BEFORE THE ILLNOIS POLLUTION CONTROL BOARD

| | | |
|---|---|---|
| IN THE MATTER OF: | ) | |
| | ) | |
| MAXIMUM SETBACK ZONES | ) | R05- 9 |
| (35 Ill. Adm. Code 618) | ) | (Rulemaking Public Water Supplies) |
| | ) | |
| | ) | |
| | ) | |

NOTICE OF FILING

Dorothy Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, Illinois 60601

General Counsel
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271

Service List

Matthew Dunn, Esq.
Environmental Bureau Chief
Office of the Attorney General
James R. Thompson Center
100 W. Randolph, 12th Floor
Chicago, Illinois 60601

Richard R. McGill, Jr.
Ill. Pollution Control Board
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, Illinois 60601

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board the written testimony of Richard P. Cobb, P.G., a copy of which is herewith served upon you.

ILLINOIS ENVRIONMENTAL
PROTECTION AGENCY

BY: Kimberly A. Geving

Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

Date: January 21, 2005

1021 North Grand Ave. East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217) 782-5544

**THIS FILING SUBMITTED ON RECYCLED PAPER**

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| | ) | |

**MOTION FOR ACCEPTANCE**

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA") and, pursuant to 35 Ill. Adm. Code 102.424, moves the Illinois Pollution Control Board ("Board") to accept the attached written testimony of Richard P. Cobb, P.G. for the above-referenced matter.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: Kimberly A. Geving

Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

Date: January 21, 2005

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**THIS FILING SUBMITTED ON RECYCLED PAPER**

**TESTIMONY OF RICHARD P.COBB, P.G.**

## QUALIFICATIONS/INTRODUCTION

My name is Richard P. Cobb and I am the Deputy Manager of the Division of Public Water Supplies of the Illinois Environmental Protection Agency's (Illinois EPA) Bureau of Water. For further detail on my qualifications I have enclosed a copy of my Curriculum Vitae in Exhibit I. The references that I have quoted or used in my testimony are detailed in Exhibit II. This testimony, the Statement of Reasons, and exhibits included with this testimony describe the basis for the proposal of a maximum setback zone for the Marquette Heights community water supply (CWS).

## BACKGROUND

In September 1987, the Illinois General Assembly enacted the Illinois Groundwater Protection Act (IGPA) (415 ILCS 55/1). The IGPA was part of Public Act 85-863, which created the IGPA and amended portions of the Environmental Protection Act (Act) dealing with public water supplies. The IGPA established minimum setback zones of 200 or 400 feet, under Section 14.2 of the Act (415 ILCS 5/14.2), for CWS wells. New potential primary sources, new potential routes, and new potential secondary sources, as defined in Sections 3.345, 3.350 and 3.355 of the Act (415 ILCS 5/ 3.345, 3.350 and 3.355), respectively, are prohibited within these areas. The Illinois General Assembly provided additional protection for CWS wells under Section 14.3 of the Act (415 ILCS 5/14.3), by authorizing either the county or municipality served by a CWS well, or the Board, to establish a maximum setback zone of up to 1,000 feet from the wellhead. Under Section 14.3(e) of the Act (415 ILCS 5/14.3), no new potential primary sources can be located within a maximum setback zone.

Section 14.3 of the Act provides the authority to establish maximum setback zones to counties and municipalities served by CWS wells, and to the Board. However, the Illinois EPA is required to approve the adequacy of a demonstration that the "lateral area of influence" is larger than the minimum setback zone before adoption of maximum setback zones. The Illinois EPA

was required to develop procedures to make such determinations using pumping tests and estimation procedures. The Illinois EPA developed, and the Joint Committee on Administrative Rules adopted, 35 Ill. Adm. Code 671, Maximum Setback Zone Rules for Community Water Supply Wells, which details the technical criteria for determining the lateral area of influence (LAI). Subpart B of Part 671 sets forth the procedures for determining the LAI of wells under normal operating conditions.

## DETERMINATION OF THE LATERAL AREA OF INFLUENCE

Illinois EPA contracted with RAPPS Engineering and Applied Science (RAPPS) to develop a regional groundwater flow model for the Creve Coeur to Pekin area, and to subsequently delineate the wellhead protection area (WHPA) for the Marquette Heights wells. A "WHPA" means the area delineated for CWS wells pursuant to Sections 1428 and/or 1453 of the Safe Drinking Water Act (SDWA) (415 ILCS 5/17.5). This more sophisticated approach allowed for the determination of an irregular shaped maximum setback zone, up to 1,000 feet, for the respective wellheads by taking into account the regional groundwater gradient in combination with the LAI, and other pumping stresses in the area. The Illinois EPA reviewed and approved the technical adequacy of this model.

The Marquette Heights proposed maximum setback zone is based on a sophisticated technique for determining the LAI pursuant to 35 Ill. Adm. Code 671.201(g), Illinois' Wellhead Protection Program approved by United States Environmental Protection Agency (U.S. EPA) pursuant to §1428 of the SDWA (Illinois EPA, 1992), and Guidance for conducting groundwater protection needs assessments (Cobb, et al., 1995). In addition, the *Guidelines for the Delineation of Wellhead Protection Areas* (U.S. EPA, 1987) and *Model Assessment for Delineating WHPAs* (U.S. EPA, 1988) were considered. Furthermore, modeling was performed to be consistent with approaches recommended in: Applied Groundwater Modeling Simulation of Flow and Advective Transport (Anderson and Woessner, 1992).

The Marquette Heights CWS wells are located in the Central Priority Groundwater Protection Planning Region established pursuant to Section 17.2 of the Act (415 ILCS 5/17.2). The regional priority planning areas were designated in part based on the Potential for Aquifer Recharge Area Map of Illinois developed by the Department of Natural Resources (DNR). This mapping was completed and published by DNR in 1990. In 1991, the first two priority regions were established including the Central Region. The Central Priority Groundwater Protection Planning Region is composed of Peoria, Tazewell, Woodford, and Mason Counties. Figure 1 illustrates the location of the Marquette Heights CWS WHPA in relation to the Potential for Aquifer Recharge Map of Illinois. Thus, the Marquette Heights WHPA is located in a hydrogeologic setting with a high potential for aquifer recharge, and is, therefore, a highly vulnerable source of Class I: Potable Resource Groundwater.

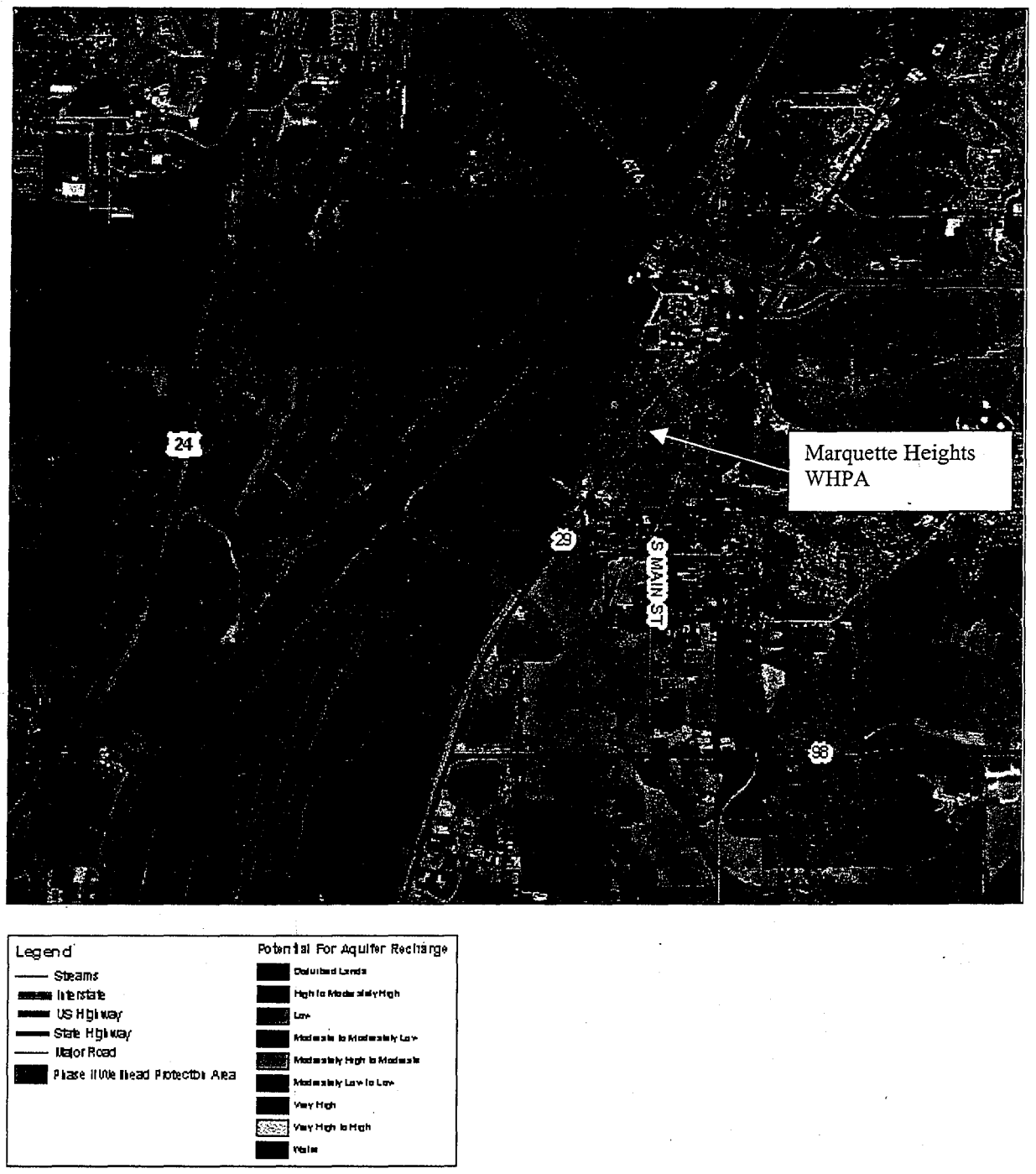



**Figure 1. Potential for Aquifer Recharge Map for Marquette Heights WHPA.**

## GROUNDWATER MODELING

The basic assumption of groundwater modeling is Darcy's Law, which states that the flow of water through a porous material is proportional to the gradient of the hydraulic head. The hydraulic head is the level to which water would rise in a non-pumping well. Darcy's Law, combined with the water balance equation (inflow – outflow = change in storage), yields a governing equation that must be satisfied[1] by the hydraulic head everywhere within the water-saturated porous medium. Once the hydraulic head values throughout the system are known, flowlines and capture zones for water flowing through the system can be delineated. Except for a few very simple hydrogeologic systems, exact solutions to boundary value problems cannot be found. However, numerical modeling techniques such as the finite difference method can be used to find approximate solutions. In the finite difference method, the model domain is separated into an assemblage of cells. The solution consists of single values of hydraulic head that best characterize each cell.

**Total hydraulic head** can be described by the following where:
**h** = total hydraulic head (meters (m));
**z** = a point that is at an elevation above a datum (m);
**P** = fluid pressure (newton-meters$^2$ ($N/M^2$));
**g** = the acceleration due to gravity constant @ 9.8 meters per second$^2$ ($m/sec^2$);
$\rho$ = density or mass per unit volume (kilograms per meter$^3$ ($kg/m^3$)); and
The velocity of groundwater flowing in a porous media under natural hydraulic gradients is relatively very low (e.g., $10^{-6}$ m/sec or 30 m/year, which is typical for groundwater). Thus, velocity can be ignored and h is given by the formula $\mathbf{h = z + P/\rho g}$. **Therefore, total "hydraulic head" means the sum of the elevation head, the pressure head, and the velocity head in an aquifer (Fetter, 94).**

The modeling grid and subsequent recharge area delineations for the community water supply wells were based on digitizing the well locations off United States Geological Survey (USGS) 1:24,000 or 1 inch equals 2,000 feet topographic quadrangle maps. Thus, the modeling grid was tied to real world coordinates. The Illinois EPA uses the Lambert Conformal Conic system of coordinates. The wells were located and mapped in the field using 1-inch equals 400-foot aerial photographic maps. The aerial photos were used to locate the wells on the USGS maps. Thus, the locations of the wells and the associated recharge area delineations have a locational

[1] The solution to this equation satisfies the governing equation not only within the model domain but also along the various boundaries of the model (Bear, 1972).

accuracy that complies with the Unites States National Map Accuracy Standards, as described in Exhibit III.

A conceptual model of the groundwater flow system based on data available from the literature, or from well records, was created for the study area. This model contains information on hydrostratigraphic units and boundary conditions, as well as acceptable ranges for hydraulic conductivity and recharge. The end members for the range of hydraulic conductivity values were based on field-measurements from an area with geologic materials similar to those found in the study area. The end members for the range of recharge values were based on an analysis of baseflow in streams or from previous groundwater flow models in similar landscapes.

A steady-state finite difference groundwater flow model was created by RAPPS from the conceptual model with MODFLOW, the USGS modular three-dimensional finite-difference groundwater flow modeling program (McDonald and Harbaugh, 1988). MODFLOW yields the distribution of hydraulic head in the flow system. The numerical, block-centered, three-dimensional finite difference approach is utilized in MODFLOW to approximate a solution to the "governing equation" of groundwater flow as a boundary value problem. Once the groundwater head elevations are simulated and calibrated according to observed mass water level measurements, pumping stresses associated with community water supply wells were induced in the model.

Particles were reverse tracked from each production well for a period of five years with MODPATH, the USGS particle-tracking program (Pollock, 1989). The trace of the particles approximates the capture zone for the well. A projection of the capture zone onto a horizontal plane defines the WHPA. The finite difference grid, which represents the bounded area of study, was created using Graphic Groundwater (Esling, 2000), a pre- and post-processor to MODFLOW and MODPATH (RAPPS, 2003).

## Calibration

The purpose of calibration is to match heads simulated by a numeric model to those actually observed in the field. Calibration is accomplished by adjusting input parameters such as hydraulic conductivity or recharge or by modifying boundary conditions. In a humid temperate climate, like that of Illinois, the water table is often a subdued reflection of the surface topography. The model developed by RAPPS, reviewed and approved by Illinois EPA, was calibrated to the regional topography in the project area.

Calibration was done systematically by bracketing reasonable ranges in the ratio of recharge to hydraulic conductivity (R/K). The ratio of the low recharge end member for a region to the highest hydraulic conductivity end member yields the lowest value of R/K. The high end of the range, on the other hand, is determined through simulations. The value of R/K is adjusted until the hydraulic head is at or immediately below the land surface in the study area. Any larger value creates the unrealistic situation where hydraulic heads rise above the land surface. The actual R/K value for the study area must fall somewhere between the low and high R/K values (RAPPS, 2003).

