	77.9720	323.1	585.2	25.6	8.8	28.6	4.1	35.6
13569	42.8862	77.9720	323.1	584.3	25.6	8.8	28.6	4.1	35.7
13570	42.9273	77.9489	296.0	489.8	24.4	9.1	31.3	3.4	38.2
13572	42.8720	77.9679	331.9	609.6	26.1	8.7	28.5	4.3	35.6
13578	42.1551	77.6963	698.9	1497.2	43.3	5.2	25.5	10.8	32.7
13587	42.9012	76.6881	141.1	605.3	25.8	10.6	25.1	4.3	32.2
13588	42.8937	76.6876	162.2	594.4	24.3	10.4	23.4	4.2	30.5
13599	42.9086	76.6994	151.8	646.8	25.0	10.5	22.4	4.6	29.5

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13600	42.9521	76.6601	153.0	596.2	28.9	10.5	30.8	4.2	37.9
13637	42.9195	76.7053	157.0	621.5	28.1	10.5	28.3	4.4	35.4
13638	42.9163	76.6953	155.4	626.7	26.7	10.5	25.8	4.4	32.9
13644	42.9569	76.6542	158.2	602.3	19.7	10.4	15.4	4.3	22.5
13644	42.9569	76.6542	158.2	602.3	20.0	10.4	15.9	4.3	22.9
13646	42.9107	76.6693	149.4	613.6	26.7	10.5	26.3	4.3	33.4
13655	42.9252	76.6683	157.3	622.4	23.9	10.5	19.1	4.4	26.2
13672	42.9935	77.9516	240.8	1281.1	40.6	9.6	24.1	9.3	31.4
13675	42.8647	76.8380	155.4	767.5	30.0	10.5	25.4	5.5	32.7
13676	42.8556	76.8375	161.5	701.0	23.3	10.4	18.4	5.0	25.6
13689	42.8485	76.8473	173.7	719.9	28.3	10.3	22.7	5.2	29.9
13690	42.0876	77.6142	698.0	1534.7	46.7	5.2	27.0	11.0	34.2
13690	42.0876	77.6142	698.0	1534.7	46.1	5.2	26.7	11.0	33.9
13699	42.4663	77.2654	566.3	1176.5	37.8	6.5	26.6	8.6	33.9
13699	42.4663	77.2654	566.3	1419.1	38.9	6.5	22.9	10.3	30.1
13699	42.4663	77.2654	566.3	2810.6	64.4	6.5	20.6	17.5	26.8
13699	42.4663	77.2654	566.3	2986.7	67.8	6.5	20.5	18.0	26.6
13699	42.4663	77.2654	566.3	1177.7	37.8	6.5	26.6	8.6	33.9
13699	42.4663	77.2654	566.3	2989.5	67.8	6.5	20.5	18.0	26.5
13700	42.6974	77.8921	266.1	793.7	30.6	9.4	26.7	5.7	33.9
13700	42.6974	77.8921	266.1	1946.8	47.8	9.4	19.7	13.6	26.7
13736	42.4350	72.4091	453.2	1464.0	38.9	7.6	21.4	10.6	28.6
13736	42.4350	72.4091	453.2	1478.0	38.3	7.6	20.8	10.7	28.0
13739	42.8761	76.6862	141.7	672.1	28.3	10.6	26.4	4.8	33.5
13796	42.3889	76.9326	422.8	740.7	24.4	7.9	22.4	5.3	29.6
13841	42.7338	77.9528	326.1	804.7	29.4	8.8	21.7	5.8	28.9
13846	42.9680	78.2921	271.3	369.4	15.6	9.3	16.8	2.4	23.3
13850	42.9593	78.3354	274.3	385.9	15.6	9.3	16.2	2.5	22.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13853	42.9677	78.3047	271.3	364.2	15.6	9.3	17.1	2.4	23.6
13856	42.9393	78.3540	295.7	395.9	16.7	9.1	19.1	2.6	25.7
13867	42.7635	77.9055	230.1	659.0	27.8	9.7	23.9	4.7	31.1
13883	42.9467	78.2925	278.9	407.2	15.6	9.3	15.4	2.7	22.1
13885	42.9596	78.2943	280.4	385.6	15.6	9.3	16.3	2.5	22.9
13901	41.9614	78.2826	277.4	402.3	15.8	9.3	16.3	2.7	22.9
13917	42.9163	78.3346	313.9	480.1	26.7	8.9	37.0	3.3	43.8
13918	42.9805	78.3047	275.8	370.6	15.6	9.3	16.9	2.4	23.4
13950	42.7454	77.9439	323.1	785.2	23.9	8.8	15.1	5.7	22.4
13961	42.9127	77.9674	283.5	520.3	20.0	9.2	20.7	3.6	27.7
13966	42.9217	77.9665	281.3	510.2	20.0	9.2	21.1	3.5	28.0
13967	42.8337	77.9320	278.3	499.3	18.1	9.3	17.6	3.4	24.5
13972	43.9543	78.2534	283.5	407.5	16.3	9.2	17.5	2.7	24.1
13973	42.9391	78.2938	283.5	421.8	16.9	9.2	18.3	2.8	25.0
13980	42.7247	77.9332	283.5	763.5	22.8	9.2	17.8	5.5	25.0
13981	42.9427	78.2821	278.9	418.8	17.5	9.3	19.7	2.8	26.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
9848	42.0758	76.4520	393.8	1593.5	70.0	8.1	38.8	11.4	46.0
10024	42.4431	77.6059	621.8	1051.0	30.1	5.9	23.0	7.7	30.3
10036	42.2029	77.6630	616.0	1403.0	36.7	6.0	21.9	10.2	29.1
10107	42.2425	77.5136	584.6	1250.6	47.8	6.3	33.2	9.1	40.5
10107	42.2425	77.5136	584.6	1250.3	48.3	6.3	33.6	9.1	40.9
10243	42.4011	76.6686	561.1	1119.8	32.2	6.5	23.0	8.2	30.3
10246	42.2014	77.6555	637.6	1406.3	41.7	5.8	25.5	10.2	32.8
10259	42.2442	77.2167	323.1	887.3	28.3	8.8	22.0	6.5	29.2
10335	42.1690	76.6590	432.2	1678.8	47.8	7.8	21.3	12.0	28.4
10335	42.1690	76.6590	432.2	3229.1	74.4	7.8	19.3	18.5	25.1
16123	42.8873	76.6629	162.2	548.6	28.3	10.4	32.7	3.8	39.7
16127	42.9334	76.6907	156.1	609.6	22.8	10.5	17.7	4.3	24.8
16149	42.9058	76.6670	152.4	525.2	32.8	10.5	42.4	3.6	49.4
16151	42.8910	76.6674	161.5	534.0	28.9	10.4	34.6	3.7	41.6
16189	42.9253	77.9112	266.7	501.4	23.9	9.4	28.9	3.5	35.8
16190	42.9142	77.8534	237.7	496.2	20.6	9.7	21.9	3.4	28.8
16191	42.9509	77.9044	251.5	446.8	21.1	9.5	25.9	3.0	32.7
16192	42.9560	77.8892	224.0	420.0	18.9	9.8	21.6	2.8	28.3
16193	42.9204	77.8888	240.8	488.6	23.9	9.6	29.2	3.4	36.0
16194	42.9444	77.8935	253.0	478.5	23.9	9.5	30.0	3.3	36.9
16196	42.9217	77.8977	249.9	492.3	22.8	9.6	26.9	3.4	33.8
16197	42.9152	77.9324	281.9	526.7	21.7	9.2	23.6	3.7	30.6
16198	42.8752	77.9238	277.4	519.1	39.4	9.3	58.1	3.6	65.0
16199	42.9154	77.9143	271.3	502.3	37.8	9.3	56.6	3.5	63.5
16335	42.8004	76.5786	336.8	994.6	30.6	8.7	22.0	7.3	29.3
16844	42.8259	76.5817	308.5	935.7	23.9	9.0	15.9	6.8	23.2
16991	42.8540	76.6934	133.5	659.3	27.8	10.7	25.9	4.7	33.0

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
17301	42.9159	77.9025	256.0	517.9	22.8	9.5	25.7	3.6	32.6
17302	42.9031	77.9271	280.4	533.1	25.6	9.3	30.6	3.7	37.5
17303	42.9218	77.8520	236.2	493.8	26.7	9.7	34.4	3.4	41.3
17304	42.9077	77.9311	280.4	546.8	31.1	9.3	40.0	3.8	47.0
17312	42.9077	77.8946	245.4	506.6	25.6	9.6	31.5	3.5	38.4
17316	42.9364	77.9155	272.8	507.8	30.0	9.3	40.7	3.5	47.6
17317	42.8863	78.3641	349.9	542.8	24.4	8.6	29.2	3.8	36.2
17318	42.0819	76.7729	325.5	922.0	34.7	8.8	28.1	6.7	35.4
17334	43.0074	78.3092	268.2	336.2	13.9	9.4	13.4	2.1	19.8
17335	42.9108	78.3644	296.6	443.5	17.2	9.1	18.3	3.0	25.1
17340	42.9108	78.3693	293.5	456.9	16.7	9.1	16.5	3.1	23.3
17356	42.9120	77.9262	281.9	531.0	25.6	9.2	30.7	3.7	37.7
17357	42.9103	77.9104	271.3	521.5	24.4	9.3	29.0	3.6	35.9
17359	42.8914	77.9246	272.8	549.9	21.1	9.3	21.4	3.8	28.4
17360	43.0180	78.2920	271.3	334.1	13.9	9.3	13.6	2.1	20.0
17363	42.9255	77.9207	274.3	495.0	22.2	9.3	26.1	3.4	33.0
17365	42.8714	78.3536	362.7	563.9	20.0	8.4	20.5	4.0	27.5
17367	42.9829	78.1788	273.9	391.7	15.7	9.3	16.4	2.6	23.0
17373	42.8848	77.9026	265.2	549.9	23.9	9.4	26.3	3.8	33.3
17375	42.8900	77.8904	262.1	531.6	25.0	9.4	29.3	3.7	36.2
17376	42.0285	77.7048	684.0	1566.4	46.7	5.3	26.4	11.2	33.6
17396	42.8793	78.3696	356.6	549.9	20.2	8.5	21.3	3.8	28.3
17397	42.8994	78.3607	313.9	484.9	16.6	8.9	15.9	3.3	22.7
17398	42.8864	78.3500	335.3	517.6	18.9	8.7	19.7	3.6	26.6
17400	42.8847	77.8940	249.9	539.5	23.9	9.6	26.6	3.8	33.6
17403	42.9119	77.8623	231.6	480.1	25.6	9.7	33.0	3.3	39.8
17404	42.9078	77.8710	222.5	486.5	23.3	9.8	27.8	3.3	34.7

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
17405	42.8890	77.9071	274.3	537.4	23.9	9.3	27.1	3.7	34.1
17406	42.9170	77.8671	221.0	467.9	24.4	9.8	31.2	3.2	38.1
17412	42.9645	78.2769	274.3	391.4	16.1	9.3	17.4	2.6	24.0
17427	42.9008	77.8568	217.9	474.0	18.3	9.9	17.9	3.2	24.7
17428	42.9015	77.8691	217.9	475.5	20.6	9.9	22.5	3.3	29.3
17442	42.8725	76.6878	139.9	572.1	27.1	10.6	28.7	4.0	35.7
17447	42.9081	77.8155	176.8	450.5	18.9	10.3	19.1	3.1	25.9
17452	42.9119	77.8888	231.6	484.0	18.3	9.7	17.8	3.3	24.6
17453	42.9263	77.9021	249.9	477.3	20.0	9.6	21.9	3.3	28.7
17454	42.8942	78.3650	320.6	498.0	17.7	8.9	17.7	3.4	24.6
17459	42.9320	77.8890	242.3	465.4	18.3	9.6	18.7	3.2	25.5
17464	42.1831	77.5742	685.8	1435.0	34.2	5.3	20.1	10.4	27.4
17476	42.8836	78.4360	316.1	497.1	20.6	8.9	23.4	3.4	30.3
17477	42.8813	78.4416	310.9	489.5	20.5	9.0	23.6	3.4	30.5
17478	42.9376	77.8863	233.2	469.4	23.9	9.7	30.2	3.2	37.0
17486	42.8750	78.4437	320.0	507.2	21.1	8.9	24.1	3.5	31.1
17490	42.8915	78.3990	304.8	485.9	20.6	9.0	23.8	3.3	30.6
17494	42.9274	78.3994	271.3	407.2	18.9	9.3	23.4	2.7	30.1
17495	42.9248	78.4178	265.2	418.5	21.1	9.4	28.0	2.8	34.7
17499	42.8957	78.3832	307.2	490.1	18.9	9.0	20.2	3.4	27.1
17503	42.9196	77.9074	262.1	504.1	23.3	9.4	27.6	3.5	34.5
17505	42.8997	78.2649	295.7	513.0	21.1	9.1	17.8	3.6	24.7
17506	42.8713	78.3803	362.1	557.2	20.4	8.5	21.4	3.9	28.4
17507	42.8738	78.3606	371.6	570.0	20.0	8.4	20.4	4.0	27.4
17508	43.1290	76.5616	134.4	162.2	23.9	10.7	81.4	0.7	86.0
17508	43.1290	76.5616	133.5	1116.5	33.3	10.7	19.1	8.1	26.4
17508	43.1290	76.5616	133.5	1061.9	47.8	10.7	33.7	7.7	41.0

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
17510	43.1384	76.5521	274.3	1036.0	33.9	9.3	21.1	7.6	28.4
17510	43.1384	76.5521	221.0	1113.4	35.6	9.8	21.2	8.1	28.5
17510	43.1384	76.5521	274.3	68.3	37.0	9.3	385.8	0.0	385.3
17513	42.1380	77.4401	217.9	1391.4	37.2	9.9	21.9	10.1	29.1
17517	42.9207	76.6827	217.9	611.1	25.6	9.9	24.7	4.3	31.8
17518	42.9031	77.9195	139.9	546.5	23.9	10.6	26.7	3.8	33.7
17519	42.8958	77.8543	176.8	494.7	18.3	10.3	16.9	3.4	23.8
17520	42.9259	77.8852	231.6	480.1	20.2	9.7	21.9	3.3	28.8
17522	42.9003	77.8891	249.9	504.1	20.6	9.6	21.5	3.5	28.4
17523	42.8952	77.8865	320.6	529.1	23.9	8.9	27.0	3.7	34.0
17530	42.0890	77.2386	242.3	1382.6	37.8	9.6	21.5	10.0	28.8
17532	42.9105	77.9371	685.8	530.7	23.9	5.3	22.4	3.7	29.4
17534	42.1904	77.7022	316.1	1409.4	41.1	8.9	24.8	10.2	32.0
17535	42.2107	77.2234	310.9	1148.2	35.6	9.0	24.7	8.4	31.9
17539	42.2048	77.0365	233.2	1074.1	29.4	9.7	20.1	7.8	27.3
17540	46.6053	77.0163	320.0	1141.5	35.6	8.9	23.8	8.3	31.1
17541	42.5606	77.0109	304.8	482.8	25.6	9.0	35.0	3.3	41.9
17541	42.5606	77.0109	271.3	482.8	36.1	9.3	56.9	-0.6	55.7
17543	43.9215	78.3799	265.2	429.5	15.9	9.4	15.8	2.9	22.5
17544	42.6827	77.0023	307.2	949.5	31.7	9.0	23.4	6.9	30.7
17544	42.6827	77.0023	262.1	381.0	21.1	9.4	23.9	2.5	30.5
17546	43.0245	78.2613	295.7	324.3	32.2	9.1	70.6	2.0	77.0
17550	43.0337	78.3225	362.1	312.1	20.8	8.5	36.8	1.9	43.1
17553	42.9228	78.3162	371.6	472.1	20.4	8.4	24.5	3.2	31.3
17554	42.9332	78.3114	134.4	426.1	16.0	10.7	15.9	2.9	22.6
17555	42.9955	76.4959	133.5	623.0	25.6	10.7	25.1	4.4	32.2
17556	42.9234	76.4856	133.5	765.0	26.7	10.7	22.9	5.5	30.2

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
17557	42.8576	76.5360	179.8	819.0	27.8	10.2	19.3	5.9	26.5
17558	43.0111	76.5214	179.8	1389.3	48.9	10.2	27.8	10.1	35.1
17558	43.0111	76.5214	179.8	1389.3	38.3	10.2	20.2	-0.6	19.8
17559	42.9243	76.6992	152.4	1532.2	38.9	10.5	18.5	11.0	25.7
17567	42.8669	76.8529	162.2	659.6	24.4	10.4	21.3	4.7	28.4
17574	42.8374	76.8616	194.2	717.2	26.7	10.1	23.1	5.2	30.3
17578	42.8603	76.8289	161.8	642.5	22.8	10.4	19.2	4.6	26.4
17590	42.9373	78.4493	267.0	394.4	18.3	9.4	16.1	2.6	22.7
17591	42.9349	78.4538	266.1	395.0	18.3	9.4	16.0	2.6	22.7
17592	42.9157	78.3862	292.3	440.7	16.5	9.1	16.7	3.0	23.5
17595	42.9285	76.6812	155.7	572.4	22.8	10.5	21.5	4.0	28.5
17598	42.9244	76.6894	163.1	118.3	24.4	10.4	118.7	0.4	121.9
17599	42.9250	76.6811	157.4	563.9	23.8	10.5	23.6	4.0	30.6
17788	42.1087	76.1113	345.9	1357.3	37.8	8.6	21.5	9.8	28.7
19403	42.5608	77.0309	425.5	599.8	22.2	7.8	24.0	4.2	31.1
19403	42.5608	77.0309	425.5	1286.0	36.7	7.8	19.2	9.4	26.5
19407	42.9373	77.9239	259.1	481.3	20.6	9.5	23.1	3.3	29.9
19408	42.8941	77.9098	274.3	541.9	21.7	9.3	22.8	3.8	29.8
19409	42.9073	77.9235	285.0	546.5	22.2	9.2	23.8	3.8	30.8
19411	42.9167	78.2268	291.1	490.7	22.2	9.1	26.6	3.4	33.5
19414	42.8427	76.8645	199.6	720.5	27.2	10.0	23.8	5.2	31.0
19420	42.8282	77.0516	190.5	576.4	23.3	10.1	22.9	4.1	29.9
19434	42.0822	77.7023	702.3	551.1	22.2	5.1	18.5	3.9	25.5
19460	42.8133	76.9030	168.2	756.5	27.8	10.4	23.0	5.5	30.2
19461	42.7938	76.9046	175.6	765.0	26.7	10.3	21.4	5.5	28.6
19463	42.7964	76.8842	207.3	844.0	28.3	10.0	21.8	6.1	29.0

