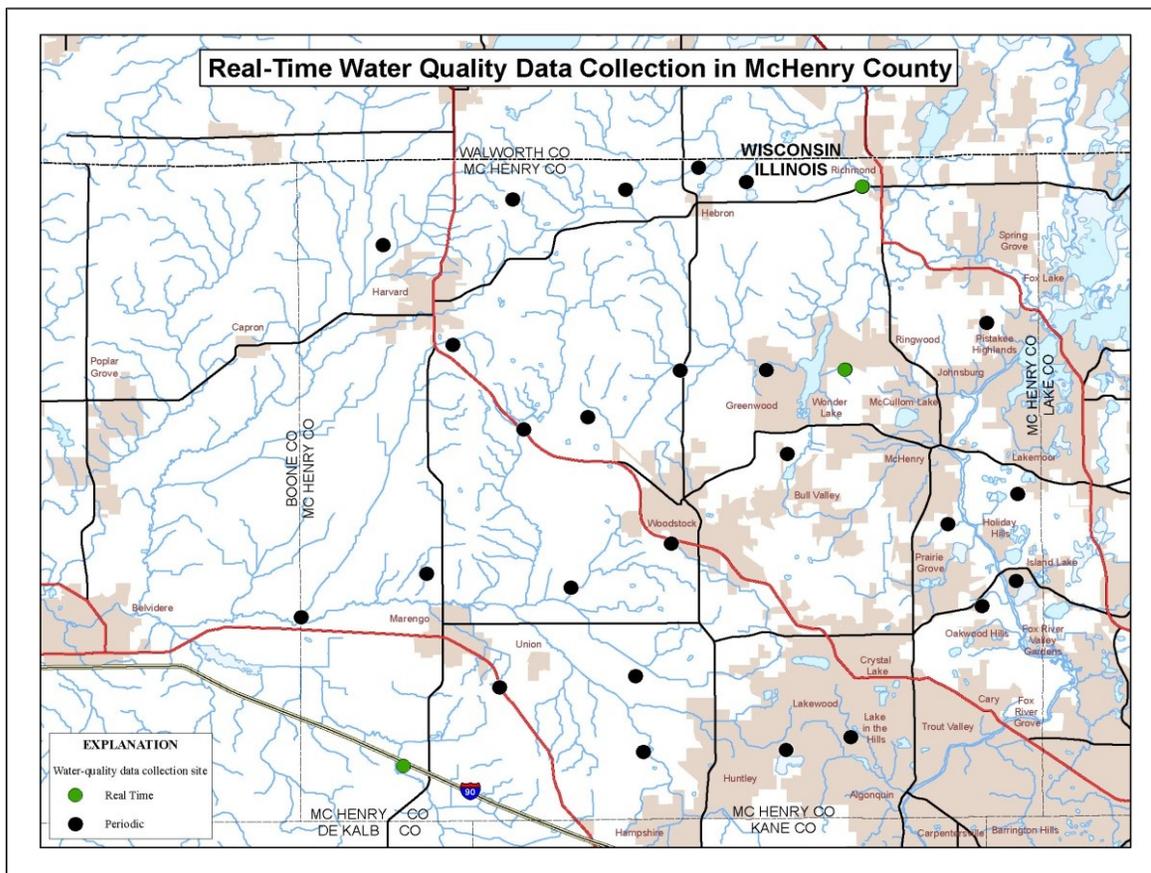


Illinois Groundwater Protection Program

Biennial Comprehensive Status and Self-Assessment Report



The State of Illinois recognizes the essential and pervasive role of groundwater in the social and economic well-being of the state, and its vital importance to the general health, safety, and welfare of its citizens.

--Illinois Groundwater Protection Act

*Prepared by the
Interagency Coordinating Committee on Groundwater*

January 2012



Illinois Environmental
Protection Agency
Bureau of Water



State of Illinois
Illinois Environmental Protection Agency
www.epa.state.il.us

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ACRONYM GLOSSARY

Act	Illinois Environmental Protection Act
AGO	Attorney General's Office (Illinois)
AWWA	American Water Works Association
Board	Illinois Pollution Control Board
BOL	Bureau of Land
BOW	Bureau of Water
CCR	Coal Combustion Residual
CMAP	Chicago Metropolitan Agency for Planning
CWS	Community Water System
DEM	Digital Elevation Model
DNP	Dedicated Nature Preserve
EPA	Environmental Protection Agency
ESVL	Earth Systems Visualization Laboratory
GAC	Groundwater Advisory Council
GCS	Geologic Carbon Sequestration
GIS	Geographic Information System
GMZ	Groundwater Management Zone
GPS	Global Positioning System
GWQS	Groundwater Quality Standards
GWR	Groundwater Rule
ICCG	Interagency Coordinating Committee on Groundwater
IDA	Illinois Department of Agriculture
IDNR	Illinois Department of Natural Resources
IDOT	Illinois Department of Transportation
IDPH	Illinois Department of Public Health
IOC	Inorganic Chemical
IGPA	Illinois Groundwater Protection Act
IRWA	Illinois Rural Water Association
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
LIRB	Lower Illinois River Basin
MAC	Mahomet Aquifer Consortium
MCL	Maximum Contaminant Level
MRL	Minimum Reporting Level
NAWQA	National Water Quality Assessment
NGWMN	National Groundwater Monitoring Network
NCPWS	Non-Community Public Water Supply
PFC	Perfluorinated Compound
RMMS	Resource Management Mapping Service
RTK	Right-To-Know
RWSPC	Regional Water Supply Planning Committee
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
TCR	Total Coliform Rule
ug/L	Micrograms per Liter
UIRB	Upper Illinois River Basin
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WHPA	Wellhead Protection Area

**CHAPTER I. INTERAGENCY COORDINATING COMMITTEE ON
GROUNDWATER OPERATIONS**

The Illinois Groundwater Protection Act (IGPA) required the creation of the Interagency Coordinating Committee on Groundwater (ICCG). The ICCG is required to report biennially to the Governor and General Assembly on groundwater quality and quantity and the state’s enforcement efforts related to groundwater. In summary, the ICCG is responsible for:

- Reviewing and coordinating the state’s policy on groundwater protection;
- Reviewing and evaluating state laws, regulations, and procedures that relate to groundwater protection;
- Reviewing and evaluating the status of the state’s efforts to improve the quality of the groundwater, the state enforcement efforts for protection of the groundwater, and make recommendations in improving the state’s efforts to protect the groundwater;
- Recommending procedures for better coordination among state groundwater programs and local programs related to groundwater protection;
- Reviewing and recommending procedures to coordinate the state’s response to specific incidents of groundwater pollution and coordinate dissemination of information between agencies responsible for the state’s response;
- Making recommendations for and prioritizing the state’s groundwater research needs; and
- Reviewing, coordinating, and evaluating groundwater data collection and analysis.

The ICCG is chaired by the Director of Illinois Environmental Protection Agency (EPA) and is comprised of members from ten state agencies/departments that have some jurisdiction over groundwater (Table 1). The ICCG continues to review and update an Implementation Plan and Regulatory Agenda pursuant to the IGPA. Detailed minutes are taken at every meeting and are available from Illinois EPA.

Environmental Protection Agency (Chair)	Marcia Willhite, designee
Department of Natural Resources Office of Water Resources Office of Mines and Minerals	Todd Rettig, designee Gary Clark, designee Vickie Broomhead, designee
Department of Public Health	Jerry Dalsin, designee
Office of the State Fire Marshal	Shelly Bradley, designee
Department of Agriculture	Dennis McKenna, designee
Emergency Management Agency, Division of Nuclear Safety	Gary McCandless, designee
Department of Commerce and Economic Opportunity	Dan Wheeler, designee
<i>Also attending the ICCG meetings are: Steve Gobelman, Illinois Department of Transportation’s Division of Highways; Allen Wehrmann, Illinois State Water Survey; David Larson, Illinois State Geological Survey; and Doug Yeskis, United States Geological Survey.</i>	

Table 1. Members of the Interagency Coordinating Committee on Groundwater

Section 1. Continue to review and update the Implementation Plan and Regulatory Agenda.

A total of eight joint ICCG meetings were held over the past two-year reporting period. These meetings included discussions on the review and development of recommendations pertaining to groundwater quality and quantity issues and to obtain input on draft revisions to the Illinois Pollution Control Board (Board) groundwater quality standards (GWQS). The ICCG provided input to an updated Nonpoint Source Management Plan.

Section 2. Work with the Groundwater Advisory Council and the regional groundwater protection and planning committees to sponsor a Groundwater Protection Policy Forum.