## Sensitivity Analysis

In a normal sensitivity analysis, the modeler examines the effect that a change in an input parameter has on the distribution of hydraulic head. However, for this purpose, the shape and extent of the capture zone is a much more important consideration. Thus, the values of the different parameters were selected from the same range of plausible values determined for the study area during development of the conceptual model. The different recharge and hydraulic conductivity end members were combined to produce a matrix of R/K values, shown below:

| | $K_{min}$ | $K_{max}$ |
|---|---|---|
| $R_{min}$ | $\frac{R_{min}}{K_{min}}$ | $\frac{R_{min}}{K_{max}}$ |
| $R_{max}$ | $\frac{R_{max}}{K_{min}}$ | $\frac{R_{max}}{K_{max}}$ |

Initially, each R/K value in the matrix was examined to make sure that it fell within the range of acceptable R/K values determined during calibration. If one or more of the R/K values fell outside the acceptable range, the hydraulic conductivity or recharge end members were adjusted. The ultimate objective was a matrix of R/K values that produced simulations that bound all possible capture zones for the study area. The best estimate for the capture zone is a simulation based on some combination of recharge and hydraulic conductivity between the end members. A high level of confidence is associated with the WHPA if the four R/K values in the matrix yield capture zones with similar shape and extent. Distinctly different bounding capture zones tend to suggest less confidence in the modeling results (RAPPS, 2003).

## CONCEPTUAL MODEL

### Geographic Setting

Marquette Heights is located in Tazewell County in central Illinois approximately 8 kilometers south of Peoria in Section 13, Township 25 North, Range 5 West and Section 18, Township 25 North, Range 4 West. The Marquette Heights wells are located on the west side of town on the floodplain of the Illinois River approximately 400 meters south and 450 meters east of the northwest corner of Section 13, Township 25 North, and Range 5 West. The land surface elevation at the wells is approximately 142 meters above sea level.

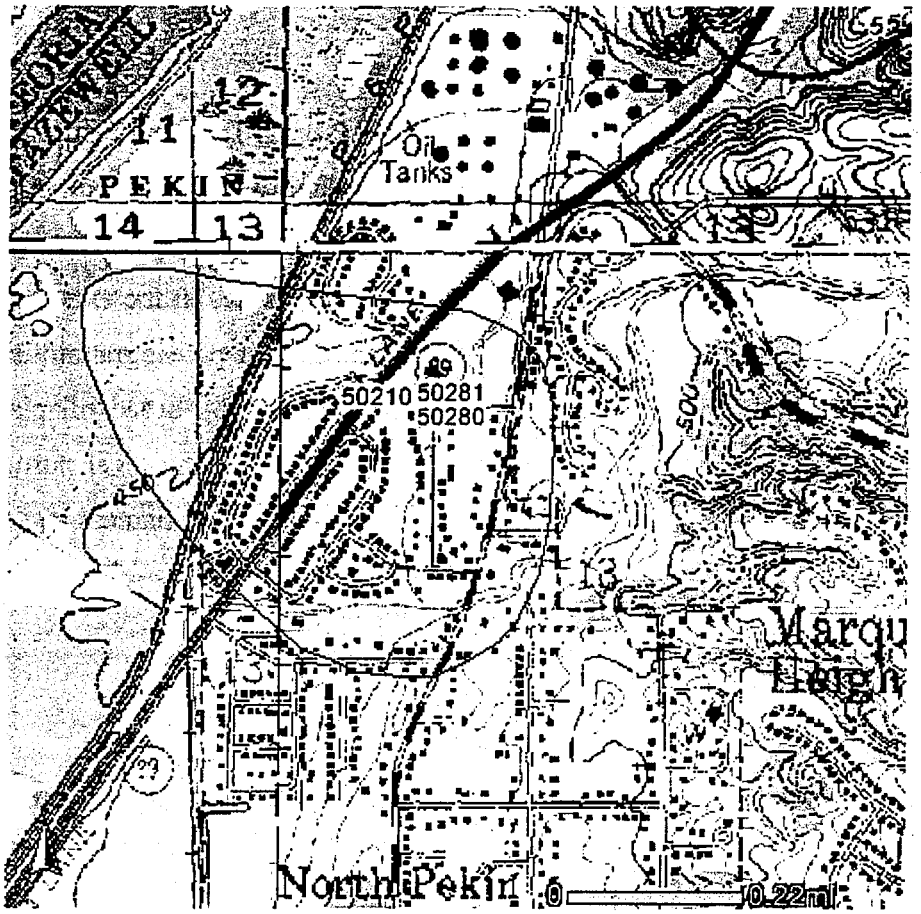



**Figure 2. USGS topographic quadrangle map of the Marquette Heights WHPA (Section 13, Township 25 North, Range 5 West and Section 18, Township 25 North, Range 4 West).**

## Physiography

Illinois is situated in the south-central part of the great Central Lowland Province near the confluence of two major lines of drainage, the Mississippi and Ohio Rivers, making it the lowest of the north-central states with a mean elevation of about 183 meters above sea level and a total relief of only 300 meters (Leighton et al., 1948). Marquette Heights lies in the extreme northern portion of the Springfield Plain of the Till Plains Section, the largest physiographic division in Illinois, covering approximately four-fifths of the state, characterized by broad till plains in an uneroded or youthful stage of erosion. The Springfield Plain includes the level portion of the Illinoian drift sheet in central and south-central Illinois, distinguished by its flatness and shallowly entrenched drainage.

## Bedrock Geology

The Quaternary deposits in the Illinois Valley south of Peoria are underlain by rocks belonging to the Pennsylvanian Carbondale Formation (Willman et al., 1967). Detailed descriptions of the Pennsylvanian strata of Illinois were published by Willman et al. (1975). The following geologic descriptions are based largely on this report.

The Quaternary deposits on the uplands south of Peoria and east of the Illinois Valley are underlain by rocks belonging to the Pennsylvanian Modesto Formation (Willman et al., 1967). Well logs indicate that the bedrock beneath the Quaternary deposits in the Marquette Heights area, both in the Illinois Valley and on the adjacent uplands, is mainly shale.

## Quaternary Geology

The Quaternary deposits in the Illinois Valley south of Peoria consist of glacial outwash deposits belonging to the Banner Formation and the Henry Formation overlain by channel and floodplain deposits of the Cahokia Formation (Berg and Kempton, 1987; Horberg, 1950; Lineback, 1979; Marino and Schicht, 1969). The Sankoty Sand Member of the Banner Formation rests directly on bedrock and fills the deepest part of the Illinois Valley in the study area. Its

thickness varies greatly from about 15 to 45 meters due to erosion and irregularities on the bedrock surface (Burch and Kelly, 1993). The Sankoty Sand is the most extensive aquifer in the region and is characterized by coarse- to medium-grained sand with an abundance of quartz grains, of which 25 percent or more are pink, rounded, and polished (Horberg, 1950). Gravel is present in some beds but is not common (Willman and Frye, 1970).

The upper part of the Sankoty Sand has been eroded in the Illinois Valley south of Peoria and is buried by glacial outwash deposits belonging to the Henry Formation. The outwash constituting the Henry Formation consists of sorted and stratified water-laid material that is dominantly sand and gravel. These outwash sediments were deposited by debris-laden meltwaters flowing away from the ice fronts during both the advances and retreats of glaciers during the Wisconsinan Age (Willman and Frye, 1970) and were previously classified with the Mackinaw Member, sand and gravel outwash deposited as valley trains. Well logs indicate that the combined thickness of the Sankoty Sand and the Henry Formation ranges from approximately 23 to 45 meters in the study area.

The Cahokia Formation consists of deposits in the floodplains and channels of modern rivers and streams, and is comprised of mostly poorly sorted sand, silt, and clay with wood and shell fragments, and local deposits of sandy gravel (Lineback, 1979). The upper part consists of overbank silts and clays, while the coarser-textured lower portion is mainly sandy channel deposits. The Cahokia is present along all Illinois streams, although locally absent where active stream erosion is occurring. In major valleys, it commonly overlies the well-sorted deposits of the Henry Formation (Willman and Frye, 1970). The Cahokia Formation is generally greater than 6 meters thick in the study area (Berg and Kempton, 1987).

Public Water Supply

Marquette Heights currently obtains its water supply from two wells located on the west side of town on the Illinois River floodplain. Wells #4 (50280) and #5 (50281) are the current production wells (Figure 2). Both wells are screened in the Sankoty Sand and/or the Henry Formation. Well #4 (50280) has a depth of 28.96 meters (95 feet) and is screened from 19.81

meters to 28.96 meters. Well #5 (50281) is 28.65 meters (94 feet) deep and is screened from 19.51 meters to 28.65 meters. Wells #4 and #5 have a total annual pumpage of 332,262 cubic meters (87.9 million gallons), corresponding to a steady pumping rate of 5.24e-3 cubic meters per second (83 gpm) for each well. Lambert coordinates for the wells are listed in Table 1.

**Table 1:** Lambert Coordinates of the Marquette Heights Production Wells

| WELL I.D. | X COORDINATE | Y COORDINATE |
|---|---|---|
| Well #4 (EPA#50280) | 2966469.25 | 2764122.75 |
| Well #5 (EPA#50281) | 2966361.75 | 2764137.50 |

## NUMERICAL MODEL

### Model Design

The conceptual model of the area was simplified into a one-layer numerical model. The model grid contains 290 columns and 474 rows with spacing of 15 meters around the production wells. Beyond the immediate vicinity of the wells, the grid spacing is gradually increased by a factor of 1.16 to a maximum of 150 meters, which is maintained out to the boundaries of the model (Figure 3). The coarse lower portion of the Cahokia Formation, the sands and gravels of the Henry Formation, and the Sankoty sand constitute a single hydrostratigraphic unit and are modeled as a single layer. Logs of the Marquette Height's wells and other nearby wells indicate that these coarse-grained deposits have a thickness of approximately 23 meters immediately south of Peoria. In the southern part of the study area, south of North Pekin, their thickness increases to a maximum of approximately 45 meters due to the presence of an alluvial terrace above the Illinois River floodplain. The fine-grained upper part of the Cahokia Formation overlying the sand and gravel deposits serves as an upper confining layer and was not simulated (RAPPS, 2003).

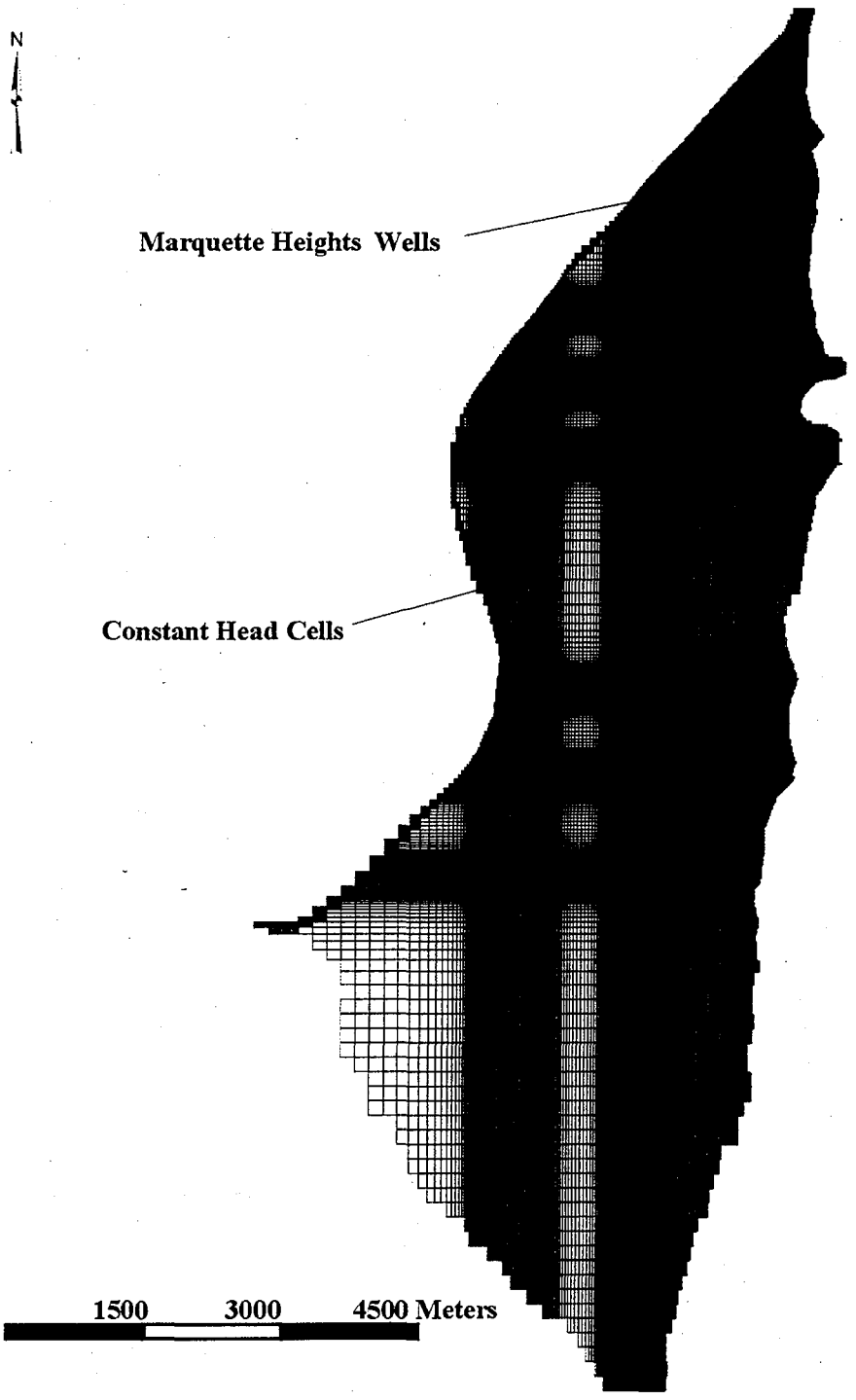



**Figure 3. Variable finite-difference grid showing the boundary conditions used in delineating the WHPA for Marquette Heights, Illinois.**

The Illinois River, which penetrates the upper confining layer and is in direct contact with the aquifer below, forms a constant head boundary along the western edge of the model. Head values for constant head cells were determined through linear interpolation of the gradient of the Illinois River. Stage data for the interpolation were obtained from contour lines crossing the river on 1:24,000 scale topographic maps and pool elevations on the upstream and downstream sides of the Peoria lock and dam. Smaller streams like Lost Creek were not simulated since they are not deep enough to fully penetrate the fine-grained upper part of the Cahokia Formation. Worley Lake and Pekin Lake, located on the Illinois River floodplain just north of Pekin, have thick clay beds and are probably not in direct contact with the aquifer. They were not simulated in order to produce more conservative results (not simulating the lakes prevents them from acting as sources that reduce the size of the capture zones) (RAPPS, 2003).

