



# ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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217-782-5544

June 1, 2011

John Therriault, Assistant Clerk  
Illinois Pollution Control Board  
James R. Thompson Center  
100 West Randolph, Suite 11-500  
Chicago, Illinois 60601-3218

ORIGINAL

RECEIVED  
CLERK'S OFFICE

JUN 06 2011

STATE OF ILLINOIS  
Pollution Control Board

Re: IN THE MATTER OF: SETBACK ZONE FOR FAYETTE WATER COMPANY  
COMMUNITY WATER SUPPLY: AMENDMENTS TO 35 ILL. ADM.CODE618  
PCB No: R11-25

Dear Assistant Clerk Therriault:

Enclosed for filing please find the original and nine copies of a NOTICE OF FILING and pre-  
filed TESTIMONY OF RICHARD P. COBB, P.G., in regard to the above captioned matter.  
Thank you.

Sincerely,

Joanne M. Olson  
Assistant Counsel  
Division of Legal Counsel

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

RECEIVED  
CLERK'S OFFICE  
JUN 06 2011  
STATE OF ILLINOIS  
Pollution Control Board

IN THE MATTER OF: )  
)  
SETBACK ZONE FOR FAYETTE WATER ) R11- 25  
COMPANY COMMUNITY WATER ) (Rulemaking Public Water Supplies)  
SUPPLY: AMENDMENTS TO 35 ILL. )  
ADM.CODE618 )

NOTICE OF FILING

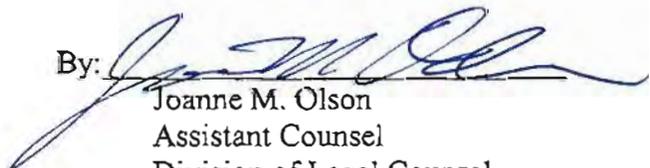
ORIGINAL

To: SEE ATTACHED SERVICE LIST

PLEASE TAKE NOTICE that on this date, I mailed for filing with the Clerk of the Pollution Control Board of the State of Illinois c/o John T. Therriault, Assistant Clerk, James R. Thompson Center, 100 W. Randolph St., Ste. 11-500, Chicago, IL 60601, the pre-filed TESTIMONY OF RICHARD P. COBB, P.G., a copy of which are attached hereto and herewith served upon you.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL  
PROTECTION AGENCY

By:   
Joanne M. Olson  
Assistant Counsel  
Division of Legal Counsel

DATED: June 1, 2011

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Springfield, IL 62794-9276  
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THIS FILING IS SUBMITTED ON RECYCLED PAPER

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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JUN 06 2011

STATE OF ILLINOIS  
Pollution Control Board

IN THE MATTER OF:	)	
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TESTIMONY OF RICHARD P. COBB, P.G.

ORIGINAL

I. QUALIFICATIONS

My name is Richard P. Cobb, and I am a licensed Professional Geologist in the State of Illinois and a Certified Professional Geologist by the American Institute of Professional Geologists. I am currently employed by the Illinois Environmental Protection Agency ("Illinois EPA"), located at 1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276, as Deputy Manager of the Division of Public Water Supplies ("Division"). I have been employed by the Illinois EPA since July 1, 1985. My responsibility includes working as the deputy administrator for the Public Water Supply Supervision Program under the federal Safe Drinking Water Act and under Illinois laws and regulations. I also manage the Administrative Support Unit, and the Groundwater Section of the Division. The Groundwater Section applies Geographic Information System ("GIS") programs, global positioning system ("GPS") technology, hydrogeologic models, 3-D geologic visualization, vadose zone, groundwater flow, groundwater particle tracking, solute transport, geochemical models, and geostatistical programs for groundwater protection and remediation projects. I have worked on the development of ground water legislation, rules and regulations. Specifically, I have served as a primary Illinois EPA witness before Senate and House legislative committees, and at Illinois Pollution Control Board ("Board") proceedings in the matter of groundwater quality standards, technology control regulations, cleanup regulations, regulated recharge areas,

maximum setback zone, water well setback zone exceptions, right-to know, radioactive release reporting, and site specific ash impoundment closure regulations. Furthermore, I have served as primary Illinois EPA witness in enforcement matters. For further detail on my qualifications I have enclosed a copy of my Curriculum Vitae. See Attachment A.

The attachments to my testimony were prepared by my staff using GIS<sup>1</sup>. The locations of the wells and the associated proposed maximum setback zones have a locational accuracy that complies with the United States National Map Accuracy Standards (“U.S. NMAS”). The map projection<sup>2</sup> used for Illinois EPA’s GIS is the Illinois Transverse Mercator (“ITM”) system. See Attachment B.

This testimony, the Statement of Reasons, and attachments included with this testimony describe the basis for the proposal of a maximum setback zone for the Fayette Water Company (“FWC”) community water supply<sup>3</sup> (“CWS”).

## **II. INTRODUCTION**

The Illinois EPA proposes that the Board adopt new regulations, Sections 618.110, 618.115, 618.210 and 618.Appendix B to Part 618 of Title 35 of the Illinois Administrative Code. It also proposes amending Sections 618.100, 618.105, 618.200 and 618.205 of Part 618. This proposed rulemaking is intended to establish a maximum setback zone for six wells owned by the FWC, pursuant to Section 14.3 of the Illinois Environmental Protection Act (“Act”), 415 ILCS 5/14.3. This maximum setback zone will protect a highly vulnerable source of CWS for

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<sup>1</sup> “GIS” means a system that captures, stores, analyzes, manages and presents data with reference to geographic location data. In the simplest terms, GIS is the merging of cartography, statistical analysis and database technology.

<sup>2</sup> “Map projection” means coordinate systems that are designations for spatial data. Their purpose is to provide a common basis for communication about a particular place or area on the earth's surface. The most critical issue in dealing with map projections is knowing what the projection is and having the correct coordinate system information associated with a dataset.

<sup>3</sup> “CWS” means a public water supply which serves or is intended to serve at least 15 service connections used by residents or regularly serves at least 25 residents. 415 ILCS 5/3.145

individuals served by the FWC. Further, the proposed amendments seek to restructure Part 618 to accommodate the establishment of additional maximum setback zones for other CWS wells.

### **III. BACKGROUND**

#### *1. Statutory Authority*

Before moving on, some background information is warranted. 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 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 (“JCAR”) 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.

## 2. *Geographic Setting*

The FWC CWS wells are located within the flood plain of the Kaskaskia River watershed<sup>4</sup> in Fayette County Illinois in Township 8 North, Range 2 East, and Sections 31 and 32. My staff located and mapped the FWC wells using 1-inch equals 400-foot aerial photographic maps. The aerial photos were used to digitize the location of the FWC wells on onto the United States Geological Survey (“USGS”) (Vera Quadrangle), 7.5 minute digital topographic maps in GIS. My staff then used GIS to overlay the topographic map with a USGS digital elevation model<sup>5</sup>. This new map shows the elevation of the land surface in this area is approximately 146 meters or 450 feet above mean sea level. See Attachment C.

## 3. *Bedrock Geology*

The vast majority of southern Illinois bedrock is composed of Pennsylvanian (“P”) aged deposits. Well records from the FWC well field confirm that the bedrock is composed of Pennsylvanian aged deposits. The upper most bedrock in the valley where the FWC well field

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<sup>4</sup> Watersheds in the United States were delineated by the USGS for the Natural Resources Conservation Service (“NRCS”) using a national standard hierarchical system based on surface hydrologic features and are classified into four types of hydrologic units: first-field (region), second-field (sub-region), third-field (“accounting unit”), and fourth-field (“cataloguing unit”). A fifth-field of classification (“watershed”) and sixth-field (“sub-watershed”) are currently under development. Each hydrologic unit is identified by a unique hydrologic unit code (“HUC”) consisting of two to twelve digits based on the six levels of classification: 2-digit HUC first-level (region); 4-digit HUC second-level (subregion); 6-digit HUC third-level (accounting unit); 8-digit HUC fourth-level (cataloguing unit); 10-digit HUC fifth-level (watershed); and 12-digit HUC sixth-level (subwatershed).

<sup>5</sup> “Digital elevation model or DEM” means a digital file consisting of terrain elevations for ground positions at regularly spaced horizontal intervals.

is located is the Bond Formation (“Pb”). See Attachment D. The Rocks of Pennsylvanian age in southern Illinois tend to be poor aquifers, with low rates of production, with a few exceptions where outcropping aquifers are recharged locally. Groundwater produced from the Pennsylvanian is also highly mineralized with high concentrations of total dissolved solids often exceeding 10,000 milligrams per liter in concentration. Therefore, the groundwater found in this Pennsylvanian bedrock in southern Illinois is generally not potable<sup>6</sup> and is considered to be Class IV: Other Groundwater under 35 Ill. Adm. Code 620.240(c).

#### 4. *Quaternary Geology*

This Pennsylvanian aged bedrock in the FWC well field is overlain by Quaternary glacial outwash deposits belonging to the Henry Formation in pre-glacial bedrock valleys overlain by modern day channel and floodplain deposits (alluvium) of the Cahokia Formation in the Kaskaskia River Valley and tributaries. See Attachment E. 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 Illinoian age. 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. 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

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<sup>6</sup> “Potable” means generally fit for human consumption in accordance with accepted water supply principles and practices. [415 ILCS 55/3(i)]

Formation. These quaternary deposits in the FWC well field range in thickness from 100 to 200 feet in this area. See Attachment F.

Quaternary geology in Southern Illinois is mainly composed of glacial deposits (i.e. Glasford Formation). Potable resource groundwater (35 Ill. Adm. Code 620.210) is very rare in the southern half of the State, because the Glasford Formation tends to be thin layers (20-50 feet thick) composed of clayey tills or loess. In southern Illinois, sand and gravel deposits usually occur in thin and discontinuous stringers, except in river valleys. These thin and discontinuous deposits are generally not aquifers<sup>7</sup> because they are not sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydraulic gradients. Well yield measured in gallons per minute (“gpm”) relates directly to the saturated thickness (“b”), porosity (“η”), and permeability of a geologic material. Aquifer hydraulics is discussed in more detail in Section IV of my testimony below.