A Groundwater Protection Policy Forum was not held during the past two-year reporting period. Illinois EPA looks forward to bringing groundwater experts together to share experiences, discuss contaminant trends and emerging contaminants and to lay the groundwork for establishing priority initiatives and new policies during the next reporting period. The proceedings of the 2008 Groundwater Protection Policy Forum are still available at: <http://www.epa.state.il.us/water/groundwater/groundwater-protection/policy-forum-proceedings.pdf>.

Section 3. Continue to assist the Groundwater Advisory Council in the review and development of recommendations pertaining to groundwater quality and quantity issues.

The Groundwater Advisory Council (GAC) members were invited to ICCG meetings. All eight ICCG meetings included updates from the Illinois Department of Natural Resources (IDNR) on the regional groundwater quantity planning process that provided for input by the GAC. The ICCG meetings also continue to focus on water quality issues. Chlorides in northern Illinois groundwater and road salt application workshops in the priority regions were one of the key focus areas. The ICCG and GAC also provided input to an updated Nonpoint Source Management Plan.

Section 4. Continue the policy discussion regarding prevention versus remediation.

Amendments were proposed to the Board to begin a process of including wellhead protection areas (WHPAs) under the compliance determination section of the GWQS regulation. These amendments were discussed during ICCG/GAC meetings to continue this dialogue. The Board went to First Notice on this proposal on October 20, 2011.

New draft rules requiring source water protection plans were discussed for initial input from the GAC. More input will be provided during the next reporting period.

Section 5. Continue the policy discussion concerning the integration of wellhead protection areas with Tiered Approach for Corrective Action Objectives.

The Illinois EPA conducted a third comprehensive trend analysis of volatile organic compounds (VOCs) being found in community water system (CWS) wells across the state. There continues to be a statistically significant increasing trend. To help address this issue, WHPAs are included under amendments to the compliance point section of the GWQS. The Board has adopted this concept in their First Notice proposal.

A Groundwater Contamination Response Strategy and legislation (Public Act 92-652, effective July 11, 2002) were developed and adopted, setting forth procedures to be used by state agencies in their responses to existing and potential groundwater contamination of private wells by VOCs. This Right-to-Know (RTK) strategy and legislation were developed to notify private well owners about potential groundwater problems of nearby CWS wells with VOC detections. Illinois EPA's Bureau of Water (BOW) and Bureau of

Land (BOL) continue to implement this strategy. Table 2 lists the sites where notification has been provided.

Table 2. Well-Centric Notification Based on Detections in Community Water Supply Wells

Facility Name	County
Antioch	Lake
Beardstown	Cass
Belvidere	Boone
Bradley Heights	Winnebago
Byron	Ogle
Carpentersville	Kane
Coyne Center Co-Op	Rock Island
Crest Hill	Will
Crestwood	Cook
Crystal Lake	McHenry
Downers Grove	DuPage
East Alton	Madison
East Dundee	Kane
East Peoria	Tazewell
Edwardsville	Madison
Fairmount	Vermilion
Ford Heights	Cook
Fox Lake	Lake
Fox River Grove	McHenry
Freeport	Stephenson
Gem Suburban MHP	Winnebago
Grafton	Jersey
Harvard	McHenry
Hebron	McHenry
Hennepin	Putnam
Heritage Environmental (Lemont)	Cook
Hiatts Hideaway MHP	Tazewell
Hinckley	DeKalb
Hollis Subdivision	Kendall
Hull	Pike
Il American - Sterling	Whiteside
Island Lake	Lake
Kershaw MHP	Henry
Lake Marian	Kane
Libertyville	Lake
Lima	Adams
Loves Park	Winnebago
Mackinaw	Tazewell
Marengo	McHenry
Marquette Heights	Tazewell
Mendon	Adams
Milan	Rock Island
Mill Creek PWD	Adams
Momence	Kankakee
Montgomery	Kane

Table 2 (cont'd.)	
Facility Name	County
North Park PWD	Winnebago
Petersburg	Menard
Plainville	Adams
Plano	Kendall
Princeville	Peoria
Roanoke	Woodford
Sandwich	DeKalb
Sauk Village	Cook
Scales Mound	Jo Daviess
Sheffield	Bureau
Six Oaks MHP	Winnebago
South Chicago Heights	Cook
South Elgin	Kane
Union-York PWD	Clark
Valley Run MHP	Vermilion
Woodstock	McHenry
Morrison	Whiteside
Naperville	DuPage
New Lenox	Will

Section 6. Continue the subcommittee led by Illinois Department of Public Health to discuss tracking and registering groundwater monitoring wells.

The Illinois Department of Public Health (IDPH) has revised the Water Well Construction Report Form to include global positioning system (GPS) coordinates for the location of water wells, including monitoring wells, and to accept data electronically using a pdf smart form.

Section 7. Establish a subcommittee to discuss registering closed-loop heat pump wells and licensing drillers.

On August 15, 2011, House Bill 308 was signed into law as Public Act 97-363. This law amended the Water Well and Pump Installation Contractor’s License Act, creating the Closed-loop Well Contractors Certification Board. Provisions call for the new Board to advise and aid the Director of the IDPH in: (1) preparing subject matter for continuing education sessions relating to closed-loop wells; (2) preparing examinations for the certification of closed-loop well contractors, relating to the construction, installation, repair, and abandonment of closed-loop wells and the rules adopted for closed-loop wells; (3) adopting rules related to closed-loop wells; (4) holding examinations; (5) holding hearings; (6) submitting recommendations to the Director; (7) grading all tests and examinations; (8) performing other duties; and (9) conferring with the Water Well and Pump Installation Contractor’s Licensing Board regarding registration and certification of closed-loop well contractors and the installation of closed-loop wells.

Public Act 97-363 also amended the Illinois Water Well Construction Code, creating a provision for IDPH, by rule, to require the registration of closed-loop well contractors. To become registered, an applicant must pass the IDPH certification examination and shall be certified by an organization approved by the IDPH for its appropriateness in determining the knowledge and expertise as a closed-loop well contractor. As an

additional provision, IDPH shall, by rule, require a one-time fee for permits for the construction, modification, or abandonment of closed-loop wells. It further prohibits all closed-loop contractors who are certified from engaging in the occupation of closed-loop well contractor unless he or she is registered with IDPH.

Lastly, the legislation established the requirement for a permit to modify or abandon a water well on top of the requirement already in place for permitting the construction of new water wells and the deepening of existing water wells.

CHAPTER II. GROUNDWATER ADVISORY COUNCIL OPERATIONS

The IGPA also required the creation of the GAC. The GAC is responsible for:

- Reviewing, evaluating, and making recommendations regarding state laws, regulations, and procedures that relate to groundwater protection;
- Reviewing, evaluating, and making recommendations regarding the state’s efforts to implement the IGPA and protect groundwater;
- Making recommendations relating to the state’s needs for groundwater research; and
- Reviewing, evaluating, and making recommendations regarding groundwater data collection and analyses.

The GAC, established in 1988, continues to be integral to development and implementation of effective groundwater protection programs in Illinois. The GAC is comprised of nine members who represent public, industrial, agricultural, environmental, and local government interests. The IGPA mandates that the council members be appointed by the Governor to serve three-year terms. Table 3 provides the members of the GAC.

Bill Compton (Chair)	Public Water Supply Interest (Groveland Public Water District)
Jack Norman	Environmental Interest (Sierra Club)
George Czapar	Agricultural Interest (ISWS, Center for Watershed Science)
Paul McNamara	Local Government Interest (Southwestern Illinois Planning Commission)
C. Pius Weibel	Business Interest (Industry Consultant) (ISGS, Industrial Minerals and Economics)
William Olthoff	Regional Planning Interest (Kankakee County Board)
John Liberg	Water Well Drilling Interest (Illinois Association of Groundwater Professionals)
Robert Kohlhase	Environmental Interest (Farnsworth Group)
Vacant	Business Interest

Table 3. Groundwater Advisory Council Members

Section 1. Conduct policy-related meetings in order to review and make recommendations regarding groundwater issues and policies.

The GAC conducted three meetings over the past two years and provided technical expertise and guidance on several priority policy-related issues including, participation in the: Public Water Supply Loan Program Advisory Committee, and the Perchlorate Task Force. In addition, the GAC reviewed and evaluated *Before the Wells Run Dry: Ensuring Sustainable Water Supplies for Illinois*. Two vacancies on the Council were also filled during this reporting period.

Section 2. Provide input to programs, plans, regulatory proposals, and reports, as appropriate.