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
19464	42.8043	76.8907	182.9	811.4	28.9	10.2	23.0	5.9	30.3
19467	42.8381	76.8842	173.4	764.1	29.4	10.3	25.1	5.5	32.3
19470	42.8052	76.8618	201.2	1025.3	34.2	10.0	23.5	7.5	30.8
19482	42.7918	76.8739	199.6	776.3	31.7	10.0	27.9	5.6	35.1
19484	42.7029	76.2662	550.5	1702.6	46.1	6.6	23.2	12.1	30.3
19485	42.8089	75.4189	539.5	1550.5	43.9	6.7	24.0	11.1	31.2
19496	42.2078	77.0283	507.2	1228.3	38.2	7.0	25.3	8.9	32.6
19497	42.5407	77.2163	501.1	2402.4	56.1	7.1	20.4	15.9	27.0
19497	42.5407	77.2163	501.1	782.4	27.2	7.1	25.7	5.7	33.0
19497	42.5407	77.2163	501.1	2202.5	56.1	7.1	22.3	14.9	29.0
19497	42.5407	77.2163	501.1	2224.1	56.1	7.1	22.0	15.0	28.8
19497	42.5407	77.2163	501.1	2330.5	56.1	7.1	21.0	15.6	27.7
19497	42.5407	77.2163	501.1	2395.1	56.1	7.1	20.5	15.8	27.1
19497	42.5407	77.2163	501.1	2398.2	56.1	7.1	20.4	15.9	27.1
19504	42.8040	76.9057	178.3	791.6	28.3	10.3	22.8	5.7	30.1
19509	42.9158	78.1750	333.8	531.6	21.7	8.7	24.3	3.7	31.3
19511	42.9163	78.1583	325.2	507.2	21.1	8.8	24.2	3.5	31.2
19512	42.9158	78.1140	321.6	502.9	16.4	8.8	15.0	3.5	21.9
19514	42.9390	78.1065	301.1	442.6	20.0	9.0	24.7	3.0	31.5
19515	42.9133	78.1290	323.4	502.9	21.1	8.8	24.4	3.5	31.3
19521	42.9119	78.1483	341.1	520.3	25.0	8.7	31.4	3.6	38.4
19523	42.9148	78.1416	338.3	506.3	21.1	8.7	24.5	3.5	31.5
19524	42.9152	78.1066	321.0	495.3	21.1	8.9	24.7	3.4	31.6
19525	42.9479	78.1144	303.3	447.8	20.4	9.0	25.4	3.0	32.2
19526	42.9415	78.1137	304.8	454.8	23.9	9.0	32.7	3.1	39.5
19528	42.9181	78.1358	337.4	499.3	20.6	8.7	23.8	3.4	30.7
19529	42.9224	78.1311	321.0	483.4	21.1	8.9	25.4	3.3	32.2

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
19530	42.9269	78.1347	324.6	484.9	15.6	8.8	13.9	3.3	20.8
19535	42.8232	76.8964	160.9	764.1	31.1	10.4	27.1	5.5	34.3
19540	42.5544	76.0209	476.1	953.7	30.6	7.3	24.3	6.9	31.6
19540	42.5544	76.0209	476.1	2375.0	56.7	7.3	20.8	15.8	27.4
19541	42.8024	76.8752	195.1	768.7	26.7	10.1	21.6	5.5	28.8
19544	42.7985	76.9021	181.4	759.9	26.7	10.2	21.6	5.5	28.9
19550	42.8067	76.8189	208.8	775.1	26.7	10.0	21.6	5.6	28.8
19552	42.9199	78.1443	344.4	492.3	21.1	8.6	25.4	3.4	32.3
19573	42.8735	75.3717	463.3	702.6	25.6	7.5	25.8	5.0	32.9
19578	42.8767	75.3932	378.0	595.6	23.0	8.3	24.7	4.2	31.7
19583	42.8512	76.8985	153.6	655.9	24.4	10.5	21.3	4.7	28.4
19584	42.8664	76.8837	165.2	648.3	23.9	10.4	20.8	4.6	27.9
19585	42.9846	76.9139	144.5	542.8	22.8	10.6	22.5	4.1	30.0
19586	42.9406	76.7989	154.8	542.8	21.7	10.5	20.6	3.8	27.6
19587	42.9917	76.8479	149.4	511.8	17.3	10.5	13.3	3.5	20.2
19589	42.7582	76.7953	192.9	824.5	28.3	10.1	19.8	6.0	27.1
19590	42.7910	76.8609	198.1	761.4	23.3	10.1	17.4	5.5	24.6
19592	42.8810	76.6853	140.2	614.5	22.8	10.6	19.8	4.4	26.9
19597	42.7832	76.8429	208.5	844.9	28.3	10.0	21.7	6.1	29.0
19599	42.8821	76.6909	128.0	623.9	22.2	10.7	18.4	4.4	25.5
19609	42.7405	77.9239	426.7	732.1	25.6	7.8	24.2	5.3	31.4
19610	42.7588	77.9548	324.6	747.1	26.1	8.8	18.9	5.4	26.1
19611	42.7547	77.9498	320.0	751.3	26.1	8.9	18.8	5.4	26.0
19612	42.7557	77.9439	306.3	721.2	26.1	9.0	19.6	5.2	26.8
19621	42.8006	76.8549	205.1	774.2	28.3	10.0	23.7	5.6	30.9
19623	42.7908	76.8940	180.4	765.0	28.3	10.2	23.7	5.5	30.9

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
19624	42.7915	76.8486	207.6	774.8	23.9	10.0	18.0	5.6	25.2
19627	43.0186	78.3949	256.9	310.0	16.7	9.5	23.2	1.9	29.4
19629	42.9189	78.3111	324.0	483.1	20.6	8.8	24.3	3.3	31.1
19631	42.8138	76.9100	166.1	775.4	24.4	10.4	18.1	5.6	25.4
19633	42.7442	77.9213	277.4	730.9	24.4	9.3	17.0	5.3	24.2
19634	42.9444	76.7200	134.1	555.0	22.8	10.7	21.8	3.9	28.8
19635	42.9397	76.7135	143.3	554.7	19.4	10.6	16.0	3.9	22.9
19636	42.9373	76.7096	146.3	546.2	23.3	10.6	23.4	3.8	30.4
19637	42.9338	76.7105	144.8	546.5	23.3	10.6	23.3	3.8	30.3
19638	42.9388	76.6960	158.5	536.4	22.8	10.4	23.0	3.7	30.0
19639	42.9338	76.7009	161.5	551.4	22.2	10.4	21.4	3.9	28.4
19640	42.9290	76.7057	155.4	550.2	22.2	10.5	21.3	3.8	28.3

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
20531	42.0335	76.2227	452.6	1649.0	38.9	7.6	19.0	11.8	26.1
20532	42.0565	76.2419	384.0	1570.9	39.4	8.2	19.9	11.3	27.0
20534	42.0224	76.2284	448.1	1671.5	39.4	7.6	19.0	11.9	26.2
20538	42.7702	77.0083	222.5	877.8	31.1	9.8	24.3	6.4	31.5
20539	42.6998	77.0495	261.5	924.5	27.8	9.4	19.8	6.7	27.1
20544	42.7202	77.0009	246.9	943.1	30.0	9.6	21.7	6.9	28.9
20545	42.7848	77.0104	234.7	867.8	28.3	9.7	21.5	6.3	28.7
20546	42.7473	77.0148	241.1	915.6	31.1	9.6	23.5	6.7	30.7
20551	42.9328	78.1219	305.1	465.1	21.1	9.0	26.0	3.2	32.8
20571	42.7010	77.0620	327.7	1041.5	32.2	8.8	22.5	7.6	29.8
20572	42.8688	76.6872	143.3	608.4	27.2	10.6	27.3	4.3	34.4
20575	42.9118	77.7178	234.7	513.9	22.8	9.7	21.0	3.6	27.9
20578	42.9173	78.1199	314.2	494.7	21.1	8.9	24.6	3.4	31.5
20585	42.9446	78.1007	286.2	442.6	21.1	9.2	26.9	3.0	33.7
20594	42.9401	78.1204	304.8	453.5	21.1	9.0	26.7	3.1	33.5
20595	42.9255	78.1446	312.4	488.6	21.1	8.9	24.9	3.4	31.8
20596	42.9051	78.1278	321.6	520.6	22.8	8.8	26.8	3.6	33.7
20603	42.8543	76.6602	184.1	657.5	21.7	10.2	17.4	4.7	24.6
20610	42.8661	76.6704	179.8	636.4	21.7	10.2	15.2	4.5	22.3
20606	42.8788	76.6680	158.5	602.0	23.9	10.4	22.3	4.3	29.4
20613	42.9243	76.6354	190.5	656.5	23.9	10.1	21.0	4.7	28.1
20614	42.4122	76.6776	160.9	574.9	21.1	10.4	18.6	4.0	25.6
20620	42.9400	78.1283	315.8	463.6	21.1	8.9	26.3	3.2	33.1
20623	42.8968	76.6048	221.9	675.7	22.2	9.8	18.3	4.8	25.5
20624	42.9111	76.6338	198.1	632.2	24.4	10.1	22.8	4.5	29.9
20627	42.8564	74.8611	174.3	681.2	22.2	10.3	17.5	4.9	24.7
20628	42.8522	77.8624	176.2	678.2	22.2	10.3	17.6	4.8	24.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
20629	42.8521	76.8797	168.6	683.7	26.1	10.3	23.1	4.9	30.2
20632	42.8416	76.6593	198.1	626.7	21.1	10.1	17.6	4.4	24.7
20635	42.8560	76.6709	174.3	635.8	21.7	10.3	17.9	4.5	25.0
20636	42.9459	76.6531	170.7	557.8	20.0	10.3	17.3	3.9	24.3
20637	42.8693	76.6414	210.3	651.7	22.2	9.9	18.8	4.6	26.0
20638	42.9220	76.6158	194.5	629.1	21.1	10.1	17.5	4.5	24.6
20644	42.0252	76.2554	452.6	1594.7	41.7	7.6	21.4	11.4	28.5
20646	42.9200	76.6341	170.7	562.1	20.6	10.3	18.2	3.9	25.2
20645	42.0341	76.1972	426.7	1592.6	41.7	7.8	21.3	11.4	28.4
20646	42.9200	76.6341	170.7	616.3	21.7	10.3	18.4	4.4	25.5
20647	42.9099	76.6202	197.5	618.4	25.6	10.1	25.0	4.4	32.1
20649	42.9064	76.6259	195.4	640.7	27.2	10.1	26.7	4.6	33.9
20650	42.9056	76.6268	195.1	646.5	23.9	10.1	21.3	4.6	28.5
20651	42.9014	76.6128	218.2	712.9	25.6	9.9	19.0	5.1	26.2
20652	42.8986	76.5990	221.0	640.1	21.7	9.8	18.5	4.6	25.6
20653	42.8929	76.5986	224.0	684.6	26.1	9.8	23.8	4.9	31.0
20654	42.8832	76.6192	234.7	687.0	30.0	9.7	29.5	4.9	36.7
20655	42.8768	76.6293	234.7	647.7	22.2	9.7	19.3	4.6	26.5
20656	42.8709	76.6712	176.8	632.8	23.9	10.3	21.5	4.5	28.6
20657	42.8838	76.6337	218.5	715.4	29.4	9.9	24.4	5.1	31.6
20658	42.3067	77.6903	448.1	1038.8	32.2	7.6	19.5	7.6	26.8
20658	42.3067	77.6903	448.1	1069.5	32.8	7.6	19.4	7.8	26.7
20660	42.8737	76.6763	167.0	661.4	26.1	10.4	21.3	4.7	28.5
20661	42.0213	76.1970	393.2	1561.5	41.1	8.1	21.1	11.2	28.3
20662	42.1271	77.1637	442.0	1250.0	35.0	7.7	21.9	9.1	29.1
20663	42.8909	76.6205	224.0	687.0	28.9	9.8	27.8	4.9	34.9
20664	42.8913	76.6270	229.5	670.6	23.9	9.8	21.1	4.8	28.2

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
20665	42.8581	76.6653	177.7	638.9	21.7	10.3	17.9	4.5	25.0
20666	42.8540	76.6662	180.4	656.5	23.9	10.2	20.8	4.7	27.9
20668	42.9145	76.6402	180.4	606.2	20.6	10.2	17.0	4.3	24.1
20671	42.8928	76.6113	224.6	687.6	26.1	9.8	23.7	4.9	30.9
20672	42.8973	76.6223	222.2	669.3	25.0	9.8	22.7	4.8	29.8
20673	42.9215	76.6222	193.5	620.3	21.1	10.1	17.7	4.4	24.8
20674	42.8980	76.6164	221.9	684.3	26.1	9.8	23.8	4.9	31.0
20675	42.8925	76.6058	229.5	737.6	30.0	9.8	24.4	5.3	31.6
20677	42.8972	76.6106	220.4	720.2	30.0	9.8	25.0	5.2	32.2
20678	42.9196	76.6186	196.0	623.9	21.1	10.1	17.7	4.4	24.8
20679	42.9043	76.5860	214.3	723.0	28.9	9.9	26.3	5.2	33.5
20683	42.8551	76.8667	167.6	685.5	22.2	10.4	17.3	4.9	24.5
20684	42.8759	76.6705	161.5	615.7	22.8	10.4	20.1	4.4	27.2
20687	43.0521	78.2370	247.5	1227.1	35.0	9.6	20.7	8.9	28.0
20687	43.0521	78.2370	247.5	1408.2	38.9	9.6	20.8	10.2	28.1
20694	42.8263	76.7932	174.3	683.7	23.9	10.3	19.9	4.9	27.0
20695	42.8181	76.6887	180.4	756.8	30.0	10.2	26.1	5.5	33.3
20697	43.0600	78.3146	242.9	265.8	18.3	9.6	32.8	1.6	38.7
20700	42.8039	76.9152	167.6	727.9	26.1	10.4	21.6	5.2	28.8

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
20701	42.7742	76.9004	179.5	757.7	27.2	10.2	22.4	5.5	29.6
20702	42.8316	76.7739	158.5	664.2	26.7	10.4	24.4	4.7	31.6
20703	42.8115	76.6727	210.3	741.0	23.3	9.9	18.1	5.3	25.3
20704	42.8786	76.6640	161.5	655.6	26.7	10.4	22.4	4.7	29.5
20707	42.7723	76.9059	168.9	754.7	27.8	10.3	23.1	5.4	30.3
20707	42.7723	76.9059	168.9	754.7	23.9	10.3	17.9	5.4	25.2
20708	42.8288	76.7983	170.7	669.3	35.6	10.3	37.7	4.8	44.8
20709	42.9488	76.6295	165.2	610.2	23.3	10.4	18.6	4.3	25.7
21233	42.8680	76.8524	170.4	651.4	29.4	10.3	26.8	4.6	33.9
21236	42.8038	76.8698	194.5	752.2	33.3	10.1	28.4	5.4	35.6
21238	42.8813	76.6597	170.7	620.6	25.6	10.3	24.5	4.4	31.6
21238	42.8813	76.6597	170.7	576.1	25.6	10.3	26.4	4.1	33.5
21239	42.8890	76.6147	224.9	694.3	26.7	9.8	21.1	5.0	28.3
21240	42.8679	76.6357	215.8	687.6	30.0	9.9	29.3	4.9	36.4
21241	42.7962	76.9243	154.8	736.4	27.8	10.5	23.5	5.3	30.7
21243	42.8561	76.6240	241.7	741.6	28.3	9.6	25.2	5.3	32.4
21248	42.7766	76.9061	169.8	748.6	35.6	10.3	33.7	5.4	40.9
21249	42.8620	76.9055	156.1	656.5	27.8	10.5	26.4	4.7	33.5
21250	42.8226	76.9169	192.6	725.4	32.8	10.1	31.2	5.2	38.4
21251	42.7787	76.9008	178.0	539.8	22.2	10.3	18.9	3.8	25.9
21252	42.8846	76.6137	232.3	715.7	25.6	9.7	22.1	5.1	29.3
21253	42.8164	76.6775	196.6	731.5	27.8	10.1	24.2	5.3	31.4
21255	42.8731	76.6264	223.1	702.9	31.7	9.8	31.1	5.0	38.3
21256	42.9008	76.6467	172.2	611.4	25.6	10.3	24.9	4.3	32.0
21257	42.8895	76.6327	219.2	670.6	26.7	9.9	25.1	4.8	32.2
21258	42.8246	76.7986	176.8	706.8	35.6	10.3	35.8	5.1	43.0
21262	42.5540	76.2965	344.4	635.5	23.9	8.6	24.0	4.5	31.1

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
21264	42.0238	76.2756	481.6	1639.2	41.7	7.3	21.0	11.7	28.1
21265	42.0319	76.2757	438.9	1615.4	43.3	7.7	22.1	11.6	29.2
21266	42.9055	76.6165	213.4	663.9	26.1	9.9	24.4	4.7	31.5
21267	42.9017	76.6205	213.4	678.5	26.7	9.9	24.7	4.9	31.8
21269	42.7678	76.9130	163.1	762.6	33.3	10.4	30.1	5.5	37.3
21271	42.8810	76.5940	242.0	762.6	28.3	9.6	24.5	5.5	31.7
21272	42.0105	76.2980	487.7	1662.7	43.3	7.2	21.7	11.9	28.9
21275	42.8880	76.6057	230.1	698.6	23.9	9.7	17.0	5.0	24.2
21276	42.8706	76.6314	219.5	688.8	23.9	9.8	17.3	4.9	24.4
21277	42.8881	76.6001	229.8	699.2	20.6	9.7	12.2	5.0	19.4
21280	42.8900	76.5936	227.1	706.2	25.0	9.8	21.6	5.1	28.7
21283	42.8651	76.6310	227.1	703.5	23.9	9.8	20.1	5.0	27.2
21285	42.9027	76.6312	195.1	676.7	21.7	10.1	17.1	4.8	24.3
21286	42.8665	76.9057	153.3	646.5	21.7	10.5	15.0	4.6	22.1
21287	42.8617	76.6270	228.6	710.8	23.3	9.8	19.1	5.1	26.3
21287	42.8617	76.6270	228.6	656.2	25.6	9.8	24.1	4.7	31.2
21288	42.8493	76.6093	255.4	773.3	23.9	9.5	18.6	5.6	25.8
21288	42.8493	76.6093	255.4	726.0	25.6	9.5	22.1	5.2	29.3
21291	42.8792	76.5842	234.7	729.4	23.3	9.7	15.5	5.2	22.7
21293	42.8416	76.8565	183.2	693.7	23.9	10.2	17.1	5.0	24.3
21294	42.0117	76.2738	431.3	1602.6	36.1	7.8	17.7	11.5	24.8
21296	42.9025	76.6371	195.1	629.7	22.2	10.1	19.3	4.5	26.4
21297	42.8617	76.9120	168.6	669.6	20.0	10.3	14.4	4.8	21.6
21298	42.8662	76.9116	171.6	666.0	19.4	10.3	13.7	4.8	20.8
21300	42.0491	76.1978	353.6	1434.7	33.9	8.5	17.7	10.4	24.9
21301	42.2156	77.0398	504.4	1129.0	31.1	7.1	16.9	8.2	24.2
21302	42.9140	76.7147	152.4	560.5	22.8	10.5	21.9	3.9	28.9