##### 5. *Principal Aquifer*

The coarse lower portion of the Cahokia Formation is one single hydrostratigraphic<sup>8</sup> unit. This hydrostratigraphic unit is known as the Cahokia Aquifer and is classified as a principal sand and gravel aquifer system by the Illinois State Water Survey. See Attachment G. A principal aquifer is defined as having a potential yield of 100,000 gallons per day per square mile and having an area of at least 50 miles. Attachment G shows how rare principal sand and gravel aquifers are in southern Illinois. The Cahokia Aquifer is used by FWC CWS wells, and is a sole source of Class I: Potable Resource Groundwater in southern Illinois. See Attachment H. This sand and gravel is overlain by relatively permeable materials that result in a high

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<sup>7</sup> "Aquifer" means saturated (with groundwater) soils and geologic materials which are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydraulic gradients. [415 ILCS 55/3(b)]

<sup>8</sup> "Hydrostratigraphy" looks at the relationship of the rock layers with water or hydrology.

potential for aquifer recharge. See Attachment I. Therefore, this principal sand and gravel aquifer used by FWC has an intrinsically high vulnerability to groundwater contamination. See Attachment J. Groundwater recharge is discussed in further detail in Section IV of my testimony.

6. *Public Water Supply*

The FWC (System # IL0510010) obtains its water from six CWS wells, wells #2, #3, #4, #5 #6 and #7 (Illinois EPA #01013, #01014, #01015, #01533, #01818, and #01858, respectively). The wells range from 40-47 feet deep, and utilize the shallow Cahokia Aquifer comprised of 35.4 feet of saturated sand and gravel overlain by a relatively permeable material. See Attachment G. The annual pumpage from the FWC is 180,613,000 gallons (“gal”), with an average daily pumpage is 494,830 gal, and a maximum daily pumpage 882,000 gal. FWC’s directly serves approximately 6,510 persons. In addition, FWC serves four satellite systems in Brownstown, St. Elmo, St. Peter and Beecher City in Fayette, Shelby, and Effingham Counties.

The groundwater being withdrawn from the Cahokia Alluvium Aquifer is metered, aerated, and discharged to 34,000 gallon detention basin. This water is pumped by one of two 600 gal per minute (“gpm”) large service pumps, is pre-chlorinated, pressure filtered, fluoridated and discharged to a 32,000 and 65,000 gal integrated clear well<sup>9</sup>. Water is then pumped by one of two 600 gpm high service pumps to the distribution system and a 0.15 million gal (“MG”) elevated storage tank which places head on the system in order to maintain pressure.

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<sup>9</sup> “Clear well” means a reservoir for storing filtered water of sufficient quantity to prevent the need to vary the filtration rate with variations in demand. Clear wells are also used to provide chlorine contact time for disinfection.

#### IV. GENERAL PRINCIPLES OF HYDROLOGY AND HYDROGEOLOGY

##### 1. *Natural Conditions*

Water infiltrating the soil may evaporate or be used by plants and be transpired. The remainder migrates downward through pore spaces in soil or rock, eventually reaching a zone where all pore spaces are saturated. Water that moves into the saturated zone and flows downward, away from the water table is *recharge*. Generally, only a portion of recharge will reach an aquifer. The overall recharge rate is affected by several factors, including intensity and amount of precipitation, surface evaporation, vegetative cover, plant water demand, land use, soil moisture content, depth and shape of the water table, distance and direction to a stream or river, and hydraulic conductivity of soil and geologic materials. *Illinois' Potential for Aquifer Recharge Map* was developed by the Illinois State Geological Survey and the Illinois State Water Survey pursuant Subsection 17.2(a) of the Act [415 ILCS 5/17.2(a)]. See Attachment I. The Potential for Aquifer Recharge Map is based on the probability of precipitation reaching the uppermost aquifer using a simplified function of: depth to the aquifer, occurrence of principal aquifers, and the potential infiltration rate of the soil. This simplification assumes that recharge rates are primarily a function of leakage from an overlying aquitard (fine grained non-aquifer materials).

The surface of the zone of saturation is called the *water table*. All water below the water table is considered groundwater. 415 ILCS 5/3.210; 35 Ill. Adm. Code 620.110. The water table can be determined by measuring the elevation of water surfaces in wells that penetrate the saturated zone. Under natural conditions, the water table forms a surface that resembles the overlying land surface topography, only in a more subdued and smoother configuration. The water table generally will be at higher elevations beneath upland areas and

at lower elevations in valley bottoms. The water table may intersect the ground surface along perennial streams, springs, and lakes, which are natural areas of groundwater discharge.

Groundwater moves in a fashion somewhat analogous to surface water, only at much slower rates. While surface water moves downhill in response to gravity, groundwater moves down-gradient from areas of higher potential energy to areas of lower potential energy. These areas of equal elevation are described as *hydraulic head*. Groundwater flows from recharge zones, where infiltration occurs, to discharge zones, where groundwater discharges into streams, lakes, and wells. In general, contaminants are transported in the direction of groundwater flow. Transport in this manner, that is, transport of dissolved constituents (solutes) at the same speed as the average groundwater pore velocity, is called *advection*.

The *direction* of groundwater movement can be estimated from a map of the *potentiometric surface*, (*i.e.*, a contour map of the elevations of water levels in observation wells). Generally, groundwater flow will be perpendicular to the contours (*i.e.*, areas of equal elevation) of the potentiometric surface. The *rate* of groundwater movement is related to the permeability of the aquifer and the magnitude of the slope of the potentiometric surface. In quantitative terms, *hydraulic conductivity*<sup>10</sup> is used in place of permeability and is a function of the size and shape of pore spaces, the degree of interconnection of these spaces, and the type of fluid (*e.g.*, water, oil, or brines) passing through the medium.

Groundwater movement is governed by the hydraulic principles described by an equation known as *Darcy's Law*. This equation states that the flow rate of a liquid through a porous medium is proportional to the head loss and inversely proportional to the length of the

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<sup>10</sup> "Hydraulic Conductivity (k)" means a coefficient of proportionality describing the rate at which water can move through a permeable medium. It can be derived by dividing transmissivity by the saturated thickness of an aquifer or  $k = T/b$ .

flow path. The Darcian velocity assumes that flow occurs across the entire cross-section of the porous material without regard to solid or pore spaces. Actually, flow is limited to the pore space only. Darcy's Law can be rearranged to determine the average linear velocity or a velocity representing the average rate at which groundwater moves between two points, as follows:

**Equation 1. Darcian groundwater velocity**

$$V_x = \frac{Kdh}{n_e dl}$$

Where:

$V_x$  = average linear velocity feet per day (ft/d)

$K$  = hydraulic conductivity (ft/d)

$n_e$  = effective porosity (dimensionless)

$dh$  = delta or change in groundwater head elevation (ft)

$dl$  = delta or change in distance between wells (ft)

2. *Groundwater Hydraulics*

The capacity of a formation to transmit groundwater is expressed by the **transmissivity** (“**T**”)<sup>11</sup>, which is the rate of flow of water, in gallons per day (“**gpd**”), through a one-foot-wide vertical strip of the aquifer (“**ft**”) extending the full saturated thickness (“**b**”) under a hydraulic gradient of 100 percent (one foot per foot) at the prevailing water temperature. Transmissivity (“**gpd/ft**”) is the product of the saturated thickness of the aquifer and the **hydraulic conductivity** (“**k**”), which is the rate of flow of water, in gpd, through a cross-sectional area of one square foot of the aquifer (“**gpd/ft<sup>2</sup>**”) under a hydraulic gradient (“**dh/dl**”) of 100 percent at

<sup>11</sup> “Transmissivity (T)” means a measure of the amount of water that can be transmitted horizontally by the full saturated thickness of an aquifer under a hydraulic gradient of 1. Transmissivity, T is the product of the hydraulic conductivity (k) and the saturated thickness of the aquifer (b) or T = kb.

the prevailing water temperature. The storage properties of an aquifer are expressed by the **storage coefficient**<sup>12</sup>("S"). The hydraulic properties of an aquifer may be determined by means of an aquifer pumping test. For further detail, see Section V below:

### 3. *Affects of Wells on Natural Conditions*

The general principles of **hydrogeology** include the affects of pumping wells (e.g., FWC CWS wells) on the potentiometric surface. The withdrawal of groundwater by a well causes a lowering of water levels ( $dh$ ) in the water table around the well. The difference between water levels during non-pumping and pumping conditions is called **drawdown**<sup>13</sup>. See Attachment K. From a three-dimensional perspective, the pattern of drawdown around single or multiple pumping wells resembles a cone, with the greatest drawdown adjacent to the pumping well. Therefore, the water table drawdown area ( $dh/dl$ ) affected by the pumping well is called the **cone of depression**. See Attachment K.

The cone of depression's entire surface area defined by the cone's rim is referred to as the LAI. Water in the LAI will reach the well faster than other water that replenishes the aquifer because, within the cone of depression, the groundwater velocity ( $V_x$ ) in the direction of the well is higher than outside the cone of depression based on Equation 1. Likewise, contaminants in the LAI will reach the well faster than contaminants outside the LAI. Therefore, preventing new potential sources from locating within the maximum LAI will reduce the possibility of well water contamination, and increase the assurance of a safe and

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<sup>12</sup> "Storage coefficient (S)" means the volume of water that a permeable unit will adsorb or expel from storage per unit surface area per unit change in head.

<sup>13</sup> "Drawdown or ( $dh$ ) or ( $h_0-h$ )" means the change in the water elevation of the static water level produced by a pumping well. (35 Ill. Adm. Code 671.102)

adequate source of potable water pursuant to 35 Ill. Adm. Code 601.101 and 35 Ill. Adm. Code 611.231(c).

#### V. DETERMINATION OF THE LAI

Section 671.302 of the **MAXIMUM SETBACK ZONE FOR COMMUNITY WATER SUPPLY WELLS** Rules (35 Ill. Adm. Code 671), establish the requirements for the hydrogeologic information that must be submitted to the Illinois EPA for technical adequacy review and approval. Available geologic well logs and maps provide that the Cahokia Aquifer is a *highly vulnerable*, unconfined<sup>14</sup>, sand and gravel aquifer that is a *sole source* of Class I groundwater in southern Illinois. See Attachments C –J. Moreover, the results from a 24 hour pumping test conducted yielded the following aquifer property data for the Cahokia Aquifer with an average saturated thickness of 35.4 ft:

- $T = 67,100$  gpd/ft,
- $k = 1,900$  gpd/ft<sup>2</sup>, and
- $S = 0.1$ .