Members of the GAC continue to provide significant input to programs, plans and reports. The GAC provided input to an updated Nonpoint Source Management Plan which put more emphasis on protecting groundwater and initial input on Illinois EPA’s draft source water protection plan requirement proposal.

CHAPTER III. EDUCATION PROGRAM FOR GROUNDWATER PROTECTION

Section 1. Develop and promote a Safe Well Water Initiative with IDPH.

The Illinois EPA and IDPH continue to promote the “Safe Well Water Initiative” to increase awareness of private well owners in Illinois of the need to have regular testing for VOCs that potentially may have historically contaminated groundwater sources. The primary purpose of this effort is to ensure that citizens across our state who obtain drinking water from an estimated 400,000 private wells do not have a potential health risk from contamination.

VOCs are increasingly being found in groundwater in many areas of our state, and across the nation, as a result of the breakdown of cleaning solvents and fuels that were historically associated with sources such as gas stations, dry cleaners, auto and boat engine repair shops, printing shops, and metal parts fabrication facilities.

As part of this initiative, the Illinois EPA has posted several helpful documents on our Web site, <http://www.epa.state.il.us/community-relations/fact-sheets/safe-water-wells/index.html>, including instructions on private well testing, laboratories accredited to analyze water samples for VOCs, links to fact sheets regarding potential health effects from exposure to specific VOCs, and information on Illinois’ RTK Laws that keep the public informed about their public and private drinking water sources.

Section 2. Market the new source water protection standards.

The Illinois EPA and the Illinois Section-American Water Works Association (AWWA) co-sponsored a Webinar on November 17, 2010, entitled, “Why should I care about implementing a wellhead protection program?” This source water protection Webinar included the promotion of the AWWA’s source water protection standard (ANSI/AWWA G300-07). Additional Webinar topics included: Illinois EPA’s source water protection CD and interactive Web site, new CWS well permit application amendments, and other tools available for implementing a source water protection program. Additional water quality issues that were discussed included: emerging contaminants, VOC trends, and bacteria occurrence in CWS wells. Participants of the Webinar earned renewal training credits hours or professional development hours.

Section 3. Conduct source water protection workshops.

The Illinois EPA and the Illinois Rural Water Association (IRWA) co-sponsored source water protection workshops at Kishwaukee Community College and in the Village of Troy on January 21, 2010, and April 19, 2010, respectively. These presentations focused on the importance of having a safe source of drinking water and updates to Illinois’ RTK Laws. Information was also provided on the use of Illinois EPA’s interactive Web site and a demonstration of a source water protection CD developed specifically for small CWSs in Illinois. In addition, Illinois EPA continues to participate in IRWA’s annual conferences in Rockford and Effingham, Illinois.

Section 4. Continue to develop and enhance Web-based educational materials, including ordering and distribution systems.

The Illinois State Water Survey (ISWS) continues to maintain a Web page on domestic water well information, <http://www.isws.illinois.edu/gws/domesticwell.asp>, including links to publications and other Illinois agency Web sites concerning proper construction of domestic wells, private drinking water systems, and private wellhead protection. The ISWS continues to add material to a water supply planning Web page, <http://www.isws.illinois.edu/wsp/>, with updates on regional water supply planning results, presentations, and reports. Shallow groundwater level (water table) data collected

from a statewide observation-well network are available at <http://www.isws.illinois.edu/warm/sgwdata/wells.aspx>. Data can be viewed on-line graphically or downloaded. Monthly data are available for 17 wells; daily data are available from another 18 observation wells co-located at Illinois Climate Network sites. Additional data on aquifer water levels is being planned. All ISWS reports are available on-line as pdf documents at <http://www.isws.illinois.edu/pubs/isearch.asp>.

The ISWS also maintains a drought-related Web page providing the latest information on drought conditions in Illinois, <http://www.isws.illinois.edu/hilites/drought/>. New this year is an updated State Drought Preparedness and Response Plan, approved by the State Water Plan Task Force on October 12, 2011. This is the first update of the State Drought Plan since it was originally published in 1983. The Plan includes short descriptions of agency responsibilities during drought, recent water supply planning results, and guidance for communities to prepare for drought before a drought occurs.

Section 5. Integrate groundwater education efforts into other state environmental planning and protection programs.

Source water protection areas (including WHPAs) have been integrated with the Resource Management Mapping Service. This mapping service also contains where best management practices have been implemented within watersheds to reduce nonpoint sources of pollution under the Clean Water Act. See <http://www.epa.state.il.us/water/watershed/nonpoint-source.html> for further detail.

Proposed Class III groundwater areas have been included under Illinois EPA's source water assessment Web page for BOL project managers evaluating leaking underground storage tanks.

Section 6. Work toward enhancing the groundwater protection education resources on a priority basis.

The Illinois State Geological Survey (ISGS) provides information on geology and hydrogeology, annual geological field trips, free downloadable short reports, a glossary of geologic and hydrogeologic terms, and an "Ask-An-Expert" interface at <http://www.isgs.uiuc.edu/education/>.

The ISWS continues to maintain an on-line domestic water well resource, including links to private well information, groundwater protection, and other Web sites with private well information at <http://www.isws.illinois.edu/gws/domesticwell.asp>.

The ISWS also has developed an ArcGIS Explorer plug-in package for visualizing and analyzing decision support variables, such as groundwater modeling results. Called the ubiquitous WebGIS Analysis Toolkit for Extensive Resources (uWATER), the toolkit is available for *free download* at <http://www.isws.illinois.edu/gws/sware/uwater/>. The toolkit conducts a complex inquiry, undertaking spatial and characteristics inquiry at the same time, on a user-desired shapefile based on defined criteria. It allows the user to select a feature in ArcGIS Explorer from the feature layer. Then it allows the user to select another feature layer or attribute of another feature layer as query criteria, and specifies the attribute query range and spatial relationship. While uWATER requires creation of shapefiles from which it can perform queries, once those shapefiles are created, a variety of analyses can be performed by public users (Yang and Lin, 2011).

CHAPTER IV. GROUNDWATER EVALUATION PROGRAM

Section 1. Continue to conduct a program of basic and applied groundwater research programs that allow decisions to be made on sound scientific principles.

Illinois EPA Ambient Monitoring Network – Section 13.1 of the Illinois Environmental Protection Act (Act) (415 ILCS 5/) requires the Illinois EPA to implement a groundwater monitoring network to assess current levels of contamination in groundwater and to detect future degradation of groundwater resources.

Further, Section 7 of the IGPA (415 ILCS 55/) requires the establishment of a statewide ambient groundwater monitoring network comprised of CWS wells, non-CWS wells, private wells, and dedicated monitoring wells. Illinois EPA’s ambient network of CWS wells is rotated every other year. The purpose of the rotating monitoring network is to maximize resources and increase groundwater quality monitoring cover at CWS wells. Illinois EPA is able to concentrate on specialized monitoring at high priority areas during alternate years. From the experience gained from these prototype networks, implemented pursuant to Section 13.1 of the Act, Illinois EPA designed a probabilistic monitoring network of CWS wells. The design of this network was completed in coordination with the United States Geological Survey (USGS), the ISGS, and the ISWS, with USGS performing the detailed design. The goal of the network is to represent contamination levels in the population of all active CWS wells.

For more information on the CWS Probabilistic Network refer to the Illinois EPA’s Groundwater Section of the “Water Resource Assessments” Web page at:
<http://www.epa.state.il.us/water/water-quality/index.html>

The network wells were selected by a random, stratified probability-based approach using a 95 percent confidence level (CWS Probabilistic Network). Further, to improve precision and accuracy, the random selection of the CWS wells was stratified by depth, aquifer type, and the presence of aquifer material within 50 feet of land surface. Illinois EPA used geological well log and construction log detail to perform this process.

The random, stratified selection process included nearly 3,000 CWS wells resulting in 357 fixed monitoring locations (see Figure 1). Additionally, in order to prevent spatial or temporal bias, 17 random groups of 21 wells, with alternates, were selected from all the 357 fixed station wells. To further assure maximum temporal randomization within practical constraints, the samples from each sample period are collected within a three-week timeframe.

This Probabilistic Network is designed to:

- Provide an overview of the groundwater conditions in the CWS wells;
- Provide an overview of the groundwater conditions in the principle aquifers (e.g., sand and gravel, Silurian, Cambrian-Ordovician, etc.);
- Establish baselines of water quality within the principle aquifers;
- Identify trends in groundwater quality in the principle aquifers; and
- Evaluate the long-term effectiveness of the IGPA, Clean Water Act, and Safe Drinking Water Act (SDWA) program activities.

