

POTENTIOMETRIC SURFACE MAP
OF THE BEDROCK AQUIFER IN THE VICINITY OF BEY ROAD
SPRINGFIELD TOWNSHIP, SUMMIT COUNTY

By

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INTRODUCTION

In the Fall of 1994, the Ohio Department of Natural Resources was contacted by a concerned citizen requesting that a potentiometric surface map be produced for the area surrounding Bey Road in Springfield Township, Summit County. On December 13, 1994, staff from the Division of Water measured the water levels in a 3.5 mi² area centered around Bey Road. Wells in both Summit and Portage Counties were measured. This report explains the procedure and findings of this water level survey

PROCEDURE

To construct a potentiometric surface map for the area, the static water level in 21 wells distributed throughout the above mentioned area were measured on December 13, 1994. The measured depth to water was subtracted from the estimated surface elevation obtained from the USGS 7.5 minute quadrangle map. This resulted in the elevation of the water level at each well site. In order to better define some of the ground water flow boundaries, static water levels recorded on well logs were used from an additional 19 wells. By contouring this data, the direction of ground water flow was determined.

DISCUSSION

Well logs on file with the Division of Water were examined to determine the aquifer, or aquifers present in this area. From well log data, most of the wells in the immediate study area completed in the Pennsylvanian-aged shale and sandstone bedrock between depths of 50 and 125 feet. Well logs were not on for all wells measured but it is believed that most of the wells that were measured are completed in the bedrock aquifer. Discontinuous sand and gravel deposits do exist and are utilized as a water supply for some wells in the southern and eastern portions of the area.

Due to the limited number of wells that could be measured, static water levels recorded on well logs were examined. Static water levels recorded on the well logs coincided closely with water levels in measured wells. Because of this close correlation, the static water levels from 19 wells located north and south of the study area were added to the 21 water levels from measured wells.

The water elevations in these 40 wells were used to determine the potentiometric surface (or water table) in the study area. The contour lines on the map (Figure 1) connect points of equal water level elevations. Like surface water, ground water flows from higher elevations to lower elevations in a direction

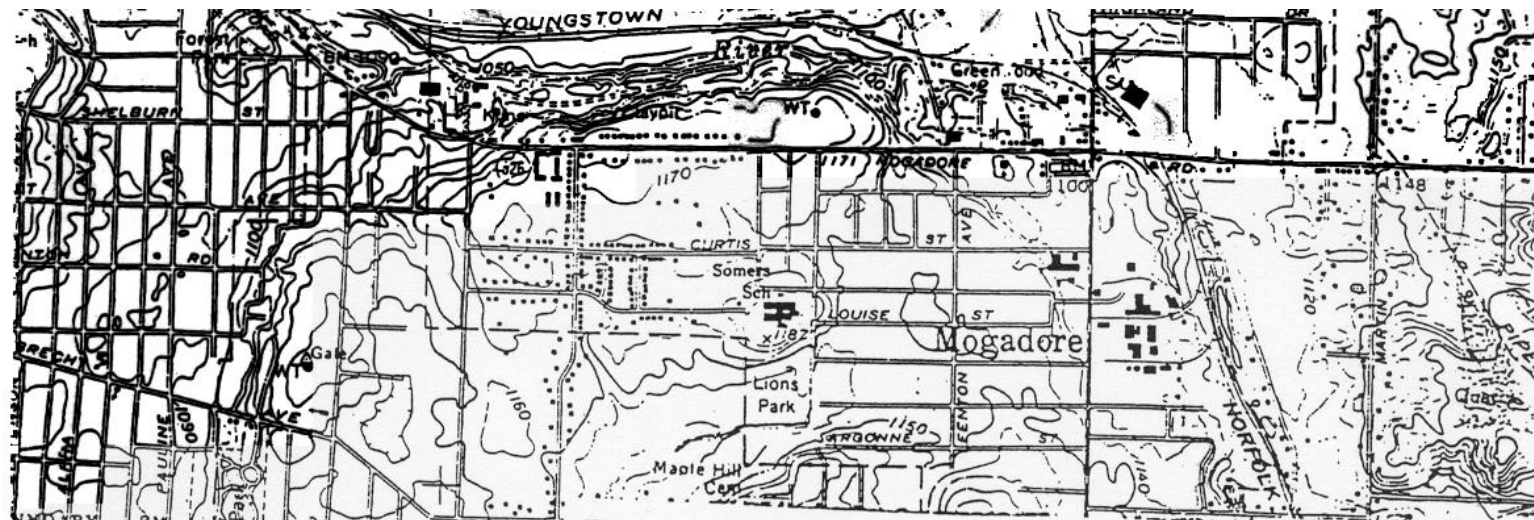
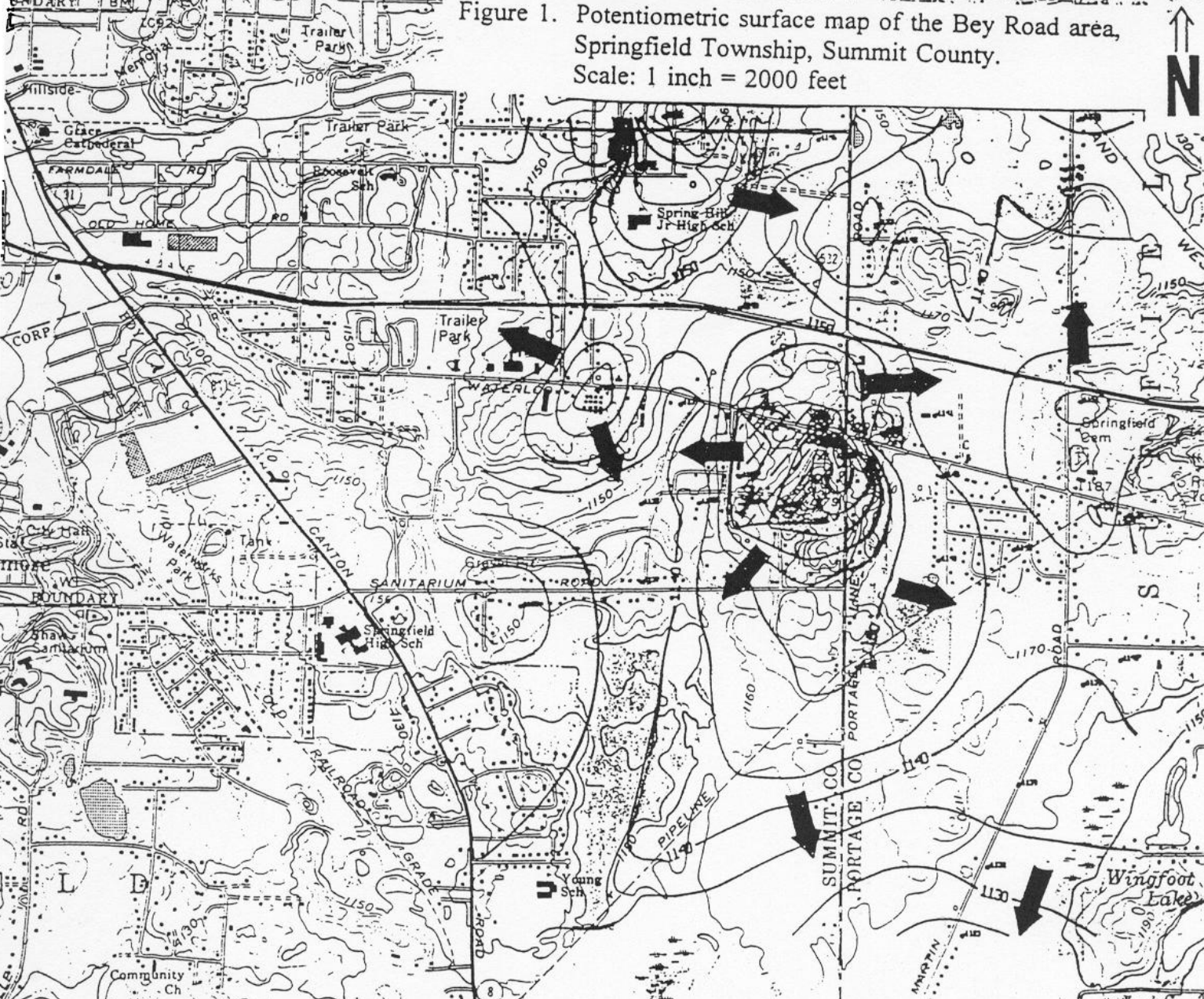