Thus, based on these results, the FWC well field will yield about 400 gpm (576,000 gpd) from two production wells (200 gpm each). Unfortunately, the deeper Henry Aquifer, in the pre-glacial bedrock valley, does not have a good potential aquifer yield and is not a dependable source of supply for FWC due to the narrowness of the pre-glacial bedrock valley at depth. This narrowness creates aquifer boundary conditions that limit the yield of the Henry Aquifer. The *aquifer property data*, provided above, was used to determine the extent of drawdown on the potentiometric surface using Equation 2 (35 Ill. Adm. Code 671.APPENDIX B):

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<sup>14</sup> "Unconfined aquifer" means an aquifer other than a confined aquifer, and a confined aquifer means an aquifer bounded above and below by impermeable beds or by shale, clay, or siltstone. (35 Ill. Adm. Code 671.102)

**Equation 2. Theis non-equilibrium equation**

$$r = \sqrt{\mu T t \div 2693S}$$

Where:

$r$  = radius of influence (feet)

$t$  = time well is pumped under normal operational conditions (minutes)

$S$  = aquifer storativity or specific yield (dimensionless)

$T$  = aquifer transmissivity (gallons per day per foot)

$\mu$  = is a dimensionless parameter related to the well function

$$W(\mu) = \frac{T(h_0 - h)}{114.6Q}$$

Where:

$W(\mu)$  = well function, the well function is calculated and  $\mu$  is obtained from 35 Ill. Adm. Code 671. Table A.

$h_0 - h$  = drawdown in the piezometer, observation well, or minimum level of measurement using a steel tape (feet)

The FWC determined the lateral radius of influence of each of its community wells is 972 feet under normal operating conditions. This radius was determined using 35 Ill. Adm. Code 671. Of course the radius is used to calculate the LAI using Equation 3:

**Equation 3. Area of a circle**

$$A_{circle} = \pi r^2$$

Where:

$A$  = area in square feet  
(ft<sup>2</sup>)

$\pi$  = 3.14 (dimensionless)

$r^2$  = square of the radius

On June 1, 2009, FWC submitted a request to the Illinois EPA to review and confirm the technical adequacy of its determination. On July 27, 2009, the Illinois EPA confirmed the

technical adequacy to the FWC's determination of the LAI pursuant to 35 Ill. Adm. Code 671. In order to qualify for establishing a maximum setback zone, the LAI must be greater than the minimum setback zone established under 415 ILCS 5/14.2. FWC's CWS supply wells all have minimum setback zones of 400 feet. Thus, the radius of influence and thereby the LAI is greater than the minimum setback back zone and qualifies for establishing a maximum setback zone.

## **VI. MEETING THE REQUIREMENTS FOR PROPOSING THE FWC MAXIMUM SETBACK ZONE TO THE BOARD**

Subsection 14.3(d) of the Act [415 ILCS 5/14.3(d)] authorizes the Illinois EPA to develop a maximum setback zone proposal if the following requirements are met:

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)

Sections III through V and the associated attachments of my testimony above, clearly indicates that this proposal meets the requirements for proposing a maximum setback zone to the Board pursuant to Subsection 14.3(d) of the Act.

## **VII. REGULATORY DEVELOPMENT**

### *1. Fayette County Board Rules and Regulations Committee*

In April 2009, after determining the LAI, and receiving the IEPA's approval of this determination, the FWC met with the Fayette County Board Rules and Regulations Committee the first time to discuss its desire to establish a maximum setback zones for its CWS wells. The Fayette County Board Rules and Regulations Committee has jurisdiction over the area and

therefore has authority to adopt the maximum setback zone ordinance pursuant to Subsection 14.3(c) of the Act (415 ILCS 5/14.3(3)). The Fayette County Board Rules and Regulations Committee did not provide feedback at this meeting.

The FWC and Illinois EPA staff then met with the Fayette County Board Rules and Regulations Committee in September 2009 a second time to discuss adoption of the maximum setback zone ordinance and answer any questions the Committee had regarding the regulations with no success. The Fayette County Board did not take any action on the maximum setback zone ordinance during the following six months.

2. *Request for Illinois EPA to Develop a Maximum Zone Proposal*

In March 2010, FWC sent a letter to the Fayette County Board requesting a response to the maximum setback zone proposal and outlining the Board's authority to adopt maximum setback zones. The County Board did not respond to FWC. On May 21, 2010, the FWC sent the Illinois EPA a written request asking the Agency to propose a maximum setback zone to the Board.

3. *Illinois EPA Notification of Proposing a Maximum Setback Zone Prior to Submission to the Board*

Pursuant to Section 14.3(d) of the Act, the Illinois EPA notified Mr. Steven Knebel, Fayette County Chairman, on July 12, 2010, of its intent to propose a maximum setback zone for the FWC CWS wells. The Fayette County Board has not sent a response to the Agency's notice. After the 30 days prescribed by Section 14.3(d) of the Act had elapsed, the Agency proceeded with development of the maximum setback zone proposal for the Fayette Water Company wells. Consistent with Fayette Water Company's request, the Illinois EPA is

proposing the adoption of a circular maximum setback zone with a radius of 1,000 feet pursuant to Section 14.3(d) of the Act.

4. *Input from the Interagency Coordinating Committee on Groundwater and the Groundwater Advisory Council*

On August 18, 2010, a summary of the history and actions taken thus far with regard to the Fayette Water Company maximum setback zone was provided to the Interagency Coordinating Committee on Groundwater<sup>15</sup> (ICCG). The ICCG had no questions or comments for the Illinois EPA. Moreover, this proposal has also been discussed with the Groundwater Advisory Council (“GAC”)<sup>16</sup> for their input on October 20, 2010, and February 24, 2011. The GAC had no questions or comments for the Illinois EPA.

## **VIII. 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 maximum setback zones that are adopted by the Board.

#### Section 618.100 Purpose and Applicability

This Section defines the purpose of maximum setback zone regulations and the applicability of Part 618.

#### Section 618.105 Definitions

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<sup>15</sup> 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).

<sup>16</sup> The IGPA also establishes the Groundwater Advisory Council (GAC). 415 ILCS 55/5. The GAC is comprised of environmental, business, public water supply, county and municipal government, regional planning and water well driller interest group representatives. 415 ILCS 55/5. The ICCG and GAC work jointly, and the Illinois EPA is the liaison between the ICCG and GAC.

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

Section 618.110 Regulated Activities, Facilities and Uses.

This Section provides that the groundwater rules of Section 14.4 of the Act and corresponding Board regulations will apply to any activities, facilities and uses within the maximum setback zones established by this Part or the Act.

Section 618.115 Prohibitions

This Section prohibits the placement of any new potential primary source within a maximum setback zone.

Subpart B Established Maximum Setback zones.

This Subpart establishes the maximum setback zones for different community water supply wells.

Section 618.200 Purpose

This Section states the purpose of Subpart B, namely to establish maximum setback zones to protect the public health, safety and welfare, to preserve water quality and to preserve groundwater resources.

Section 618.205 Marquette Heights' Maximum Setback Zone.

This Section establishes Marquette Heights' CWS wells' maximum setback zones.

Section 618.210 Fayette Water Company's Maximum Setback Zones

This Section establishes Fayette Water Company's CWS wells' maximum setback zones.

Section 618.Appendix A

Appendix A details a map of the Marquette Heights' CWS wells, maximum setback zone boundaries, roads, and property boundaries and associated identification numbers.

Section 618.Appendix B

Appendix B details a map of the Fayette Water Company's CWS wells, maximum setback zone boundaries, roads, and property boundaries and associated identification numbers.

**IX. TECHNICAL FEASIBILITY AND ECONOMICAL REASONABLENESS**

In previous testimony provided to the Board, I have indicated that the pollution of groundwater can have wide-ranging economic implications to local communities and businesses. 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. Further, communities that deliver water that violates 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. All of these costs have the potential to adversely affect local economic development. 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.

**X. CONCLUSION**

The Illinois EPA proposes that the Board establish maximum setback zones for the FWC's wells. The proposed regulations expand the applicability of the Board's existing technical standards and prohibit new potential primary sources from locating within the maximum setback zone. Promulgation of this proposal is necessary to protect the immediate recharge area of the FWC CWS wells and the groundwater supplying facilities in Fayette, Shelby, and Effingham Counties. The proposed regulation is economically reasonable and technically feasible.

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

A handwritten signature in blue ink, appearing to read "Richard P. Cobb", written over a horizontal line.

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

Date: June 1, 2011

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## Attachment A - Richard P. Cobb's Curriculum Vita

### Work Experience

**Deputy Manager, Division of Public Water Supplies (DPWS),** Bureau of Water (BOW), Illinois Environmental Protection Agency (EPA). (5/02- Present) My primary responsibilities include managing the: Groundwater Section, Field Operation Section, and the Administrative Support Unit of the Division. Further, I assist with administering the public water supervision program under the federal Safe Drinking Water Act ("SDWA") and the Wellhead Protection Program ("WHPP") approved by the United States Environmental Protection Agency ("U.S. EPA"). Additionally, my 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 directly manage the BOW's Groundwater Section. The Groundwater Section applies Geographic Information System ("GIS") programs, global positioning system ("GPS") technology, hydrogeologic models (3D geologic visualization, vadose zone, groundwater flow, groundwater particle tracking, solute transport, and geochemical models), and geostatistical programs for groundwater protection and remediation projects. The Groundwater Section also continues to operate a statewide ambient groundwater monitoring program for the assessment of groundwater protection and restoration programs. I also do extensive coordination with federal, state and local stakeholders including the Governor appointed Groundwater Advisory Council ("GAC"), the Interagency Coordinating Committee on Groundwater ("ICCG"), four Priority Groundwater Protection Planning Committees, Illinois Source Water Protection Technical and Citizens Advisory Committee, and with the Ground Water Protection Council ("GWPC"), Association of State Drinking Water Administrators ("ASDWA"), and the Association of State and Interstate Water Pollution Control Administrators ("ASWIPCA") to develop and implement groundwater protection policy, plans, and programs. I represent the BOW on Illinois EPA's: Contaminant Evaluation Group ("CEG"); Strategic Management Planning Team; Environmental Justice Committee; GIS Steering Committee; Information Management Steering Committee; and Leadership in Energy and Environmental Design for Existing Building ("LEED-EB") Committee. Since starting with Illinois EPA in 1985, I have worked on the development of legislation, rules and regulations. I have also served as a primary Illinois EPA witness before Senate and House legislative committees, and at Illinois Pollution Control Board ("Board") proceedings in the matter of groundwater quality standards, technology control regulations, cleanup regulations, regulated recharge areas, maximum setback zone, and water well setback zone exceptions. Furthermore, I have served as primary Illinois EPA witness in enforcement matters.