Where unconsolidated aquifer materials are in direct contact with bedrock, both at the base of the aquifer and along the model's eastern edge, a no-flow boundary is assumed. Although some exchange of groundwater between these units is possible, the unconsolidated deposits have a much higher hydraulic conductivity than the predominantly shale bedrock and flow between the two units likely constitutes only a small portion of the overall hydrologic budget for the area. The southern boundary of the model is a no-flow boundary located at a sufficient distance from the production wells so that their cones of depression do not extend out to these boundaries (RAPPS, 2003).

The wells of Creve Coeur, Pekin, North Pekin, and the Groveland Township Water District are located within the modeled area and have been included in the model to account for their significant pumpage in the region. Eight remediation wells and 7 collector wells operated by BP Amoco as part of a subsurface contamination clean-up and recovery system have been included in the model for the same reason. These wells are located just south of the Creve Coeur wells.

**Table 2:** Lambert Coordinates and Pumping Rates – All Additional Wells

| WELL I.D. | X Coordinate | Y Coordinate | Pumping Rate($m^3/s$) |
|---|---|---|---|
| Creve Coeur (#50382) | 2967459.00 | 2967459.00 | 7.65e-3 |
| Creve Coeur (#50383) | 2967302.00 | 2768305.00 | 1.39e-2 |
| Creve Coeur (#50384) | 2967382.00 | 2768378.25 | 1.39e-2 |
| North Pekin (#50210) | 2966114.00 | 2764259.50 | 3.19e-3 |
| North Pekin (#50211) | 2966346.75 | 2759770.00 | 3.19e-3 |
| Groveland TWP (#50075) | 2964975.75 | 2757126.50 | 2.72e-3 |
| Groveland TWP (#50076) | 2964971.00 | 2757368.00 | 2.72e-3 |
| Pekin (#50056) | 2958573.00 | 2744193.50 | 4.29e-2 |
| Pekin (#50057) | 2957913.25 | 2744007.75 | 4.23e-2 |
| Pekin (#50058) | 2958378.25 | 2744190.75 | 4.23e-2 |
| Pekin (#50060) | 2962602.50 | 2746887.75 | 3.38e-2 |
| Pekin (#50061) | 2962694.75 | 2746881.25 | 4.23e-2 |
| Pekin (#50062) | 2957061.50 | 2740658.75 | 4.23e-2 |
| Pekin (#50063) | 2962168.75 | 2755077.75 | 3.62e-2 |
| AMOCO (RW1) | 2966778.49 | 2766233.33 | 1.05e-3 |
| AMOCO (RW2) | 2966682.06 | 2766115.47 | 1.05e-3 |
| AMOCO (RW3) | 2966649.91 | 2765933.33 | 1.05e-3 |
| AMOCO (RW4) | 2966821.34 | 2765954.76 | 1.05e-3 |
| AMOCO (RW5) | 2966949.91 | 2765922.61 | 1.05e-3 |
| AMOCO (RW6) | 2967078.49 | 2765911.9 | 1.05e-3 |
| AMOCO (RW7) | 2967228.49 | 2765901.19 | 1.05e-3 |

**Table 2 (Continued):** Lambert Coordinates and Pumping Rates – All Additional Wells

| WELL I.D. | X Coordinate | Y Coordinate | Pumping Rate($m^3/s$) |
|---|---|---|---|
| AMOCO (RW8) | 2967378.49 | 2765890.47 | 1.05e-3 |
| AMOCO (CW1) | 2965921.34 | 2764926.19 | 2.1e-3 |
| AMOCO (CW2) | 3966360.36 | 2764936.9 | 2.1e-3 |
| AMOCO (CW3) | 2966167.77 | 2765204.67 | 2.1e-3 |
| AMOCO (CW4) | 2966339.2 | 2765483.33 | 2.1e-3 |
| AMOCO (CW5) | 2966585.03 | 2765419.04 | 2.1e-3 |
| AMOCO (CW6) | 2966821.34 | 2765376.19 | 2.1e-3 |
| AMOCO (CW7) | 2967035.63 | 2765344.04 | 2.1e-3 |

Model Parameters

Values for initial head, top and bottom elevation, hydraulic conductivity, porosity, and recharge had to be assigned for every cell in the finite difference grid. These values were determined using data from well logs, topographic maps, pump tests, and published literature sources (RAPPS, 2003).

**Initial Head** - An initial head value of 190 meters was assigned to every cell except constant head cells. Steady-state models are self-correcting, hence a uniform initial head distribution is appropriate. One hundred ninety meters is the maximum land surface elevation, and therefore the maximum potential hydraulic head, in the model domain. Head values for constant head cells were determined through linear interpolation of the gradient of the Illinois River and range from 130.96 to 131.06 meters.

**Cell Top and Bottom Elevations** – The elevation of the top of the aquifer varies spatially in the model domain. Cell top elevations were therefore varied in order to simulate aquifer top elevations as accurately as possible. A top elevation of 135 meters was assigned to cells in the northern part of the domain. Cells in the southern part of the domain (south of North Pekin),

where the aquifer is thicker due to the presence of an alluvial terrace above the Illinois River floodplain, were assigned a top elevation of 143 meters. Linear interpolation was used to gradually increase top elevations from 135 to 143 meters between these two areas. Aquifer bottom elevations do not vary spatially in the model domain and all cells were assigned a bottom elevation of 112 meters.

**Hydraulic Conductivity** - Hydraulic conductivity (K) values for the Sankoty Sand were calculated from transmissivity values reported by Visocky and Sanderson (1996) from one 24-hour and one 7-day aquifer test in the Sankoty Well Field in Peoria, Illinois. These values range from 5.2e-4 to 7.86e-4 meters/second. Hydraulic conductivity values derived from pump tests on the Creve Coeur wells (located approximately 1,300 meters north of the Marquette Heights wells) and other nearby wells in the modeled area range from 4.53e-4 to 2.19e-3 meters/second. Because this range includes the Visocky and Sanderson values and is more conservative (higher K values result in larger capture zones), it was used in the model instead of the values reported by Visocky and Sanderson.

**Recharge** - Minimum and maximum recharge rates were determined using hydrograph separation techniques and published literature values. To determine minimum recharge using hydrograph separation techniques, daily discharge data from Farm Creek at East Peoria were analyzed using HYSEP (Sloto and Crouse, 1996), the U.S. EPA's streamflow hydrograph separation and analysis program. HYSEP produces an annual hydrograph of streamflow for each year of record analyzed, then estimates base flow by using one of three methods (fixed interval, sliding interval, or local minimum) to systematically draw connecting lines between the low points of the stream hydrograph. The sequence of connecting lines defines the base flow component of the hydrograph. The estimated base flow is then divided by the area of the stream's drainage basin or catchment to yield an estimate of average recharge. Using the local minimum method, annual estimates of base flow and recharge were determined for Farm Creek at East Peoria, then an average recharge rate was calculated from the annual estimates. This rate, 2.39e-9 meters/second (2.97 in/yr), is considered the minimum rate for the study area. An alluvial valley would have a higher recharge rate than an upland area in a similar climate.

The upper end member for recharge was determined from values reported in the literature in areas with similar climate and geologic setting (alluvial valley). Thornthwaite (1964) used his water balance model to determine the quantitative impact of climatic factors that determine the water surplus (recharge) of an area. He calculated recharge at the southern tip of Illinois for the town of Cairo of 0.274 meters (10.79 in) per year. Schicht (1965) calculated recharge directly from precipitation based on flow-net analysis of piezometric maps in the American Bottoms of the Mississippi Valley and found a range of 0.16 meters/year to almost 0.254 meters/year. A maximum rate for Marquette Heights was determined by rounding the large values found in the literature to a conservative 9.67e-9 meters/second (12 in/year).

**Porosity** - Sand and gravel deposits can have a porosity ranging from 25-50% (Domenico and Schwartz, 1998; Fetter, 1994; Morris and Johnson, 1967). Numerous studies by the Hydrologic Laboratory of the U.S. Geological Survey show that fine gravel deposits typically have a porosity between 25-39% with an average value around 34% (Morris and Johnson, 1967). Rounding down to 30% from the average provides a conservative estimate for defining the capture zone.

Calibration

The low R/K end member was determined by taking the lowest value for recharge (2.39e-9 meters/second) and dividing by the largest value of hydraulic conductivity (2.19e-3 meters/second). The resultant R/K value is 1.09e-6. This value represents an unlikely scenario because it is based on too low a recharge and too high a hydraulic conductivity. A high R/K value was then determined by running several simulations of the model, gradually increasing the R/K value until hydraulic head intersected the land surface somewhere in the study area, or until the R/K value determined by taking the highest value for recharge (9.67e-9 meters/second) and dividing by the smallest hydraulic conductivity value (4.53e-4 meters/second) was reached. This R/K value is 2.13e-5. Upon increasing the recharge to the maximum value and decreasing the hydraulic conductivity to the smallest value the heads did not reach the land surface. The high R/K end member is therefore 2.13e-5 (RAPPS, 2003).

Sensitivity Analysis

Trials were designed to determine what effects varying the R/K value would have on the capture zone geometry. The objective was to vary the hydraulic conductivity and recharge while remaining in the range of R/K values determined during calibration. In a normal sensitivity analysis, recharge is first set to the minimum rate and hydraulic conductivity set to the maximum value, simulating an unrealistically low R/K case. Recharge is then set to the maximum rate and hydraulic conductivity set to the minimum value, simulating an unrealistically high R/K case. Groundwater conditions in the study area must fall somewhere between these two R/K extremes. Finally, intermediate trials are run using combinations of low recharge with low hydraulic conductivity and high recharge with high hydraulic conductivity. The capture zones produced during these trials are compared, and if all four are similar in both size and geometry then a high degree of confidence is associated with the resultant WHPA. Table 3 shows the matrix of R/K values for the sensitivity analysis of the Marquette Heights model (RAPPS, 2003).

**Table 3:** R/K Combinations for the Sensitivity Analysis of the Marquette Heights Model

| | | **HYDRAULIC CONDUCTIVITY** | |
|---|---|---|---|
| **RECHARGE** | | Low Hydraulic Conductivity<br>4.53e-4 meters/second | High Hydraulic Conductivity<br>2.19e-3 meters/second |
| | Low Recharge<br>2.39e-9 meters/second | Intermediate R/K Member<br>5.28e-6 | **Low R/K End Member**<br>**1.09e-6** |
| | High Recharge<br>9.67e-9 meters/second | **High R/K End Member**<br>**2.13e-5** | Intermediate R/K Member<br>4.42e-6 |

During the low recharge/low hydraulic conductivity sensitivity trial the cells with well stresses representing Pekin wells # 3 and #6 went dry. In a steady-state model, all wells are pumped simultaneously at their steady-state pumping rates for the duration of the simulation. When recharge is minimal and a low hydraulic conductivity value is used, there is increased drawdown in and around the pumping wells and cells with large well stresses can easily go dry,

especially when they are in close proximity to other cells with large well stresses. Pekin wells #3 and #6 are in close proximity to other Pekin wells (well #6 is near well #5; well #3 is near wells #1 and #2), and it is for this reason that they went dry during the trial. The wells do not go dry in reality because they are cycled (i.e., they are not pumped continuously) and are most likely not pumped at the same time as the nearby wells. Also, the actual hydraulic conductivity and recharge values in the study area are most likely higher that the lowest values determined during development of the conceptual model (RAPPS, 2003).

The rewetting feature of MODFLOW allows the reactivation of cells that have been converted from active to inactive cells by the program because the head has dropped below the bottom elevation of the cell (McDonald et al., 1991). Rewetting was unable to prevent the cells with well stresses representing Pekin wells # 3 and #6 from going dry during the low recharge/low hydraulic conductivity sensitivity trial, however, so hydraulic conductivity was adjusted (while recharge remained set at 2.39e-9 meters/second) until the cells no longer went dry. The hydraulic conductivity value that achieves this was determined by running several simulations of the model, gradually increasing the hydraulic conductivity value until neither of the cells was dry at the end of the simulation. The resultant K value is 5.09 e-4 meters/second. This value replaced the low hydraulic conductivity value of 4.53e-4 meters/second in the low recharge/low hydraulic conductivity sensitivity trial so the results from the four sensitivity trials could be compared (RAPPS, 2003).

## RESULTS

The groundwater head elevations were simulated and calibrated according to observed mass water level measurements, based on the methods described by the foregoing. Figure 4 illustrates the predicted groundwater elevation contours or lines of equipotential predicted by MODFLOW. A "equipotential line" means a line in a two-dimensional groundwater flow field such that the total hydraulic head is the same for all points along the line (Fetter, 1994).

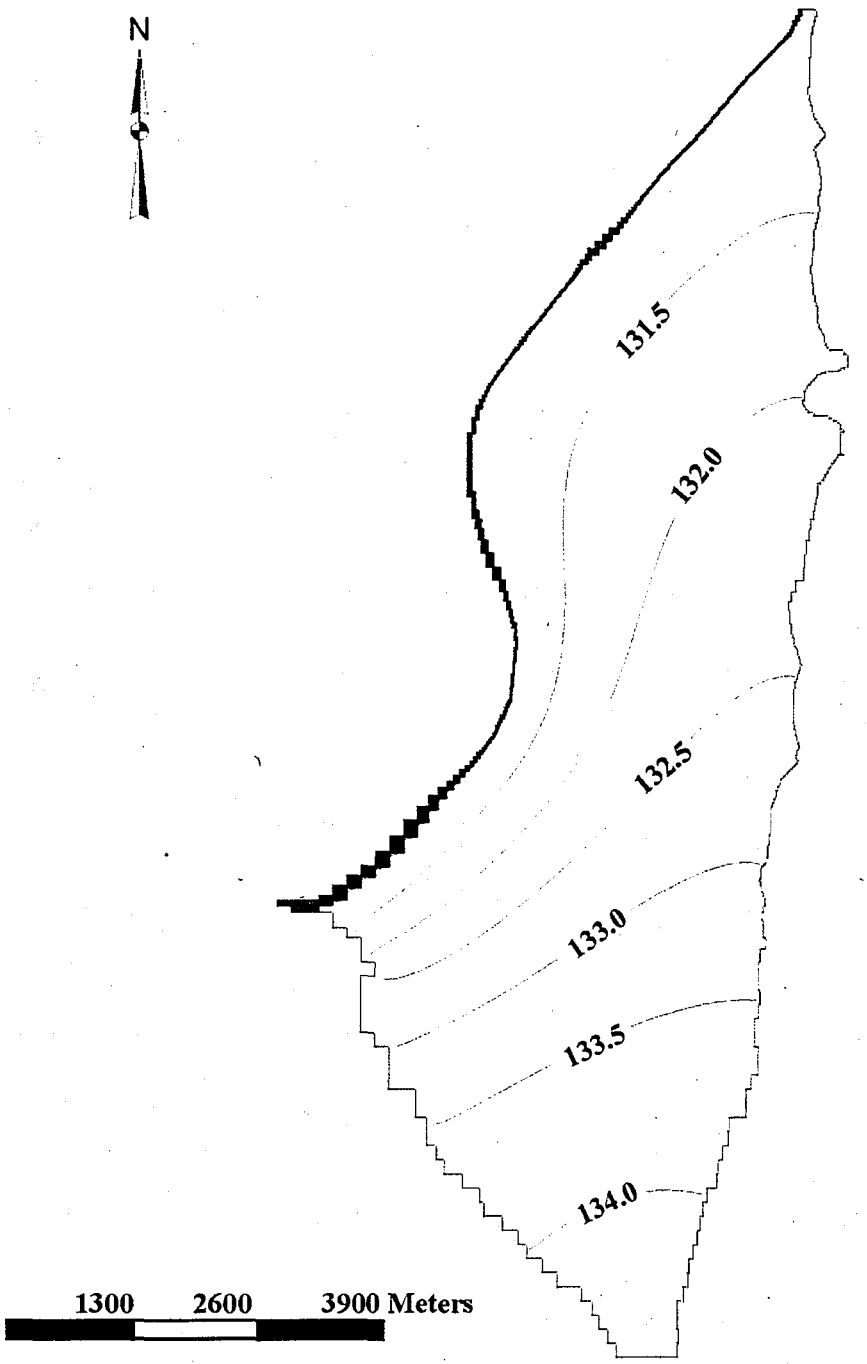



**Figure 4. Contour map of equipotential lines indicating groundwater flow patterns (0.5 meters contour interval).**

The capture zones produced by the four sensitivity analysis trials varied in size and geometry. Therefore, a conservative WHPA was constructed by outlining the area encompassed by the four individual capture zones. Because these four capture zones likely bound all possible capture zones for the model, there is a high degree of confidence in this composite WHPA than in any of the individual WHPAs (RAPPS, 03).