**All Community Water Supply Wells
In Illinois**

**Community Water Supply Probabilistic
Network Wells**

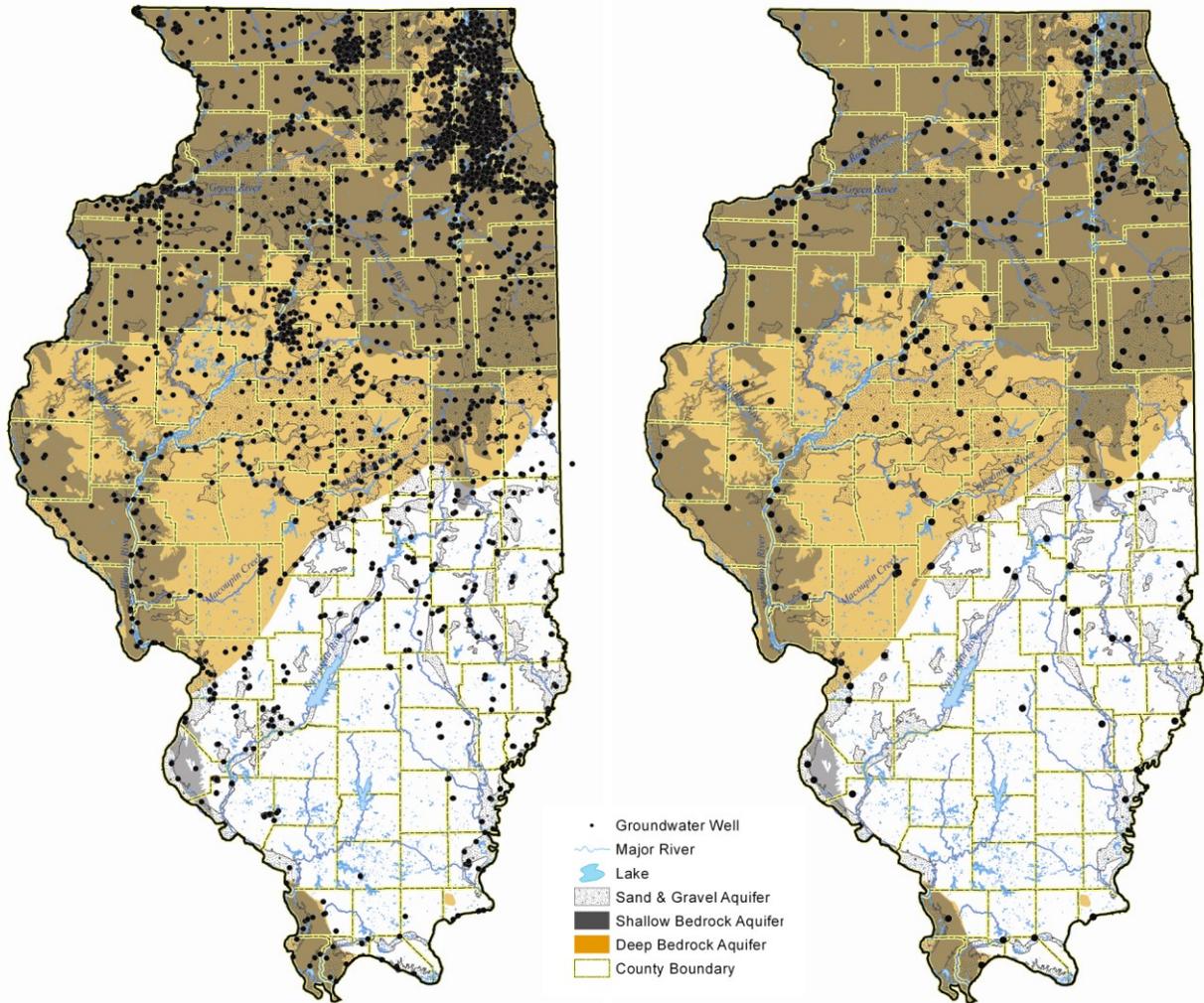


Figure 1. Active Community Water Supply Wells and Community Water Supply Probabilistic Network Wells

Volatile Organic Compound Trend Analysis – Protecting and managing groundwater are critical. Groundwater is an important natural resource that not only provides Illinois’ citizens water for drinking and household uses, but also supports industrial, agricultural, and commercial activities throughout the state.

Unfortunately, industrial, agricultural, and commercial activities can often produce volatile organic compounds. They are usually produced in large volumes and are associated with products such as plastics, adhesives, paints, gasoline, fumigants, refrigerants, and dry-cleaning fluids. They can reach groundwater through many sources and routes, including leaking storage tanks, landfills, infiltration of urban runoff and wastewater, septic systems, and injection through wells. Volatile organic compounds are

an important group of environmental contaminants to monitor and manage in groundwater because of their widespread and long-term use, as well as their ability to persist and migrate in groundwater.

A long-term investigation by the U.S. Geological Survey continues to provide the most comprehensive national analysis, to date, of the occurrence of volatile organic compounds in groundwater. One of the major findings is that volatile organic compounds were detected in most aquifers throughout the nation, and were not limited to a few specific aquifers or regions. For further detail see http://toxics.usgs.gov/highlights/monitoring_vocs.html.

In the 2010 biennial report, Illinois EPA used its groundwater monitoring data set (1990 to the present) to complete a volatile organic compound trend analysis. While year-to-year evaluation of groundwater monitoring data from community water supply wells has shown fluctuations of volatile organic compounds, analyses of this data show a statistically increasing trend of volatile organic compound contamination in community water supply wells. Illinois EPA also evaluated the data collected in 2010 for this report. Unfortunately, this overall trend (i.e. Blue Line) has continued to increase as illustrated in Figure 2.

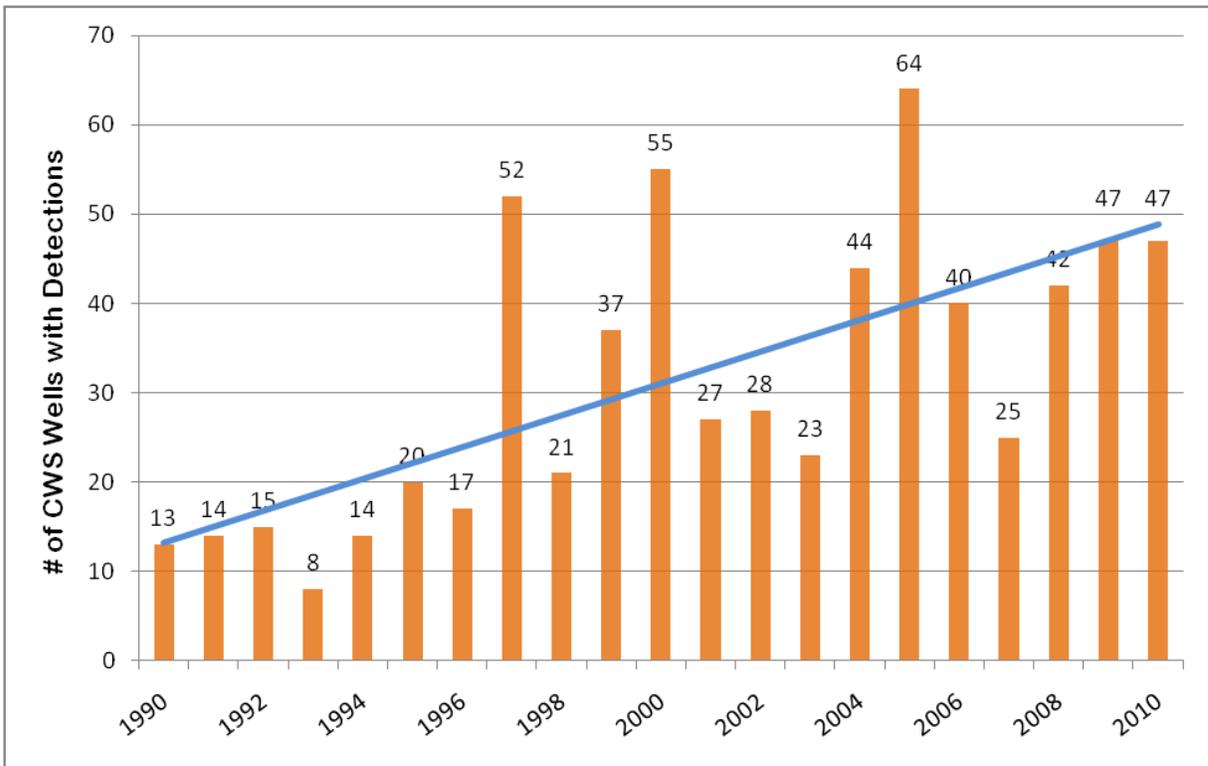


Figure 2. Overall Increasing Trend of Community Water Supply Wells with Volatile Organic Compound Detections

Illinois EPA Trend Monitoring Network – For the calendar year 2011, the Illinois EPA developed and implemented an inorganic chemical (IOC) Trend Monitoring Network consisting of three trend subsets with ten wells within each group (see Figure 3). The 30 CWS wells were selected from the Probabilistic Sampling Network which provided wells with a history of IOC results. The subsets include Nitrate Trend wells, Chloride Trend wells, and Mahomet Aquifer Trend wells. Each well was sampled once every two months at approximately the same time of the month to maintain an even temporal interval between sampling events. When available, the static and pumping water levels were obtained. The groundwater monitoring data will be analyzed to determine if there were any fluctuations in the water chemistry during the next IGPA reporting period. Moreover, the detailed analysis will be included in the 2012 State Water Quality Report (Integrated Report).