**Manager, Groundwater Section,** DPWS, BOW, Illinois EPA. (9/92-5/02) My primary responsibilities included development and implementation of Illinois statewide groundwater quality protection, USEPA approved WHPP, and source water protection program. The Groundwater Section worked with the United States Geological Survey ("USGS") to refine Illinois EPA's ambient groundwater monitoring network using a random stratified probability based design. The Groundwater Section continued to operate a statewide ambient groundwater monitoring program for the assessment of groundwater protection and restoration programs

based on the new statistically-based design. I co-authored a *Guidance Document for Conducting Groundwater Protection Needs Assessments* with the Illinois State Water and Illinois State Geological Surveys. I also continued to conduct extensive coordination with federal, state and local stakeholders including the Governor appointed GAC, the ICCG, four Priority Groundwater Protection Planning Committees, Illinois Source Water Protection Technical and Citizens Advisory Committee, and at the national level as Co-chair of the GWPC Ground Water Division to develop and implement groundwater protection policy, plans, and programs. I also served periodically as Acting Manager for the Division of Public Water Supplies. Additionally, the Groundwater Section provided hydrogeologic technical assistance to the BOW Permit Section and Mine Pollution Control Program to implement source water protection, groundwater monitoring and aquifer evaluation and remediation programs. I continued to work on the development of legislation, rules and regulations. I also served as a primary Illinois EPA witness at Board proceedings in the matter of groundwater quality standards, technology control regulations, regulated recharge areas and water well setback zone exceptions. Furthermore, I served as an Agency witness in enforcement matters.

**Acting Manager, Groundwater Section, DPWS, BOW, Illinois EPA. (7/91-9/92)** My responsibilities included continued development and implementation of Illinois statewide groundwater quality protection, U.S. EPA approved WHPP, and ambient groundwater monitoring program. The Groundwater Section developed the Illinois EPA's WHPP pursuant to Section 1428 of the SDWA and was fully approved by U.S. EPA. Illinois EPA was the first state in U. S. EPA Region V to obtain this approval. I performed extensive coordination with state and local stakeholders including the Governor appointed GAC, the ICCG to develop and implement groundwater protection, plans, policy, and programs. Developed and implemented the establishment of Illinois' Priority Groundwater Protection Planning Committees. Developed and implemented Pilot Groundwater Protection Needs Assessments. The Groundwater Section also provided hydrogeologic technical assistance to the BOW Permit Section 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 Board proceedings in the matter of groundwater quality standards and technology control regulations. Additionally, I served as an Agency total quality management ("TQM") facilitator, and TQM trainer.

**Manager of the Hydrogeology Unit, Groundwater Section, DPWS, Illinois EPA (7/88-7/91)** Managed a staff of geologists and geological engineers that applied hydrogeologic and groundwater modeling principals to statewide groundwater protection programs. Developed, and integrated the application of GIS, GPS, geostatistical, optimization, vadose zone, solute transport, groundwater flow and particle tracking computer hardware/software into groundwater protection and remediation projects. Conducted extensive coordination with state and local stakeholders including the Governor appointed GAC and ICCG to develop and implement groundwater protection policy, plans, and programs. Developed and implemented a well site survey program to inventory potential sources of contamination adjacent to community water supply wells. Additionally, I worked on the development of rules to expand setback zones based on the lateral area of influence of community water supply wells. Furthermore, I provided administrative support to the Section manager in coordination,

planning, and supervision of the groundwater program. I also assisted with the development of grant applications and subsequent management of approved projects. In addition, I assisted the section manager with regulatory and legislative development in relation to the statewide groundwater quality protection program. I also served on the Illinois EPA's Cleanup Objectives Team ("COT").

***Environmental Protection Specialist I, II, and III, Groundwater Section***, DPWS, Illinois EPA. (7/85-7/88) I was the lead worker and senior geologist in the development and implementation of Illinois statewide groundwater quality protection program. I worked on the development of Illinois EPA's ambient groundwater monitoring network, and field sampling methods and procedures with the USGS. I published the first state-wide scientific paper on volatile organic compound occurrence in community water supply wells in Illinois. In addition, I assisted with the development of *A Plan for Protecting Illinois Groundwater*, and the legislation that included the *Illinois Groundwater Protection Act*.

***Consulting Well Site Geologist***, Geological Exploration (GX) Consultants, Denver Colorado. (3/81-12/83) I worked as a consulting well site geologist in petroleum exploration and development for major and independent oil companies. I was 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. In addition, I provided daily telephone reports and final written geologic reports to clients.

***Undergraduate Teaching Assistant***, Geology Department, Illinois State University. (3/79-3/81) I was responsible for teaching and assisting with lecture sessions, lab sessions, assignment preparation and grading for Petrology, Stratigraphy and Geologic Field Technique courses.

#### Undergraduate Education

***B.S Geology***, 1981, Illinois State University ("ISU"). Classes included field geology at South Dakota School of Mines and Technology, and Marine Ecology Paleocology at San Salvador Field Station, Bahamas

#### Post Graduate Education

***Applied Hydrogeology***, 1984, ISU Graduate Hydrogeology Program

***Engineering Geology***, 1984, ISU Graduate Hydrogeology Program

***Geochemistry for Groundwater Systems***, 1986, USGS National Training Center

***Hydrogeology of Waste Disposal Sites***, 1987, ISU Graduate Hydrogeology Program

***Hydrogeology of Glacial Deposits in Illinois***, 1995, ISU Graduate Hydrogeology Program

***MODFLOW, MODPATH and MT3D groundwater modeling***, 1992, USGS National Training Center

***24 Hour Occupational Health & Safety Training***, 1994

***Computer Modeling of Groundwater Systems***, 1995, ISU Graduate Hydrogeology Program

***Introduction to Quality Systems Requirements and Basic Statistics***, 2001, U.S. EPA

***Source Water Contamination Prevention Measures***, 2001, U.S.EPA, Drinking Water Academy

***Fate and Transport Processes and Models***, 2006, Risk Assessment and Management Group, Inc.,

***National Response Framework (NRF) IS-800.b***, 2010, EMI

***National Response Plan (NRP), an Introduction IS-800.a***, 2007, EMI

***National Incident Management System (NIMS) an Introduction IS-00700***, 2006, Emergency Management Institute (EMI),

***Intermediate ICS for Expanding Incidents IS-00300***, 2008, EMI

***ICS for Single Resources and Initial Action Incidents IS-00200***, 2006, EMI,

***Introduction to the Incident Command System (ICS) IS-00100***, 2006, EMI

#### License

***Licensed Professional Geologist*** 196-000553, State of Illinois, expires 3/31/2013

#### Certification

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

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

## Summary of Computer Skills

I have utilized the following computer programs ARC VIEW, Aqtesolv, SURFER, WHPA, DREAM, AQUIFEM, MODFLOW, MODPATH, and MT3D.

## Professional Representation

Illinois EPA liaison to the *GAC* and representative on the *ICCG* (1988 – present)

### *Senate Working Committee on Geologic Mapping.*

Illinois EPA representative and subcommittee chairman, *State Certified Crop Advisory Board*, and *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)

*Illinois groundwater quality standards regulations technical work group* (1988 – 1991).

*ICCG State Pesticide Management Plan Subcommittee* for the protection of groundwater.

Illinois EPA representative, *State task group involved with developing the siting criteria for a low level radioactive waste site in Illinois.*

*Fresh Water Foundation's Groundwater Information System (GWIS)* project in the great lakes basin.

Illinois EPA technical advisor, *four priority regional groundwater protection planning committees* designated by the Director to advocate groundwater protection programs at the local level (1991 – present)

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

*Ground Water Protection Council's Wellhead Protection Subcommittee.*

Co-Chair, *Groundwater Division of the GWPC* on (September 1997 to 2003)

Chairman, *Illinois' Source Water Protection Technical and Citizens Advisory Committee.*

*United States Environmental Protection Agency National Ground Water Report Work Group.* 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)

Illinois EPA representative, ***Northeastern Illinois Planning Commission Water Supply Task Force***. 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)

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

***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 to March 2005.

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

Chair, ***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 – April 2002.

Illinois EPA representative, ***ICCG Water Quantity Planning Subcommittee*** working on development of a surface and groundwater quantity- planning program for Illinois. June 2002 – January 2003

Chair, ***ICCG Right-to-Know (RTK) Subcommittee, 2006***

***GWPC, Groundwater Science and Research Advisory Board, 2007***

#### 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

#### Honors

***Sigma Xi*** - Elected to *Sigma Xi* The Scientific Research Society for undergraduate research conducted and presented to the Illinois Academy of Science. 4/81

***Director's Commendation Award*** - 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*** - 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*** - 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*** - GWPC 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*** - United States Environmental Protection Agency Administrator Carol Browner at the 25<sup>th</sup> Anniversary of the Federal Safe Drinking Water Act Futures Forum in Washington D.C. 12/99.

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

***Exemplary Systems in Government (ESIG) Award*** - Nomination by the Governor's Office of Technology 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

#### Expert Witness Experience

IN THE MATTER OF: GROUNDWATER QUALITY STANDARDS (35 ILL. ADM. CODE 620), R89-14(B) (Rulemaking). Subject: I served as the principal witness recommending adoption of this Illinois EPA Agency proposal. R89-14(B) was adopted by the Board. The standards became effective January 1991.

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.

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.

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 and became effective January 1992.

HOUSE BILL 171 METHYL TERTIARY BUTYL ETHER (MTBE) ELIMINATION ACT,

House Environmental and Energy Committee. Subject: This law required the 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 as Public Act 92-0132 on July 24 2001. PA 92-132 required the ban of MTBE within three years.

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.

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: The 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. STONEHEDGE INC. Case no. 94-CH-46, Circuit Court of the 19<sup>th</sup> 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.

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: 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: 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: 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.