## REGULATORY DEVELOPMENT

On March 29, 2004 the Illinois EPA received a letter from the Mayor of Marquette Heights with an enclosed resolution requesting that we develop this proposal. This letter and the resolution are provided in Exhibit IV. After receipt of this letter and resolution the source water assessment completed for Marquette Heights on April 25, 2003 was evaluated to determine the susceptibility/vulnerablity of the wells to groundwater contamination. Marquette Heights Source Water Assessment Fact Sheet is detailed in Exhibit V. The Illinois EPA can develop a maximum setback zone proposal based upon the following from Section 14.3(d) of the Act (415 ILCS 5/14.3(d)):

> Such proposal shall be based upon all reasonably available hydrogeologic information, include the justification for expanding the zone of wellhead protection, and specify the boundaries of such zone, no portion of which shall be in excess of 1,000 feet from the wellhead. Such justification shall include the need to protect a sole source of public water supply or a highly vulnerable source of groundwater, or an Agency finding that the presence of potential primary or potential secondary sources or potential routes represents a significant hazard to the public health or the environment. (Emphasis added)

Evaluation conducted by the Illinois EPA, documented in Exhibit V, concludes that the Marquette Heights CWS wells are a highly vulnerable source of groundwater. Figure 1 also supports this conclusion. In addition, the Illinois EPA issued an advisory of groundwater contamination hazard for North Pekin and Marquette Heights on July 25, 1990 pursuant to Section 17.1(g) of the Act (415 ILCS 5/17.1(g)). This advisory was issued due to the presence of potential sources of groundwater contamination that represented a significant hazard to public health and the environment. Therefore, this proposal meets the requirements for justification,

emphasized above, under Section 14.3(g) of the Act. Further, pursuant to Section 14.3(d) of the Act, the Illinois EPA provided notice by certified mail to the City of Marquette Heights, Village of North Pekin, the Tazewell County Zoning Office, and the Central Priority Groundwater Protection Planning Committee on June 21, 2004. On July 7, 2004 the Central Priority Planning Committee included discussion of the proposed Marquette Heights maximum setback zone as one of the agenda items for discussion. I presented the background on the proposal and asked for the committee's input. A couple of general questions were asked and answered to their satisfaction. The regional committee understood the need for this protective measure and raised no objections to proceeding with the proposal.

The IGPA (415 ILCS 55/5), established the Interagency Coordinating Committee on Groundwater (ICCG). The Illinois EPA chairs the ICCG. The ICCG is comprised of: the Illinois Department of Public Health (IDPH); Department of Natural Resources (DNR); Department of Agriculture (DOA); Illinois State Fire Marshall (ISFM); Department of Commerce and Economic Opportunity (DCEO), and Illinois Emergency Management Agency (IEMA). The IGPA also establishes the Groundwater Advisory Council (GAC). The GAC is comprised of environmental, business, public water supply, county and municipal government, regional planning, and water well driller interest group representatives. The ICCG and GAC work jointly, and the Illinois EPA is the liaison between the ICCG and GAC. This state level coordinating committee and advisory council also works with the four priority groundwater protection-planning committees (415 ILCS 5/17.2) with diverse local stakeholder representation. A joint meeting of the ICCG and GAC was held on July 27, 2004 to discuss, among other issues, their input on the Marquette Heights maximum setback zone proposal. Similar to the regional committee, the GAC understood the need for the proposal and raised no objections.

Pursuant to Section 14.3 (d) of the Act, the Illinois EPA "...may proceed with filing such a proposal unless the county or municipality, within 30 days of the receipt of the written notice, files a request for a conference with the Agency. The Illinois EPA did not receive any comments, within the 30-day period prescribed by Section 14.3(d) of the Act, from City of Marquette Heights, Village of North Pekin, or the Tazewell County Zoning Office in regard to the written notice

provided to them by the Illinois EPA on June 25, 2004. Accordingly, we are proceeding with this proposal to the Board.

## The Illinois EPA's Proposal

The following is a section-by-section summary of the Illinois EPA's proposal.

## Subpart A General Maximum Setback Zones

This Subpart establishes the general provisions associated with all maximum setback zones that are adopted by the Board.

## Section 618.100 Purpose

This Section defines the purpose of maximum setback zone regulations delineated pursuant to Section 14.3 of the Act (415 ILCS 5/14.3).

## Section 618.105 Definitions

The Illinois EPA has proposed general definitions for maximum setback zones within the State of Illinois. The definitions proposed are derived from the Act, IGPA, and other Board regulations.

## Subpart B Marquette Heights CWS Well Maximum Setback Zones

This Subpart details the specific requirements that are being proposed to apply within the delineated Marquette Heights CWS well maximum setback zones.

Section 618.200 Purpose

The Purpose section describes the standards and requirements being proposed for the protection of the Marquette Heights CWS wells.

Section 618.205 1,000 Foot Maximum Setback Zone Prohibition

Section 618.205 describes the requirement that new potential primary sources are prohibited within the maximum setback zone of the Marquette Heights CWS wells in Appendix A of this Part. This requirement is based on Section 14.3 of the Act.

Section 618. Subpart B.Appendix A

Appendix A details a map of the Marquette Heights CWS wells (50280 and 50281), maximum setback zone boundaries, roads, and property boundaries and associated identification numbers. The local property boundaries and associated identification numbers were obtained from the county assessor's office. In addition, to assist with implementation, ease of understanding of the area being regulated, and conformance with local zoning, Illinois EPA has annotated the map with the properties located wholly or partially within the proposed maximum setback zone.

Technical Feasibility and Economical Reasonableness

The pollution of groundwater can have wide-ranging economic implications to local communities and businesses (Bhagwat and Berg, 1992) and (U.S. EPA, 1996). Groundwater contamination can produce significant economic hardships for local businesses and communities, including the following: devalued real estate; diminished home sales or commercial real estate sales; loss to the tax base; consulting and legal fees; increased operation and maintenance costs; increased water rates for alternative water supplies as well as the cost of new equipment and

treatment; and remediation costs including site characterization, feasibility studies, and long-term treatment and disposal costs (Freshwater Foundation, 1989). Further, communities that deliver water that exceeds the drinking water standards are placed on restricted status and are not issued permits for water main extensions that would allow the expansion of the distribution system. The ratio of contamination costs to basic prevention costs may be as large as 200:1 (U.S. EPA, 1996). All of these costs have the potential to adversely affect local economic development.

The U.S. EPA prepared an assessment of the national water supply replacement cost due to groundwater contamination from nine types of contamination sources. The total national value of resource damage from these sources was estimated to be greater than S28 billion. The U.S. EPA study also provided a summary from a site-specific case involving a leaking underground storage tank that has cost $1.9 million in state funds, and $1 million for direct and borrowed funds to the community for aquifer rehabilitation. In addition, for contamination cases where the only feasible alternative is drilling new wells, the cost of installing new transmission and distribution lines to connect private well users to existing community water supplies is substantial. In cases where these alternatives were necessary, costs have ranged from $70 thousand to over $2.3 million, depending on the extent of contamination and the population served.

The Illinois EPA has also evaluated costs associated with contaminated community water supplies in Illinois (Cobb, 2000 and 2001). In addition, to previous testimony provided by Illinois EPA, the groundwater contamination at East Alton provides another example of the cost versus the benefit of implementing groundwater protection measures. East Alton, located in Madison County, has had to use one of their wells as a hydraulic containment well with treatment and discharge to surface water to protect their well field from a methyl tertiary butyl ether (MTBE plume) with a concentration exceeding 1,000 parts per billion ("ppb"). Two leaking underground storage tanks located with the recharge area of the East Alton well field have each spent nearly $1,000,000 each, and the remediation is not complete. Table 4 details the cost-benefit analysis that East Alton's consultant performed on providing a safe and adequate water supply.

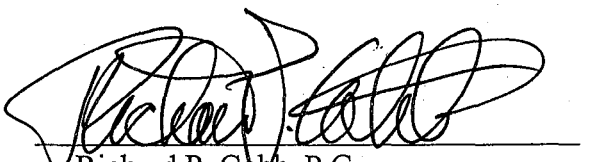
**Table 4:** Cost Benefit Analysis of Treating or Providing an Alternative Water Supply in East Alton, Illinois (Madison County) due to MTBE Groundwater Contamination

| COST COMPARISON SUMMARY<br>(a) Assume Illinois EPA loan, 20 years, 3%, Level debt (no coverage)<br>(b) Increase over and above current annual cost of $590,000, excluding depreciation | | | | | | |
|---|---|---|---|---|---|---|
| Case | Description | Capital Cost | Debt Service (a) | O&M Cost Increase | Annual Cost Increase | % Revenue Increase (b) |
| 1a | Pump, Treat, Discharge (Iron & Manganese Reduction) | $41,700 | $2,803 | $89,900 | $92,603 | 15.7% |
| 1b | Pump, Treat, Discharge (Iron & Manganese Reduction: MTBE Reduction with Air Stripper) | $658,300 | $44,254 | $156,900 | $201,154 | 34.1% |
| 1c | Pump, Treat, Discharge (Iron & Manganese Reduction: MTBE Reduction with GAC) | $1,048,600 | $70,492 | $738,200 | $808,692 | 137.1% |
| 2 | Pump, Treat, Discharge (Iron & Manganese Reduction: MTBE Reduction with Air Strippers & GAC) | $2,904,500 | $195,255 | $1,561,000 | $1,756,255 | 297.7% |
| 3 | New Well Field | $2,727,100 | $183,329 | $51,400 | $234,729 | 39.8% |
| 4 | Alternate Treated Water Supply | $1,505,000 | $101,174 | $568,900 | $670,074 | 113.6% |

These and other examples (Bhagwat and Berg, 1992) document that the cost of groundwater contamination is significant. In contrast, establishing a maximum setback zone will reduce the likelihood of contamination, thereby reducing costs. In summary, the benefit of adopting a maximum setback zone that minimizes the risk of potential contamination exceeds the cost of this proposed regulation.

## CONCLUSION

This concludes my testimony. I will be happy to address any questions.



Richard P. Cobb, P.G.
Deputy Manager
Division of Public Water Supplies
Illinois Environmental Protection Agency

**EXHIBIT I - Richard P. Cobb's Curriculum Vitae**

# CURRICULUM VITAE
# of
# RICHARD P. COBB, P.G.

## I. Personal

A. Present Position: Deputy Manager, Division of Public Water Supplies, Bureau of Water, Illinois Environmental Protection Agency

B. Personal: Married to Janet Cobb since July 12, 1986 with one son Dylan Cobb who is 11 years old. Actively involved at Our Saviors' Lutheran Church and School, as follows: Director of the Board of Missions and Evangelism, December 1999 to December 2001; Director of the Spiritual Life Team associated with implementation of a capital campaign in 2002; 5 grade Sunday school teacher, May 2003 – May 2004; Board of Elders, December 2003 - present; Parent Teacher League; and Cub Scouts.

## II. Education

1979 San Salvador Bahamian Research Station (Marine Ecology and Paleoecology)

1980 South Dakota School of Mines and Technology (Field Geology)

1981 B.S. Illinois State University (Geology)

1984 Illinois State University (Hydrogeology and Engineering Geology)

1986 United States Geological Survey National Training Center (Geochemistry for Groundwater Systems)

1986 Illinois State University Graduate Hydrogeology Program (Hydrogeology of Waste Disposal Sites)

1987 Illinois State University Graduate Hydrogeology Program (Hydrology of Glacial Deposits in Illinois)

1992 United States Geological Survey (MODFLOW and MODPATH groundwater modeling)

1994 24 Hour Occupational Health & Safety Training

| | |
|---|---|
| 1995 | Illinois State University Graduate Hydrogeology Program (Computer Modeling of Groundwater Systems) |
| 2001 | United States Environmental Protection Agency Introduction to Quality Systems Requirements and Basic Statistics Courses |
| 2001 | United States Environmental Protection Agency, Drinking Water Academy, Source Water Contamination Prevention Measures |

**III. License**

Licensed Professional Geologist 196-000553, State of Illinois, expires 3/31/2005

**IV. Certification**

Certified Professional Geologist 7455, Certified by the American Institute of Professional Geologists 4/88

Certified Total Quality Management Facilitator
Certified by Organizational Dynamics Inc., 5/92

**V. Summary of Experience**

Nineteen years of diversified, interdisciplinary experience as a: deputy division manager (2-years), section manager (10-years), unit manager (4-years), and lead worker (3-years) for Illinois' statewide groundwater protection and drinking water program. More than twenty years of experience of working as a professional geologist in hydrogeology, environmental geology and petroleum geology. Three years of experience as a consulting well site geologist for major and independent oil companies conducting petroleum exploration and development in Arkansas, Kansas, Louisiana, Montana, North Dakota, Oklahoma and Utah. Two years of undergraduate teaching assistant experience for petrology, geologic field techniques, and stratigraphy courses.