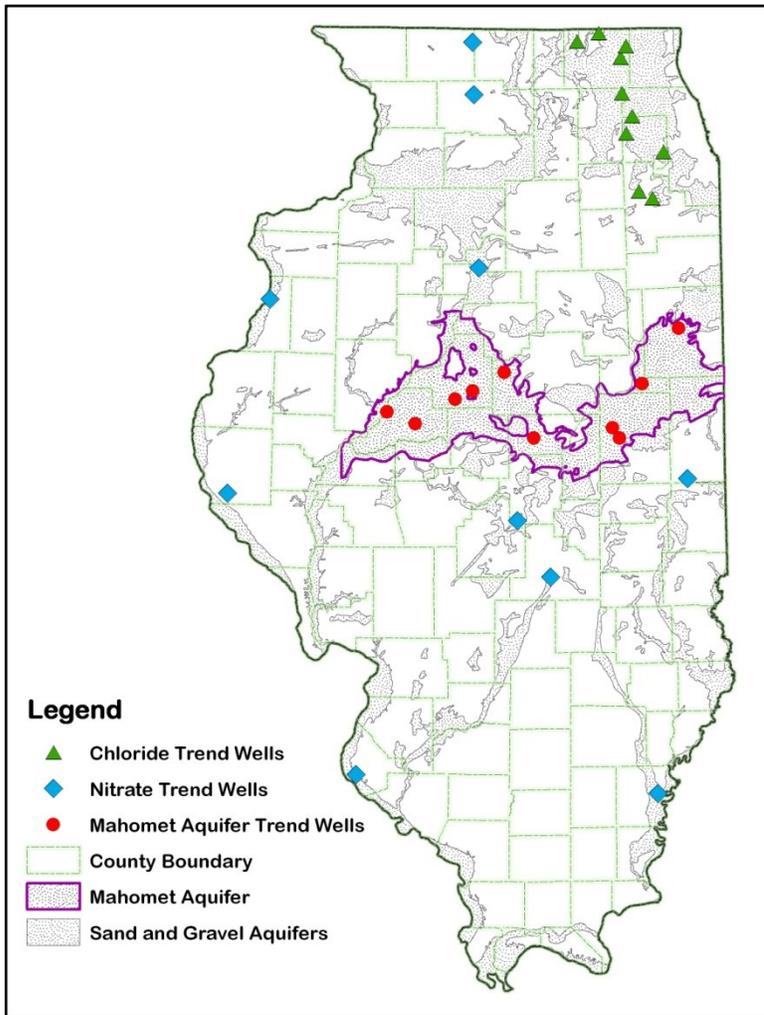


Figure 3. Illinois EPA 2011 Trend Monitoring Network

The *Nitrate Trend* wells are distributed throughout the state and are largely situated within sand and gravel aquifers that are more susceptible to nonpoint source contamination. These wells were selected based upon their history of nitrate detections which ranged from an average concentration of 4-11 ug/L (micrograms per liter). The majority of the wells selected for the Nitrate Trend network are located within or directly adjacent to agricultural fields and are less than 100 feet in depth.

The *Chloride Trend* wells are all concentrated in Northeastern Illinois, including, Cook, DuPage, Kane, McHenry, and Will Counties. This part of the state has been experiencing increasing levels of chloride concentrations in the past 50 years possibly related to runoff from increased use of road salt. The

shallow aquifers of the region are vulnerable to surface-derived contaminants, and the increase in developed land may be increasing the rate at which groundwater quality is being degraded. Approximately 16 percent of the samples collected from municipal wells in northeastern Illinois in the 1990s had chloride concentrations greater than 100 mg/L; median values were less than 10 mg/L prior to 1960, before extensive road salting. Wells indicating both a history of relative stable chloride levels and apparent increasing levels

were selected. The sand and gravel and the shallow (Silurian) bedrock aquifers are represented.

The *Mahomet Aquifer Trend* wells are a subset of wells selected as part of a pilot study for the National Groundwater Monitoring Network (NGWMN) of the Mahomet-Teays Aquifer. The NGWMN was proposed by the Subcommittee on Ground Water of the Federal Advisory Committee on Water Information with the goal to collect and to analyze data for present and long-term water quality management and implementation needs. The Mahomet Aquifer stretches across central Illinois and into western Indiana. These trend wells were initially chosen in conjunction with the ISWS as part of the NGWMN pilot study, and were added to the Illinois EPA 2011 Trend Network as continued support in cooperation with the Mahomet-Teays Aquifer study.

Illinois EPA Pathogen Monitoring Program – The United States Environmental Protection Agency (U.S. EPA) published the Groundwater Rule (GWR) in the Federal Register on November 8, 2006. By December 1, 2009, all CWSs were required to comply with this regulation. The purpose of the GWR is to provide for increased protection against microbial pathogens, particularly fecal contamination, in public water systems that use groundwater sources. The GWR provides for “triggered monitoring” of representative source (wells), based on one Total Coliform Rule (TCR) positive detection in the distribution system.

Illinois drinking water law and regulations have dealt with the threats posed by bacteria and pathogens for quite some time. State law and regulations are more stringent than the GWR in that they address not only monitoring pertaining to sanitary quality, but also the use of the best available source, as well as treatment of groundwater with unfavorable characteristics.

Beginning in 2007, Illinois EPA began requiring sampling at all wells on a monthly basis for total coliform and *Escherichia coli* (*E. coli*) bacteria. This source water sampling was done concurrently with the existing TCR distribution system sampling requirements. The benefit of this monitoring is two-fold: (1) this data have identified wells at risk which, in most cases, has led to mitigation efforts; and (2) this approach has allowed Illinois EPA to compare source water monitoring to TCR distribution system monitoring to evaluate the efficacy of a triggered monitoring approach.

Table 4 describes the corrective actions undertaken to address bacterial detections in the

Remedy/Action/Investigation	Number
Installed new sample taps	107
Installed appropriate long term treatment	7
Quit using the well source	19
Drilled a new well	7
Detections as a result of well rehabilitation	21
Wells were shock chlorinated	36
Targeted treatment for speciated bacteria	7
Deficiency (e.g., holes in the casing)	45
Investigation is on-going	11
Determined to be groundwater under the direct influence of surface water	3
Received Violation Notice and submitted CCA (Compliance Commitment Agreement)	48
Total	311

Table 4. Pathogen Monitoring, Remedies, Actions, and Investigations

samples collected. To date, 3,828 wells have been, and continue to be, tested and evaluated at CWSs across the state. Based upon available data, 3,517 (92 percent) of these wells are currently viewed as using a sanitarly safe source of groundwater. Of the 311 (8 percent) CWS wells that have shown bacterial contamination, 302 wells have addressed, or are addressing, sanitary defects or corrected monitoring location concerns. The remaining 9 wells are in the process of being evaluated for necessary corrective actions.