TERESA LeCLERCO; AL LeCLERCO; JAN LeCLERCO; WALT LeCLERCO, 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 LeCLERCO; AL LeCLERCO; JAN LeCLERCO; WALT LeCLERCO, 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.

IN THE MATTER OF: PROPOSED AMENDMENTS TO TIERED APPROACH TO CORRECTIVE ACTION OBJECTIVES (35 Ill. Adm. Code 742) (TACO), (Rulemaking). Subject: I served as the Illinois EPA witness supporting amendments TACO to include wellhead protection areas. September 2004.

MAXIMUM SETBACK ZONES FOR MARQUETTE HEIGHTS PUBLIC WATER SUPPLY (35 ILL. ADM. CODE 618), R05-09 (Rulemaking). Subject: Pursuant to request by the Village of Marquette Heights the Illinois EPA developed a maximum setback zone for the Marquette Heights community water supply wells. I served as Illinois EPA's principal witness. The proposal was adopted on May 4, 2006.

IN THE MATTER OF: STANDARDS AND REQUIREMENTS FOR POTABLE WATER WELL SURVEYS AND FOR COMMUNITY RELATIONS ACTIVITIES PERFORMED IN CONJUNCTION WITH AGENCY NOTICES OF THREATS FROM CONTAMINATION UNDER P.A. 94-134 (35 Ill. Adm. Code 1505), R06-023 (Rulemaking), JANUARY 2006. I served as an Agency panel witness to support the adoption of the RTK regulation.

IN THE MATTER OF: PROCEDURES REQUIRED BY P. A. 94-849 FOR REPORTING RELEASES OF RADIONUCLIDES AT NUCLEAR POWER PLANTS: NEW 35 Ill. Adm. Code 1010, R07-20. I served as the Agency primary witness in this proceeding.

IN THE MATTER OF: GROUNDWATER QUALITY STANDARDS (35 ILL. ADM. CODE 620), R08-18 (Rulemaking). Subject: I served as the principal witness recommending amendments and updates to the existing regulation. These regulatory amendments are still pending before the Board.

IN THE MATTER OF: IN THE MATTER OF: AMEREN ASH POND CLOSURE RULES (HUTSONVILLE POWER STATION): PROPOSED 35 ILL. ADM. CODE PART 840.101 THROUGH 840.144 (R09-21) (Rulemaking – Land) Subject: I served as the one of principal witnesses on this site specific regulation. These regulatory amendments were adopted by the Board on January 20, 2011.

PEOPLE OF THE STATE OF ILLINOIS vs., EXELON CORPORATION (No. 06 MR 248), Will County Circuit Court. Subject: I served as one of the primary Illinois EPA technical witnesses in a case where the State of Illinois and Will County sued Exelon for water pollution

and exceeding groundwater standards beginning in 2001 at its Dresden Nuclear Generating Station near Morris. **Exelon will pay more than \$1 million** to resolve three civil complaints stemming from radioactive tritium leaks at the Braidwood, Bryon and Dresden nuclear power plants.

#### Publications

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

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

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.

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

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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.

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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.

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 Minneapolis Minnesota.

Cobb, R.P., and W.A. Dulka, 1996. ***Discussion Document on the Development of a Regulated Recharge Area for the Pleasant Valley Public Water District***. Illinois Environmental Protection Agency. pp 28.

Cobb, R.P., 1996. ***Illinois Source Water Protection Initiatives-Groundwater Perspective***. In the proceedings of the American Water Works Association's Annual Conference and Exposition in Toronto Canada. pp 585- 594.

Cobb, R.P., and Dulka, W.A., 1996. ***Illinois Community Examines Aquifer Protection Measures***. American Water Works Association Journal. p10.

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

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.

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.

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.

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.

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

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

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

#### **Additional Legislative Publications that I Participated in Developing**

*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.

Public Act 92-0132 (*MTBE Elimination Act*), July 24 2001.

*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. 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.

**Public Act 94-314 (Senate Bill 0214)** – This is referred to as Right-to-Know (RTK) law. The law includes providing the Illinois EPA with administrative order authority (AO), information order authority, and established the requirements for providing notices to residents or business exposed or potentially exposed to contamination. The Illinois EPA had been seeking this type of AO authority for the past 35 years. Senate Bill 0214 was unanimously passed by both the Senate and the House May 2005. The legislation was signed into law by the Governor July 27, 2005.

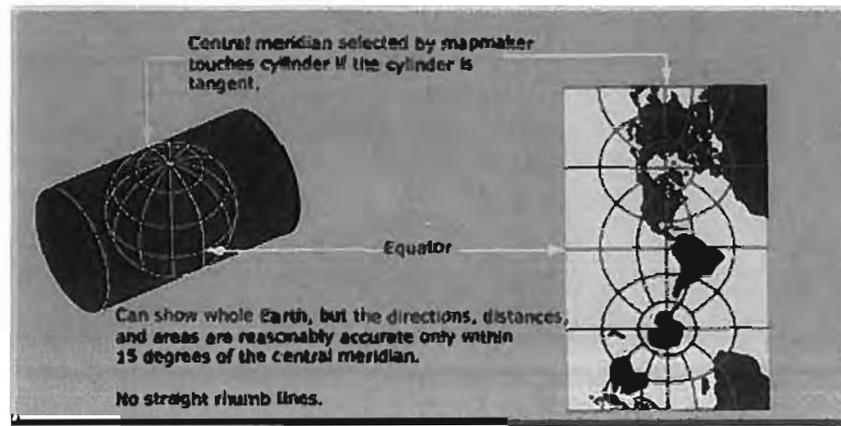
**Public Act 94-849 (House Bill 1620)** - Amends the Environmental Protection Act. Requires the owner or operator of a nuclear power plant to report to the Environmental Protection Agency any unpermitted release of a contaminant within 24 hours. The bill was signed by the Governor on June 12, 2006.

**Public Act 96-0603 (Crestwood Bill)** - Amends the Environmental Protection Act. This law requires the owners and operators of community water systems to maintain certain documents and to make those documents available to the Agency for inspection during normal business hours. This law requires that notices be provided expeditiously notification when groundwater contamination poses a threat of exposure to the public above the Class I groundwater quality standards to all residents of a community water system. The law creates a civil penalty for violations of these notice requirements, and makes it a felony to make certain false, fictitious,

or fraudulent statements. The bill passed both houses on May 30, 2009. The bill was sent to the Governor for signature on June 26, 2009, and was signed into law on August 24, 2009.

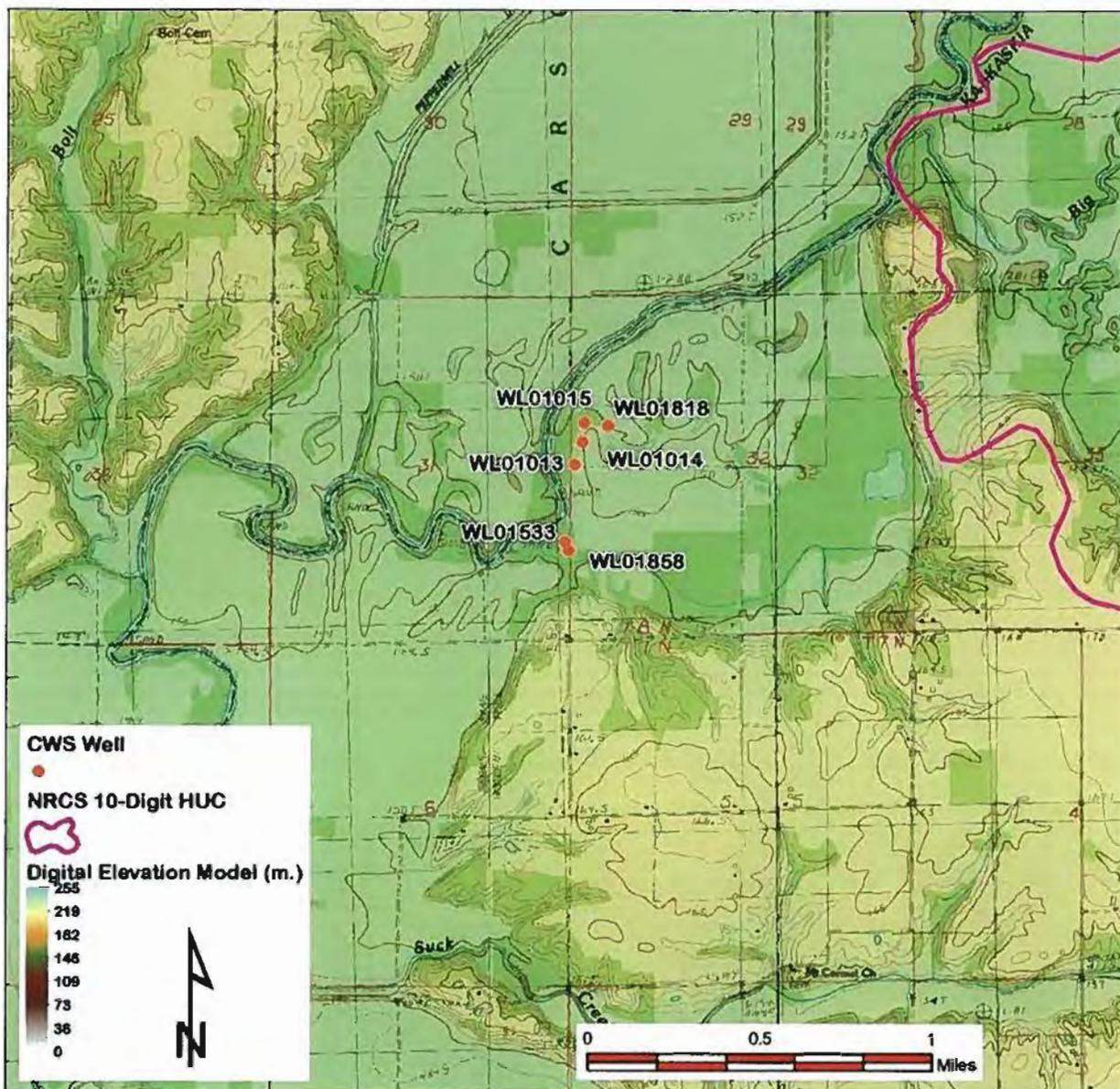
***Public Act 096-1366*** – Amends the Environmental Protection Act. This new law requires public water supplies to submit a corrective action plan to the Illinois EPA upon the Agency's issuing a right-to-know notice upon verifying that the finished public water has in fact exceeded 50% of the MCL for carcinogenic VOCs. Requires the response plan to include periodic sampling to measure and verify the effectiveness of the response plan, but also requires the Illinois EPA to take into account the technical feasibility and economic reasonableness of the response plane in approving, modifying, or denying the response plan. Signed into law on July 28, 2010; effective July 28, 2010.