**VI. Summary of Computer Skills**

I use the following computer programs: WordPerfect 10, Microsoft Word 2000, Excel, Access, Power Point, ARC VIEW 3.2, Aqtesolv, SURFER, WHPA, DREAM, AQUIFEM, MODFLOW, MODPATH, and Visual MODFLOW.

**VII. Professional Representation**

A. Illinois Environmental Protection Agency (Agency) liaison to the Governor appointed Groundwater Advisory Council (GAC).

B. Agency representative on the Interagency Coordinating Committee on Groundwater (ICCG).

C. Agency representative on the Senate Working Committee on Geologic Mapping.

D. Agency representative on the State Certified Crop Advisory Board, and chairman of the ethics and regulatory subcommittee established in association with the American Society of Agronomy/American Registry of Certified Professionals in Agronomy, Crops and Soils 1995 – 2001.

E. Past Chairman of the Agency Geographic Information System Users Group.

F. Past member of the Agency Cleanup Objectives Team from 1988 to 1993 that established soil and groundwater cleanup objectives on a site-by-site basis.

G. Member of technical work group that developed Illinois groundwater quality standards regulations.

H. Project leader for a special Agency work group that utilized vadose zone and solute transport modeling to develop soil cleanup objectives under different hydrogeologic settings for the leaking underground storage tank program.

I. Agency representative on a special subcommittee of the ICCG charged with the development of a State Pesticide Management Plan for the protection of groundwater.

J. Member of Agency task group involved with developing the siting criteria for a low level radioactive waste site in Illinois.

K. Environmental regulatory representative from Illinois on the Fresh Water Foundation's Groundwater Information System (GWIS) project in the great lakes basin.

L. Agency representative on four priority regional groundwater protection planning committees designated by the Director to advocate groundwater protection programs at the local level.

M. Representative on the Groundwater Subcommittee of the National Section 305(b) Report, of the Clean Water Act Consistency Workgroup.

N. Bureau of Water representative on the Agency's Locational Data Policy Workgroup.

O. Bureau of Water representative on the Agency GIS Steering Committee.

P. Member of the Ground Water Protection Council's Wellhead Protection Subcommittee.

Q. Elected Co-Chair of the Groundwater Division of the GWPC on September 1997. GWPC is a national, not for profit organization whose members are interested in the protection of the

nation's ground water supplies. The mission of the GWPC is to promote the safest methods and most effective regulations regarding comprehensive ground water protection and underground injection techniques. GWPC's meetings, workshops, seminars, and symposia provide forums, educational resources, open communication, and active participation by its members. GWPC's membership includes local, state, and federal governments, citizen groups, industry, academia, and other parties interested in responsible protection and management of ground water resources.

R. Chairman of Illinois' Source Water Protection Technical and Citizens Advisory Committee.

S. United States Environmental Protection Agency National Ground Water Report work group member. One of 10 state representatives serving on a work group sponsored by U.S. EPA headquarters charged with development of a national report to be submitted to the U.S. Congress on the status and needs for groundwater protection programs across the country. January 1999 to July 2000.

T. Northeastern Illinois Planning Commission Water Supply Task Force member. The purpose of this task force is to assist the Commission in the development of a Strategic Plan for Water Resource Management. March 1999 to 2001.

**U.** GWPC/U.S. EPA Futures Forum Work Group providing input on source water protection for the next 25 years. January 1999 to 2001.

**V.** GWPC/ASDWA work group providing input into the U.S. EPA Office of Ground and Drinking Water Strategic Plan for Source Water Protection. June 2000.

**W.** Co-Chair U.S. EPA Headquarters/GWPC/ASDWA/ASWIPCA workgroup to develop the second Ground Water Report to Congress. March 2002 – Present.

**X.** Member of Agency Enforcement and Compliance System (ACES) Oversight Committee and Agency Information Management Steering Committee. June 2002 – Present.

**Y.** Chaired the ICCG Groundwater Contamination Response Subcommittee responsible for developing a new strategy for responding to groundwater contamination and the subsequent notification of private well owners. March 2002 – Present.

**Z.** Illinois EPA representative on the ICCG Water Quantity Planning Subcommittee working on development of a surface and groundwater quantity- planning program for Illinois. June 2002 - Present

**ZZ.** Bureau of Water representative on Agency Environmental Justice Advisory Group. January 2003.

**AA.** Bureau of Water representative working on the development of a new Strategic Management Plan for Illinois EPA under the new administration. August 2003 – present.

## VIII. Professional Affiliation

American Institute of Professional Geologists
Illinois Groundwater Association
Ground Water Protection Council
National Groundwater Association -Association of Groundwater Scientists and Engineers
Sigma Xi – The Scientific Research Society

## IX. Chronological Experience

**5/02 – Present - Deputy Manager, Division of Public Water Supplies, Bureau of Water (BOW), Illinois Environmental Protection Agency (EPA).** My primary responsibilities include managing the groundwater and source water protection, field operations, and the administrative sections of the division. Further, I assist with administering the public water supervision program under the federal Safe Drinking Water Act ("SDWA"). Additionally, responsibility includes the integration of source water protection with traditional water supply engineering and treatment practices, and to further assist with linking Clean Water Act and SDWA programs. I also represent on the BOW on Illinois EPA's: Strategic Management Planning Team; Environmental Justice Committee; Agency Information Management Steering Committee; Agency Compliance and Enforcement System Oversight Group (ACES OG); and the Geographic Information System Steering Committee. Further, I chair the ACES OG Subcommittee working on an e-permit system.

**9/92-5/02 - Manager of the Groundwater Section, Division of Public Water Supplies, BOW, Illinois EPA.** I also serve periodically as Acting Manager for the Division of Public Water Supplies. My primary responsibilities include development and implementation of Illinois statewide groundwater quality protection, USEPA approved wellhead protection program, and source water protection program. My responsibilities include development and implementation of Illinois statewide groundwater quality protection, USEPA approved wellhead protection program, and the source water assessment and protection program for surface and groundwater public drinking water supplies. These duties include extensive coordination with federal, state and local stakeholders that include the Governor appointed Groundwater Advisory Council, the Interagency Coordinating Committee on Groundwater, four Priority Groundwater protection planning Committees, Illinois Source Water Protection Technical and Citizens Advisory Committee and through being co-chair of the GWPC Ground Water Division. Additionally, work with the Bureau of Water permit and Mine Pollution Control Program staff to develop source water protection, groundwater monitoring and aquifer evaluation and remediation programs. I have also served as a primary Agency witness at Illinois Pollution Control Board proceedings in the matter of groundwater quality standards, technology control regulations, regulated recharge areas and water well setback zone exceptions. Furthermore, I have served as an Agency witness in enforcement matters.

**7/91-9/92 - Acting Manager of the Groundwater Section, Division of Public Water Supplies, BOW, Illinois EPA.** My responsibilities include continued development and implementation of Illinois statewide groundwater quality protection and USEPA's approved

wellhead protection program. Additionally, work with the Bureau of Water permit and Mine Pollution Control Program staff to develop groundwater monitoring and aquifer evaluation, remediation and/or groundwater management zone programs. I also served as a primary Agency witness at Illinois Pollution Control Board proceedings in the matter of groundwater quality standards and technology control regulations. Additionally, serve as an Agency total quality management (TQM) facilitator, and TQM trainer.

Manage a statewide regulatory compliance program for activities located within setback zones and regulated recharge areas of potable water supply wells.

**7/88-7/91 - Manager of the Hydrogeology Unit, Groundwater Section, Division of Public Water Supplies, Illinois EPA**. Manage a staff of geologists and geological engineers that apply hydrogeologic and groundwater modeling principals to statewide groundwater protection programs. Oversight the development, integration and application of Geographic Information System, global positioning system, geostatistical, optimization, vadose zone, solute transport, groundwater flow and particle tracking computer hardware/software programs for groundwater protection and remediation projects.

Provide administrative support to the Section manager in coordination, planning, supervision, grant application and management, regulatory and legislative development in relation to the statewide groundwater quality protection program. Establish soil and groundwater cleanup objectives on the Agency Cleanup Objectives Team.

**7/85-7/88 - Environmental Protection Specialist I, II, and III in the Groundwater Section, Division of Public Water Supplies, Illinois EPA.** Lead worker and senior geologist in the development and implementation of Illinois statewide groundwater quality protection program.

**3/81-12/83 - Consulting Well Site Geologist** for Geological Exploration (GX) Consultants of Denver Colorado. Worked as a consulting well site geologist in petroleum exploration and development for major and independent oil companies. Responsible for the geologic oversight of test drilling for the determination and presence of petroleum hydrocarbons. Prepared geologic correlations and performed analysis of geophysical logs, drilling logs and drill cuttings. Supervised and analyzed geophysical logging. Made recommendations for conducting and assisted with the analysis of drill stem tests and coring operations. Provided daily telephone reports and final written geologic reports to clients.

**1/79-3/81** Title: **Undergraduate Teaching Assistant** for Illinois State University Geology Department. Responsible for teaching and assisting with lecture sessions, lab sessions, assignment preparation and grading for petrology, stratigraphy and geologic field techniques.

**X. List of Rulemaking or Cases in Which Expert Witness Experience Has Been Gained**

IN THE MATTER OF: GROUNDWATER QUALITY STANDARDS (35 ILL. ADM. CODE 620), R89-14(B) (Rulemaking). Subject: I served as the principal Illinois EPA witness recommending adoption of this Agency proposal. R89-14(B) was adopted by the Board.

IN THE MATTER OF: GROUNDWATER PROTECTION: REGULATIONS FOR EXISTING AND NEW ACTIVITIES WITHIN SETBACK ZONES AND REGULATED RECHARGE AREAS (35 ILL. ADM. CODE 601, 615, 616 and 617), R89-5 (Rulemaking). Subject: I served as the principal Illinois EPA witness supporting adoption of this Agency proposal. R89-5 was adopted by the Board.

IN THE MATTER OF: GROUNDWATER QUALITY STANDARDS (35 ILL. ADM. CODE 620), R93-27 (Rulemaking). Subject: I served as the principal Illinois EPA witness recommending amendments of new constituent standards in this Agency proposal.

IN THE MATTER OF: PROPOSED REGULATED RECHARGE AREAS FOR PLEASANT VALLEY PUBLIC WATER DISTRICT, PROPOSED AMENDMENTS TO (35 ILL. ADM. CODE 617), R00-17 (Rulemaking). Subject: I served as the principal Illinois EPA witness supporting adoption of this Agency proposal. The proposal was adopted on July 26, 2001 and became effective September 1, 2001.

IN THE MATTER OF: NATURAL GAS-FIRED, PEAK-LOAD ELECTRICAL GENERATION FACILITIES (PEAKER PLANTS), R01-10 (Informational Hearing) Subject: I served as a supporting Illinois EPA witness to discuss the impact of peaker plants on groundwater.

IN THE MATTER OF: PROPOSED AMENDMENTS TO TIERED APPROACH TO CORRECTIVE ACTION OBJECTIVES (35 Ill. Adm. Code 742), (R00-19(A) and R00-19(B)) (Rulemaking). Subject: I served as a supporting Illinois EPA witness recommending inclusion of MTBE in this Agency proposal.

IN THE MATTER OF: GROUNDWATER QUALITY STANDARDS AND COMPLIANCE POINT AMENDMENTS (35 ILL. ADM. CODE 620), R01- 14 (Rulemaking). Subject: I served as the principal Illinois EPA witness recommending amendments of a groundwater standard for MTBE and compliance point determinations in this Agency proposal. The Board adopted the proposal unanimously on January 24, 2002.

STATE OIL COMPANY vs. DR. KRONE, McHENRY COUNTY and ILLINOIS EPA, PCB 90-102 (Water Well Exception). Subject: This case involved obtaining an exception from the owner of a non-community water supply well for placing new underground gasoline storage tanks within the 200 foot setback zone of well. I served as the principal witness for Illinois EPA on this case. The Board granted the exception with conditions.

SHELL OIL COMPANY vs. COUNTY of DuPAGE and THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, PCB 94-25 (Water Well Setback Exception). Subject: A new underground gasoline storage tank was seeking an exception from the Illinois Pollution Control Board in relation to a private drinking water supply well setback zone. The DuPage County and the Illinois EPA held that the tank would be a significant hazard and opposed the exception. I served as the principal Illinois EPA witness. Shell withdrew the petition from the Board after hearings were held.

People ex rel. Ryan v. STONEHEDGE, INC., 288 Ill.App.3d 318, 223 Ill.Dec. 764, 680 N.E.2d 497 (Ill.App. 2 Dist. May 22, 1997). Subject: State brought Environmental Protection Act action against company engaged in business of spreading deicing salt, alleging that salt stored on company's industrial property leaked into area's groundwater supply, thereby contaminating it. The Circuit Court, McHenry County, James C. Franz, J., granted company's motion for summary judgment. State appealed. The Appellate Court, Colwell, J., held that: (1) wells existing before Illinois Water Well Construction Code was enacted are not "grandfathered" in as being in compliance with Code, so as to be automatically subject to testing for groundwater contamination, and (2) fact issues precluded summary judgment on claim arising from alleged deposit of at least 50,000 pounds of salt in pile within 200 feet of two existing water supply wells. Affirmed in part and reversed in part; cause remanded.

People vs. AMOCO OIL COMPANY and MOBIL CORPORATION, Case no. 90-CH-79, Tenth Judicial Court, Tazewell County, Illinois. Subject: Groundwater contamination resulting from releases at above ground bulk petroleum storage terminals resulting in violation of Illinois' Groundwater Quality Standards Regulations (35 Illinois Administrative Code 620). I served as the principal Illinois EPA witness on this case. The case was settled with a penalty of $125,000 and the requirement of a comprehensive corrective action program.

People vs. STONEHEDGE INC. Case no. 94-CH-46, Circuit Court of the 19th Judicial Circuit, McHenry County. Subject: This case involved a violation of the potable well setback zone provisions of Section 14.2 of the Illinois Environmental Protection Act. Stonehedge Inc. placed a salt pile of greater than 50,000 pounds within the 200 foot setback of multiple private drinking water supply wells. I served as an Agency principal witness. Stonehedge Inc. was found to be guilty of violating the setback prohibition in this case and was assessed a penalty of $1,500 and attorneys fees of $4,500.

SALINE VALLEY CONSERVANCY DISTRICT vs. PEABODY COAL COMPANY, Case No. 99-4074-JLF, United States District Court for the Central District of Illinois. Subject: Groundwater contamination from the disposal of 12.8 million tons of coarse coal refuse, slurry and gob. Witness for the Illinois EPA. This is an on-going case.

HOUSE BILL 171 METHYL TERTIARY BUTYL ETHER (MTBE) ELIMINATION ACT, House Environmental and Energy Committee.
Subject: Legislation to phase out MTBE within 3 years of enactment. I served as a principal Illinois EPA witness in support of the proposed legislation. The legislation was adopted to require the ban of MTBE within three years.