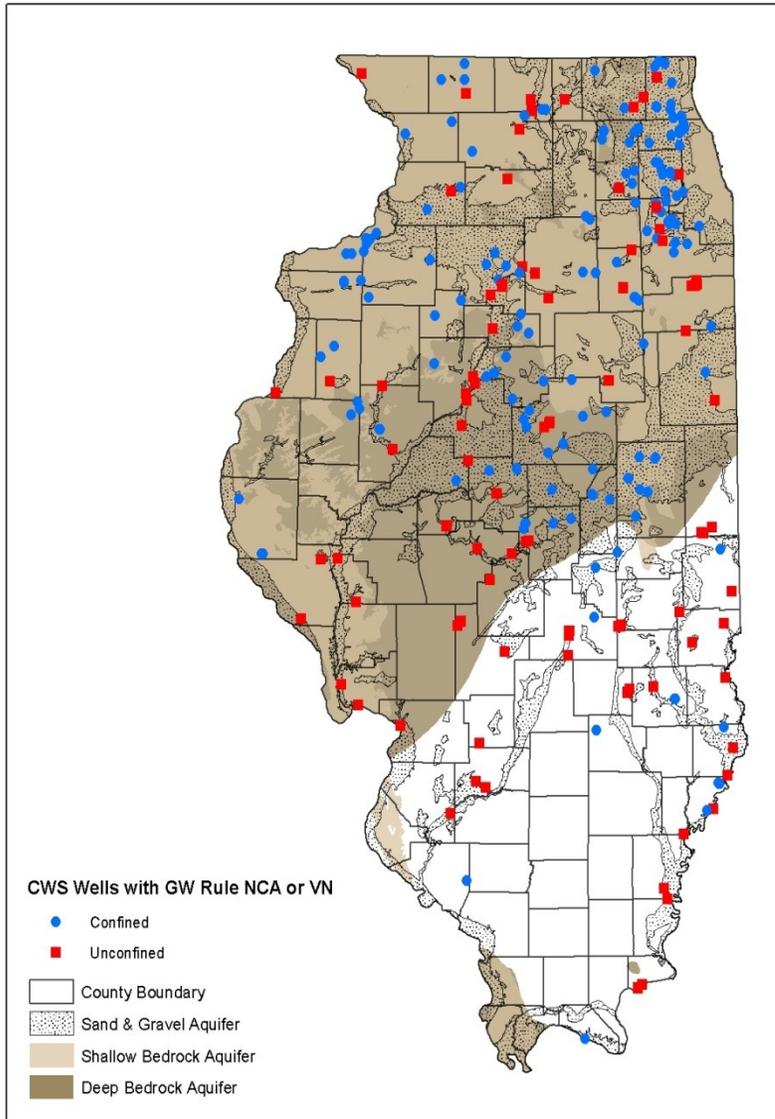


Figure 4. Community Water Supply Wells Assessed for Pathogenic Contaminants in Confined and Unconfined Aquifers

To further focus outreach and technical assistance efforts, the Illinois EPA has initiated evaluation of potential correlations among bacteria occurrence, hydrogeology, and other factors. As a first step, occurrence data was referenced to wells using geologically confined or unconfined aquifers. Of the CWS wells that are currently viewed as having sanitarly safe source water, approximately 65 percent utilize geologically confined aquifers.

Further analysis indicates that 183 (or 59 percent) of the 311 wells, initially viewed as having bacterially contaminated water, use confined aquifer systems (Figure 4), and 179 of these wells have been addressed.

Bacterial sample detections for 128 of these confined wells were determined to be related to improper collection procedures and/or devices or integrity issues.

Additionally, evaluation shows a high percentage of CWS wells with bacterial contamination to be in proximity of a river or stream. If the 150 detections (from Table 4) determined to be related to improper collection procedures and well deficiencies are

subtracted, it results in a total of 161 wells with bacteria detections which required further mitigation. Of these 161 wells, 90 (56 percent) were located within 1,000 feet of a stream or river. These can be further characterized, as described in Table 5:

Stream buffer distance	0 – 199 feet	200 – 499 feet	499 – 1,000 feet
Number of wells	24 wells	31 wells	35 wells

Table 5. Distribution of Community Water Supply Wells Using Unconfined Aquifers with Bacterial Detections in Proximity to Streams or Rivers

The age of the 285 CWS wells with known dates of construction that have shown bacterial contamination was also analyzed. Figure 5 illustrates that there is a strong correlation between the increasing age of the well and detections in sample results for CWS wells using a confined aquifer. With this said, the data analyzed to this point appears to show that certain geologic conditions can provide an effective hydrologic barrier (assuming proper engineering controls) to protect groundwater sources of drinking water from pathogenic contaminants.

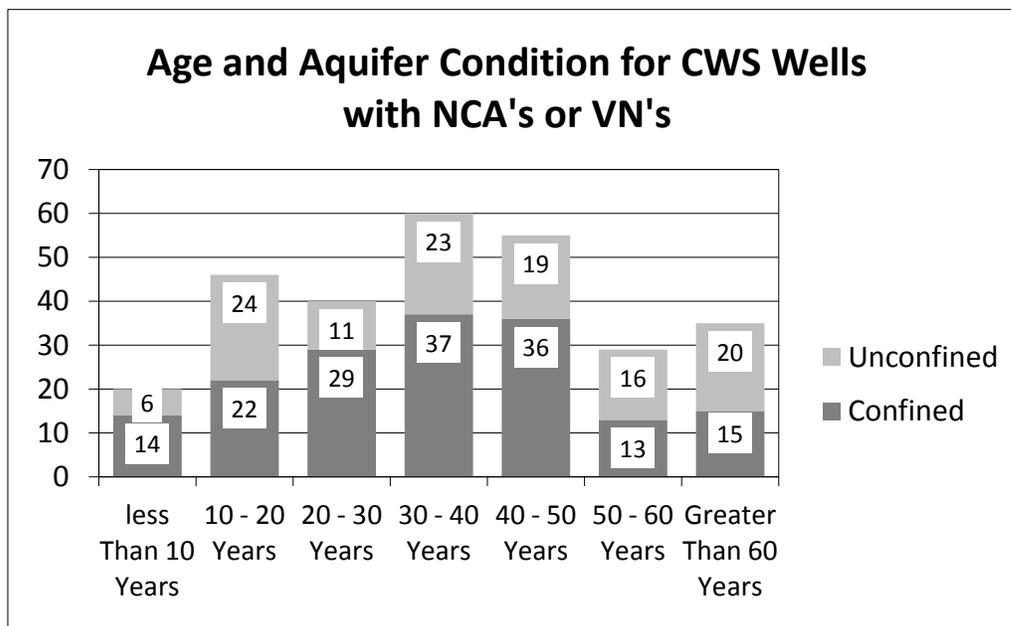


Figure 5. Correlation between Age of Well and Aquifer Condition for Sampling Detections

Groundwater Resource Assessment – The occurrence, extent, availability, and quality of groundwater resources continue to be of significant interest in several parts of the state. During the 2010 and 2011 reporting period, ISGS and ISWS scientists were involved with studies pertaining to the availability of groundwater resources in several areas of the state, especially northeastern and east-central Illinois.

Northeastern Illinois – During 2010 and 2011, the ISGS continued geological studies that provide the data and analyses to the development of three-dimensional (3-D) mapping of

the geologic and hydrogeologic framework of Kendall, Lake, and McHenry Counties. The results of the mapping will help identify, characterize, manage, and protect the counties' groundwater resources. The technical information from the mapping provides the basis for addressing groundwater issues faced by the counties.

Results of ISWS groundwater investigations in Kendall County are presented in a new report, *Groundwater Studies for Water Supply Planning in Kendall County, Illinois*. The report includes results of groundwater level measurements and sampling of selected shallow wells within Kendall County and results of regional groundwater flow modeling for sponsoring Kendall County communities.

The link between sound groundwater management and sustainable economic growth has prompted McHenry County to seek the appropriate scientific and technical assistance from the ISWS and ISGS. The ISGS has created a digital 3-D geological map of the Quaternary deposits and has passed digital geologic layer elevation data to the ISWS for creation of a groundwater flow model for the County. The ISWS will also utilize and interpret information gathered from the County's real-time Observation Well Network, http://groundwaterwatch.usgs.gov/googlemaps/IL_111_gm.html. ISWS researchers are presently mapping groundwater levels in McHenry County. Approximately 350-400 private rural well measurements are anticipated. Such data will be invaluable as monitoring data for comparison with past and future measurements and will facilitate a range of groundwater protection efforts, including site-specific assessments and regional-scale groundwater flow modeling. The groundwater flow model will provide a tool to examine impacts from current and future groundwater development, determine groundwater flow directions and groundwater interaction between aquifers, and provide insight on the location and relative sensitivity of groundwater recharge areas.