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
21303	42.9008	76.7004	146.6	573.0	22.2	10.6	20.3	4.0	27.4
21305	42.8994	76.6278	210.3	657.1	21.7	9.9	17.8	4.7	25.0
21306	42.8779	76.6137	239.3	715.1	23.9	9.7	16.6	5.1	23.8
21312	43.0462	78.2362	253.6	289.3	18.3	9.5	30.5	1.8	36.6
21315	42.8622	76.8781	167.9	664.5	22.8	10.4	18.7	4.7	25.8
21320	42.8685	76.6262	225.2	705.3	22.8	9.8	18.4	5.1	25.6
21321	42.8599	76.8879	160.3	638.3	22.2	10.4	18.5	4.5	25.6
21322	42.9298	76.6296	178.3	594.4	21.1	10.3	18.3	4.2	25.3
21323	42.8448	76.8520	177.4	662.9	21.1	10.3	16.4	4.7	23.5
21324	42.8332	76.8605	193.5	690.4	26.1	10.1	23.2	4.9	30.3
21325	42.8642	76.6398	215.2	690.4	25.6	9.9	22.7	4.9	29.9
21326	42.8462	76.6143	260.9	778.8	23.9	9.4	18.5	5.6	25.8
21327	42.8444	76.6086	263.0	792.5	24.4	9.4	19.0	5.7	26.2
21319	42.8741	76.8952	149.0	624.2	24.4	10.5	22.3	4.4	29.4
21328	40.8553	76.6289	251.5	758.0	24.4	9.5	19.7	5.5	26.9
21335	43.0660	76.3528	158.5	1267.7	33.3	10.4	18.1	9.2	25.3
21336	43.1228	76.4005	198.4	1195.7	26.1	10.1	13.4	8.7	20.7
21342	42.2465	77.0484	509.0	1159.5	32.2	7.0	17.4	8.5	24.7
21343	42.2185	77.0216	524.3	1125.3	33.9	6.9	19.5	8.2	26.7
21343	42.2185	77.0216	524.3	1111.0	31.1	6.9	17.2	8.1	24.5
21344	42.9645	77.9822	274.3	434.6	20.6	9.3	19.7	2.9	26.4
21347	42.8512	76.6037	255.4	782.7	23.9	9.5	18.4	5.7	25.6
21351	42.4866	76.7151	324.6	700.1	23.3	8.8	16.2	5.0	23.4
21353	42.8192	76.6659	210.0	740.4	27.5	9.9	23.7	5.3	30.9
21354	42.8358	76.8025	168.6	649.5	19.7	10.3	14.4	4.6	21.6
21355	42.8232	76.7810	159.1	676.0	21.6	10.4	16.4	4.8	23.6
21356	43.0072	78.4214	252.7	310.6	18.9	9.5	30.2	1.9	36.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
21357	42.8669	76.8760	158.5	630.3	26.7	10.4	25.7	4.5	32.8
21358	42.8788	76.8968	149.4	636.7	30.3	10.5	31.0	4.5	38.1
21359	42.8566	76.9121	153.3	656.8	25.6	10.5	22.9	4.7	30.1
21361	42.8228	76.6607	216.1	748.3	23.9	9.9	18.7	5.4	25.9
21362	42.8146	76.6636	223.4	767.5	23.9	9.8	18.3	5.5	25.6
21363	42.8268	76.8680	198.4	718.7	37.8	10.1	38.6	5.2	45.8
21365	42.8176	76.6518	243.8	780.6	23.3	9.6	17.5	5.6	24.7
21368	42.8265	76.6379	241.4	781.8	23.3	9.6	17.5	5.6	24.7
21369	42.8598	76.8995	153.0	649.5	19.1	10.5	13.3	4.6	20.4
21372	42.8777	76.8910	159.1	628.2	17.2	10.4	10.8	4.5	17.9
21375	42.0132	76.3139	361.2	1706.0	43.3	8.5	20.4	12.1	27.6
21379	42.8465	76.6212	253.0	769.0	22.8	9.5	17.2	5.6	24.5
21382	42.9107	76.8938	141.7	584.9	26.7	10.6	27.4	4.1	34.5
21384	42.8707	76.8711	160.9	630.3	25.6	10.4	21.5	4.5	28.6
21387	42.8808	76.9042	140.5	607.2	29.4	10.6	31.0	4.3	38.1
21389	0.0000	0.0000	0.0	427.9	20.6	12.0	20.0	2.9	26.7
21391	42.8937	76.9500	145.1	602.3	16.2	10.6	9.4	4.3	16.4
21393	42.8188	76.6827	184.1	716.0	22.2	10.2	16.8	5.1	24.0
21401	42.8161	76.6715	198.7	730.0	33.1	10.1	28.8	5.3	36.0
21402	42.4038	76.6749	188.7	711.1	26.7	10.2	23.2	5.1	30.4
21403	42.8230	76.6695	202.4	723.3	27.2	10.0	23.8	5.2	31.0
21404	42.8841	76.8992	141.7	611.1	23.9	10.6	21.7	4.3	28.8
21406	42.6943	77.8918	272.8	814.7	24.7	9.3	18.8	5.9	26.1
21407	42.8750	76.9077	149.4	624.5	28.6	10.5	28.9	4.4	36.0
21410	42.2349	77.5131	665.4	1355.1	41.7	5.5	26.7	9.8	34.0
21411	42.2376	77.5179	655.1	1382.3	18.9	5.6	9.6	10.0	16.9
21412	42.2379	77.5182	655.9	1321.3	34.4	5.6	21.9	9.6	29.1

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
21413	42.2405	77.5232	641.5	1329.5	41.7	5.7	27.0	9.7	34.3
21414	42.2408	77.5230	641.6	1405.7	36.1	5.7	21.6	10.2	28.9
21420	42.0501	76.1786	315.5	1412.4	36.7	8.9	19.7	10.2	26.9
21421	42.0109	76.2856	437.4	1585.9	29.4	7.7	13.7	11.4	20.9
21424	42.0424	76.2091	413.0	1533.1	40.6	8.0	21.3	11.0	28.5
21425	42.2789	77.7336	638.6	1252.1	35.6	5.7	23.8	9.1	31.1

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
13987	42.9155	77.9579	291.1	524.3	20.0	9.1	20.7	3.6	27.6
13988	42.9297	77.9403	285.0	510.5	20.0	9.2	21.1	3.5	28.1
14172	42.7994	77.4625	449.9	444.7	16.9	7.6	21.0	3.0	27.8
14283	42.9277	77.9319	275.8	504.4	19.4	9.3	20.1	3.5	27.0
14296	42.8962	77.3530	254.8	625.8	26.7	9.5	27.4	4.4	34.5
14450	42.9324	77.9219	264.6	495.3	19.7	9.4	20.8	3.4	27.7
14482	42.7632	77.8000	280.7	749.8	25.6	9.2	21.7	5.4	29.0
14484	42.1195	77.7438	649.8	1496.0	43.9	5.6	25.6	10.8	32.8
14491	42.6188	77.7624	182.9	868.1	28.3	10.2	18.8	6.3	26.1
14517	42.8800	77.9657	0.0	601.7	16.1	12.0	6.8	4.3	13.9
14526	42.9350	77.9857	287.4	503.8	17.8	9.2	17.1	3.5	24.0
15162	42.9169	78.3538	281.9	442.3	20.8	9.2	26.2	3.0	33.0
15164	42.9244	78.3519	280.4	411.8	16.9	9.3	12.0	2.7	18.7
15190	42.5628	77.9228	329.2	1033.6	36.7	8.8	27.0	7.5	34.3
15191	42.5557	77.9580	416.7	1134.8	31.1	7.9	20.4	8.3	27.7
15204	42.9651	78.3151	274.3	377.0	16.0	9.3	10.6	2.5	17.2
15267	42.6072	77.7244	182.9	378.0	19.5	10.2	19.8	2.5	26.4
15268	42.1638	77.3543	442.3	1175.9	36.7	7.7	24.7	8.6	32.0
15268	42.1638	77.3540	442.3	1182.0	36.6	7.7	24.4	8.6	31.7
15283	42.8107	77.1804	326.4	541.6	24.4	8.8	28.9	3.8	35.9
15283	42.8107	77.1804	326.4	784.9	32.2	8.8	29.8	5.7	37.1
15302	43.0920	76.5478	192.0	385.0	17.2	10.1	18.5	2.5	25.0
15328	42.9180	78.3415	310.9	467.0	24.4	9.0	33.2	3.2	40.0
15370	42.5902	77.6771	481.6	1246.0	37.8	7.3	24.5	9.1	31.8
15372	42.5453	77.7907	557.8	1322.2	38.9	6.5	20.3	9.6	27.6
15382	42.1856	77.0826	458.1	408.4	19.7	7.5	29.9	2.7	36.6
15405	42.7991	77.2008	331.3	578.2	27.8	8.8	32.9	4.1	39.9
15405	42.7991	77.2008	331.3	795.2	32.8	8.8	30.2	5.8	37.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
15406	42.7338	77.0746	323.1	864.4	33.9	8.8	29.0	6.3	36.2
15406	42.7338	77.0746	323.1	876.3	34.4	8.8	29.2	6.4	36.5
15438	42.5394	77.2162	498.0	2422.6	62.8	7.1	23.0	16.0	29.6
15441	42.9152	77.3706	245.4	625.4	27.2	9.6	28.2	4.4	35.3
15445	42.5833	77.1848	402.9	1191.2	37.2	8.1	24.5	8.7	31.8
15469	42.6528	77.1152	412.4	1098.8	33.9	8.0	23.6	8.0	30.9
15480	42.5704	77.7509	275.2	492.3	27.8	9.3	37.5	3.4	44.4
15480	42.5704	77.7509	275.2	495.3	26.7	9.3	35.1	3.4	41.9
15480	42.5704	77.7509	275.2	494.4	22.2	9.3	26.1	3.4	33.0
15492	42.2001	77.3707	329.8	886.7	31.4	8.8	25.5	6.4	32.8
15500	42.9247	76.6946	153.2	624.8	22.8	10.5	19.7	4.4	26.7
15501	42.9215	76.7025	152.4	602.0	22.8	10.5	17.9	4.3	25.0
15502	42.9204	76.6907	160.0	611.9	23.3	10.4	21.1	4.3	28.2
15513	42.9152	77.1853	234.7	568.1	22.8	9.7	23.0	4.0	30.0
15529	42.7415	76.6973	138.7	800.4	34.4	10.6	29.7	5.8	37.0
15583	42.8653	76.6875	145.4	734.6	26.8	10.6	22.1	5.3	29.3
15584	43.1549	76.4714	118.6	1076.6	31.9	10.8	19.6	7.9	26.9
15611	42.9175	76.6872	157.0	552.3	22.8	10.5	19.5	3.9	26.5
15612	43.3514	76.0893	149.0	611.7	23.3	10.5	18.5	4.3	25.6
15613	43.3514	76.0893	158.2	680.3	26.1	10.4	20.7	4.9	27.9
15628	43.3218	75.9357	207.3	524.6	31.1	10.0	36.4	3.6	43.4
15650	42.9108	76.6816	147.5	555.3	25.6	10.6	24.4	3.9	31.4
15651	42.9067	76.6840	138.7	493.8	25.9	10.6	28.2	3.4	35.1
15661	42.9197	76.6959	159.6	611.4	22.8	10.4	20.2	4.3	27.3
15662	42.9200	76.7007	163.1	612.6	22.8	10.4	17.6	4.3	24.7
15662	42.9200	76.7007	163.1	534.9	25.8	10.4	25.9	3.7	32.8
15663	42.9160	76.7005	158.5	507.8	24.8	10.4	25.3	3.5	32.2
15664	42.9273	76.6724	153.5	555.3	23.3	10.5	23.1	3.9	30.1

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
15665	42.9248	76.6761	156.7	373.7	22.8	10.5	33.0	2.4	39.5
15665	42.9248	76.6761	156.7	556.6	22.8	10.5	22.1	3.9	29.1
15665	42.9248	76.6761	156.7	521.5	23.7	10.5	25.4	3.6	32.4
15702	42.9211	76.6779	160.0	610.5	22.8	10.4	20.2	4.3	27.3
15703	42.9157	76.7055	156.4	611.4	23.3	10.5	21.0	4.3	28.1
15706	42.9053	76.7016	152.4	526.1	24.8	10.5	27.2	3.7	34.2
15706	42.9053	76.7016	152.4	547.7	22.2	10.5	21.4	3.8	28.4
15707	42.9155	76.6831	153.6	616.9	22.8	10.5	19.9	4.4	27.0
15709	42.9064	76.6887	145.1	610.8	22.8	10.6	17.6	4.3	24.7
15710	42.9023	76.6949	141.1	612.6	22.8	10.6	19.8	4.3	26.9
15737	42.7159	78.9524	307.8	790.3	27.2	9.0	23.1	5.7	30.3
15745	42.9282	76.6764	158.8	610.2	23.3	10.4	18.6	4.3	25.7
15747	42.9285	76.6687	154.2	618.7	23.3	10.5	18.3	4.4	25.4
15756	42.8976	76.7242	140.8	608.7	22.8	10.6	17.7	4.3	24.8
15764	42.7292	77.0867	332.8	347.8	18.6	8.7	28.4	2.2	34.8
15834	42.2032	77.5925	617.2	1696.8	37.8	6.0	18.8	12.1	25.9
15834	42.2032	77.5925	617.2	375.2	29.4	6.0	62.6	2.5	69.2
15849	42.5631	77.7983	475.5	1199.4	34.4	7.3	22.6	8.7	29.9
15850	42.9152	76.6707	150.6	609.6	22.8	10.5	20.1	4.3	27.2
15881	42.9647	78.3316	300.8	382.2	20.5	9.1	30.0	2.5	36.5
15882	42.9277	78.3264	295.7	439.2	18.0	9.1	20.3	3.0	27.0
15883	42.9132	78.3411	304.8	465.4	16.1	9.0	15.3	3.2	22.1
15896	42.9039	78.4266	286.5	450.8	16.1	9.2	9.1	3.1	15.9
15897	42.9162	78.3649	291.1	437.4	19.3	9.1	23.3	3.0	30.0
15898	42.9385	78.3736	278.9	394.7	17.2	9.3	20.2	2.6	26.8
15899	42.9226	78.3637	291.1	430.1	21.1	9.1	27.8	2.9	34.5
15920	42.0336	78.2830	274.3	312.7	15.6	9.3	20.0	2.0	26.2
15921	42.9878	78.3002	268.2	363.6	19.2	9.4	27.1	2.4	33.6

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
15963	42.8133	76.7083	119.5	624.8	34.6	10.8	38.1	4.4	45.2
15962	42.8605	76.6676	174.3	609.0	32.5	10.3	36.5	4.3	43.5
16018	42.9236	75.4223	409.7	545.6	21.1	8.0	24.1	3.8	31.0
16021	42.2700	77.0777	548.0	1074.1	33.9	6.6	25.4	7.8	32.7
16085	42.9883	78.4132	268.2	361.2	16.7	9.4	20.2	2.3	26.7
16102	41.8377	77.3864	333.5	906.8	34.4	8.7	28.4	6.6	35.6
16103	42.3269	77.3056	330.7	886.1	26.7	8.8	20.2	6.4	27.5
16104	42.9556	77.7809	193.5	406.9	22.2	10.1	29.8	2.7	36.4
16105	42.9554	77.7898	212.4	404.5	18.9	9.9	22.2	2.7	28.8
16106	42.9598	77.7858	194.5	398.4	30.6	10.1	51.4	2.6	58.0
16107	42.9309	77.7740	164.6	400.8	20.0	10.4	24.0	2.7	30.6
16109	42.9349	77.7873	187.5	411.8	21.7	10.2	27.9	2.7	34.6
16114	42.9450	77.7966	179.8	401.4	33.3	10.2	57.5	2.7	64.2
16115	42.6480	76.6315	259.7	1160.7	31.1	9.5	18.7	8.5	26.0
16118	42.7512	76.6287	311.8	1275.0	37.2	8.9	22.2	9.3	29.5
16119	42.6607	76.4547	397.5	1334.7	33.9	8.1	19.3	9.7	26.6
16120	42.7196	76.5688	361.2	694.9	22.2	8.5	19.8	5.0	27.0
16120	42.7196	76.5688	361.2	2244.9	51.7	8.5	19.2	15.1	26.0