TERESA LeCLERCQ; AL LeCLERCQ; JAN LeCLERCQ; WALT LeCLERCQ, individually; and on behalf of all persons similarly situated vs. THE LOCKFORMER COMPANY, a division of MET-COIL SYSTEMS CORPORATION, Case no. 00 C 7164, United States District Court, Northern District of Illinois. Subject: I was called as a witness by Lockformer Company to testify about a Well Site Survey prepared and published in 1989 by the Illinois EPA for Downers Grove community water supply.

TERESA LeCLERCQ; AL LeCLERCQ; JAN LeCLERCQ; WALT LeCLERCQ, individually; and on behalf of all persons similarly situated vs. THE LOCKFORMER COMPANY, a division of MET-COIL SYSTEMS CORPORATION, Case no. 00 C 7164, United States District Court, Northern District of Illinois. Subject: I was called as a witness by Lockformer Company to testify about groundwater contamination in the Lisle and Downers Grove area.

HOUSE BILL 4177 PRIVATE WELL TESTING PROPERTY TRANSFER and DISCLOSURE ACT, House Environmental and Energy Committee. Subject: Legislation to require volatile organic chemical contamination testing of private wells at the time of property transfer and reporting to the Illinois Department of Public Health and the Illinois EPA. I served as a principal Illinois EPA witness in support of the proposed legislation. The legislation was not supported due to the opposition from the realtors association.

MATTER OF PEOPLE vs. PEABODY COAL, PCB 99-134 (Enforcement). Subject: the State of Illinois developed an amended complaint against Peabody Coal Company (PCC) for violation of the groundwater quality standard for total dissolved solids, chloride, iron, manganese, and sulfate. I developed testimony to address PCC's affirmative defense of challenging the basis for the groundwater quality standards for these contaminants.

**XI. Honors**

Sigma Xi 4/81

Superior Performance Award 1/86

Superior Performance Award 11/87

Certificate of Commendation for Groundwater Protection Programs 4/92

Certificate of Appreciation for work on the Agency's Cleanup Objectives Team 4/93

Certificate of Appreciation for participation as an Agency TQM facilitator 4/93

Certificate of Appreciation for participation on a total quality action team 4/93

Certificate of Appreciation for participation in the Governors Environmental Youth Corps Program 4/93

Director's Commendation Award for participation in the development of the City of Pekin, Il. Groundwater Protection Program and commitment to the protection of Illinois groundwater. 7/95

Certificate of Appreciation for outstanding contribution to the development of the Ground Water Guidelines for the National Water Quality Inventory 1996 Report to Congress from the United States Environmental Protection Agency Office of Ground Water and Drinking Water. 8/96

Groundwater Science Achievement Award from the Illinois Groundwater Association for outstanding leadership and service in the application of groundwater science to groundwater protection in Illinois and in the development of the wellhead protection program and pertinent land-use regulations. 11/97

Certificate of Appreciation from the Ground Water Protection Council for distinguished service, remarkable dedication, valuable wisdom and outstanding contribution as a GWPC member, division co-chair and special committee member. 9/99

Drinking Water Hero Recognition by United States Environmental Protection Agency Administrator Carol Browner at the 25th Anniversary of the Federal Safe Drinking Water Act Futures Forum in Washington D.C. 12/99.

Certificate of Recognition from United States Environmental Protection Agency Region V Adminstrator Fred Lyons for outstanding achievements in protecting Illinois' groundwater resources. 12/99

Nominated by the Governor's Office of Technology for an Exemplary Systems in Government (ESIG) Award from the Urban and Regional Information Systems Association (URISA) for the Illinois EPA's Source Water Assessment and Protection Internet Geographic Information System. 6/01

## XII. PUBLICATIONS

### A. Illinois EPA Strategic Plans

**Principal Author**

Illinois Environmental Protection Agency's *Homeland Security Strategy*, March 2003, 20pp.

**Co-Author**

Illinois Environmental Protection Agency' *Strategic Plan, Bureau of Water Section*, September 2003, pp.

### B. Enforcement

**Principal Author**

*Opinions and Conclusions of Richard Cobb For the Matter of People v. Peabody Coal*, PCB 99-134 (Enforcement), May 23, 2003. 60 pp.

## C. Legislation and Legislative Development Documents

### Co-Author

*A Plan for Protecting Illinois Groundwater*, Illinois Environmental Protection Agency, January 1986. 65 p.

*Groundwater in Illinois: A Threatened Resource, A Briefing Paper Regarding the Need for Groundwater Protection Legislation*, Governors Office and Illinois Environmental Protection Agency, April 1987. 34 pp.

*Illinois Groundwater Protection Act*, Public Act 85-0863, September 1987. 68 pp.

*Executive Order #5* - requires the ICCG to designate a subcommittee to develop an integrated groundwater and surface water resources agenda and assessment report. The report shall analyze the burden's on Illinois finite water resources, quantify Illinois' water resources, and prioritize an agenda to plan for the protection of these water resources. The Director of the Department of Natural Resources chaired this subcommittee. The ICCG and GAC shall use the subcommittee's agenda and report to establish a water-quantity planning procedure for the State. The Governor signed executive order #5 on Earth Day April 22, 2001.

*Amendments to Sections 2, 3 and 4 of the Illinois Groundwater Protection Act 415 ILCS 55/2* to establish a Groundwater and Surface Water Quantity Protection Planning Program, January 2002, 3 pp. These amendments were never adopted due to opposition from the Illinois Farm Bureau.

*Public Act 92 –652/Senate Bill 2072* - Amends the Illinois Groundwater Protection Act to require the Environmental Protection Agency to notify the Department of Public Health, unless notification is already provided, of the discovery of any volatile organic compound in excess of the Board's Groundwater Quality Standards or the Safe Drinking Water Act maximum contaminant level. Provides an exception to the restriction that the Act does not apply to a community water supply that is regulated under the Environmental Protection Act. Requires the Department to notify the public within 60 days of the receipt of the notice from the Agency that the owner of any private water system, semi-private water system, or non-community public water system needs to test his or her system for potential contamination. Provides guidelines for the publication of notice. Passed the Senate Environment and Public Works Committee February 2002. The Governor signed this into law as Public Act 29-652 (effective July 25, 2002).

*House Bill 4177* - amends the Illinois Groundwater Protection Act. Provides that before property that has a well used for drinking water on it can be sold, the owner must have the well

water tested for volatile organic chemical groundwater contaminants. Provides that if the well water does not meet the Illinois Pollution Control Board's Groundwater Quality Standards (35 Il Adm Code Part 620), the owner shall notify the Illinois Department of Public Health (IDPH) and the prospective buyer of the property. The realtors association July 2002 opposed House Bill 4177.

*House Resolution 1010* - The resolution drafted by in cooperation with Senator Patrick Dunn' staff urge the Illinois Environmental Protection Agency to further strengthen its public outreach efforts by developing, after negotiations with individuals representing areas affected by contamination and other relevant State agencies, a procedure to notify property owners whenever the Agency has confirmed an exceedence of applicable health and safety standards, using scientifically credible data and procedures under Illinois regulations. HR 1010 was adopted by voice vote on June 1, 2004.

**D. Water Quantity Management and Protection**

**Principal Author**

R.P., Cobb, August 2002, *Development of Water Quantity Planning and Protection in Illinois – A New Direction*, Proceedings of the Annual Ground Water Protection Council Technical Forum, San Francisco, California, 10pp.

**E. Regulations**

**Co-Author**

*Groundwater Quality Standards* (35 Ill. Adm. Code 620), November, 1991. 79 pp.

*Groundwater Protection: Regulations for Existing and New Activities within Setback Zones and Regulated Recharge Areas* (35 Ill. Adm. Code 601, 615, 616 and 617), December 1991. 132 pp.

**Principal Author**

*Maximum Setback Zone Rules For Community Water Supply Wells* (35 Ill. Adm. Code 671), February 1988. 50 pp.

*Minimal Hazard Certification Rules (35 Ill. Adm. Code 670)*, February, 1994. 21 pp.

*Amendments to the Groundwater Quality Standards Regulation, (35 Ill. Adm. Code 620)*, February 1994.

*Regulated Recharge Area Regulation for Pleasant Valley Public Water District, (35 Ill: Adm Code 617)*, September 1, 2001 Effective date.

*Maximum Setback Zone Regulation for Illinois American Water Company-Peoria, (35 Ill. Adm. Code 618)*, under development.

*Maximum Setback Zone Regulation for Marquette Heights,* June 2004, under development.

**F. Groundwater Quality and Hydrogeology**

**Principal Author**

Cobb, R.P., and Sinnott, C.L., 1987. *Organic Contaminants In Illinois Groundwater.* Proceedings of the American Water Resources Association, Illinois Section, Annual Conference, Champaign, IL, April 28-29, p. 33-43.

Clarke, R.P., and Cobb, R.P., 1988. *Winnebago County Groundwater Study.* Illinois Environmental Protection Agency. 58 pp.

Cobb, R.P., etal, 1992. *Pilot Groundwater Protection Needs Assessment for the City of Pekin.* Illinois Environmental Protection Agency. 111 pp.

Cobb, R.P., December 2001.*Using An Internet Geographic Information System (GIS) to Provide Public Access to Hydrologic Data*, Association of Groundwater Scientists and Engineers, National Groundwater Association, National Conference Proceedings, Nashville, Tennessee.

Wilson, S., Cobb, R.P., and K. Runkle, January 2002. *Arsenic in Illinois Groundwater.* Illinois State Water Survey, Illinois Environmental Protection Agency, and Illinois Department of Public Health. http://www.epa.state.il.us/water/groundwater/publications/arsenic/index.html, 7 pp.

Cobb, R.P., Fuller, C., Neibergall, K., and M. Carson, February 2004. *Community Water Supply Well Shooting/Blasting near the Hillcrest Subdivision Lake County, Illinois Fact Sheet.* Illinois Environmental Protection Agency. 4 pp.

**Co-author**

P.C. Mills, K.J. Halford, R.P. Cobb, and D.J. Yeskis, 2002. *Delineation of the Troy Bedrock Valley and evaluation of ground-water flow by particle tracking, Belvidere, Illinois*, U.S. Geological Survey Water-Resources Investigations Report 02-4062, 46 pp.

**G. Groundwater Protection Program Documents**

**Principal Author**

Buscher, W.E., and Cobb, R.P., 1990. *Maximum Setback Zone Workbook.* Illinois Environmental Protection Agency. 62 pp.

Cobb, R.P., 1990. *Illinois Groundwater Protection Program: A Biennial Report.* Interagency Coordinating Committee on Groundwater. 53 pp.

Cobb, R.P., Buscher, W.E., and A. Dulka, 1991. *Illinois Approved Wellhead Protection Program* Submitted to the United States Environmental Protection Agency Pursuant to Section 1428 of the Safe Drinking Water Act. Illinois Environmental Protection Agency. 44 pp.

Cobb, R.P., 1992. *Illinois Groundwater Protection Program: A Biennial Report.* Interagency Coordinating Committee on Groundwater. 118 pp.

Cobb, R.P., 1994. *Illinois Groundwater Protection Program: A Biennial Report.* Interagency Coordinating Committee on Groundwater. 118 pp.

Cobb, R.P., 1994. *Briefing Paper and Executive Summary on the Illinois Groundwater Protection Act and Groundwater Protection Programs with Recommendations from the Illinois Environmental Protection Agency Regarding the Siting of a Low Level Radioactive Waste Site.* Presented to the Low Level Radioactive Waste Task Force on December 9, 1994 in Champaign-Urbana.

Cobb, R.P., 1994. *Measuring Groundwater Protection Program Success.* In the proceedings of a national conference on Protecting Ground Water: Promoting Understanding, Accepting Responsibility, and Taking Action. Sponsored by the Terrene Institute and the United States Environmental Protection Agency in Washington D.C., December 12-13, 1994.

Cobb, R.P., Wehrman, H.A., and R.C. Berg, 1994. *Groundwater Protection Needs Assessment Guidance Document.* Illinois Environmental Protection Agency. +94 pp.

Cobb, R.P., and Dulka, W.A., 1995. *Illinois Prevention Efforts: The Illinois Groundwater Protection Act Provides a Unified Prevention-Oriented Process to Protect Groundwater as a Natural and Public Resource,* The AQUIFER, Journal of the Groundwater Foundation, Volume 9, Number 4, March 1995. 3pp.

Cobb, R.P., 1995. *Integration of Source Water Protection into a Targeted Watershed Program.* In the proceedings of the GROUND WATER PROTECTION COUNCIL'S Annual Ground Water Protection Forum in Kansas City Missouri.

Cobb, R.P., 1996. *A Three Dimensional Watershed Approach: Illinois Source Water Protection Program.* In the proceedings of the GROUND WATER PROTECTION COUNCIL'S Annual Ground Water Protection Forum in Minneappolis Minnesota.

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Cobb, R.P., 1996. *Illinois' Core Comprehensive State Groundwater Protection Program Application.* Illinois Environmental Protection Agency. 159 pp.

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Cobb, R.P., etal. October 1999, *Ground Water Report to Congress*, United States Environmental Protection Agency.

Cobb, R.P., September 2001, *Regulated Recharge Area Proposal for the Pleasant Valley Public Water District*, Ground Water Protection Council Annual Forum Proceedings, Reno Nevada, 13 pp.

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**Co-Author**

Clarke, R.P., Cobb, R.P. and C.L. Sinnott, 1988. *A Primer Regarding Certain Provisions of the Illinois Groundwater Protection Act.* Illinois Environmental Protection Agency. 48 pp.

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Dulka, W.A., and R.P. Cobb, 1995. *Grassroots Group Forges Groundwater Protection Law.* American Water Works Association, Opflow, Vol. 21 No. 3. 2pp.

**H. Geology**

**Principal Author**

Cobb, R.P., 1980. *Petrography of the Houx Limestone in Missouri.* Transactions of the Illinois Academy of Science Annual Conference, Illinois Wesleyan, Bloomington, IL.