## Attachment B - Transverse Mercator Projection

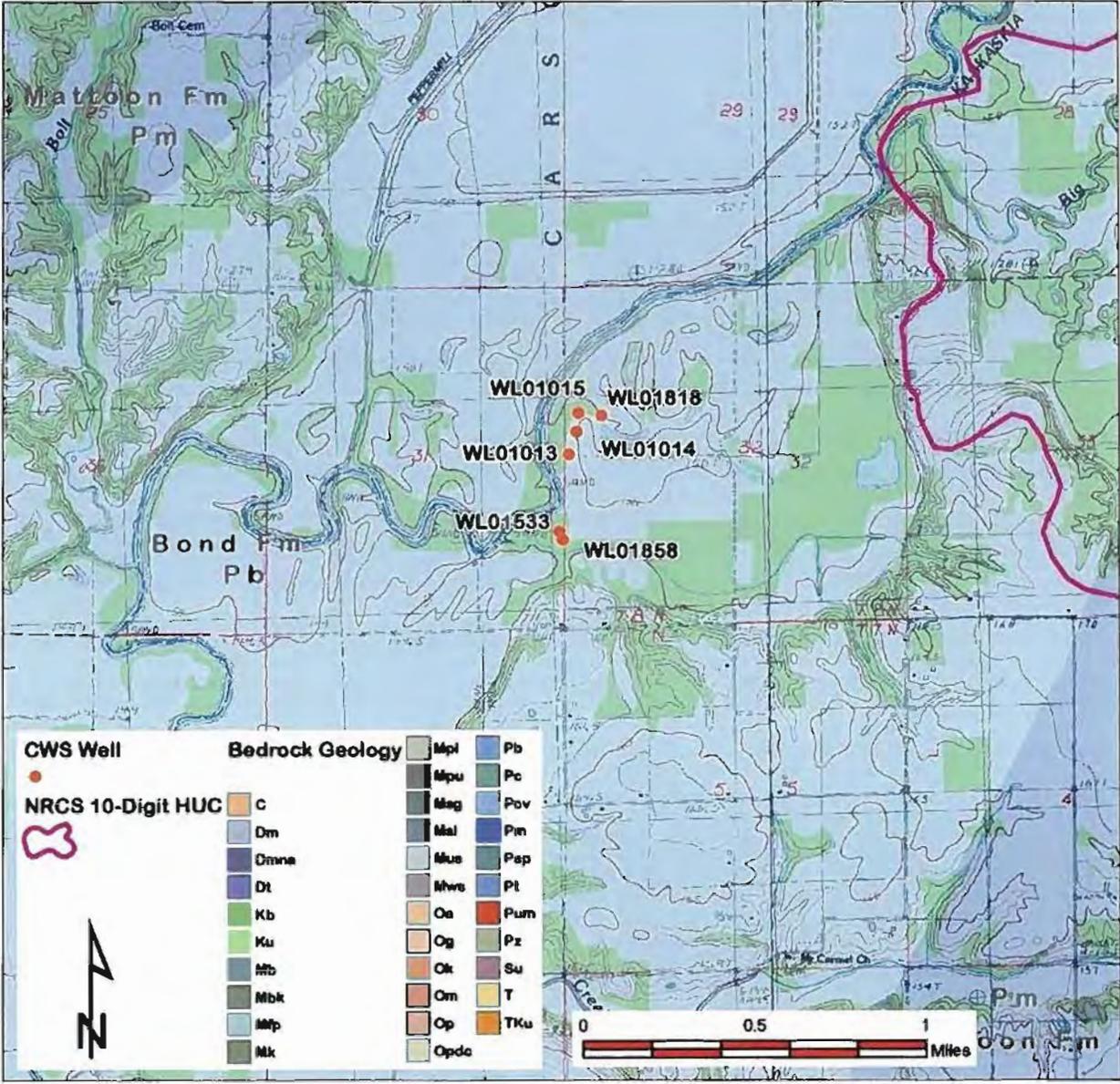


Transverse Mercator is mathematically projected on a cylinder tangent to a meridian, as shown above. (Cylinder may also be secant.) The **Transverse Mercator** map projection is used by the USGS for many quadrangle maps at scales of 1:24,000 to 1:250,000. Because the map is conformal shapes and angles within any small area (such as that shown on a USGS topographic map) are essentially true.

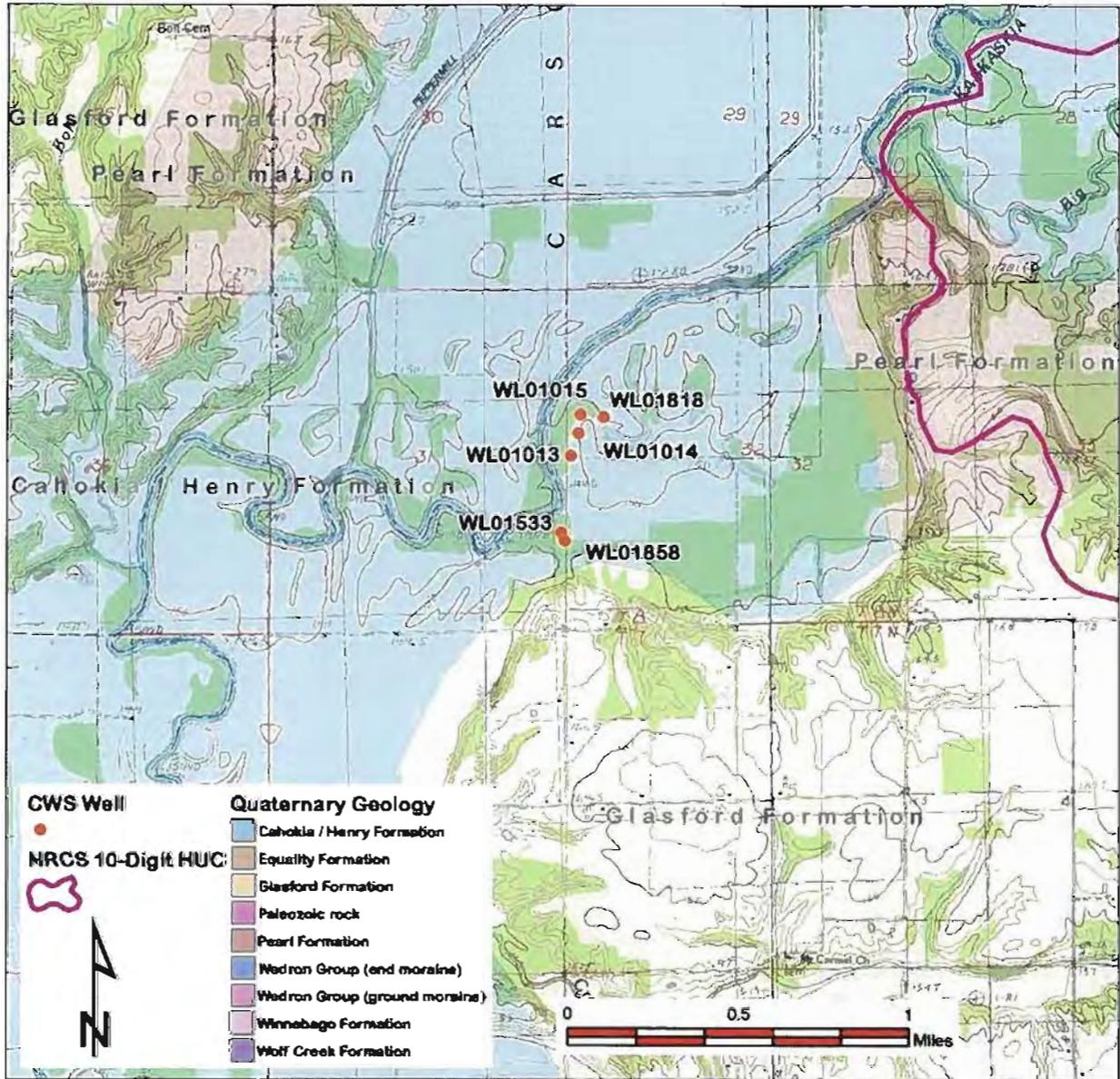
### Attachment C – USGS DEM at the FWC Well Field