Water supply planning in the Chicago metropolitan region reached a new level with publication in 2010 of *Water 2050: Northeastern Illinois Regional Water Supply/Demand Plan*. Produced with the input and approval of the independent Regional Water Supply Planning Group, that broad-based effort led to a new awareness of the relatively finite and vulnerable nature of the region's groundwater resources that serve 19 percent of the region's population and account for 17 percent of water withdrawals in 2000. Designed to inform regional planning, scientific studies conducted by the ISWS and water demand studies commissioned of Southern Illinois University Carbondale, contributed to an emerging picture of real potential for groundwater supply and demand imbalances as the region looks out to midcentury.

The primary driver of future water demand in the region's dominant water-use sector¹ – public supply – is population served. Population throughout the 11-county planning region could grow as much as 44 percent between 2000 and 2050.² Population growth among the nine counties that are either solely or largely dependent on groundwater (i.e., excluding Cook and DuPage counties), however, will be more dramatic: as much as 120 percent by 2050. This equates to about 2.6 million new people who will settle in areas that obtain drinking water predominantly from either shallow- or deep-bedrock aquifers. Perhaps even more startling is that growth in water demand could well outstrip the rate of population growth under a hands-off or business-as-usual approach to planning and management.³

Population growth, therefore, needs to be reconciled with ISWS study conclusions indicating that: (1) the deep-bedrock aquifer is being mined at current withdrawal rates;

¹ Here, the thermoelectric power generation sector using a once-through cooling system is excluded from total water demand.

² By comparison, regional population grew approximately 58 percent between 1950 and 2000.

³ See the more-resource intensive (MRI) scenario in *Water 2050*.

(2) the shallow-aquifer system is being overpumped in some areas, leading to well interference and streamflow capture; and (3) shallow groundwater quality is degrading due to increasing chloride concentrations. Illinois EPA monitoring and data analysis further finds that groundwater quality is declining in general due to other more onerous contaminants.

In response to the situation now faced by the region's policy makers and citizenry, *Water 2050* makes several recommendations aimed at curbing water demand, and thus, pressure on groundwater resources, and improving groundwater quality protection. Additionally, the Chicago Metropolitan Agency for Planning (CMAP), regional partners, and local interests are using watershed planning forums as another means to promote groundwater quality protection and conservation efforts. Released in early 2012, the three newest watershed plans to emerge from CMAP—Blackberry Creek, Ferson-Otter Creek, and Silver Creek / Sleepy Hollow Creek—engage groundwater dependent communities within the Fox River Basin and all make a number of recommendations aimed at protecting groundwater from both quality and quantity or use perspectives. Among such recommendations are: (1) municipal-run public water suppliers should engage their residents and others in developing wellhead protection programs; (2) municipalities should adopt some or all of CMAP's model water-use conservation ordinance; (3) local governments should adopt sensible (wintertime) road salting practices; and (4) private well owners should replace timer-based water softener systems with volume-based systems to reduce use of salt in the home-water-conditioning process.

While raising awareness of a collective need to protect groundwater resources is more important than ever, taking action to reduce use of groundwater and protect resource quality is even more critical. CMAP's *Water 2050-GO TO 2040*, the region's comprehensive plan, and more tightly focused watershed planning efforts all aim to reverse unsustainable trends in both regional groundwater use and groundwater quality.

East-Central Illinois and the Mahomet Aquifer – As east-central Illinois' major groundwater resource, considerable attention is being paid to the Mahomet Aquifer by the ISWS. Principal effort is being devoted toward continued collection of groundwater levels in Mason and Tazewell Counties (with funding from the Imperial Valley Water Authority), in McLean and eastern Tazewell Counties (funded by the Long Range Water Plan Steering Committee), and in the greater Champaign County region (funded by Illinois-American Water Company). In addition, a door-to-door private well inventory was conducted (funded by a consortium of water authorities: Mackinaw Valley, Allin Township, and Danvers Township) for assessment of potential impacts on those wells as a result of potential new major groundwater developments, such as to supplement Bloomington's reservoir supply.

In June 2009, the Subcommittee on Ground Water to the Advisory Committee on Water Information issued a report entitled [A National Framework for Ground-Water Monitoring in the United States](#). This report describes a framework for the establishment and long-term operation and use of a NGWMN. One of the key elements in the framework document was the development of pilot studies to test the concepts detailed in the framework document. A Request for Proposals was produced and in early 2010 five pilot states were selected from the responses received. One of the pilots selected was an Illinois-Indiana joint submission using the Mahomet Aquifer as the principal focus for monitoring. The ISWS was the lead agency for the Illinois-Indiana team, but significant input was provided by the ISGS and Illinois EPA.

The ISWS collects data from an observation well "network" composed of over 180 wells at over 140 sites (Figure 6), largely comprised of wells especially built for monitoring aquifer conditions (i.e., water levels and quality). Numerous sites contain "nested" observation wells to monitor the Mahomet Aquifer, overlying confined units, and the

water table. Numerous local and state entities have funded a cooperative ISWS/ISGS drilling and monitoring effort. On the west, the Imperial Valley Water Authority funds the ISWS to maintain 11 wells (blue asterisks). Also in this region are wells constructed for the Illinois Department of Agriculture (IDA) (green crosses) for agrichemical sampling and ISWS wells (brown circles) for local resource development monitoring.

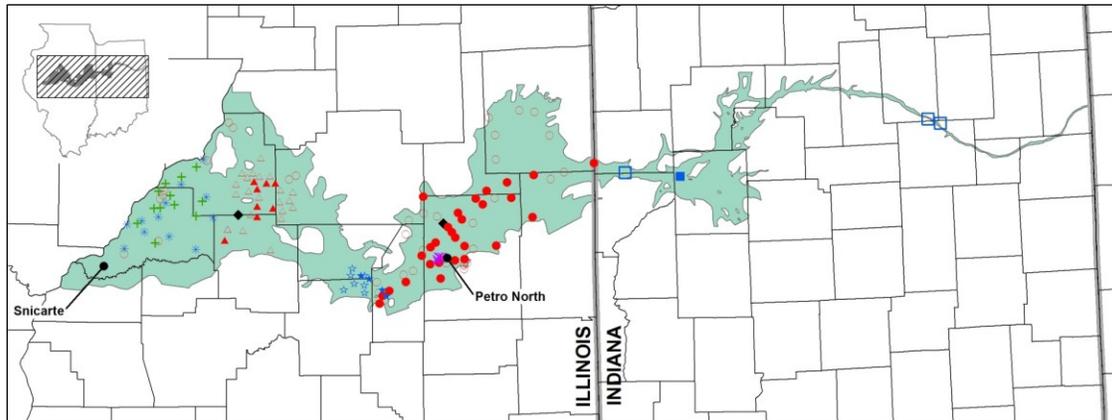


Figure 6. Mahomet-Teays Aquifer System Observation Wells in Illinois and Indiana (Closed symbols are nested sites.)

Just east of this area are observation well sites (orange triangles) maintained by the ISWS via funding from the Long Range Water Plan Steering Committee, a coalition of local water authorities, counties, and communities, to assess the viability of the aquifer for a potential major development of 15 million gallons/day to serve the City of Bloomington, and surrounding communities. The City of Decatur maintains a set of observation wells (blue stars) around a well field intermittently operated in times of drought to supplement their surface reservoir supply. The eastern half of the aquifer contains a host of observation wells (red circles and magenta x's) drilled and maintained by ISWS/ISGS through state and private funds (e.g., Illinois American Water Company). Two ISWS observation wells have over 50 years of historical records (Snicarte and Petro North), having been started in the 1950s during or after the major drought of that era. In addition, the USGS-Illinois Water Science Center in cooperation with the ISWS has initiated real-time groundwater level monitoring at two well sites within the Mahomet-Teays Aquifer system (marked by black diamonds in Figure 5). Data for these two sites can be accessed through USGS' National Water Information System Web Interface. After careful examination of well construction records and the water level data already available from these wells, a subset of these wells was selected to be part of the NGWMN for water level observation (Figure 7).