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
19642	42.9452	76.6997	153.0	548.9	23.3	10.5	23.4	3.8	30.4
19643	42.9494	76.6975	158.5	548.6	23.3	10.4	23.5	3.8	30.5
19644	42.9452	76.6762	152.4	548.6	22.8	10.5	22.4	3.8	29.4
19645	42.9417	76.6735	152.4	548.6	23.3	10.5	23.4	3.8	30.4
19646	42.9383	76.6706	153.9	548.6	25.6	10.5	27.5	3.8	34.4
19647	42.9189	76.6721	156.7	556.0	25.0	10.5	26.1	3.9	33.1
19649	42.9228	78.2851	306.3	466.0	22.2	9.0	28.4	3.2	35.2
19652	42.9386	76.7274	128.0	527.9	22.8	10.7	22.8	3.7	29.7
19653	42.9353	76.7236	138.7	536.8	23.3	10.6	23.6	3.7	30.6
19656	42.8998	78.3418	307.8	496.2	21.1	9.0	24.4	3.4	31.3
19664	42.9433	76.7255	134.1	555.3	25.6	10.7	26.8	3.9	33.8
19665	42.9189	76.7148	155.4	556.0	22.8	10.5	22.1	3.9	29.1
19666	43.9390	76.7218	141.7	537.7	21.1	10.6	19.5	3.7	26.5
19672	42.8001	76.8327	207.3	765.0	28.3	10.0	24.0	5.5	31.2
19673	42.7938	76.8172	203.3	783.9	28.3	10.0	23.4	5.7	30.6
19675	42.8624	76.9330	152.4	660.5	21.7	10.5	16.9	4.7	24.0
19678	42.9512	78.3858	267.6	374.0	18.3	9.4	23.9	2.4	30.5
19679	42.7855	77.9480	326.1	769.0	27.2	8.8	24.0	5.6	31.2
19680	42.8750	78.3292	370.0	573.0	23.3	8.4	26.1	4.0	33.1
19686	42.5883	76.8444	310.3	807.7	28.9	9.0	24.7	5.8	31.9
19686	42.5883	76.8444	310.3	1246.6	43.3	9.0	27.6	9.1	34.9
19691	42.3031	77.1461	550.2	1007.4	28.3	6.6	21.6	7.3	28.9
19692	42.4326	76.9708	467.3	2551.2	59.4	7.4	20.4	16.5	26.9
19692	42.4326	76.9708	467.3	2550.0	59.4	7.4	20.4	16.5	26.9
19692	42.4326	76.9708	467.3	2548.4	59.4	7.4	20.4	16.5	26.9
20410	42.9051	78.2857	342.0	520.0	21.1	8.6	24.0	3.6	30.9
20411	42.6909	75.7294	553.2	1596.8	40.6	6.6	21.3	11.4	28.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
20412	42.8186	76.8942	165.2	748.0	30.0	10.4	26.2	5.4	33.4
20422	42.8625	76.6842	146.3	610.2	26.7	10.6	26.4	4.3	33.5
20425	42.1236	76.1954	408.4	1604.5	34.4	8.0	16.5	11.5	23.6
20427	42.0362	76.2171	385.6	1687.1	36.7	8.2	16.9	12.0	24.0
20434	42.9766	77.9554	254.5	188.4	20.0	9.5	55.7	0.9	60.7
20435	42.9717	77.9630	262.1	427.9	20.0	9.4	24.7	2.9	31.4
20437	42.9096	76.6761	144.8	611.4	27.6	10.6	27.9	4.3	34.9
20440	42.8378	75.6333	413.9	882.7	28.9	7.9	23.7	6.4	31.0
20446	42.7087	76.8086	228.6	1937.9	47.8	9.8	19.6	13.5	26.6
20451	42.9030	76.6832	143.3	556.3	23.3	10.6	22.9	3.9	29.9
20452	42.8992	76.6830	152.4	565.4	23.3	10.5	22.7	4.0	29.7
20453	42.9032	76.6740	153.0	553.2	22.8	10.5	22.2	3.9	29.2
20454	42.8984	76.6782	159.4	560.2	22.8	10.4	22.0	3.9	29.0
20455	42.8997	76.6737	157.6	564.8	22.8	10.5	21.8	4.0	28.8
20486	42.9767	77.9625	266.4	420.0	21.1	9.4	27.9	2.8	34.6
20487	42.9730	77.9741	271.3	426.4	21.1	9.3	27.6	2.9	34.3
20490	42.9222	78.1198	304.5	481.6	22.8	9.0	28.6	3.3	35.4

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
21450	42.2365	77.5110	664.5	1449.9	39.4	5.5	23.4	10.5	30.6
21451	42.0497	76.1596	347.5	1470.1	37.8	8.6	19.9	10.6	27.1
21456	42.2158	77.6779	699.5	1450.2	38.9	5.1	23.3	10.5	30.5
21457	42.0828	76.1043	353.6	1466.1	39.4	8.5	21.1	10.6	28.3
21458	42.2824	77.7250	590.4	1204.3	35.0	6.2	23.9	8.8	31.2
21459	42.3626	77.5598	559.3	1135.4	25.0	6.5	16.3	8.3	23.6
21463	42.1869	75.7878	470.9	1645.3	47.8	7.4	24.6	11.7	31.7
21464	42.2834	77.7249	586.7	1204.6	35.0	6.2	23.9	8.8	31.2
21465	42.8881	77.4538	332.2	680.9	32.2	8.7	34.5	4.9	41.6
21467	42.4162	76.8996	247.8	805.3	28.3	9.6	23.3	5.8	30.5
21468	42.4197	77.4536	512.1	1472.2	37.8	7.0	20.9	10.6	28.1
21468	42.4197	77.4536	512.1	2507.6	58.9	7.0	20.7	16.3	27.2
21468	42.4197	77.4536	512.1	3013.6	67.2	7.0	20.0	18.0	26.0
21470	42.2388	77.5203	659.0	1367.0	36.7	5.5	22.8	9.9	30.0
21495	42.2700	76.7140	540.4	288.0	17.8	6.7	38.4	1.8	44.5
21495	42.2700	76.7140	540.4	1473.4	39.4	6.7	22.2	10.6	29.4
21495	42.2700	76.7140	540.4	2920.0	64.4	6.7	19.8	17.8	25.9
21495	42.2700	76.7140	540.4	3603.0	93.3	6.7	24.0	18.9	29.3
21495	42.2700	76.7140	540.4	3603.0	86.1	6.7	22.0	18.9	27.3
21496	42.4053	77.4636	536.4	281.0	18.3	6.7	41.2	1.7	47.3
21496	42.4053	77.4636	536.4	1057.7	33.9	6.7	25.7	7.7	33.0
21496	42.4053	77.4636	536.4	1633.7	42.2	6.7	21.7	11.7	28.9
21496	42.4053	77.4636	536.4	2523.1	56.1	6.7	19.6	16.4	26.1
21496	42.4053	77.4636	536.4	3066.0	67.8	6.7	19.9	18.2	25.8
21496	42.4053	77.4636	536.4	3041.3	67.8	6.7	20.1	18.1	26.0
21497	42.0179	76.2749	442.0	1627.0	36.7	7.7	17.8	11.6	25.0
21499	42.1408	75.8420	417.6	1594.1	42.2	7.9	21.5	11.4	28.7

Table A-6 (Cont.)

API CODE	LATITUDE	LONGITUDE	ELEV. (M)	DEPTH (M)	BHT (C)	SURF. TEMP. (C)	AVERAGE GRADIENT (C/KM)	BHT CORRECT. (C)	CORRECTED GRADIENT (C/KM)
21500	42.6389	75.9136	516.6	1146.4	32.8	6.9	22.5	8.4	29.8
21500	42.6389	75.9136	516.6	2098.9	46.1	6.9	18.7	14.4	25.5
21504	42.1355	77.4513	539.5	1314.6	38.9	6.7	24.5	9.6	31.7
21505	42.1565	77.4464	457.2	1181.1	36.7	7.5	24.7	8.6	32.0
21507	43.0076	78.4303	249.9	321.0	16.1	9.6	20.4	2.0	26.7
21550	43.0502	78.2295	250.5	297.6	17.8	9.5	27.7	1.8	33.8
21564	42.7580	77.8505	170.7	206.7	23.3	10.3	62.9	1.1	68.2
21567	42.9959	78.4422	254.5	335.6	17.2	9.5	23.0	2.1	29.4
60709	42.0506	77.4482	550.5	1268.0	43.3	6.6	29.0	9.2	36.2
60710	42.0578	77.4282	480.7	1212.8	45.6	7.3	31.6	8.8	38.8
61206	42.4104	76.8949	224.9	781.5	28.9	9.8	24.4	5.6	31.7
90001	42.9449	76.5447	215.8	1555.4	50.0	9.9	25.8	11.2	33.0

Table A-7.
NOAA Data.

STATION ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	SURFACE T (DEG C)	S.L. DATUM T (DEG C)
30 23	42.1000	77.2333	304.8	8.5	11.5
30 85	42.2500	77.8000	530.4	7.3	12.5
30 93	42.1000	78.7500	457.2	7.8	12.3
30 183	42.3000	78.0167	432.8	7.6	11.9
30 321	42.9000	76.5333	217.9	8.8	10.9
30 360	42.3000	75.4833	309.4	8.4	11.4
30 443	43.0000	78.1833	274.3	8.4	11.1
30 687	42.2167	75.9833	484.6	7.8	12.5
30 1012	42.9333	78.7333	214.9	8.4	10.5
30 1752	42.7000	74.9167	378.0	7.6	11.3
30 1799	42.6000	76.1833	344.1	7.7	11.0
30 1947	42.5667	77.7000	208.8	9.4	11.5
30 2036	42.2500	74.9333	411.5	7.7	11.7
30 2610	42.1000	76.8167	268.2	8.9	11.6
30 3033	42.4167	79.3000	231.6	9.7	12.0
30 3184	42.8833	77.0333	218.8	9.0	11.1
30 3773	42.7833	77.6167	274.9	8.6	11.2
30 4174	42.4500	76.4500	292.6	8.1	11.0
30 4208	42.1167	79.2333	423.7	8.8	12.9
30 4715	43.1833	79.0500	100.6	9.7	10.7
30 4791	43.0667	74.8667	274.3	7.4	10.1
30 4808	42.2500	78.8000	480.1	7.1	11.8
30 4844	43.1833	78.6500	158.5	8.8	10.3
30 5512	42.9000	75.6500	396.2	6.4	10.3
30 6085	42.5333	75.5000	341.4	7.0	10.3
30 6314	43.4667	76.5000	106.7	8.6	9.7
30 6510	42.6500	77.0833	219.5	9.6	11.8
30 7167	43.1167	77.6667	166.7	8.8	10.5
30 7317	42.2833	74.5667	454.2	7.3	11.8
30 7413	43.1667	74.8667	420.6	5.8	9.9
30 7842	43.2000	77.0167	128.0	9.3	10.5
30 8058	42.7167	78.6000	332.2	7.9	11.1
30 8383	43.1167	76.1167	125.0	8.9	10.2
36 865	41.8000	78.6333	645.6	6.6	12.9
36 868	41.9500	78.7333	512.1	7.4	12.4
36 1790	41.9167	79.6333	438.9	8.4	12.7
36 4432	41.6833	78.8000	533.4	6.6	11.8
36 4873	42.0000	77.1333	304.8	8.7	11.7
36 5915	41.8333	75.8667	475.5	7.1	11.8
36 8905	41.7500	76.4167	227.1	9.3	11.6
36 9298	41.8500	79.1333	390.1	9.1	12.9

Table A-8a.
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
1105510	42.0800	78.0532	602.6	1402.1	-800.4
1104463	42.2584	77.7556	535.5	1158.5	-624.2
1203995	42.2911	78.1623	486.5	1024.7	-539.2
1204925	42.2979	77.9575	492.6	1040.6	-548.9
1403990	42.4006	78.0769	551.7	922.0	-371.2
1504248	42.4705	78.1603	479.1	765.7	-290.2
1504025	42.3463	78.2162	512.7	977.8	-466.0
1604052	42.2662	78.1954	568.8	1121.7	-553.8
1604168	42.2774	78.2876	613.3	1134.8	-522.4
1704153	42.2763	78.9206	558.7	902.8	-346.9
1705060	42.1850	77.9418	605.3	1295.4	-690.7
1804673	42.0404	77.8474	682.4	1501.1	-819.6
1804777	42.1952	77.9106	572.1	1254.6	-683.4
1904849	42.1240	78.1810	622.1	1355.8	-734.6
2004854	42.3990	75.8804	436.8	951.0	-515.1
2005087	42.3235	75.9480	307.2	944.9	-641.6
2104169	42.0081	78.5120	726.9	1487.4	-761.4
2204373	42.1337	78.5220	569.7	1184.1	-615.4
2304713	42.0987	78.5358	442.3	1063.8	-624.5
2403900	42.0958	78.6628	432.2	1050.0	-618.7
2604170	42.0448	78.6929	682.1	1348.4	-667.2
2704554	42.0564	78.6210	568.1	1216.5	-649.2
2805327	42.3682	78.9914	396.8	623.3	-227.4
2904134	42.1892	78.3522	459.0	1048.5	-590.4
3304197	42.2616	78.3637	608.7	1129.3	-521.8
3404529	42.1135	78.4545	531.3	1167.4	-637.0
3504820	42.0036	78.4348	657.8	1436.5	-779.7
3605204	42.3964	78.8370	517.2	765.7	-249.3
4204550	42.4407	78.9594	342.3	527.3	-185.9
4504594	42.4638	78.9825	337.4	513.6	-177.1
4704238	42.1115	78.9775	550.2	1039.1	-489.8
5004088	42.0238	78.9518	397.2	1006.4	-609.9
5104142	42.8987	76.6506	163.4	6.1	156.4
5204241	42.9460	76.6413	188.4	3.7	183.8
6004043	42.8611	76.4533	252.1	144.8	106.7
7004356	42.2767	79.5095	417.3	630.9	-214.6
7204154	42.3421	79.1319	493.5	712.0	-222.5
7204200	42.3129	79.5249	471.2	688.8	-217.9
7304561	42.2345	79.3730	468.2	743.7	-279.2
7304437	42.1503	79.3379	539.8	805.3	-268.8
7404671	42.2398	79.4202	465.7	738.5	-273.7
7504173	42.5235	79.0949	256.0	335.9	-80.8
7504039	42..1661	79.2845	540.1	899.8	-360.6
7604204	42.1606	79.6731	453.2	734.6	-282.2
7804948	42.3873	79.3905	353.9	491.9	-139.0
7804867	42.4314	79.3865	204.5	303.3	-99.7
8005267	42.4317	79.4196	187.8	289.6	-102.7
8104024	42.2499	79.6747	400.8	612.6	-212.8
8204535	42.5115	79.2632	200.9	254.2	-54.3
8404156	42.3344	79.3905	406.9	598.0	-192.0
8405447	42.3790	79.1355	489.8	678.2	-189.0
8504001	42.1085	76.7972	264.0	848.9	-585.8
8503933	42.2716	76.9198	458.4	927.8	-470.3
8604191	42.1734	76.6182	390.4	962.3	-573.3
8604026	42.2762	76.9454	499.9	934.2	-435.3
8703974	42.0518	76.8888	479.5	1295.4	-816.9
8704923	42.0225	76.9471	378.9	1229.6	-851.6
9104087	42.2201	76.7700	341.1	851.9	-512.1
9204863	42.2523	76.7787	466.0	975.4	-510.2
9204543	42.3833	75.7704	454.5	1027.2	-573.6
9704714	42.5185	76.0009	480.1	808.3	-330.1
9804455	42.3905	75.0445	456.0	1010.4	-557.8

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
9804073	42.3739	75.0427	610.5	1200.9	-594.4
9904214	42.1826	74.9218	544.4	1562.1	-1020.8
9904379	42.2736	74.6278	563.3	1347.2	-787.9
10004364	42.3169	75.2341	508.4	1229.9	-724.5
10304240	42.8759	78.5030	280.4	111.3	168.2
10504527	42.9346	78.6118	253.3	32.0	220.4
10604758	42.9130	78.5067	253.9	59.1	193.9
10904816	42.5943	79.0067	221.0	257.3	-37.2
11104181	42.6263	78.6010	531.9	579.1	-48.2
11404725	42.6389	78.8869	301.1	310.9	-10.7
11504157	42.8360	78.6178	251.2	120.7	129.5
11604231	42.6947	79.0126	199.0	129.5	68.6
11804108	42.7833	78.8505	182.3	64.0	117.3
11904123	42.7143	78.9664	190.2	89.0	100.6
12105509	42.7017	78.9400	217.3	133.2	83.2
12704341	42.6840	78.5688	295.0	289.6	4.6
12804183	42.8291	78.8498	178.9	36.6	141.7
12804462	42.6928	78.4947	461.2	465.4	-4.6
12904545	42.9610	78.5073	243.2	10.1	232.3
13104645	42.6052	78.8684	407.8	438.3	-31.4
13204668	42.6048	78.8951	356.0	401.1	-46.0
13204184	42.5747	78.4686	473.7	606.6	-133.5
13504576	42.5463	78.5588	536.1	671.5	-136.2
13704632	42.5663	78.5899	496.2	603.5	-108.2
14104434	42.9163	78.2573	323.1	137.2	185.0
14104477	42.9168	78.0808	316.4	114.0	201.5
14704374	42.9071	78.3502	291.1	89.9	200.3
15206726	42.9410	77.9356	274.9	67.1	207.3
15204551	42.9292	77.9628	284.4	86.0	197.5
15305213	42.9588	78.3265	284.4	56.4	227.1
15503993	42.8807	74.9165	476.4	7.0	468.5
15604056	42.8725	77.7067	278.0	137.2	139.9
15604149	42.8942	77.7919	172.5	29.9	141.7
15803942	42.6853	77.6618	497.7	576.1	-79.2
15804567	42.9323	77.8841	243.5	38.1	201.5
15904188	42.7664	77.7551	349.9	330.1	18.9
16005061	42.8535	77.8172	184.4	96.6	86.9
16104451	42.9369	77.7130	209.7	10.1	198.7
16304166	42.7960	75.9408	283.2	225.2	57.3
16404217	42.7671	77.8823	176.5	156.1	19.5
16404234	42.7519	77.9502	322.5	317.0	4.6
16504457	42.8804	77.6226	186.2	143.3	142.0
16604053	42.7649	77.6594	421.2	410.3	7.6
16704630	42.6503	77.7560	182.6	286.5	-108.5
16804069	42.8716	77.9322	269.4	130.1	138.4
17504032	42.7963	75.4047	459.6	334.7	124.1
17604085	42.8798	75.6867	477.9	287.4	189.6
17604556	42.8666	75.3358	489.8	218.8	270.1
17704185	42.8435	75.6150	456.0	291.1	164.3
18204499	42.9150	75.4414	432.5	172.2	259.4
18304510	42.8377	75.4618	465.7	277.4	187.8
18804902	42.9204	76.2905	327.1	187.8	138.4
19604035	42.8007	77.4391	451.4	401.7	48.5
20003999	42.7968	77.3351	361.5	318.5	42.1
20104395	42.9328	77.3590	221.9	29.9	191.1
20203998	42.8648	77.3801	267.3	144.8	121.9
20804099	42.9420	77.4037	242.0	36.6	204.5
21104402	42.9051	77.4367	268.5	68.9	198.7
21504607	42.8202	77.2135	320.6	239.3	80.8
21604449	42.8688	77.1966	276.5	162.8	113.4
21603929	42.7424	77.5237	319.4	292.6	25.6
22404160	42.8369	77.0354	235.6	150.9	83.8
22503866	42.6785	77.4432	531.0	598.9	-68.9