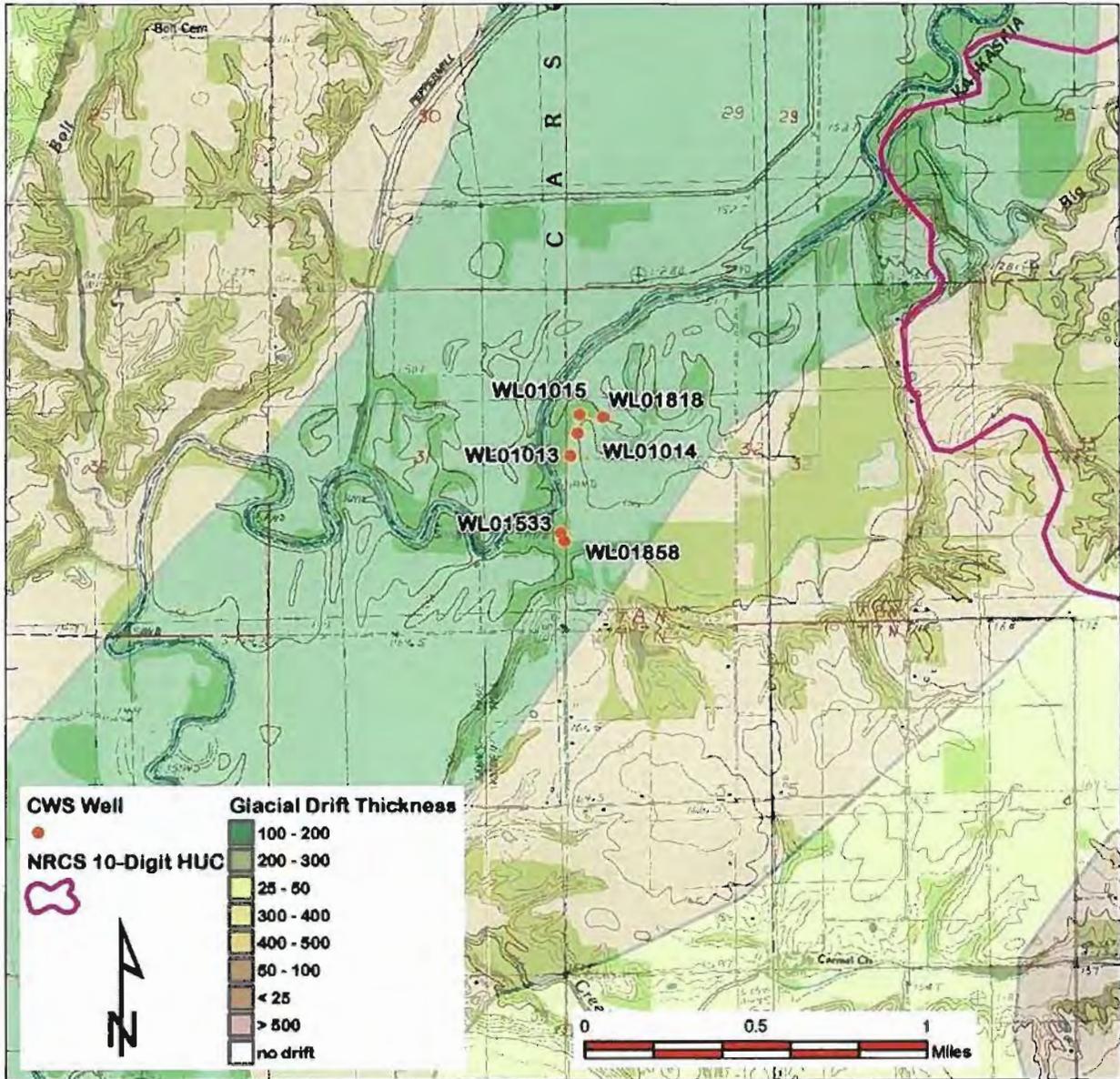
**Attachment D – Map of the Pennsylvanian Bedrock at the FWC Well Field**



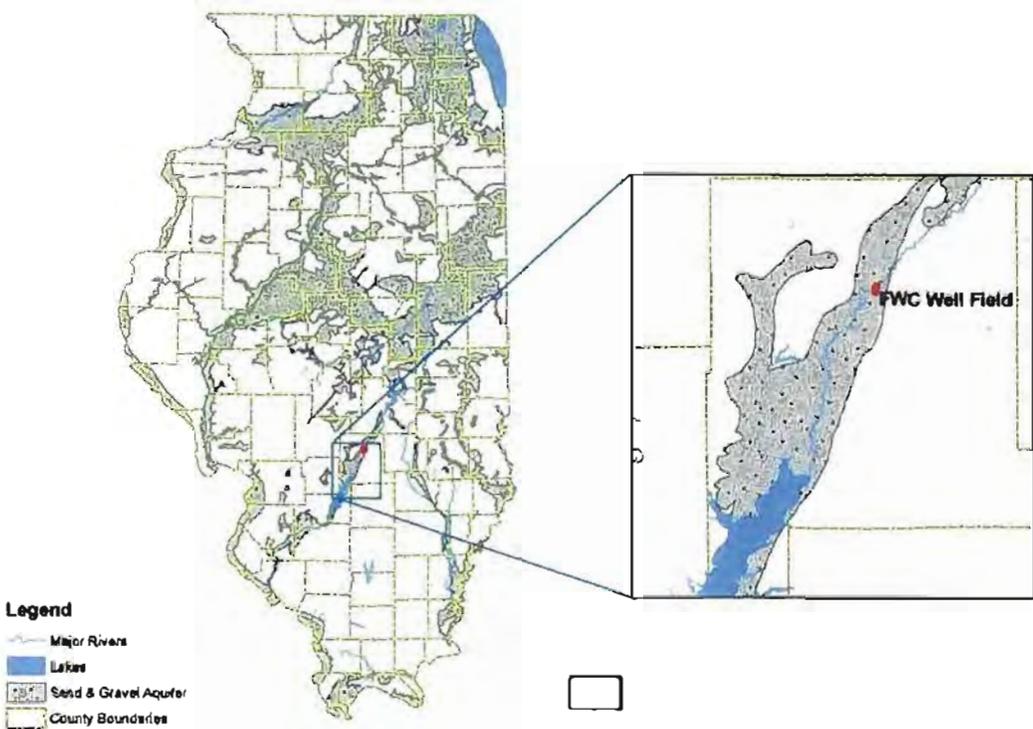
### Attachment E - Map of the Quaternary Geology at the FWC Well Field



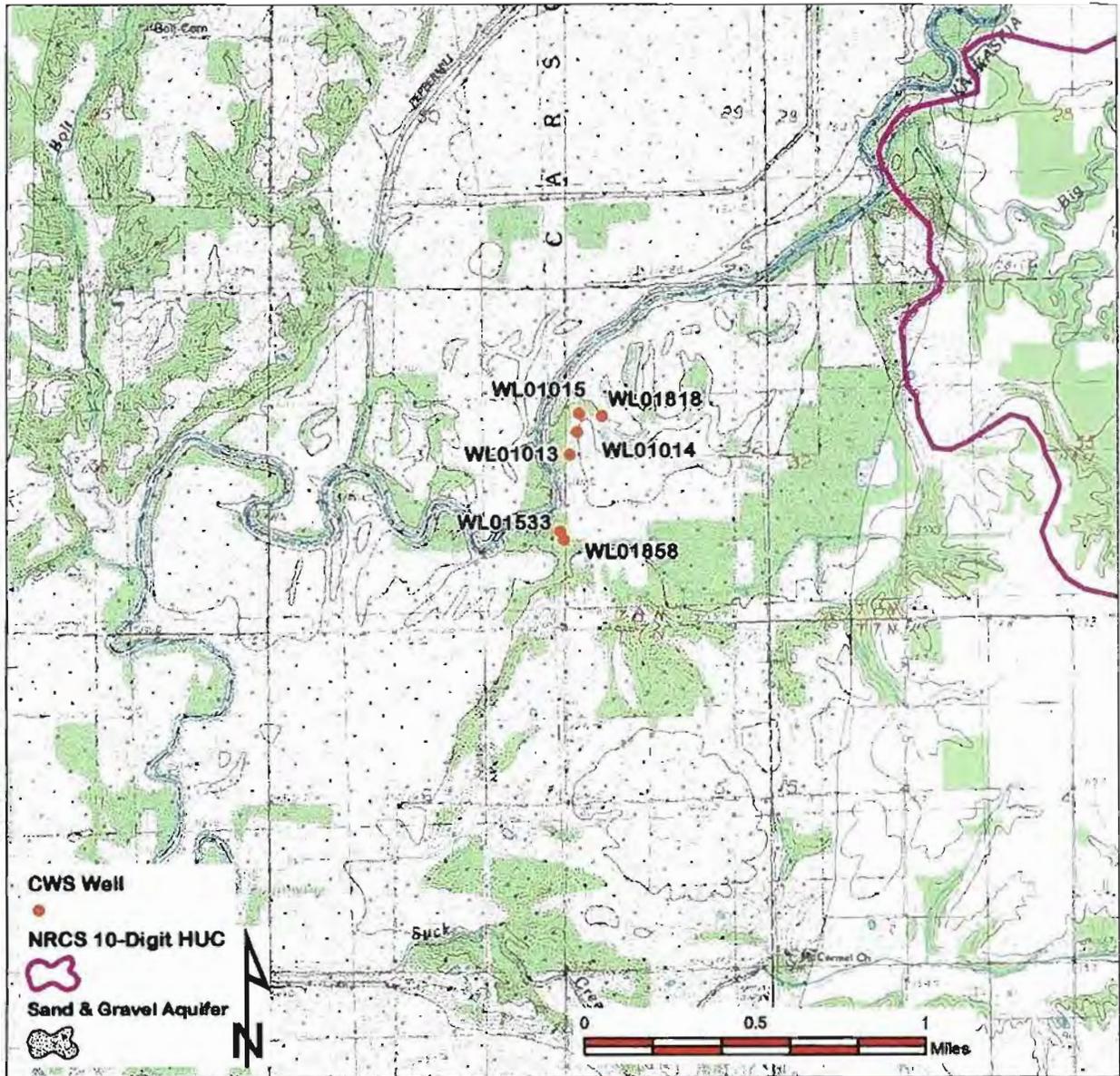
**Attachment F – Map of the Glacial Deposit Thickness at the FWC Well Field**



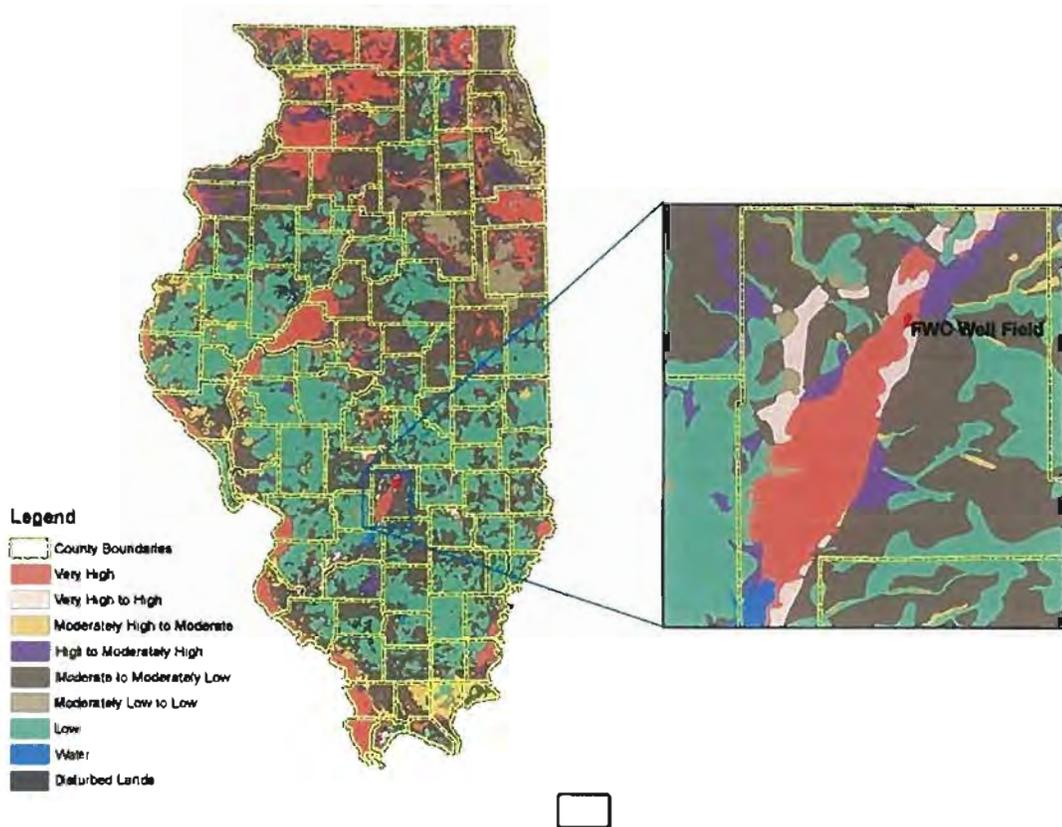
**Attachment G - Principal Sand and Gravel Aquifers in Illinois**