Figure 1. Potentiometric surface map of the Bey Road area, Springfield Township, Summit County. Scale: 1 inch = 2000 feet



-  - Recharge area for Bey Road wells
-  - contour line (contour interval = 10 feet)
-  - direction of ground water flow

perpendicular to the contour lines. The arrows on the figure indicate the direction of ground water flow. As shown in Figure 1, there are several ground water divides in this area. A ground water divide is a theoretical line separating a change in the direction of ground water flow. The topographic high between Bey and Portage Line Roads acts as a ground water divide. Ground water flows from east to west beneath Bey Road and from west to east beneath Portage Line Road.

There is another ground water divide that coincides with the topographic high located at Waterloo and Neal Roads. Ground water flows from this high toward the unnamed creek valley located to the east and south. During wet times of the year, ground water appears to discharge to this unnamed creek from the location of both topographic highs.

Drawing boundaries along the different ground water divides will determine the area of ground water recharge for particular wells. The recharge area for the wells on Bey Road is the approximate area bounded by Bey Road to the west, Waterloo Road to the north and Portage Line Road to the east. This area is shown as a dashed line pattern on Figure 1.

Information from the Ohio Environmental Protection Agency (OEPA) was obtained for the Wingfoot Lake area. The aquifer under investigation is a shallow sand and gravel aquifer (pers. com.

Jeff Rizzo, OEPA-NEDO). The OEPA has determined that the direction of ground water flow in the sand and gravel aquifer is to the north. This was determined by constructing a historic potentiometric surface map from static water levels recorded on well logs. This sand and gravel aquifer is not present in the Bey Road area.

CONCLUSION

In most of the study area shown in Figure I, the aquifer is the sandstone and shale bedrock. To the east and south, a sand and gravel aquifer is present. A potentiometric surface map was constructed from wells completed in the bedrock aquifer. This map indicates that there are a few ground water divides, or changes in the ground water flow direction in this area.

The ground water recharge area for wells along Bey Road is to the east and northeast and is very limited in areal extent. The dashed area in Figure 1 shows the approximate recharge area for the wells along Bey Road.