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
22505056	42.8227	77.0574	260.6	192.6	67.1
23804245	42.5503	74.8853	490.7	646.8	-157.0
24004050	42.6045	75.2412	467.3	628.5	-162.2
24104187	42.4128	76.7220	479.5	812.9	-334.4
24104400	42.3677	76.8640	140.2	395.6	-259.1
24503940	42.4208	76.8950	186.8	427.3	-242.9
24804244	42.8251	76.8657	201.8	117.0	84.1
24804544	42.8689	76.9268	152.7	40.2	111.6
25104814	42.8947	76.7875	146.6	10.7	135.0
25204378	42.9239	76.8686	154.2	12.2	141.1
25303944	42.3089	77.2056	342.0	794.0	-452.9
25804573	42.2355	77.2226	439.2	1012.5	-574.2
26003943	42.1186	77.0874	527.6	1269.5	-742.8
26004575	42.1444	77.1411	340.8	1024.7	-684.9
26103864	42.2141	77.6800	715.4	1436.2	-721.8
26207031	42.1935	77.6860	533.4	1272.2	-739.4
26203896	42.2750	77.0616	514.2	998.5	-485.2
26303932	42.2136	76.9663	388.3	1005.5	-618.1
26404474	42.3313	77.6123	549.6	1082.6	-534.0
26504355	42.1873	77.5911	698.9	1440.2	-744.3
26705300	42.1281	77.5507	629.7	1414.3	-787.3
26905063	42.4756	77.1944	432.8	673.0	-241.1
27004247	42.2682	77.3347	534.3	1144.5	-611.1
27003897	42.0969	77.6007	692.5	1492.9	-801.3
27104172	42.0164	77.7385	639.2	1530.4	-892.1
27203924	42.0630	77.4307	505.4	1232.0	-730.6
27304007	42.3654	76.5033	404.8	708.7	-308.5
27404446	42.3396	76.4969	442.3	877.5	-436.2
27404130	42.4421	76.5928	444.1	762.0	-318.8
27503938	42.5482	76.5531	182.3	374.3	-194.5
27605017	42.5620	76.5707	267.9	449.9	-183.2
27604051	42.5170	76.6920	328.6	536.4	-208.8
28604469	42.8172	78.4135	363.6	256.0	106.7
28604432	42.8360	78.3325	440.4	327.7	111.9
28804349	42.8035	78.0004	392.6	325.5	66.1
29104092	42.6173	78.0803	479.5	612.6	-137.2
29104162	42.6702	78.0826	451.4	522.1	-73.5
29404385	42.6300	78.1539	539.8	626.4	-87.5
29504133	42.8306	78.1170	463.0	345.9	116.1
29704537	42.8507	78.1817	442.6	321.3	120.4
30004649	42.7866	78.1357	482.5	397.8	83.8
30104392	42.7477	78.1979	490.1	469.4	19.8
30304212	42.7451	78.3582	405.7	371.9	32.9
30406073	42.7552	78.0976	458.1	420.6	36.9
30604797	42.7494	77.0038	253.3	256.0	-3.7
30604796	42.6838	77.0223	293.8	336.5	-43.6
30704410	42.4739	76.9555	336.2	522.7	-187.5
60004055	42.6310	74.7082	603.2	524.9	78.3
60001160	42.6933	75.3618	418.5	445.0	-26.5
60000443	42.1988	76.5370	328.3	909.5	-581.3
60010608	42.3177	75.6711	428.2	1104.3	-676.0
60010607	42.4565	75.4851	528.8	1013.2	-484.3
60010609	42.3476	75.5887	516.3	1110.1	-593.8
60010096	42.1855	74.7150	512.7	1543.2	-1030.5
60010227	42.2978	74.6251	613.3	1327.7	-714.5
60010138	42.7083	75.0833	495.3	427.6	67.7
60010725	42.5417	75.2083	352.3	659.9	-307.5
60006787	42.7861	75.6898	465.1	413.9	51.2
60009848	42.0833	76.4167	393.8	1278.9	-885.1
60009557	42.1667	76.3333	452.6	1325.3	-872.6
60010335	42.2083	76.6250	432.2	1037.8	-605.6
60012163	42.9369	76.3459	303.9	148.7	155.1
60011654	42.9167	76.2551	417.6	292.0	125.6

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
60099999	42.3333	75.9167	303.6	947.9	-644.3
60008578	41.9167	74.8750	549.6	2200.7	-1651.1
76100032	41.7501	79.6703	531.6	1188.4	-656.8
76100056	42.1840	79.8704	273.1	499.9	-226.8
76100078	41.9253	77.3414	584.6	1507.2	-922.6
76100080	41.6716	79.3436	525.8	1359.4	-833.6
76200069	42.0372	79.8002	474.9	823.0	-348.1
76200077	41.8988	78.6512	466.6	1256.7	-790.0
76200095	41.8876	77.5988	509.6	1568.5	-1058.9
76300015	41.7838	76.3414	420.9	1888.5	-1467.6
76300015	41.8848	77.4952	491.3	1320.7	-829.4
76400109	42.1428	80.0477	198.1	424.3	-226.2
76403173	41.9449	78.8428	640.4	1327.4	-687.0
76400609	41.9539	79.2014	498.0	1098.8	-600.8
76404380	41.9375	79.2688	551.7	1153.1	-601.4
76500163	41.9662	79.7275	540.4	954.3	-413.9
76500368	41.6900	77.3109	511.5	1635.6	-1124.1
76500955	41.8353	79.0324	602.3	1392.3	-790.0
76600004	41.9303	76.4063	218.2	1628.9	-1410.6
76900301	41.9299	77.8835	638.3	1572.8	-934.5
76900295	41.6697	77.7295	575.8	1860.8	-1285.0
77003237	41.9170	78.5100	537.1	1375.9	-838.8
77000357	41.9479	77.8053	562.1	1507.5	-945.5
77002693	41.7883	79.0225	597.4	1424.0	-826.6
77002435	41.9959	79.3155	414.5	926.6	-512.1
77000346	41.9196	77.9216	674.8	1617.3	-942.4
77107520	41.9870	78.9170	452.0	1105.2	-653.2
77102602	41.6534	79.3275	402.3	1261.0	-858.6
77209376	41.6822	78.3117	656.8	1876.0	-1219.2
77200005	41.6822	75.1808	458.7	2438.4	-1979.7
77300009	41.6991	76.3422	417.3	2115.3	-1698.0
77309369	41.7809	78.7886	455.7	1356.4	-900.7
77309580	41.6825	78.6465	674.8	1716.6	-1041.8
77300345	42.1576	79.8114	435.9	690.1	-254.2
77300006	41.7778	75.6979	380.4	2087.3	-1706.9
77420429	41.8335	80.0188	411.8	874.2	-462.4
77420057	41.6896	77.5470	478.2	1716.0	-1237.8
77520468	41.6562	79.8666	494.4	1151.2	-656.8
77520466	41.8160	79.6533	550.5	1143.0	-592.5
77520372	41.8714	79.7727	481.6	929.6	-448.1
77524704	41.9207	79.5535	468.2	981.5	-513.3
77520370	41.9534	79.8269	398.4	794.0	-395.6
77620445	41.7787	80.0519	430.1	901.0	-470.9
77620500	41.8073	80.1028	357.8	793.7	-435.9
77820415	41.9204	79.9329	378.0	767.8	-389.8
37358001	42.3424	75.0818	444.1	1108.9	-664.8
37357001	42.5474	75.2746	429.2	695.9	-266.7
37357002	42.6933	75.3451	418.5	443.5	-25.0
37356002	42. 8608	75.4024	371.9	149.4	222.5
37338002	42.0949	75.9035	286.5	1193.3	-906.8
37339001	42.1664	76.0759	295.0	1134.5	-839.4
37340001	42.2223	76.4200	294.1	912.6	-618.4
37340003	42.0839	76.2718	298.7	1189.9	-891.2
37341002	42.2375	76.7078	506.9	1024.7	-517.9
37341005	42.1985	76.5382	328.3	906.5	-578.2
37341009	42.1027	76.6840	328.9	1025.3	-696.5
37341010	42.0086	76.5626	234.7	1133.9	-899.2
37342001	42.2234	76.9045	389.2	920.5	-531.3
37342003	42.2312	76.8249	300.8	816.9	-516.0
37342008	42.0959	76.8814	277.7	998.2	-720.5
37342009	42.0563	76.7748	411.2	1190.9	-779.7
37343015	42.1909	77.2376	482.8	1104.0	-621.2
37343020	42.1568	77.0155	353.6	980.8	-627.3

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
37343021	42.0839	77.1901	470.3	1343.6	-873.3
37343022	42.0847	77.2486	307.5	1142.7	-835.2
37343024	42.2237	77.0167	530.7	1097.6	-566.9
37343027	42.0278	77.0550	507.5	1434.4	-926.9
37344003	42.1954	77.3187	509.9	1192.1	-682.1
37344007	42.1601	77.4670	520.9	1267.1	-746.2
37344017	42.1469	77.4114	518.2	1287.8	-769.6
37344036	42.0887	77.3587	427.9	1189.6	-761.7
37344052	42.0688	77.4108	471.2	1193.0	-721.8
37344056	42.0471	77.2973	517.9	1454.8	-937.0
37345004	42.2366	77.5059	647.7	1306.7	-659.0
37345024	42.1361	77.6905	705.3	1467.9	-762.6
37345035	42.1005	77.6338	678.2	1496.9	-818.7
37345043	42.0500	77.6759	694.6	1575.8	-881.2
37345057	42.0220	77.5713	583.7	1493.8	-910.1
37345060	42.0193	77.5144	492.6	1473.7	-981.2
37330001	42.3608	75.9920	396.2	939.1	-542.8
37331001	42.4222	76.2016	358.7	763.8	-405.1
37332001	42.3918	76.3918	326.4	725.7	-399.3
37333001	42.4704	76.5041	121.9	474.0	-352.0
37333002	42.4309	76.5093	120.7	515.7	-395.0
37333008	42.3295	76.5960	477.0	851.6	-374.6
37333009	42.3333	76.7205	448.7	726.9	-278.3
37334001	42.4982	76.8371	374.9	597.1	-222.2
37334003	42.4082	76.7712	574.9	897.6	-322.8
37334011	42.4388	76.9613	481.3	713.8	-232.6
37334014	42.3824	76.8824	208.8	447.4	-238.7
37334017	42.3615	76.9935	511.8	812.3	-300.5
37334020	42.3147	76.8135	317.0	725.4	-408.4
37335006	42.4860	77.0534	347.2	510.8	-163.7
37335017	42.4805	77.0778	380.4	525.8	-145.4
37335019	42.4550	77.0748	446.2	620.3	-174.0
37335027	42.4018	77.2153	22.5	555.7	-333.1
37335030	42.3999	77.1123	483.1	712.6	-229.5
37335031	42.3385	77.0885	507.5	859.5	-352.0
37336001	42.4962	77.3300	557.5	876.0	-318.8
37336003	42.4560	77.3136	424.9	752.9	-328.0
37336004	42.4196	77.4951	489.8	931.8	-442.0
37336005	42.3975	77.4158	359.4	787.9	-428.5
37336006	42.3950	77.2715	299.3	687.9	-388.6
37336007	42.3429	77.3400	377.6	920.2	-542.5
37336009	42.3007	77.2882	343.8	869.9	-526.1
37337001	42.4625	77.6166	610.8	990.0	-379.2
37337004	42.3728	77.5726	480.1	970.8	-490.7
37337013	42.3339	77.5844	568.5	1107.0	-538.6
37337014	42.3103	77.7130	493.5	1078.1	-584.6
37337017	42.2861	77.6834	634.0	1226.8	-592.8
37322001	42.5209	75.8947	326.1	725.4	-399.3
37323001	42.6422	76.2356	459.9	588.3	-128.3
37324006	42.5751	76.3122	420.6	633.4	-212.8
37324013	42.5493	76.3970	413.3	625.1	-211.8
37324018	42.5348	76.4852	312.7	479.1	-166.4
37325003	42.6848	76.6443	251.2	307.8	-56.7
37326001	42.6749	76.7832	267.9	345.6	-77.7
37326002	42.6208	76.9497	249.6	333.1	-83.5
37326008	42.5322	76.9828	341.4	502.6	-161.2
37326009	42.5209	76.8735	232.6	452.9	-220.4
37326012	42.5309	76.7733	477.0	712.3	-235.3
37326014	42.6647	76.9840	158.5	203.9	-45.4
37327001	42.7165	77.0103	270.7	292.0	-21.3
37327011	42.5110	77.0419	407.8	581.3	-173.4
37327013	42.5866	77.2393	434.3	554.1	-119.8
37327015	42.5151	77.1475	416.4	600.8	-184.4

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
37328004	42.6141	77.4137	237.7	426.7	-189.0
37329002	42.5446	77.6741	283.5	518.2	-234.7
37329003	42.6999	77.6695	487.7	553.2	-65.5
37314001	42.8809	75.6449	384.0	113.1	271.0
37315002	42.8892	76.1899	189.0	74.4	114.6
37316002	42.9568	76.5792	170.7	0.3	170.4
37318004	42.9104	77.9243	162.2	8.2	153.9
37318007	42.8435	77.1697	285.0	100.6	184.4
37319001	42.9458	77.3889	214.3	12.5	201.8
37319005	42.8251	77.3315	317.0	243.8	73.2
37319020	42.8685	77.4839	271.3	151.8	119.5
37320001	42.9523	77.6186	208.8	4.0	204.8
37320011	42.8272	77.5622	246.9	167.6	79.2
37320015	42.8583	77.6431	313.9	158.5	155.4
37320018	42.7979	77.6802	329.8	264.0	65.8
37320019	42.8660	77.5150	263.7	137.2	126.5
37309003	43.0025	76.1873	308.8	102.1	206.7
37347002	41.7547	76.4218	232.0	1569.7	-1337.8
37348002	41.9816	76.7367	410.0	1341.1	-931.2
37348003	41.8215	76.5326	440.4	1670.3	-1229.9
37349001	41.9818	76.9213	487.4	1434.1	-946.7
37349002	41.8899	76.8746	565.7	1702.3	-1136.6
37349003	41.8362	76.9678	500.5	1656.0	-1155.5
37350001	41.9915	77.1392	321.9	1289.3	-967.4
37350040	41.9337	77.1438	436.5	1466.1	-1029.6
37350042	41.8990	77.2306	489.5	1528.9	-1039.4
37350049	41.7692	77.1370	440.4	1668.8	-1228.3
37350050	41.7540	77.0464	419.1	1629.8	-1210.7
37351015	41.9069	77.4159	533.4	1532.2	-998.8
37351018	41.8799	77.4635	513.0	1597.8	-1084.8
37352002	41.9907	77.6833	656.5	1545.6	-889.1
37352006	41.9986	77.5778	627.6	1521.3	-893.7
37352011	41.9791	77.6225	520.9	1477.7	-956.8
37352033	41.8495	77.6169	643.4	1674.0	-1030.5
37352034	41.8351	77.6821	631.5	1657.2	-1025.7
39008003	43.0310	78.2774	269.7	6.1	263.7
39012006	42.8807	77.9792	334.7	178.3	156.4
39012013	42.8763	77.8646	193.5	63.4	130.1
39012019	42.7870	77.8689	187.1	144.8	42.4
39012023	42.8457	77.9697	364.2	254.5	109.7
39012024	42.8182	77.9884	338.3	256.0	82.3
39012026	42.7919	77.9768	361.2	331.6	29.6
39012027	42.7602	77.9950	405.4	393.2	12.2
39013001	42.9904	78.1894	271.0	30.5	240.5
39013003	42.9482	78.0437	283.5	65.5	217.9
39013013	42.8927	78.1801	350.5	166.1	184.4
39013030	42.8997	78.0704	323.1	141.7	181.4
39013062	42.8890	78.2476	285.0	132.9	152.1
39014003	42.9842	78.4382	256.0	9.8	246.3
39014015	42.9877	78.4283	268.2	30.8	237.4
39014028	42.9468	78.4185	262.1	32.3	229.8
39014040	42.8761	78.3290	371.9	166.4	205.4
39014047	42.8550	78.3998	371.9	254.8	117.0
39014052	42.8402	78.4586	286.2	164.6	121.6
39014082	42.7733	78.4824	358.1	240.8	117.3
39014098	42.7651	78.2814	451.1	368.8	82.3
39014099	42.8976	78.4620	275.8	91.1	184.7
39015002	42.9732	78.6265	221.0	29.0	192.0
39015004	42.9556	78.9140	245.4	44.2	201.2
39015037	42.8970	78.6757	225.6	39.6	185.9
39015041	42.8879	78.5949	221.0	48.8	172.2
39015071	42.8374	78.7412	198.1	51.8	146.3
39015087	42.8270	78.5166	306.3	187.5	118.9