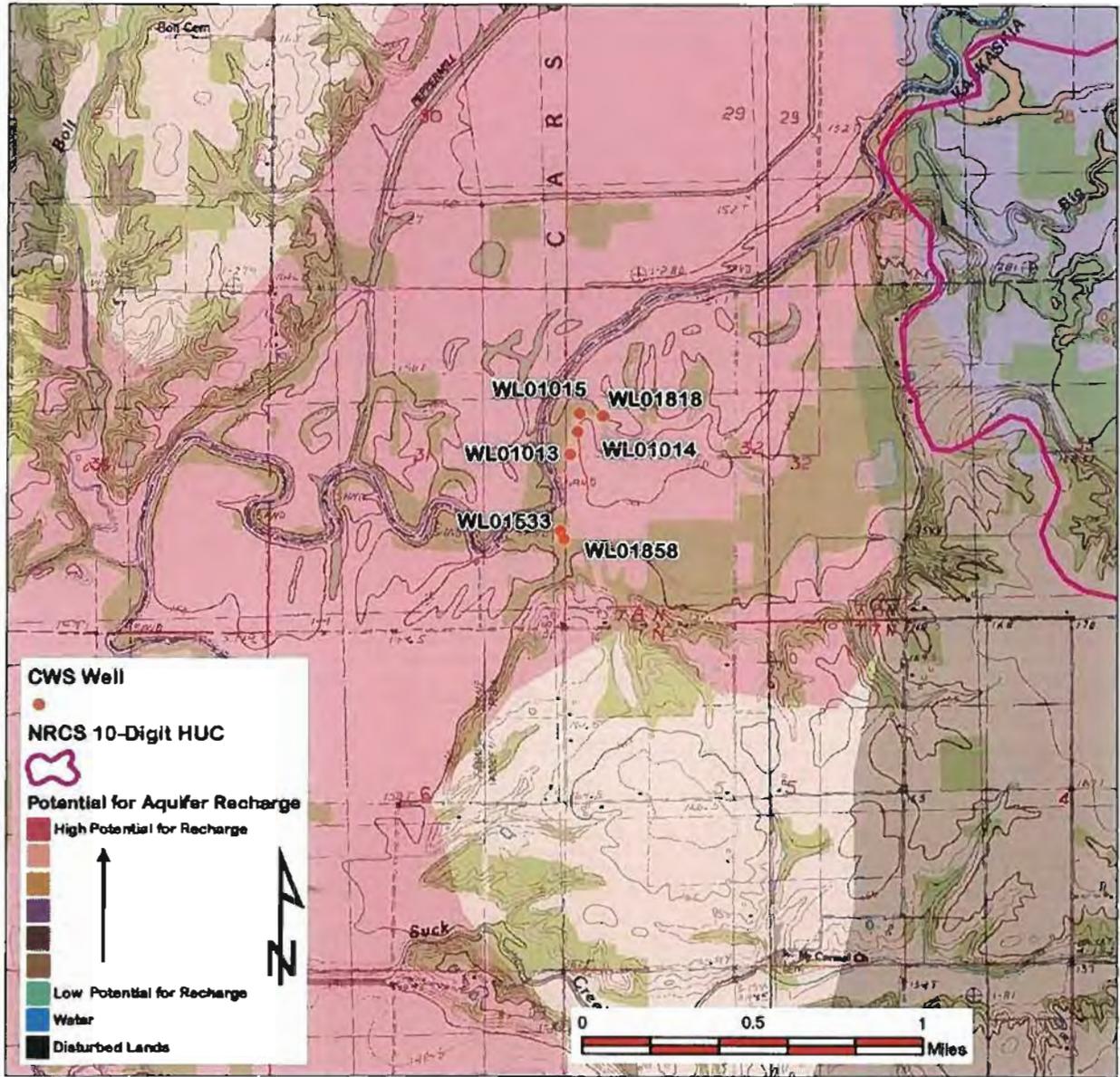
# Attachment H – Principal Sand and Gravel Aquifer at the FWC Well Field



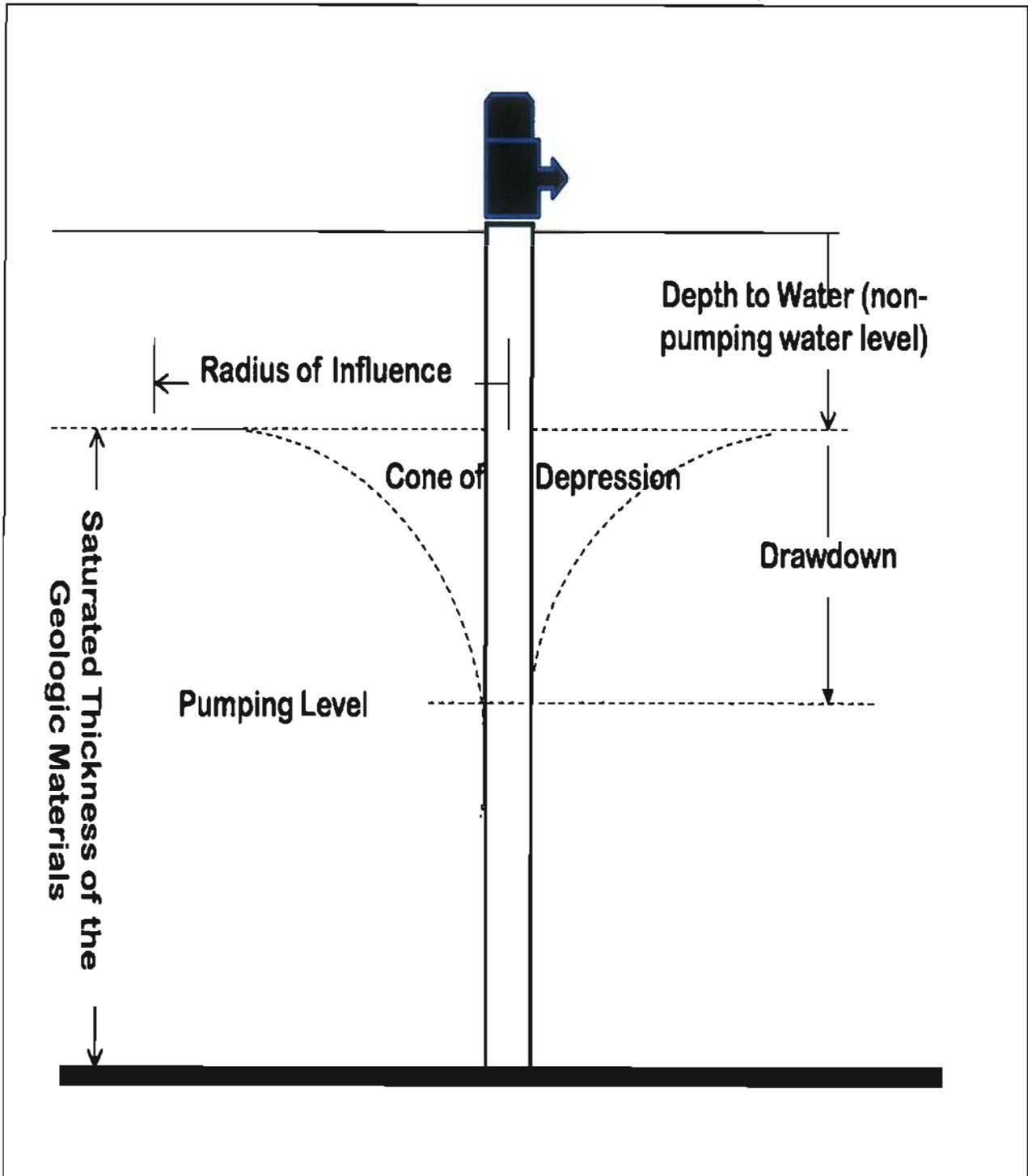
## Attachment I – Potential for Aquifer Recharge in Illinois



## Attachment J – Potential for Aquifer Recharge at the FWC Well Field



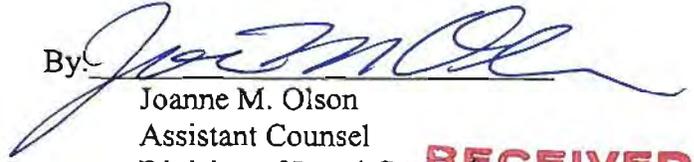
**Attachment K – Conceptual Model of the Cone of Depression**



**CERTIFICATE OF SERVICE**

Joanne M. Olson, Assistant Counsel for the Illinois EPA, herein certifies that she has served a copy of the foregoing NOTICE OF FILING and TESTIMONY OF RICHARD P. COBB, P.G. upon persons listed on the Service List by mailing a true copy thereof in an envelope duly addressed bearing proper first class postage and deposited in the United States mail at Springfield, Illinois on June 1, 2011.

By:



Joanne M. Olson  
Assistant Counsel  
Division of Legal Counsel

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**JUN 06 2011**

**STATE OF ILLINOIS**  
**Pollution Control Board**

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