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## EXHIBIT III – United States National Map Accuracy Standards

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EXHIBIT
III

# *United States National Map Accuracy Standards*

With a view to the utmost economy and expedition in producing maps which fulfill not only the broad needs for standard or principal maps, but also the reasonable particular needs of individual agencies, standards of accuracy for published maps are defined as follows:

1. **Horizontal accuracy.** For maps on publication scales larger than 1:20,000, not more than 10 percent of the points tested shall be in error by more than 1/30 inch, measured on the publication scale; for maps on publication scales of 1:20,000 or smaller, 1/50 inch. These limits of accuracy shall apply in all cases to positions of well-defined points only. Well-defined points are those that are easily visible or recoverable on the ground, such as the following: monuments or markers, such as bench marks, property boundary monuments; intersections of roads, railroads, etc.; corners of large buildings or structures (or center points of small buildings); etc. In general what is well defined will be determined by what is plottable on the scale of the map within 1/100 inch. Thus while the intersection of two road or property lines meeting at right angles would come within a sensible interpretation, identification of the intersection of such lines meeting at an acute angle would obviously not be practicable within 1/100 inch. Similarly, features not identifiable upon the ground within close limits are not to be considered as test points within the limits quoted, even though their positions may be scaled closely upon the map. In this class would come timber lines, soil boundaries, etc.
2. **Vertical accuracy,** as applied to contour maps on all publication scales, shall be such that not more than 10 percent of the elevations tested shall be in error more than one-half the contour interval. In checking elevations taken from the map, the apparent vertical error may be decreased by assuming a horizontal displacement within the permissible horizontal error for a map of that scale.
3. **The accuracy of any map may be tested** by comparing the positions of points whose locations or elevations are shown upon it with corresponding positions as determined by surveys of a higher accuracy. Tests shall be made by the producing agency, which shall also determine which of its maps are to be tested, and the extent of the testing.
4. **Published maps meeting these accuracy requirements** shall note this fact on their legends, as follows: "This map complies with National Map accuracy Standards."
5. **Published maps whose errors exceed those aforestated** shall omit from their legends all mention of standard accuracy.
6. **When a published map is a considerable enlargement** of a map drawing (manuscript) or of a published map, that fact shall be stated in the legend. For example, "This map is an enlargement of a 1:20,000-scale map drawing," or "This map is an enlargement of a 1:24,000-scale published map."
7. **To facilitate ready interchange and use of basic information for map construction** among all Federal mapmaking agencies, manuscript maps and published maps, wherever economically feasible and consistent with the uses to which the map is to be put, shall conform to latitude and longitude boundaries, being 15 minutes of latitude and longitude, or 7.5 minutes, or 3-3/4 minutes in size.

*Issued June 10, 1941*
*Revised April 26, 1943*
*Revised June 17, 1947*

U.S. BUREAU OF THE BUDGET

## EXHIBIT IV - Marquette Heights Resolution

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# CITY OF MARQUETTE HEIGHTS

715 LINCOLN ROAD
MARQUETTE HEIGHTS, IL 61554
PHONE (309) 382-3455

EXHIBIT
IV

Earl Carter
Mayor, Peoria Heights
4901 N. Prospect Road
Peoria Heights, Il 61614

Re: Increase in setback/City of Marquette Heights water wells

Dear Mr. Carter:

The City of Marquette Heights (the "City") owns and operates two separate water wells located in North Pekin. Those wells lie in close proximity to petroleum terminals currently owned by British Petroleum, successor to Amoco Oil Company ("Amoco"). At various times Amoco and its predecessors were responsible for unlawful discharges of petroleum products into the soil. These discharges resulted in the contamination of ground water immediately adjacent to the terminal and in close proximity to the water wells operated by the City. In 1990 the Attorney General filed suit against Amoco. Ultimately, the Attorney General reached an agreement with Amoco under the terms of which Amoco agreed to implement a "Corrective Action Plan" which was designed to remediate the conditions created as a result of the unlawful discharges. It appears, however, that Amoco may be in a position to circumvent the terms and conditions of the Corrective Action Plan unless the Illinois Environmental Protection Agency ("IEPA") petitions to increase the setback from the existing wells operated by the City. In order to increase the probability that the Corrective Action Plan will be fully implemented, the City has asked the IEPA to petition the Pollution Control Board to increase the setback which establishes the water supply protection area for those wells from 400 feet to 1,000 feet. More details concerning this situation are set forth in the preambles to a resolution recently approved by the City Council of the City, a copy of which I have enclosed for your review.

Representatives of the IEPA have suggested that support from the Central Regional Groundwater Planning Committee could help to motivate the Pollution Control Board to approve an increase in the setback to 1,000 feet. I am, therefore, on behalf of the City of Marquette Heights requesting that the Central Regional Groundwater Planning Committee support any effort undertaken by the IEPA to increase the setback from the City's wells to 1,000 feet. In particular, I ask that your committee consider a proposed resolution, a copy of which I have enclosed herewith. I ask that a representative of the committee advise me as soon as possible whether or not the committee will support the proposed resolution. If the committee will support the proposed resolution, I ask that upon approval of the resolution, the committee forward a signed original of the resolution to me. I will assume responsibility for delivery of that resolution to the IEPA. In the meantime should you have any questions, comments, or suggestions concerning this matter, please do not hesitate to contact me.

Very truly yours,

David Redfield, Mayor
City of Marquette Heights

**RESOLUTION NO. 413**

**Marquette Heights, Illinois**
March 22, 2004

**RESOLUTION REQUESTING THAT THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY PROPOSE A REGULATION TO INCREASE THE SETBACK ZONE WHICH ESTABLISHES A WATER SUPPLY PROTECTION AREA FOR THE COMMUNITY WATER SUPPLY OF THE CITY OF MARQUETTE HEIGHTS**

**WHEREAS**, the City of Marquette Heights (the "City") currently owns and operates a community water supply (the "Water System") for the purpose of providing an adequate and safe supply of water to residents of the City; and

**WHEREAS**, no water bearing deposits capable of supplying an adequate and safe supply of water to residents of the City lie within the current corporate limits of the City; and

**WHEREAS**, the City supplies water to the Water System from two wells (the "Existing Wells") located in close proximity to each other within the corporate limits of the Village of North Pekin; and

**WHEREAS**, in the event that the water drawn from the Existing Wells became contaminated, the City would have no cost effective means of securing a replacement source of water; and

**WHEREAS**, in 1990 Amoco Oil Company ("Amoco") owned and operated a bulk storage and distribution terminal (the "Amoco Facility") used to store gasoline, fuel oil and other petroleum products; and

**WHEREAS**, in 1990 Mobil Oil Corporation ("Mobil") owned a bulk storage and distribution terminal (the "Mobil Facility") used to store gasoline, fuel oil and other petroleum products; and

**WHEREAS**, the Amoco Facility is contiguous to the Mobil Facility; and

**WHEREAS**, in 1990 Amoco operated the Mobil Facility and, subsequently, in 1993 Amoco acquired the Mobil Facility; and

**WHEREAS**, the boundaries of the Amoco Facility and the Mobil Facility lie within 2,000 feet of the wellheads of the Exiting Wells; and

**WHEREAS**, in 1990 the State of Illinois initiated litigation in Tazewell County Circuit Court at Case No. 90 CH 79 (the "Amoco Litigation") alleging that Amoco and/or Mobil had at various times unintentionally discharged petroleum products into the soil at the Amoco Facility and the Mobil Facility in violation of the Illinois Environmental Protection Act (the Act") found at 415 ILCS 5/1, et. seq.; and

**WHEREAS**, on May 17, 1999, the Tazewell County Circuit Court entered an order (the "Consent Order") which concluded the Amoco Litigation; and

**WHEREAS**, the Consent Order incorporated by reference a corrective action plan (the "Corrective Action Plan") designed to remediate the conditions created when Amoco and Mobil violated the Act; and

**WHEREAS**, the Corrective Action Plan is designed to bring about removal of harmful quantities of the material deposited into the soil as a result of the activities of Amoco and Mobil; and

**WHEREAS**, the current setback of 400 established for the Existing Wells is inadequate to insure that the Corrective Action Plan will be fully implemented in accordance with its terms and conditions; and

**WHEREAS**, the Source Water Assessment provided by the Illinois EPA indicates low levels of organic contaminants have been found in and proximate to the City's wells; and

**WHEREAS**, the Source Water Assessment provided by the Illinois EPA indicates there are 22 sites that could pose a potential hazard to the City's water supply; and

**WHEREAS**, because the Existing Wells lie within the corporate limits of the Village of North Pekin, the City has no authority to increase the setbacks for those wells; and

**WHEREAS**, the Act authorizes the Illinois Environmental Protection Agency ("IEPA") to petition the Illinois Pollution Control Board (the "Pollution Control Board") to adopt a regulation which would increase the setback for the Existing Wells up to a distance of 1,000 feet; and

**WHEREAS**, the Existing Wells constitute both a sole source of public water supply for the City and a highly vulnerable source of ground water, both of which conditions justify an increase in the setback of the Existing Wells to the maximum of 1,000 feet;

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARQUETTE HEIGHTS, TAZEWELL COUNTY, ILLINOIS, THAT:**

**Section 1**. The foregoing recitals are hereby adopted and found to be correct.

**Section 2**. The City hereby requests that the IEPA propose to the Pollution Control Board a regulation establishing a maximum setback zone for the Existing Wells of 1,000 from the well heads.

**Section 3**. The Mayor is hereby authorized and directed to submit a copy of this resolution to the Central Regional Groundwater Planning Committee with a request that such committee support the request of the City that the setback from the Existing Wells be established at 1,000 feet.

**Section 4**. The Mayor is hereby authorized to the extent he deems necessary to direct the City Engineer, the City Attorney and employees of the City to support any effort undertaken by the IEPA to increase the setback zones from the Existing Wells.

**Section 5**. The City Clerk is hereby authorized and directed to immediately submit a certified copy of this resolution to the IEPA.

**APPROVED:**

Mayor

**ATTEST:**

Sandra Brooks

City Clerk

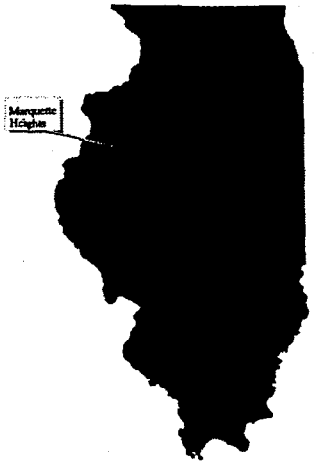
**EXHIBIT V – Source Water Assessment Program Fact Sheet for the City of Marquette Heights, Tazewell County, Illinois**

EXHIBIT

V

# Illinois Environmental Protection Agency

USGS science for a changing world




## Source Water Assessment Program

# *FACT SHEET*

## MARQUETTE HTS

TAZEWELL COUNTY

Prepared in cooperation with the U.S. Geological Survey.

Information and data used in the preparation of this Fact Sheet are provided by the Illinois EPA and are subject to revision.

**IMPORTANCE OF SOURCE WATER:**

The City of Marquette Heights (Facility Number 1790400) utilizes two active community water supply wells. Wells #4 and #5 (Illinois EPA #50280 and 50281, respectively) supply an average of 240,900 gallons per day (gpd) to 1,006 direct services and 41 satellite services or a population of 3,200. Large consumers include Briarwood Subdivision.

**WATER SUPPLIES THAT OBTAIN SOURCE WATER FROM THIS FACILITY:**

No connected water supplies existed at the time this Source Water Assessment fact sheet was completed.

**SOURCE OF WATER SUPPLY:**

Wells #4 and #5 are located in two pump houses east of route 29 and west of Main Street. Both wells produce approximately 450 gallons per minute (gpm). Well #2 is no longer used as a source of water and has been reported as properly abandoned. Wells #1 and #3 are listed as inactive. Wells #4 and #5 are 95 and 94 feet in depth, respectively. The wells obtain their source water from a shallow, permeable sand and gravel aquifer. Permeability is the meaure of the capability of a soil or sediment to transmit fluids. These wells are considered geologically sensitive by the Illinois EPA.

**WELL DATA FOR THIS FACILITY:**

| Well ID | Well Description | Status | Depth (Feet) | Min Setback (Feet) | Aquifer Description |
|---|---|---|---|---|---|
| 50280 | WELL 4 710 FT WNW OF WTP | A | 95 | 400 | Sand & Gravel |
| 50281 | WELL 5 30 FT W OF WELL 4 | A | 94 | 400 | Sand & Gravel |

**SOURCE WATER QUALITY:**

Wells #4 and #5 were sampled beginning on June 15, 1987 as part of a Statewide Groundwater Monitoring Program. The wells were sampled and analyzed for inorganic chemicals (IOC) and volatile organic compounds (V0C).

Inorganic analyses indicated that parameters are consistent with other sand and gravel aquifer of similar character in this part of Illinois. It is important to note that the IOC results were below the groundwater quality standards established under 35 Illinois Administrative Code Part 620.410.

VOC analyses have shown one detection of 1,1,1-trichloroethane in well #5 of 6.4 parts per billion (ppb). The groundwater quality standard for 1,1,1-trichloroethane established under Part 620.410 is 200 ppb. In addition, a groundwater assessment was conducted by Amoco/Mobil Oil Co. to determine the extent of impacts to the aquifer

by recent and historical spills at both the Amoco and Mobil Petroleum Terminals north of the Marquette Heights wells. This investigation disclosed that a floating product layer was encountered on-site. The investigation also found a plume of dissolved gasoline constituents extending to the southwest. The latter includes benzene, toluene, xylene, ethylbenzene, and MTBE. North Pekin has a community water supply well adjacent to this area. Marquette Heights' wells are located just east of the North Pekin well #1. Off-site contamination of groundwater was found in monitoring wells within the minimum setback zone of North Pekin well #1. Unconfirmed results from an independent laboratory on May 9, 1990 quantified 2 micrograms per liter of MTBE in the Village of North Pekin well #1.

**FINISHED WATER QUALITY:**

As referenced in the Source Water Quality Section of this report, the Marquette Heights community water supply has mineralized groundwater. Sampling performed after treatment shows no detections of any VOC. Further information on finished water quality data, tables of monitored parameters, contaminants detected, health advisory information, drinking water standards, and maximum contaminant levels is available at http://www.epa.gov/ogwdw/. Similar information is also available in the Consumer Confidence Report supplied by the City of Marquette Heights to its customers.

**POTENTIAL SOURCES OF CONTAMINATION:**

The sites labeled on the Wellhead Protection Planning Map and described in the following tables are "potential" sources of contamination. (Maps and tables are not available in the Visually Impaired Accessible version of this fact sheet. However, information included in the maps and tables are summarized within the following text sections of this fact sheet.) These sites are predominantly identified through the Illinois EPA's Well Site Survey Program based on the nature of their activity, the availability of data in electronic databases, and their geographic proximity to the source water protection area. In addition, the Illinois EPA made use of the information from its leaking underground storage tank database (http://epadata.epa.state.il.us/land/ust/search.asp) and site remediation program database (http://epadata.epa.state.il.us/land/srp/search.asp) to further assess potential sources of contamination to the source water. These databases include information from the Illinois EPA Division of Land Pollution Control (LPC) and the Illinois Emergency Management Agency (IEMA). The following is a list of facilities contained within these databases.