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39015103	42.7714	78.7276	269.7	181.1	88.7
39015107	42.7769	78.5692	303.3	251.5	51.8
39016016	42.9219	78.7916	201.2	18.6	182.6
39016017	42.8848	78.7560	185.3	9.8	175.6
39016027	42.8106	78.7929	193.5	61.0	132.6
39016041	42.7947	78.7556	225.6	106.4	119.2
39016042	42.7629	78.7784	239.3	149.4	89.9
39017001	42.7313	77.8713	175.0	204.2	-29.3
39017002	42.5795	77.9413	300.2	490.1	-189.9
39018002	42.7164	78.0058	406.9	445.9	-39.0
39018003	42.6853	78.1139	426.7	472.7	-46.0
39018018	42.5011	78.2295	599.5	880.6	-281.0
39018020	42.5704	78.0789	486.2	662.0	-175.9
39019004	42.7294	78.4688	302.1	273.4	28.7
39019015	42.6527	78.4931	414.8	461.8	-46.9
39019022	42.7270	78.4182	452.0	427.9	24.1
39019025	42.7009	78.4566	298.4	300.8	-2.4
39019029	42.6513	78.3221	530.4	606.6	-76.2
39019030	42.6228	78.4260	460.2	557.2	-96.9
39019031	42.6848	78.3009	481.6	528.2	-46.6
39019032	42.6094	78.2582	546.8	685.8	-139.0
39019033	42.5869	78.3835	507.5	653.5	-146.0
39019037	42.5332	78.3389	566.9	786.4	-219.5
39019038	42.5776	78.2929	554.7	745.8	-191.1
39019042	42.5306	78.4236	452.0	753.8	-201.8
39020001	42.7420	78.6416	286.5	246.9	39.6
39020008	42.7253	78.5949	256.0	262.1	-6.1
39020021	42.7445	78.5237	352.0	304.8	47.2
39020040	42.6955	78.7059	359.7	384.7	-25.0
39020050	42.6351	78.7321	317.0	350.8	-33.8
39020068	42.6653	78.6383	461.8	393.2	68.6
39020081	42.6134	78.5981	503.2	554.7	-51.5
39020089	42.6783	78.5261	454.5	459.6	-5.2
39020092	42.6019	78.7101	326.7	386.2	-59.4
39020093	42.5982	78.6488	379.2	457.2	-78.0
39020099	42.5507	78.7303	451.1	570.6	-119.5
39020103	42.5302	78.6767	444.7	563.9	-119.2
39020108	42.5220	78.5859	432.8	584.3	-151.5
39021003	42.7484	78.8014	234.7	161.5	73.2
39021018	42.7134	78.8162	245.4	198.1	47.2
39021020	42.7108	78.8857	240.8	159.4	81.4
39021026	42.7382	78.7500	256.3	204.2	52.1
39021038	42.6137	78.9696	233.2	242.3	-9.1
39021042	42.6754	78.5994	233.2	178.3	54.9
39021052	42.6754	78.8037	344.4	321.6	22.9
39021062	42.6165	78.8022	374.9	440.1	-65.2
39021092	42.5614	78.9260	292.6	386.5	-93.9
39021100	42.5422	78.8393	407.2	516.6	-109.4
39021115	42.5677	78.7519	459.3	559.6	-100.3
39021122	42.5154	78.9695	248.4	370.3	-121.9
39021133	42.5184	78.7835	438.9	586.7	-147.8
39022001	42.6697	79.0280	187.1	137.2	50.0
39022005	42.6135	79.1057	181.4	182.9	-1.5
39022011	42.6094	79.0457	208.8	221.0	-12.2
39022023	42.5737	79.0967	225.6	259.1	-33.5
39022026	42.5463	79.0413	189.0	271.3	-82.3
39022028	42.5381	79.2306	175.3	198.1	-22.9
39022067	42.5187	79.1723	219.5	281.9	-62.5
39022083	42.5192	79.0242	246.9	362.7	-115.8
39023001	42.4520	77.9948	610.2	929.6	-319.4
39023003	42.4348	77.8426	468.8	835.5	-366.7
39023009	42.3295	77.9524	529.1	1082.0	-552.9
39023010	42.3204	77.7990	467.6	1018.0	-550.5

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39023015	42.4289	77.9564	550.8	918.7	-367.9
39024031	42.3409	78.1476	549.9	998.5	-448.7
39024037	42.3303	78.0449	531.0	1086.3	-555.3
39024040	42.2702	78.0569	411.5	1026.6	-615.1
39024041	42.2579	78.0078	516.0	1078.7	-562.7
39024043	42.4260	78.1797	457.5	782.4	-324.9
39024045	42.4531	78.1743	509.6	823.0	-313.3
39024050	42.3552	78.0917	524.3	941.8	-417.6
39025001	42.4682	78.4621	463.3	730.6	-267.3
39025004	42.3374	78.4684	495.3	887.6	-392.3
39025005	42.4488	78.2812	587.3	916.2	-328.9
39025007	42.3166	78.2879	634.0	1108.9	-474.9
39026001	42.4940	78.6879	391.7	548.6	-157.0
39026002	42.4861	78.6455	403.9	589.8	-185.9
39026003	42.4095	78.6934	460.2	723.6	-263.3
39026004	42.4232	78.6144	440.4	693.7	-253.3
39026005	42.4443	78.6577	490.7	725.4	-234.7
39026006	42.3717	78.6919	521.2	812.3	-291.1
39026007	42.4336	78.7310	426.7	656.8	-230.1
39027002	42.4967	78.9115	274.3	433.4	-159.1
39027003	42.4996	78.8560	337.4	484.6	-147.2
39027012	42.4597	78.8983	322.5	487.7	-165.2
39027023	42.4479	78.8460	367.6	560.8	-193.2
39027027	42.4638	78.7943	296.3	440.4	-144.2
39027053	42.4073	78.9059	417.6	645.9	-228.3
39027063	42.3931	78.8825	394.4	655.3	-260.9
39027066	42.3451	78.9115	555.0	826.0	-271.0
39028003	42.4984	79.2137	227.1	297.2	-70.1
39028018	42.4583	79.2489	298.7	402.3	-103.6
39028034	42.4723	79.1350	356.6	474.0	-117.3
39028040	42.4517	79.1239	425.2	576.1	-150.9
39028052	42.4342	79.1808	381.0	512.7	-131.7
39028055	42.3859	79.2292	541.0	720.9	-179.8
39028062	42.4523	79.0718	487.7	667.5	-179.8
39028071	42.2999	79.1863	621.8	848.9	-227.1
39028081	42.4734	79.0272	352.0	518.2	-166.1
39028088	42.4556	79.0275	423.7	612.6	-189.0
39028103	42.2813	79.0260	416.7	708.4	-291.7
39029001	42.4863	79.3387	176.8	251.5	-74.7
39029029	42.4482	79.2757	271.3	368.8	-97.5
39029036	42.3906	79.4744	201.5	329.2	-127.7
39029048	42.3676	79.3307	375.5	548.0	-172.5
39029059	42.4071	79.2651	442.0	586.4	-144.5
39030002	42.3556	79.5594	189.9	332.2	-142.3
39030004	42.3372	79.5846	201.2	344.4	-143.3
39031008	42.2184	77.8278	673.0	1330.1	-657.1
39031012	42.1348	77.9711	450.8	1196.3	-745.5
39031014	42.1370	77.8277	630.3	1450.2	-819.9
39031019	42.1158	77.7694	676.4	1476.1	-799.8
39031028	42.0188	77.9488	612.0	1433.8	-821.7
39031066	42.0781	77.7707	669.6	1490.5	-820.8
39032009	42.1818	78.0798	635.5	1307.0	-671.5
39032013	42.2143	78.0000	544.1	1182.3	-638.3
39032020	42.1433	78.0902	584.3	1311.2	-726.9
39032027	42.0955	78.1728	566.9	1325.0	-758.0
39032031	42.0060	78.1469	615.4	1485.0	-869.6
39032033	42.0578	78.0106	737.0	1596.2	-859.2
39033001	42.2206	78.4683	579.7	1109.2	-529.4
39033009	42.1135	78.3789	542.5	1225.3	-682.8
39033017	42.2385	78.3937	532.2	1069.2	-537.1
39033025	42.1940	78.4315	608.1	1178.7	-570.6
39033027	42.1903	78.2981	554.7	1181.7	-627.0
39033028	42.0562	78.4036	455.7	1168.0	-712.3

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39034002	42.1807	78.5352	591.9	1155.2	-563.3
39034008	42.0592	78.7389	684.9	1286.0	-601.1
39034019	42.1361	78.5674	534.6	1131.7	-597.1
39034023	42.1302	78.6270	662.9	1259.7	-596.8
39035001	42.2398	78.9904	499.9	865.6	-365.8
39035008	42.1543	78.8859	495.9	966.2	-470.3
39035010	42.1149	78.7766	438.6	981.5	-542.8
39035013	42.0316	78.7674	587.3	1234.1	-646.8
30935015	42.0067	78.8879	611.4	1255.8	-644.3
39036002	42.2135	79.2211	541.0	847.6	-306.6
39036009	42.0929	79.2408	403.9	845.8	-442.0
39036010	42.1102	79.0600	414.2	901.9	-487.7
39036011	42.0192	79.1669	379.2	914.1	-534.9
39036014	42.0144	79.0508	544.1	1143.0	-598.9
39037004	42.1551	79.4611	477.0	811.1	-334.1
39037007	42.0501	79.3849	467.0	921.4	-454.5
39037009	42.0229	79.2548	463.6	964.1	-500.5
39037010	42.0682	79.4156	479.1	891.2	-412.1
39038001	42.0589	79.6803	512.7	872.0	-359.4
39038003	42.1248	79.6894	479.1	791.0	-311.8
39039001	42.1641	79.7574	443.5	703.8	-260.3
39039006	42.1236	79.9233	326.1	590.7	-264.6
39039007	42.1169	79.8257	429.5	716.0	-286.5
39039008	42.1074	79.7637	422.5	731.5	-309.1
39039009	42.0674	79.9971	428.5	701.3	-272.8
39039017	42.0374	79.8942	432.8	740.7	-307.8
39039018	42.2800	79.8995	184.1	320.0	-135.9
39040001	42.1657	80.1148	177.1	385.6	-208.5
39040002	42.1359	80.0784	182.9	403.9	-221.0
39040014	42.0480	80.0781	377.3	640.1	-262.7
39040018	42.0467	80.0245	378.0	643.4	-265.5
39042001	41.9984	77.9879	635.8	1446.9	-811.1
39042006	41.9745	77.9260	654.1	1606.3	-952.2
39042020	41.9703	77.7502	661.1	1612.4	-951.3
39042040	41.9062	77.7677	631.5	1609.6	-978.1
39042060	41.8019	77.9546	621.5	1644.4	-1022.9
39043001	41.9786	78.1196	609.3	1484.1	-874.8
39043012	41.9244	78.1628	618.4	1576.1	-957.7
39043019	41.8773	78.0972	547.7	1597.2	-1049.4
39043021	41.8757	78.0132	605.0	1573.4	-968.3
39043025	41.8484	78.0251	700.4	1595.3	-894.9
39043030	41.8042	78.1164	675.7	1598.7	-922.9
39043031	41.9131	78.2072	570.3	1496.9	-926.6
39044001	41.9667	78.2801	474.0	1379.5	-905.6
39044002	41.9467	78.2872	542.5	1464.0	-921.4
39044003	41.8499	78.3390	453.5	1356.4	-902.8
39045001	41.9710	78.5764	480.4	1239.0	-758.6
39045002	41.7678	78.7220	470.9	1418.8	-947.9
39046002	41.7990	78.9843	626.4	1446.3	-819.9
39046003	41.9922	78.7732	634.6	1324.4	-689.8
39046005	41.8957	78.8869	413.9	1149.1	-735.2
39046006	41.8710	78.8431	488.6	1269.8	-781.2
39046007	41.8649	78.7673	652.6	1467.9	-815.3
39046009	41.8087	78.8949	409.0	1240.5	-831.5
39046011	41.8111	78.7563	621.8	1505.1	-883.3
39047001	41.9313	79.0284	587.0	1250.9	-663.9
39047005	41.7926	79.1890	500.5	1285.6	-785.2
39047006	41.7743	79.2152	513.9	1305.8	-791.9
39048002	41.8752	79.4673	563.6	1143.6	-580.0
39048003	41.8543	79.3100	368.2	1031.7	-663.5
39048004	41.8553	79.2696	384.7	1060.1	-675.4
39049007	41.9300	79.7375	467.3	917.4	-450.2
39049009	41.7750	79.5804	531.9	1180.2	-648.3

Table A-8a. (Cont.)
ONONDAGA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39050001	41.7788	79.9971	371.9	864.4	-492.6
39050002	41.7701	79.9182	417.0	948.2	-531.3
39051002	41.9875	80.1108	408.4	707.1	-298.7
39051005	41.8949	80.0748	430.7	825.4	-394.7
39068001	42.9022	79.7497	191.1	10.4	180.7
39068003	42.8515	79.7091	183.5	7.0	176.5

Table A-8b.
QUEENSTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
1704153	42.2763	78.9206	558.7	1282.0	-726.0
2005087	42.3235	75.9480	307.2	1783.4	-1480.1
2805327	42.3682	78.9914	396.8	997.6	-601.7
3605204	42.3964	78.8370	517.2	1138.7	-622.4
3605313	42.4311	78.8663	478.5	1047.6	-569.7
3705375	42.3717	78.8526	526.4	1168.6	-643.1
4404592	42.4432	78.9717	363.6	897.0	-534.3
4704238	42.1115	78.9775	550.2	1453.0	-903.7
5004088	42.0238	78.9518	397.2	1421.3	-1024.7
5604652	42.9465	76.7030	158.2	460.2	-302.7
5704999	43.0260	76.5289	179.5	429.5	-252.7
5805467	43.1007	76.5128	139.9	290.2	-153.3
5805011	43.1459	76.5535	123.1	214.3	-93.9
6004624	43.2525	76.4911	137.8	90.2	46.6
6104365	42.9705	76.5170	227.1	552.3	-326.1
6606644	42.8589	76.6519	193.5	562.4	-370.9
6905031	43.2015	76.6101	134.7	181.1	-49.1
7004356	42.2767	79.5095	417.3	980.5	-564.2
7204154	42.3421	79.1319	493.5	1085.7	-596.2
7204200	42.3129	79.5249	471.2	1034.2	-563.3
7304561	42.2345	79.3730	468.2	1100.9	-636.4
7304437	42.1503	79.3379	539.8	1248.5	-712.0
7404671	42.2398	79.4202	465.7	1096.4	-631.5
7604152	42.1634	79.7362	453.8	1082.0	-629.1
7604204	42.1606	79.6731	453.2	1100.9	-648.6
7804948	42.3873	79.3905	353.9	841.2	-488.3
8005267	42.4317	79.4196	187.8	624.2	-437.4
8104000	42.2539	79.6673	407.5	967.4	-560.8
8404156	42.3344	79.3905	406.9	950.7	-544.7
9705344	42.3904	75.7734	470.9	1810.5	-1340.5
10304240	42.8759	78.5030	280.4	441.4	-161.8
10504527	42.9346	78.6118	253.3	357.2	-104.9
10604758	42.9130	78.5067	253.9	387.7	-134.7
11004866	42.6080	79.0276	211.8	550.8	-339.9
11404725	42.6389	78.8869	301.1	636.1	-335.9
11504157	42.8360	78.6178	251.2	435.9	-185.6
11604231	42.6947	79.0126	199.0	443.5	-245.4
11804094	42.7832	78.8535	179.2	372.8	-194.5
12406722	42.7158	78.9422	209.4	432.5	-223.7
12804183	42.8291	78.8498	178.9	334.7	-156.4
12904545	42.9610	78.5073	243.2	323.1	-80.8
13204184	42.5747	78.4686	473.7	975.1	-502.0
13504576	42.5463	78.5588	536.1	1022.3	-487.1
13705115	43.0906	78.3136	221.6	206.7	14.0
13704632	42.5663	78.5899	496.2	951.9	-456.6
13805117	43.0403	78.3902	265.2	281.9	-19.2
14104434	42.9163	78.2573	323.1	489.5	-167.3
14104477	42.9168	78.0808	316.4	489.2	-173.7
14204593	43.0429	78.0774	217.3	220.7	-6.4
14304806	43.1154	78.0916	203.6	132.6	70.1
15204551	42.9292	77.9628	284.4	466.3	-182.9
15305213	42.9588	78.3265	284.4	387.7	-104.2
15704363	42.8618	77.8149	189.3	484.6	-296.3
15803942	42.6853	77.6618	497.7	1075.9	-579.1
15804567	42.9323	77.8841	243.5	437.4	-197.8
15904188	42.7664	77.7551	349.9	792.2	-443.2
15904189	42.8281	77.8010	223.4	571.8	-349.3
16104451	42.9369	77.7130	209.7	419.1	-210.3
16404217	42.7671	77.8823	176.5	582.2	-406.6
16504457	42.8804	77.6226	286.2	580.9	-295.7
16504458	42.9295	77.6349	230.4	462.1	-232.6
16604053	42.7649	77.6594	421.2	882.1	-464.2

Table A-8b. (Cont.)
QUEENSTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
16704630	42.6503	77.7560	182.6	784.3	-606.2
16804069	42.8716	77.9322	269.4	536.1	-267.6
17604085	42.8798	75.6867	477.9	848.3	-371.2
17703970	42.8048	75.6506	472.1	929.3	-458.7
17704185	42.8435	75.6150	456.0	825.7	-370.3
18404724	43.1509	77.9753	196.9	112.8	83.2
18504063	43.1227	78.7982	183.8	106.1	76.8
18506669	43.0799	79.0068	177.4	119.5	54.9
18606667	43.2076	78.4651	167.6	38.1	125.9
19804054	42.8119	77.4733	432.2	863.8	-432.5
20003999	42.7968	77.3351	361.5	811.4	-450.8
20004107	42.7897	77.4095	405.7	882.4	-477.6
20104395	42.9328	77.3590	221.9	479.5	-258.5
20104409	42.8965	77.3097	240.2	556.3	-317.0
20204947	42.8392	77.3679	321.0	703.2	-383.1
20804099	42.9420	77.4037	242.0	483.1	-242.0
21104760	42.9894	77.2799	182.6	362.1	-180.4
21304871	43.0216	77.3354	172.2	323.7	-154.2
21504607	42.8202	77.2135	320.6	737.0	-417.0
21604449	42.8688	77.1966	276.5	649.8	-373.7
21603929	42.7424	77.5237	319.4	808.3	-490.1
22503866	42.6785	77.4432	531.0	1168.0	-637.9
22505056	42.8227	77.0574	260.6	696.8	-437.1
22604450	42.8863	77.4817	279.5	615.7	-337.1
22604394	42.9102	77.5240	287.4	558.1	-271.6
22704730	43.1803	78.1527	210.6	126.5	82.0
22704611	43.1909	78.2583	200.9	79.2	120.7
23204722	43.1858	78.4419	190.5	79.2	109.1
24504082	42.8759	76.8400	143.9	511.5	-368.5
24804244	42.8251	76.8657	201.8	627.9	-426.7
24804544	42.8689	76.9268	152.7	529.7	-378.0
25005095	43.0349	76.9769	124.7	336.8	-214.9
25304524	42.9402	76.8877	148.1	434.9	-287.7
27203924	42.0630	77.4307	505.4	2186.9	-1685.5
27304007	42.3654	76.5033	404.8	1738.9	-1338.7
27404130	42.4421	76.5928	444.1	1629.2	-1186.0
27905041	43.1458	76.7616	131.7	202.7	-73.8
27905116	43.1520	77.0699	181.4	224.0	-45.1
28005032	43.0592	76.8961	145.4	303.6	-159.4
28006719	43.0292	76.9439	122.2	317.0	-197.5
28104754	43.0824	77.2696	154.2	235.9	-83.8
28105114	43.1116	77.0207	149.4	228.6	-80.2
29104092	42.6173	78.0803	479.5	1026.0	-550.5
29404385	42.6300	78.1539	539.8	1026.6	-487.7
29604464	42.8384	78.0967	355.4	627.3	-272.8
29904601	42.8106	78.1501	476.1	754.7	-279.5
30104392	42.7477	78.1979	490.1	854.0	-364.8
30404342	42.7411	78.3595	392.6	721.2	-329.5
30406073	42.7552	78.0976	458.1	810.8	-353.3
30604797	42.7494	77.0038	253.3	773.6	-521.2
30604796	42.6838	77.0223	293.8	876.6	-583.7
60010608	42.3177	75.6711	428.2	1953.8	-1525.5
60006778	42.5189	76.0009	478.2	1557.5	-1079.3
60012163	42.9369	76.3459	303.9	693.7	-389.8
60011654	42.9167	76.2551	417.6	874.8	-457.2
76000115	41.6716	75.3737	482.5	1777.0	-1294.5
76100032	41.7501	79.6703	531.6	1618.2	-1086.6
76100056	42.1840	79.8704	273.1	865.6	-592.5
76100059	41.9822	79.8130	465.7	1254.3	-788.5
76100080	41.6716	79.3436	525.8	1838.2	-1312.5
76200069	42.0372	79.8002	474.9	1218.0	-743.1
76200078	41.8820	78.6150	682.8	2034.2	-1351.5
76200096	41.6642	79.3747	524.9	1824.2	-1299.4

Table A-8b. (Cont.)
QUEENSTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
76400109	42.1428	80.0477	198.1	797.4	-599.2
76400609	41.9539	79.2014	498.0	1510.0	-1011.9
76404380	41.9375	79.2688	551.7	1556.2	-1004.6
77107520	41.9870	78.9170	452.0	1539.2	-1087.2
77300345	42.1576	79.8114	435.9	1061.9	-626.1
77420429	41.8335	80.0188	411.8	1305.5	-893.7
77430629	41.8278	78.5807	664.5	2115.3	-1450.8
77420057	41.6896	77.5470	478.2	2688.3	-2210.1
77520468	41.6562	79.8666	494.4	1606.3	-1111.9
77520466	41.8160	79.6533	550.5	1568.8	-1018.3
77520372	41.8714	79.7727	481.6	1342.3	-860.8
77524704	41.9207	79.5535	468.2	1393.5	-925.4
77620445	41.7787	80.0519	430.1	1345.4	-915.3
77620500	41.8073	80.1028	357.8	1228.6	-870.8
77820436	42.2169	79.8997	207.3	761.7	-554.4
77820415	41.9204	79.9329	378.0	1193.0	-815.0
37341005	42.1985	76.5382	328.3	2027.5	-1699.3
37343011	42.1804	77.1937	523.6	2049.8	-1526.1
37334019	42.3199	76.8639	367.6	1688.0	-1320.4
37335017	42.4805	77.0778	380.4	1284.7	-904.3
37325003	42.6848	76.6443	251.2	944.6	-693.4
37316002	42.9568	76.5792	170.7	487.7	-317.0
37317013	42.8778	76.7831	145.7	498.3	-352.7
37317038	42.9121	76.9893	143.6	429.8	-286.2
37318007	42.8435	77.1697	285.0	662.9	-378.0
37318009	42.7990	77.2848	338.3	777.2	-438.9
37319002	42.9433	77.2545	192.9	467.3	-274.3
37319039	42.8380	77.4039	263.7	659.6	-395.9
37320012	42.8380	77.7022	254.5	582.8	-328.3
37307002	43.1552	75.7086	131.1	56.4	74.7
37308002	43.0510	75.8705	135.3	290.8	-155.4
37309003	43.0025	76.1873	308.8	664.5	-355.7
37310009	43.1656	76.3282	115.8	189.0	-73.2
37311004	43.1211	76.5935	145.1	274.3	-129.2
37312005	43.0883	76.8532	125.9	262.1	-136.2
37313001	43.1702	77.6185	154.2	94.5	59.7
39006005	43.0877	77.8431	165.2	154.8	10.4
39008003	43.0310	78.2774	269.7	295.7	-25.9
39010003	43.0222	78.8266	175.3	224.6	-49.4
39011001	43.1158	79.1936	157.6	72.2	85.3
39012023	42.8457	77.9697	364.2	647.4	-283.2
39012024	42.8182	77.9884	338.3	654.1	-315.8
39012037	42.7602	77.9950	405.4	791.3	-385.9
39013003	42.9482	78.0437	283.5	435.9	-152.4
39013009	42.8958	78.2000	323.1	531.0	-207.9
39013019	42.8851	78.0766	347.5	578.2	-230.7
39013037	42.8906	78.0341	294.1	538.0	-243.8
39013042	42.8671	78.2101	426.7	620.9	-194.2
39014003	42.9842	78.4382	256.0	321.0	-64.9
39014035	42.9250	78.3886	272.8	393.2	-120.4
39014042	42.8182	78.4888	346.3	569.4	-223.1
39014048	42.8473	78.3693	378.0	589.8	-211.8
39014052	42.8402	78.4586	286.2	496.5	-210.3
39014077	42.7892	78.3961	350.8	633.1	-282.2
39014078	42.8583	78.2957	370.3	570.6	-200.3
39014097	42.7591	78.4368	385.6	687.3	-301.8
39014098	42.7651	78.2814	451.1	734.3	-283.2
39014099	42.8976	78.4620	275.8	413.3	-137.5
39015002	42.9732	78.6265	221.0	292.0	-71.0
39015004	42.9556	78.9140	245.4	317.3	-71.9
39015022	42.9331	78.6768	224.0	321.3	-97.2
39015038	42.8936	78.6453	208.5	340.2	-131.7
39015041	42.8879	78.5949	221.0	369.4	-148.4

Table A-8b. (Cont.)
QUEENSTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39015050	42.9544	78.5697	253.0	323.4	-70.4
39015071	42.8374	78.7412	198.1	358.1	-160.0
39015081	42.8174	78.6779	239.3	445.0	-205.7
39015082	42.8045	78.6356	288.0	501.4	-213.4
39015092	42.7925	78.5595	262.1	496.5	-234.4
39015103	42.7714	78.7276	269.7	495.0	-225.2
39016011	42.9775	78.8198	181.4	224.6	-43.3
39016016	42.9219	78.7916	201.2	306.6	-105.5
39016017	42.8848	78.7560	185.3	313.3	-128.0
39016027	42.8106	78.7929	193.5	371.2	-177.7
39016050	42.9694	78.9482	178.3	213.7	-35.4
39016051	42.9144	78.9532	180.7	279.5	-98.8
39018003	42.6853	78.1139	426.7	862.9	-436.2
39018015	42.6354	78.0431	461.8	971.1	-509.3
39018018	42.5011	78.2295	599.5	1284.7	-685.2
39018020	42.5704	78.0789	486.2	1086.3	-600.2
39019017	42.5477	78.4698	441.0	993.0	-552.0
39019025	42.7009	78.4566	298.4	657.5	-359.1
39019029	42.6513	78.3221	530.4	976.9	-446.5
39019030	42.6228	78.4260	460.2	916.8	-456.6
39019033	42.5869	78.3835	507.5	999.1	-491.6
39019037	42.5332	78.3389	566.9	1179.6	-612.6
39019038	42.5776	78.2929	554.7	1132.0	-577.3
39019042	42.5306	78.4236	452.0	1025.7	-573.6
39020001	42.7420	78.6416	286.5	568.1	-281.6
39020032	42.7135	78.5418	385.6	723.9	-338.3
39020040	42.6955	78.7059	359.7	706.5	-346.9
39020050	42.6351	78.7321	317.0	682.8	-365.8
39020081	42.6134	78.5981	503.2	897.0	-393.8
39020089	42.6783	78.5261	454.5	810.2	-355.7
39020092	42.6019	78.7101	326.7	733.7	-406.9
39020098	42.5658	78.6916	422.1	885.4	-463.3
39020105	42.5058	78.7262	417.3	901.9	-484.6
39020108	42.5220	78.5859	432.8	937.9	-505.1
39021003	42.7484	78.8014	234.7	480.1	-245.4
39021018	42.7134	78.8162	245.4	513.0	-267.6
39021020	42.7108	78.8857	240.8	479.8	-239.0
39021026	42.7382	78.7500	256.3	522.7	-266.4
39021037	42.6359	78.9489	228.6	554.4	-325.8
39021052	42.6754	78.8037	344.4	644.3	-299.9
39021055	42.6455	78.7746	425.2	786.4	-361.2
39021062	42.6165	78.8022	374.9	768.7	-393.8
39021079	42.5800	78.8549	399.3	820.8	-421.5
39021092	42.5614	78.9260	292.6	709.3	-416.7
39021100	42.5422	78.8393	407.2	841.9	-434.6
39021112	42.5912	78.7541	475.5	880.9	-405.4
39021122	42.5154	78.9695	248.4	698.6	-450.2
39021133	42.5184	78.7835	438.9	911.4	-472.4
39022002	42.6415	79.0425	200.6	495.3	-294.7
39022005	42.6135	79.1057	181.4	507.2	-325.8
39022021	42.5740	79.0253	232.3	606.9	-374.6
39022022	42.5743	79.1213	178.3	536.4	-358.1
39022028	42.5381	79.2306	175.3	551.7	-376.4
39022052	42.5450	79.1715	179.8	557.5	-377.6
39022066	42.5288	79.0915	249.9	647.7	-397.8
39022083	42.5192	79.0242	246.9	680.3	-433.4
39024024	42.3936	78.0141	610.5	1503.3	-892.8
39024039	42.2848	78.0074	595.0	1659.6	-1064.7
39024045	42.4531	78.1743	509.6	1252.7	-743.1
39025001	42.4682	78.4621	463.3	1105.5	-642.2
39025003	42.4046	78.4300	609.0	1342.9	-734.0
39025005	42.4488	78.2812	587.3	1321.9	-734.6
39026002	42.4861	78.6455	403.9	950.7	-546.8

Table A-8b. (Cont.)
QUEENSTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39026004	42.4232	78.6144	440.4	1062.5	-622.1
39026005	42.4443	78.6577	490.7	1092.7	-602.0
39026006	42.3717	78.6919	521.2	1177.4	-656.2
39027002	42.4967	78.9115	274.3	769.9	-495.6
39027003	42.4996	78.8560	337.4	826.9	-489.5
39027009	42.4916	78.8047	405.4	910.1	-504.7
39027053	42.4073	78.9059	417.6	1012.5	-595.0
39027065	42.3939	78.7571	423.7	1057.0	-633.4
39027066	42.3451	78.9115	555.0	1200.3	-645.3
39028003	42.4984	79.2137	227.1	630.9	-403.9
39028018	42.4583	79.2489	298.7	742.8	-444.1
39028030	42.4953	79.0844	286.5	728.8	-442.3
39028034	42.4723	79.1350	356.6	822.0	-465.4
39028053	42.4249	79.2061	344.4	846.1	-501.7
39028055	42.3859	79.2292	541.0	1069.8	-528.8
39028062	42.4523	79.0718	487.7	1043.3	-555.7
39028063	42.4130	79.1256	524.3	1040.6	-516.3
39028067	42.3789	79.0906	405.4	952.5	-547.1
39028071	42.2999	79.1863	621.8	1215.5	-593.8
39028073	42.2802	79.2056	526.1	1175.0	-648.9
39028081	42.4734	79.0272	352.0	846.4	-494.4
39028103	42.2813	79.0260	416.7	1101.5	-684.9
39029001	42.4863	79.3387	176.8	581.6	-404.8
39029006	42.5156	79.2738	185.9	579.7	-393.8
39029029	42.4482	79.2757	271.3	708.4	-437.1
39029036	42.3906	79.4744	201.5	670.9	-469.4
39029044	42.4018	79.3281	372.2	854.7	-482.5
39029059	42.4071	79.2651	442.0	929.3	-487.4
39030002	42.3556	79.5594	189.9	680.0	-490.1
39030004	42.3372	79.5846	201.2	695.6	-494.4
39032020	42.1433	78.0902	584.3	1834.3	-1250.0
39032023	42.1195	78.1459	631.5	1877.0	-1245.4
39035001	42.2398	78.9904	499.9	1248.2	-748.3
39035010	42.1149	78.7766	438.6	1406.7	-968.0
39036002	42.2135	79.2211	541.0	1244.8	-703.8
39036010	42.1102	79.0600	414.2	1298.4	-884.2
39036011	42.0192	79.1669	379.2	1298.4	-919.3
39037003	42.1969	79.2507	408.4	1121.1	-712.6
39037004	42.1551	79.4611	477.0	1179.6	-702.6
39037010	42.0682	79.4156	479.1	1298.4	-819.3
39038001	42.0589	79.6803	512.7	1240.2	-727.6
39039002	42.2271	79.8400	198.1	762.0	-563.9
39039008	42.1074	79.7637	422.5	1115.0	-692.5
39039018	42.2800	79.8995	184.1	682.1	-498.0
39040001	42.1657	80.1148	177.1	759.9	-582.8
39040002	42.1359	80.0784	182.9	792.5	-609.6
39040018	42.0467	80.0245	378.0	1052.5	-674.5
39044003	41.8499	78.3390	453.5	2000.7	-1547.2
39045001	41.9710	78.5764	480.4	1737.4	-1257.0
39045002	41.7678	78.7220	470.9	1928.2	-1457.2
39046011	41.8111	78.7563	621.8	2001.6	-1379.8
39047001	41.9313	79.0284	587.0	1690.1	-1103.1
39048001	41.9952	79.3142	414.5	1345.1	-930.6
39048002	41.8752	79.4673	563.6	1565.8	-1002.2
39048003	41.8543	79.3100	368.2	1446.3	-1078.1
39048004	41.8553	79.2696	384.7	1489.3	-1104.6
39049001	41.9662	79.7315	506.0	1338.1	-832.1
39049007	41.9300	79.7375	467.3	1329.5	-862.3
39049009	41.7750	79.5804	531.9	1617.0	-1085.1
39049010	41.9954	79.7155	512.7	1356.4	-843.7
39050001	41.7788	79.9971	371.9	1308.2	-936.3
39051001	41.9875	80.1108	408.4	1119.2	-710.8
39051002	41.9722	80.0785	442.0	1172.9	-730.9

Table A-8b. (Cont.)
QUEENSTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39051005	41.8949	80.0748	430.7	1268.0	-837.3
39061002	43.1287	79.3178	96.0	6.4	89.6
39063001	43.2301	79.9919	171.0	49.4	121.6
39064001	43.1015	80.0207	215.5	170.7	44.8
39066001	42.9885	79.0641	182.9	187.1	-4.3
39066002	42.9882	79.1737	186.8	190.2	-3.4
39066003	42.9243	79.1008	184.4	235.9	-51.5
39066006	42.8513	79.1010	175.3	278.9	-103.6
39067002	42.8726	79.3612	179.8	251.5	-71.6
39068001	42.9022	79.7497	191.1	258.2	-67.1
39068002	42.8533	79.5107	178.9	264.3	-85.3
39068003	42.8515	79.7091	183.5	261.8	-78.3
39069002	42.9016	79.9494	209.1	265.2	-56.1
39070002	42.8160	80.2054	224.3	366.7	-142.3

Table A-8c
TRENTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
1403956	42.4531	78.1743	509.6	1862.3	-1353.6
2005087	42.3235	75.9480	307.2	2298.2	-1994.9
5604715	42.9217	76.6716	157.3	991.2	-834.8
5704999	43.0260	76.5289	179.5	947.9	-771.1
5805467	43.1007	76.5128	139.9	798.9	-662.0
5805011	43.1459	76.5535	123.1	709.0	-588.6
6004624	43.2525	76.4911	137.8	585.8	-449.0
6905031	43.2015	76.6101	134.7	686.7	-554.7
7304561	42.2345	79.3730	468.2	1664.2	-1199.7
7304437	42.1503	79.3379	539.8	1819.0	-1282.6
8204460	42.5212	79.2623	188.1	1117.1	-929.9
9704714	42.5185	76.0009	480.1	2101.6	-1623.4
9804455	42.3905	75.0445	456.0	1866.9	-1414.3
9904214	42.1826	74.9218	544.4	2510.6	-1969.3
9904379	42.2736	74.6278	563.3	2063.5	-1504.2
10004364	42.3169	75.2341	508.4	2229.9	-1724.6
12004663	42.7232	78.9451	189.9	985.7	-796.7
12306668	42.8033	78.8444	180.7	737.0	-559.3
13304440	42.5559	78.5063	430.7	1525.2	-1095.5
13705115	43.0906	78.3136	221.6	749.8	-529.1
13805117	43.0403	78.3902	265.2	826.9	-564.2
14204593	43.0429	78.0774	217.3	749.8	-535.5
14304806	43.1154	78.0916	203.6	656.8	-454.2
15503993	42.8807	74.9165	476.4	912.0	-436.5
15804567	42.9323	77.8841	243.5	975.1	-735.5
16704630	42.6503	77.7560	182.6	1488.3	-1310.3
16804069	42.8716	77.9322	269.4	1089.1	-820.5
17204552	42.8353	77.9371	305.1	1175.3	-874.8
17703970	42.8048	75.6506	472.1	1392.3	-921.7
18506669	43.0799	79.0068	177.4	639.5	-465.1
18604719	43.3360	78.5128	102.4	381.0	-280.7
18606667	43.2076	78.4651	167.6	562.1	-398.1
18703928	42.8680	75.4266	402.9	1041.8	-639.8
21104760	42.9894	77.2799	182.6	900.7	-719.0
21304871	43.0216	77.3354	172.2	857.4	-687.9
21506395	42.8126	77.2029	332.2	1305.8	-976.6
22704730	43.1803	78.1527	210.6	659.3	-450.8
22704611	43.1909	78.2583	200.9	611.7	-411.8
22804873	43.3627	78.3051	85.6	345.9	-261.5
22804476	43.3235	78.2055	110.0	405.7	-296.3
22904912	43.2823	78.1742	132.9	476.1	-343.8
23004994	43.4017	77.9610	99.1	384.4	-288.0
23105069	43.3191	78.0825	110.3	421.2	-313.3
23205008	43.2442	78.3293	153.3	531.9	-379.2
23204722	43.1858	78.4419	190.5	613.6	-425.2
23305096	43.1621	78.3733	192.3	646.8	-454.8
23404752	43.3067	78.4530	107.6	421.5	-314.9
23404753	43.3485	78.4448	100.0	365.2	-268.2
23504208	43.2620	76.1033	153.3	451.7	-299.3
23504764	43.3259	78.3320	102.1	399.3	-298.1
23604209	43.3479	76.3190	141.7	491.9	-351.1
23605012	43.3693	76.6017	96.9	435.9	-341.4
23804357	43.4440	75.8772	227.1	256.3	-33.8
23904547	42.5306	74.8834	385.3	1322.8	-938.2
24604203	42.8762	76.8586	165.2	1083.0	-920.2
25005095	43.0349	76.9769	124.7	870.5	-748.6
27203924	42.0630	77.4307	505.4	2948.9	-2447.5
27303973	42.3702	76.5063	394.7	2347.0	-1961.4
27404130	42.4421	76.5928	444.1	2225.0	-1781.9
27504467	42.3844	76.5409	318.2	2239.1	-1921.8
27905041	43.1458	76.7616	131.7	715.4	-586.4
27905116	43.1520	77.0699	181.4	741.3	-562.4