IEMA # Site Name-Address
20020427 Rocket Motor Freight Lines 1501 Edgewater Dr. North Pekin 61554
921715 Gary Davis & Sons RT. 29 North Pekin 61554
932220 Hight Sales & Service RT. 29 Wesley Rd. North Pekin 61554
942410 North Pekin, Village of 318 North Main St. North Pekin 61554
980068 EHR Development Rt. 29 & Wesley Rd. North Pekin 61554

LPC# Site Name-Address
1790555009 Rocket Motor Freight Lines 1501 Edgewater Drive North Pekin 61554

**SITE DATA FOR THIS FACILITY:**

| Well ID | Map Code | Site Name | Site Description | Distance (Feet) |
|---|---|---|---|---|
| 50280 | 23590 | TOYOTA DEALESHIP OFFCE BUI | OFFICE | 1450 |
| 50280 | 23616 | TOMMY HOUSE TIRES | COMMERCIAL APPLICATION OR | 1700 |
| 50280 | 23617 | "Q" LUBE & AUTO CAR & CAR W | AUTO REPAIR | 1450 |
| 50280 | 23588 | CITGO GAS STATION | BELOW GROUND STORAGE (PET | 1200 |
| 50280 | 23589 | HIGHT'S AUTO SALES | AUTO REPAIR | 1100 |
| 50280 | 23587 | LANDMARK DODGE | AUTO REPAIR | 350 |
| 50280 | 06444 | MAURICE DAILY TRANSPORT CO | BELOW GROUND STORAGE (PET | 1000 |
| 50280 | 06443 | MOBIL OIL CO | ABOVE GROUND STORAGE (PET | 1300 |
| 50280 | 06445 | TOMPCO | STORAGE FACILITY HAZARDOUS | 750 |
| 50280 | 06451 | SCHERER PONTIAC BUICK | AUTO REPAIR | 50 |
| 50280 | 06456 | NORTH PEKIN-FUEL STORAGE | BELOW GROUND STORAGE (PET | 825 |
| 50280 | 06457 | KELLEY'S AUTO SALES | AUTO REPAIR | 1100 |

| Well ID | Map Code | Site Name | Site Description | Distance (Feet) |
|---|---|---|---|---|
| 50280 | 06453 | MARQUETTE HEIGHTS-INACTIVE | ABANDONED OR IMPROPERLY P | 650 |
| 50280 | 06458 | PRICE'S VW & FOREIGN AUTO P | AUTO REPAIR | 1450 |
| 50280 | 06455 | NORTH PEKIN-FUEL STORAGE | BELOW GROUND STORAGE (PET | 900 |
| 50280 | 06452 | CASEY'S GENERAL STORE | BELOW GROUND STORAGE (PET | 500 |
| 50280 | 06454 | MARQUETTE HEIGHTS-INACTIVE | ABANDONED OR IMPROPERLY P | 750 |
| 50280 | 06450 | TOYOTA | BELOW GROUND STORAGE (PET | 775 |
| 50280 | 06449 | LUFT VOLKSWAGON | AUTO REPAIR | 775 |
| 50280 | 06448 | RUAN TRANSPORT | STORAGE FACILITY HAZARDOUS | 1200 |
| 50280 | 06447 | HIGHT AUTO SALES & SERVICE | BELOW GROUND STORAGE (PET | 1500 |
| 50280 | 06446 | PARKWAY DODGE INC | AUTO REPAIR | 350 |
| 50281 | 23590 | TOYOTA DEALESHIP OFFCE BUI | OFFICE | 1450 |
| 50281 | 23587 | LANDMARK DODGE | AUTO REPAIR | 350 |
| 50281 | 23617 | "Q" LUBE & AUTO CAR & CAR W | AUTO REPAIR | 1450 |
| 50281 | 23616 | TOMMY NOUSE TIRES | COMMERCIAL APPLICATION OR | 1700 |
| 50281 | 23589 | HIGHT'S AUTO SALES | AUTO REPAIR | 1100 |
| 50281 | 23588 | CITGO GAS STATION | BELOW GROUND STORAGE (PET | 1200 |
| 50281 | 06445 | TOMPCO | STORAGE FACILITY HAZARDOUS | 750 |
| 50281 | 06444 | MAURICE DAILY TRANSPORT CO | BELOW GROUND STORAGE (PET | 1000 |
| 50281 | 06443 | MOBIL OIL CO | ABOVE GROUND STORAGE (PET | 1300 |
| 50281 | 06450 | TOYOTA | BELOW GROUND STORAGE (PET | 800 |
| 50281 | 06449 | LUFT VOLKSWAGON | AUTO REPAIR | 800 |
| 50281 | 06448 | RUAN TRANSPORT | STORAGE FACILITY HAZARDOUS | 1200 |
| 50281 | 06452 | CASEY'S GENERAL STORE | BELOW GROUND STORAGE (PET | 530 |
| 50281 | 06447 | HIGHT AUTO SALES & SERVICE | BELOW GROUND STORAGE (PET | 1500 |
| 50281 | 06453 | MARQUETTE HEIGHTS-INACTIVE | ABANDONED OR IMPROPERLY P | 675 |
| 50281 | 06446 | PARKWAY DODGE INC | AUTO REPAIR | 350 |
| 50281 | 06454 | MARQUETTE HEIGHTS-INACTIVE | ABANDONED OR IMPROPERLY P | 775 |
| 50281 | 06451 | SCHERER PONTIAC BUICK | AUTO REPAIR | 50 |
| 50281 | 06456 | NORTH PEKIN-FUEL STORAGE | BELOW GROUND STORAGE (PET | 825 |
| 50281 | 06457 | KELLEY'S AUTO SALES | AUTO REPAIR | 1100 |
| 50281 | 06458 | PRICE'S VW & FOREIGN AUTO P | AUTO REPAIR | 1450 |
| 50281 | 06455 | NORTH PEKIN-FUEL STORAGE | BELOW GROUND STORAGE (PET | 900 |

**OTHER IDENTIFIED POTENTIAL SOURCES:**

For this community water supply, no additional potential sources of contamination have been identified beyond those in Illinois EPA databases.

**SUSCEPTIBILITY TO CONTAMINATION:**

To determine Marquette Heights' susceptibility to contamination, a Well Site Survey, published by the Illinois EPA in 1990, was reviewed. Based upon this survey, there are 22 potential sources of groundwater contamination that could pose a hazard to groundwater utilized by Marquette Heights' wells. These include 1 above ground fuel storage tan, 6 below ground fuel storage tanks, 2 hazardous waste storage facilities, 9 auto repairs, 2 abandoned or improperly plugged wells, 1 office, and 1 commercial application of pesticides facility. In addition, information provided by the Leaking Underground Storage Tank and Remedial Project Management Sections of the Illinois EPA indicated additional sites with on-going remediation which may be of concern.

Based upon this information, the Illinois EPA has determined that the Marquette Heights community water supply's source water is susceptible to contamination. As such, the Illinois EPA has provided 5-year recharge area calculations for the wells. The land use within the recharge area of the wells was analyzed as part of this susceptibility determination. This land use includes residential, industrial, and commercial properties.

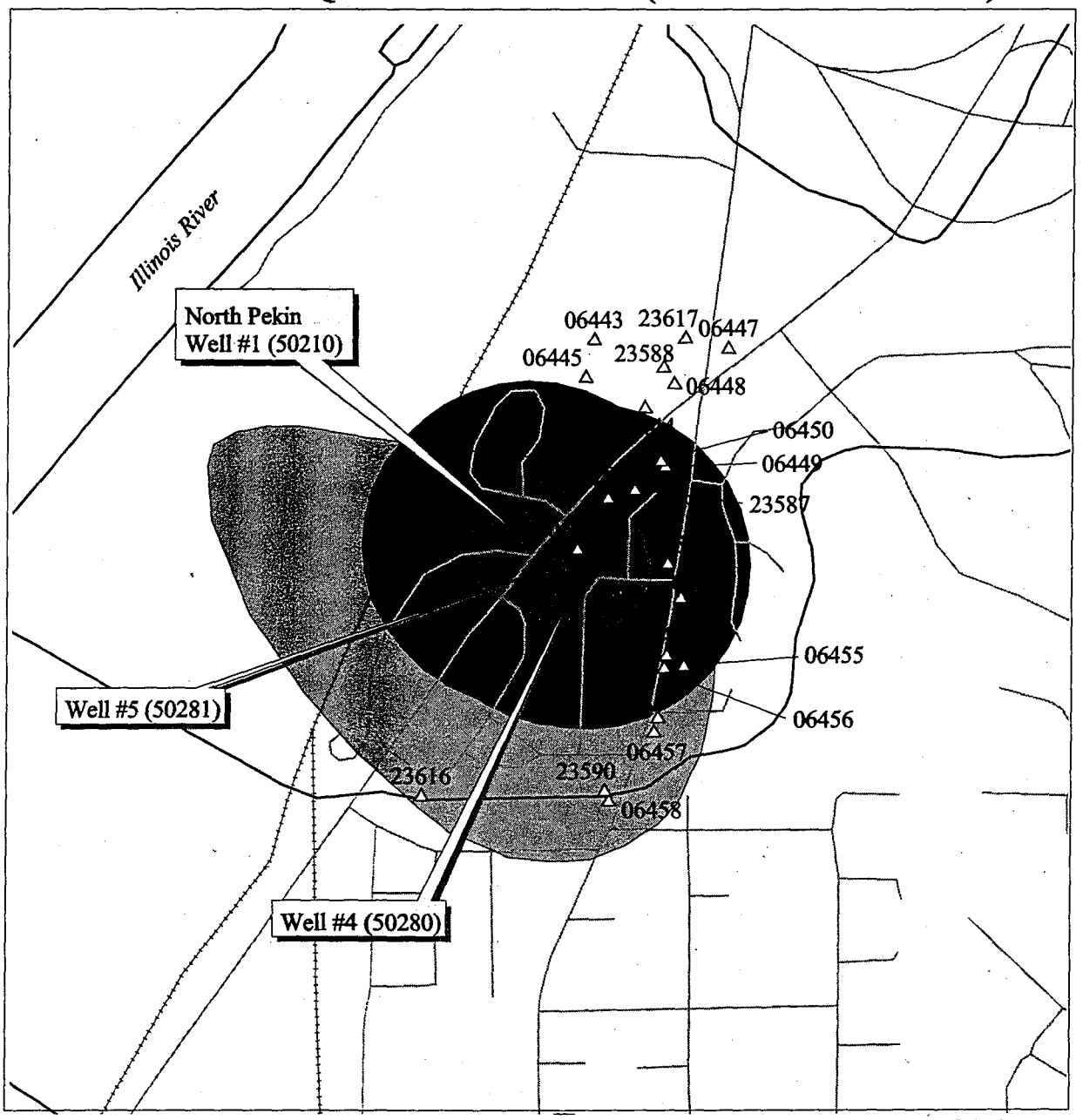
**SOURCE WATER PROTECTION EFFORTS:**

The Illinois Environmental Protection Act provides minimum protection zones of 400 feet for Marquette Heights'

wells. These minimum protection zones are regulated by the Illinois EPA. To further reduce the risk to the source water, maximum protection zones may be enacted. These maximum protection zones, which are authorized by the Illinois Environmental Protection Act, allow county and municipal officials the opportunity to provide additional source prohibitions up to usually 1,000 feet from their wells.

To further minimize the risk to the city's groundwater supply, the Illinois EPA recommends that the following additional activities by considered. First, the water supply staff may want to develop a contingency plan. Contingency planning documents are a primary means to ensure that, through emergency preparedness, a community will minimize their risk of being without water. Second, the water supply staff is encouraged to review their cross connection control ordinance to ensure that it remains current and viable. Cross connections to either the water treatment plant or in the distribution system (for example, at bulk water loading stations) may negate all source water protection initiatives. Third, inactive wells #1 and #3 are potential routes of contamination. It is recommended that the facility either properly abandon the wells or retro-fit them for use. Fourth, it is recommended that the screens on wells #4 and #5 be replaced as noted in the engineering evaluation dated January 17, 2001. Finally, the Illinois EPA recommends that the city investigate additional source water protection management options to address the land use activities within the community wells' recharge areas. To further reduce the risk to the source water, Marquette Heights may wish to implement a wellhead protection program which includes the proper abandonment of any potential routes of groundwater contamination within the recharge areas and correction of any sanitary defects at the water treatment facility.

# WELLHEAD PROTECTION PLANNING MAP
# FOR MARQUETTE HEIGHTS (FACILITY #1790400)




## Legend

- CWS Wells
- Potential Sources Of Contamination
- Rails
- Roads
- Streams
- Minimum Setback Zone
- Existing or Potential Maximum Setback Zone
- Recharge Area


FOR MORE INFORMATION CONTACT:

Groundwater Section, Bureau of Water
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, IL 62794-9276
Ph# (217)785-4787


Source Information
Roads, Rails, and Streams from Illinois DNR.
CWS Wells and Potential Sources from Illinois EPA.
Map compiled by Groundwater Section, Illinois EPA.

STATE OF ILLINOIS )
)
COUNTY OF SANGAMON )

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached Written Testimony of Richard P. Cobb, P.G. upon the person to whom it is directed, by placing a copy in an envelope addressed to:

Dorothy Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, Illinois 60601

General Counsel
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271

Service List

Matthew Dunn, Esq.
Environmental Bureau Chief
Office of the Attorney General
James R. Thompson Center
100 W. Randolph, 12th Floor
Chicago, Illinois 60601

Richard R. McGill, Jr.
Ill. Pollution Control Board
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, Illinois 60601

and mailing it from Springfield, Illinois on January 21, 2005 with sufficient postage affixed.

Cynthia A. Georg

SUBSCRIBED AND SWORN TO BEFORE ME

This 21 day of January, 2005.

Brenda Boehner
Notary Public

OFFICIAL SEAL
BRENDA BOEHNER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 11-14-2005

| Party Name | Role | City & State | Phone/Fax |
|---|---|---|---|
| IEPA | 1021 North Grand Avenue East | Springfield | 217/782-5544 |
| Petitioner | P.O. Box 19276 | IL 62794-9276 | 217/782-9807 |
| Kimberly A. Geving, Assistant Counsel | | | |
| Stephanie Flowers, Attorney | | | |
| Office of the Attorney General | Environmental Bureau | Chicago | 312/814-2550 |
| Interested Party | 100 West Randolph Street, 11th Floor | IL 60601 | 312/814-2347 |
| Matthew J. Dunn, Chief | | | |
| Illinois Pollution Control Board | 100 W. Randolph St. | Chicago | 312/814-3956 |
| Interested Party | Suite 11-500 | IL 60601 | |
| Dorothy M. Gunn, Clerk of the Board | | | |
| Richard McGill, Hearing Officer | | | |
| Department of Natural Resources | One Natural Resources Way | Springfield | 217/782-1809 |
| Interested Party | | IL 62702-1271 | 217/524-9640 |
| General Counsel | | | |

Total number of participants: 6