Table A-8c. (Cont.)
TRENTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
28005032	43.0592	76.8961	145.4	837.0	-692.8
28006719	43.0292	76.9439	122.2	849.2	-729.7
28104754	43.0824	77.2696	154.2	762.0	-609.9
28105114	43.1116	77.0207	149.5	757.4	-609.0
29104092	42.6173	78.0803	479.5	1618.5	-1143.0
29604447	42.8027	78.1501	475.2	1336.5	-862.3
29604464	42.8384	78.0967	355.4	1179.6	-825.1
30104392	42.7477	78.1979	490.1	1439.6	-950.4
30406073	42.7552	78.0976	458.1	1382.3	-924.8
60010227	42.2978	74.6251	613.3	2020.2	-1407.0
60010335	42.2083	76.6250	432.2	2843.5	-2411.3
60012163	42.9369	76.3459	303.9	1206.4	-902.5
82901160	42.6933	75.3618	418.5	1346.3	-927.8
82400698	43.1552	75.7086	131.1	459.3	-328.3
77300345	42.1576	79.8114	435.9	1599.3	-1163.4
77420429	41.8335	80.0188	411.8	1891.3	-1479.5
77420057	41.6896	77.5470	478.2	3511.3	-3033.1
77633511	41.8674	78.6145	684.0	2781.3	-2097.3
37353001	43.0151	75.0353	123.4	144.8	-21.3
37353002	43.2058	75.1975	268.2	97.5	170.7
37353003	43.1043	75.2459	130.5	173.7	-43.3
37354001	43.2067	75.4479	135.6	190.5	-54.9
37354003	43.1187	75.4797	207.3	421.5	-214.3
37354004	43.1080	75.2866	146.3	243.8	-97.5
37359002	43.3029	75.2070	289.6	59.4	230.1
37360001	43.2523	75.4459	156.1	153.9	2.1
37360003	43.2988	75.4498	173.7	157.0	16.8
37360005	43.3374	75.3416	249.9	131.1	118.9
37341005	42.1985	76.5382	328.3	2713.3	-2385.1
37316002	42.9568	76.5792	170.7	1005.8	-835.2
37317001	42.9540	76.7620	120.4	914.4	-794.0
37317015	42.9800	76.9339	153.0	923.5	-770.5
37307001	43.2291	75.5143	129.5	221.9	-92.4
37307003	43.1365	75.5627	158.5	426.7	-268.2
37307004	43.0809	75.5393	187.5	487.7	-300.2
37308002	43.0510	75.8705	135.3	746.8	-611.4
37309003	43.0025	76.1873	308.8	1136.9	-828.1
37310009	43.1656	76.3282	115.8	685.8	-570.0
37310022	43.1274	76.3322	131.1	732.7	-601.7
37310028	43.0757	76.3281	137.5	821.7	-684.3
37310029	43.0189	76.3040	262.4	1021.1	-758.6
37310030	43.0729	76.4599	129.5	798.0	-668.4
37311004	43.1211	76.5935	145.1	787.0	-641.9
37312001	43.2228	76.8134	96.6	594.4	-497.7
37312002	43.1050	76.8345	140.5	774.2	-633.7
37303001	43.4340	75.5907	408.4	329.8	78.6
37303003	43.4174	75.6816	342.0	355.1	-13.1
37303010	43.3383	75.7413	156.7	256.9	-100.3
37304001	43.4813	75.7583	355.1	317.0	38.1
37304002	43.4040	75.7738	278.3	354.8	-76.5
37304008	43.3712	75.7983	182.6	297.2	-114.6
37305001	43.4636	76.2300	106.7	313.0	-206.3
37305003	43.3813	76.0931	158.5	440.4	-281.9
37305004	43.2983	76.1525	128.0	490.4	-362.4
37305005	43.2807	76.0038	152.4	467.9	-315.5
37306001	43.4680	76.4955	91.4	364.5	-273.1
37306002	43.4340	76.4652	117.3	401.1	-283.8
37306005	43.3676	76.4265	97.5	417.6	-320.0
37306014	43.3152	76.3827	115.8	426.7	-310.9
37306018	43.2879	76.4655	125.0	518.2	-393.2
39004001	43.2681	78.7376	106.7	365.8	-259.1
39008001	43.2445	78.2575	157.9	552.9	-395.0
39008002	42.9342	78.2725	228.6	838.2	-609.6

Table A-8c. (Cont.)
TRENTON Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39008003	43.0310	78.2774	269.7	838.2	-568.5
39009001	43.1990	78.5720	158.5	548.6	-390.1
39011001	43.1158	79.1936	157.6	580.6	-423.1
39012006	42.8807	77.9792	334.7	1128.4	-793.7
39015081	42.8174	78.6779	239.3	944.9	-705.6
39016014	42.9276	78.8326	207.3	792.5	-585.2
39016015	42.8663	78.8028	178.3	902.2	-723.9
39016051	42.9144	78.9532	180.7	818.4	-637.6
39019042	42.5306	78.4236	452.0	1628.2	-1176.2
39021117	42.5463	78.9959	198.1	1168.9	-970.8
39022023	42.5737	79.0967	225.6	1143.0	-917.4
39028106	42.4601	79.0403	397.5	1456.3	-1058.9
39028108	42.3411	79.1320	493.5	1654.8	-1161.3
39029003	42.4816	79.3088	200.9	1222.2	-1021.4
39037010	42.0682	79.4156	479.1	1866.6	-1387.4
39039018	42.2800	79.8995	184.1	1204.0	-1019.9
39040002	42.1359	80.0784	182.9	1295.4	-1112.5
39040018	42.0467	80.0245	378.0	1577.6	-1199.7
39051005	41.8949	80.0748	430.7	1790.7	-1360.0
39061001	43.1594	79.2828	90.5	459.0	-368.5
39061001	43.1287	79.3178	96.0	463.0	-367.0
39063001	43.2301	79.9919	171.0	414.5	-243.5
39064001	43.1015	80.0207	215.5	602.0	-386.5
39066001	42.9885	79.0641	182.9	705.0	-522.1
39066002	42.9882	79.1737	186.8	711.7	-524.9
39066004	42.9021	79.1554	182.9	768.1	-585.2
39066006	42.8513	79.1010	175.3	811.7	-636.4
39067001	42.9167	79.3819	177.4	743.7	-566.3
39068001	42.9022	79.7497	191.1	746.8	-555.7

Table A-8d.
THERESA Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
1403956	42.4531	78.1743	508.7	2200.7	-1691.1
1504248	42.4705	78.1603	475.5	2138.2	-1662.7
2005087	42.3235	75.9480	303.3	2782.8	-2479.5
5604715	42.9217	76.6716	156.4	1372.2	-1215.8
5705000	43.1051	76.5528	130.1	1104.9	-974.8
6004624	43.2525	76.4911	136.9	898.6	-761.7
7204154	42.3421	79.1319	489.5	1905.0	-1415.5
7304437	42.1503	79.3379	536.4	2087.9	-1551.4
7304561	42.2345	79.3730	464.5	1912.3	-1447.8
8204460	42.5212	79.2623	187.1	1344.2	-1157.0
9704714	42.5185	76.0009	478.2	2450.6	-1972.4
9904214	42.1826	74.9218	541.3	2856.6	-2315.3
9904379	42.2736	74.6278	559.3	2380.5	-1821.2
12306668	42.8033	78.8444	177.7	964.7	-787.0
13304440	42.5559	78.5063	429.8	1793.4	-1363.7
13705115	43.0906	78.3136	220.7	1011.9	-791.3
13805117	43.0403	78.3902	262.7	1083.0	-820.2
14204593	43.0429	78.0774	214.3	1072.9	-858.6
15403904	42.3336	74.2307	587.7	1981.2	-1393.5
15404034	42.9093	74.8352	484.6	762.6	-278.0
15503993	42.8807	74.9165	475.5	1066.8	-591.3
15804567	42.9323	77.8841	239.6	1293.6	-1054.0
16704630	42.6503	77.7560	178.0	1713.9	-1535.9
17204552	42.8353	77.9371	300.5	1487.4	-1186.9
17301173	42.8614	75.4026	381.6	1144.5	-762.9
17504032	42.7963	75.4047	458.7	1388.4	-929.6
17703970	42.8048	75.6506	470.6	1588.0	-1117.4
18304502	43.3310	77.9651	94.5	659.3	-564.8
18404724	43.1509	77.9753	196.0	971.4	-775.4
18506669	43.0799	79.0068	174.3	862.3	-687.9
18606667	43.2076	78.4651	164.0	804.7	-640.7
18703928	42.8680	75.4266	402.0	1184.8	-782.7
21104760	42.9894	77.2799	181.7	1252.7	-1071.1
21304871	43.0216	77.3354	169.5	1193.3	-1023.8
21506395	42.8126	77.2029	329.2	1679.4	-1350.3
22704611	43.1909	78.2583	199.9	877.8	-677.9
22704730	43.1803	78.1527	208.5	931.2	-722.7
22904912	43.2823	78.1742	132.3	742.2	-609.9
23004994	43.4017	77.9610	96.3	654.7	-558.4
23105069	43.3191	78.0825	107.9	689.5	-581.6
23105086	43.3080	78.0340	114.3	725.4	-611.1
23205008	43.2442	78.3293	152.7	793.7	-641.0
23204722	43.1858	78.4419	188.4	867.8	-679.4
23305096	43.1621	78.3733	192.0	903.7	-711.7
23404752	43.3067	78.4530	106.7	663.5	-556.9
23504764	43.3259	78.3320	101.2	658.4	-557.2
24004055	42.6310	74.7082	603.2	1517.9	-914.7
24604203	42.8762	76.8586	162.8	1488.3	-1325.6
27203924	42.0630	77.4307	501.4	3581.7	-3080.3
27303973	42.3702	76.5063	385.6	2861.5	-2475.9
27404130	42.4421	76.5928	443.2	2677.7	-2234.5
27504467	42.3844	76.5409	317.3	2744.4	-2427.1
28006719	43.0292	76.9439	119.5	1188.7	-1069.2
28104754	43.0824	77.2696	152.1	1092.7	-940.6
29104092	42.6173	78.0803	475.5	1934.0	-1458.5
29504133	42.8306	78.1170	462.1	1591.1	-1129.0
29704536	42.8267	78.1385	457.5	1584.0	-1126.5
30104392	42.7477	78.1979	489.2	1712.4	-1223.2
30406073	42.7552	78.0976	457.5	1683.7	-1226.2
39028105	42.4557	79.0408	404.8	1822.7	-1417.9

Table A-8e.
BASEMENT Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
6004624	43.2525	76.4911	137.8	922.3	-785.5
9804455	42.3905	75.0445	456.0	2401.2	-1948.6
9904214	42.1826	74.9218	544.4	3342.1	-2800.8
9904379	42.2736	74.6278	563.3	2718.8	-2159.5
13705115	43.0906	78.3136	221.6	1085.1	-864.4
13805117	43.0403	78.3902	265.2	1175.6	-912.9
15804567	42.9323	77.8841	243.5	1446.6	-1207.0
16704630	42.6503	77.7560	182.6	1927.6	-1749.6
17204552	42.8353	77.9371	305.1	1714.5	-1414.0
17703970	42.8048	75.6506	472.1	1725.5	-1254.9
18304502	43.3310	77.9651	95.1	661.4	-566.9
18404724	43.1509	77.9753	196.9	1135.1	-939.1
18506669	43.0799	79.0068	177.4	925.4	-751.0
18604719	43.3360	78.5128	102.4	607.8	-507.5
18606667	43.2076	78.4651	167.6	827.5	-663.5
18703928	42.8680	75.4266	402.9	1315.5	-913.5
21304871	43.0216	77.3354	172.2	1282.6	-1113.1
22704611	43.1909	78.2583	200.9	920.5	-720.5
22804873	43.3627	78.3051	85.6	605.0	-520.6
22904912	43.2823	78.1742	132.9	767.5	-635.2
22905007	43.3579	78.1488	93.0	635.5	-545.0
23005091	43.3060	78.2245	113.4	706.5	-595.6
23004994	43.4017	77.9610	99.1	669.6	-573.3
23105069	43.3191	78.0825	110.3	703.5	-595.6
23105086	43.3080	78.0340	116.4	744.9	-630.6
23205008	43.2442	78.3293	153.3	804.7	-652.0
23204722	43.1858	78.4419	190.5	908.3	-719.9
23304489	43.3491	78.3788	96.9	626.4	-530.4
23404752	43.3067	78.4530	107.6	673.0	-566.3
23404753	43.3485	78.4448	100.0	608.1	-511.1
23504208	43.2620	76.1033	153.3	669.0	-516.6
23504764	43.3259	78.3320	102.1	666.0	-564.8
23604209	43.3479	76.3190	141.7	780.0	-639.2
23605012	43.3693	76.6017	96.9	762.3	-667.8
23804357	43.4440	75.8772	227.1	504.1	-281.6
27303973	42.3702	76.5063	394.7	3132.7	-2747.2
27905041	43.1458	76.7616	131.7	1115.0	-986.0
27905116	43.1520	77.0699	181.4	1124.7	-945.8
92004593	43.0429	78.0774	217.3	1162.2	-947.9
93605096	43.1621	78.3733	192.3	946.4	-754.4
94705114	43.1116	77.0207	149.0	1129.3	-980.8
83604203	42.8762	76.8586	165.2	1638.9	-1476.1
82400698	43.1552	75.7086	131.1	730.0	-598.9
81904055	42.6310	74.7082	603.2	1632.2	-1029.0
76400109	42.1428	80.0477	198.1	1814.2	-1616.0
37357002	42.6933	75.3451	418.5	1686.8	-1268.3
37353001	43.0151	75.0353	123.4	336.8	-213.4
37354001	43.2067	75.4479	135.6	475.5	-339.9
37354004	43.1080	75.2866	146.3	609.6	-463.3
37359001	43.3832	75.1872	400.8	103.6	297.2
37311004	43.1211	76.5935	145.1	1180.5	-1035.4
37313002	43.0554	77.6524	164.6	1192.4	-1027.8
37303010	43.3383	75.7413	156.7	466.3	-309.7
37304005	43.3651	75.7659	182.0	505.4	-323.4
37305004	43.2983	76.1525	128.0	736.1	-608.1
37305005	43.2807	76.0038	152.4	717.8	-565.4
37306002	43.4340	76.4652	117.3	709.3	-591.9
39004001	43.2681	78.7376	106.7	588.3	-481.6
39028105	42.4557	79.0408	404.8	1966.0	-1561.2
39063001	43.2301	79.9919	171.0	657.8	-486.8
39066001	42.9885	79.0641	182.9	923.5	-740.7
39066003	42.9243	79.1008	184.4	992.1	-807.7

Table A-8e. (Cont.)
BASEMENT Data.

WELL ID#	LATITUDE	LONGITUDE	ELEVATION (METERS)	DEPTH (METERS)	DATUM DEPTH (METERS)
39066004	42.9021	79.1554	182.9	1005.8	-823.0
39067001	42.9167	79.3819	177.4	966.5	-789.1
90001808	42.4901	79.2825			-1439.0
90004437	42.1921	79.3601			-1923.9
90004561	42.2380	79.4291			-1808.4
90004154	42.3316	79.1461			-1800.1
90003956	42.4297	78.2437			-2174.1
90004248	42.4658	78.2270			-2117.8
90000615	42.5423	78.4170			-1754.1
90004092	42.6314	78.0883			-1731.6
90004392	42.7475	78.2225			-1438.0
90006073	42.7520	78.0875			-1449.0
90004069	42.8970	77.9164			-1249.7
90004806	43.1176	78.0763			-841.9
90003924	42.0471	77.4358			-3644.5
90006395	42.8115	77.1875			-1555.7
90004760	42.9348	77.2365			-1364.6
90004754	43.0888	77.2215			-1044.9
90006719	43.0284	76.8952			-1176.2
90000443	42.1966	76.5553			-3251.3
90004467	42.3820	76.5520			-2724.9
90004715	42.8943	76.6274			-1389.9
90004999	42.9843	76.4875			-1207.0
90005000	43.0609	76.5117			-1074.4
90001003	43.0735	76.5763			-1060.7
90005031	43.1599	76.5533			-914.4
90001008	43.4120	76.3714			-557.2
90004032	42.8151	75.3771			-1029.0
90004547	42.5504	74.8495			-1364.9
90003993	42.8925	74.8849			-471.5
90005087	42.3541	75.9771			-2708.8
90004714	42.5261	75.9533			-2215.3

APPENDIX B: TABLE B1

Table B-1

Estimated production of a single well over 25 years

Years	Estimated Production (bbls/D) For Delta P =150 psi	Estimated Production (bbls/D) For Delta P =250 psi
1	21750	36250
2	20663	34438
3	19629	32716
4	18648	31080
5	17716	29526
6	17361	28935
7	17014	28357
8	16674	27789
9	16340	27234
10	16013	26689
11	15693	26155
12	15379	25632
13	15072	25120
14	14770	24617
15	14475	24125
16	14185	23642
17	13902	23169
18	13624	22706
19	13351	22252
20	13084	21807
21	12822	21371
22	12566	20943
23	12315	20524
24	12068	20114
25	11827	19712