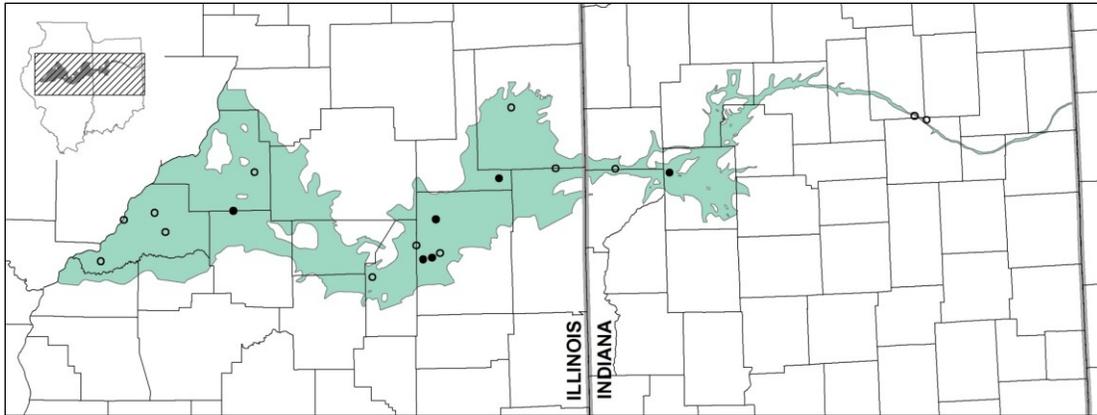


Figure 7. Locations of Wells Selected for the Illinois/Indiana Pilot Water Level Subnetwork (Closed black circles represent nested well locations.)

An evaluation process for water quality data also was conducted. Routine water quality sampling of these observation wells is not currently done. However, the Illinois EPA includes several Mahomet Aquifer community supply wells in their Ambient Groundwater Monitoring Network. A review of these wells, including historical sampling protocols and data, provided the basis for selection of wells to be part of the water quality subnetwork of the NGWMN (Figure 8).

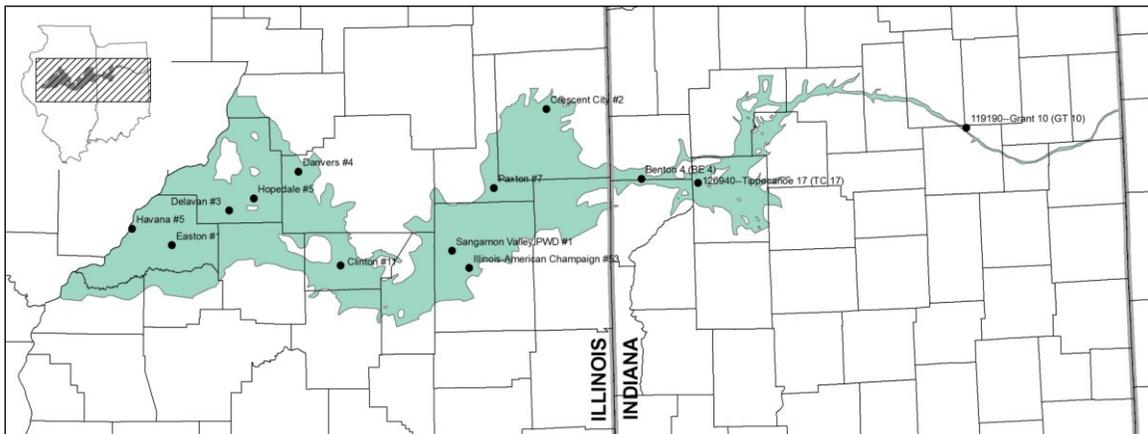


Figure 8. Wells in the Water-Quality Subnetwork of the Mahomet-Teays Aquifer

Water level and water quality data from these wells will be made available publicly through a data portal set up by the USGS. Data can be accessed remotely and will upload the data selected from databases maintained by the ISWS. Federal funding for the NGWMN is being sought.

Statewide and Regional Water Supply Planning – A three-year pilot program for comprehensive regional water-supply planning and management, initiated in July 2006 under the direction of Executive Order #1-2006, has been completed. Final reports from the two original stakeholder planning committees have been published and are available on-line for: (1) east-central Illinois, <http://rwspc.org/index.html>; and (2) northeast Illinois, <http://www.cmap.illinois.gov/water-2050>. The ISWS and ISGS served as technical lead agencies to the two regional stakeholder planning committees and the final technical reports for these two regions will be published in 2011.

Reports on the analysis of the impacts of future water demands for both the northeastern and the east-central Illinois water-supply planning regions have been completed and will be published in 2011 (Roadcap et al., 2011, and Meyer et al., 2011). The ISGS provided descriptions of the hydrogeologic frameworks for both the northeastern and the east-central Illinois water-supply planning regions. The ISWS has completed groundwater flow models and surface water statistical tools to assess the water resource impacts of meeting water demand scenarios to 2050. Assistance was provided by IDNR- Office of Water Resources regarding availability of water from Lake Michigan. Over the past two years, the ISGS and ISWS provided geologic and hydrologic expertise to the Northeast Illinois Regional Water Supply Planning Committee (RWSPC), the East-Central Illinois RWSPC, CMAP, and the Mahomet Aquifer Consortium (MAC). The ISGS maintains the Web site for the East-Central Illinois RWSPC <http://www.rwspec.org> and the MAC <http://www.mahometaquiferconsortium.org>.

A third water supply planning region, a 22-county region in southwestern Illinois, was initiated in 2010. A stakeholder committee has been formed and monthly meetings are being held. Planning is coordinated through the Southwestern Illinois Resource Conservation and Development. As with the previous two planning regions, water demands to 2050 were estimated to form the basis for assessing future supply adequacy. The water demand report is available on line, <http://swircd.org/KBWSP.html>. Throughout the coming year, the ISWS will be developing models and statistical tools to assess water resource availability. Groundwater is not abundant within this area and water supply in the region is greatly influenced by the presence of two federally operated reservoirs, Lake Shelbyville and Carlyle Lake.

The ISWS continues to maintain a Web site on water supply planning, <http://www.isws.illinois.edu/wsp/>, with links to all involved agencies and organizations. Final reports will be available at this Web site upon completion of final editing. Work continues to improve model interpretations in the pilot regions as new data are collected and interpreted. Future work includes assessing the feasibility of water resource development alternatives.

Assessment Techniques –The ISWS continues to offer aquifer testing and analysis services to communities and industries seeking new or expanded groundwater resource pumping capacity. Often, aquifer testing follows ISGS-conducted geophysical exploration, especially electrical earth resistivity, which can delineate potentially higher-producing locations and depths. The ISWS is particularly interested in testing previously undeveloped aquifers and previously untested areas of large highly-productive aquifers.

Groundwater Quality

Groundwater Quality / Agriculture – ISWS continues to have a long-term collaboration with agricultural scientists at Illinois State University. Current research, funded by U.S. Department of Energy and U.S. EPA, is evaluating the use of treated wastewater from a small community (Lexington, Illinois) to irrigate corn, soybeans, and switchgrass. The ISWS is assisting in evaluating subsurface water quality, with a focus on pharmaceuticals and personal care products.

A multi-state study designed to determine the sources of fecal bacteria in karst systems, sponsored by the Midwest Technical Assistance Center, is almost completed. Wells and springs were sampled in Illinois, Wisconsin, Kentucky, and Missouri by ISWS, ISGS, and the University of Illinois Department of Civil and Environmental Engineering. A final report will be published in early 2012 (Liu et al., 2012)

Groundwater Quality / Arsenic – ISWS continues to examine the occurrence and spatial and temporal variability of arsenic in Illinois groundwater, as well as treatment for removal of arsenic from groundwater. In early 2011, after several Tolono area private

well samples submitted to the ISWS Public Service Lab produced elevated arsenic concentrations, additional samples were collected by ISWS scientists. Results were provided to the homeowners, a public meeting was held, and a brief report will be published (Kelly and Holm, 2011).

Groundwater Quality / Urban – Evaluation of road salt runoff on water resources in the Chicago region continues, using publically available data from the USGS, ISWS, Illinois EPA, and Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). Recent publications include Kelly et al. (2010) and Kelly et al. (2011a). A report on chloride in the waters of Illinois is also in press (Kelly et al., 2011b).

Groundwater Quality / Mahomet Aquifer – ISWS and ISGS geochemists have been collaborating with microbiologists in the University of Illinois Departments of Civil and Environmental Engineering and Geology to examine microbially-mediated geochemical reactions in the Mahomet Aquifer. The most recent research is focused on methanogenesis (i.e., methane formation) in the Mahomet.

Chloride in the Illinois River Basin – The ISGS has been involved in studies with the ISWS to evaluate the quality of shallow groundwater and surface water in the Illinois River watershed, particularly with regard to evaluation of chloride concentrations and trends.

Saline Springs and Seeps in the Illinois Basin – The ISGS also continues to study the occurrence of saline seeps throughout the Illinois Basin and evaluate the chemical characteristics and hydrogeologic origin of these features. Preliminary results have found most of these springs to be related to folds and faults in the underlying bedrock structure.

Geology of Illinois – The ISGS has published a new book, *Geology of Illinois*. Among its many chapters is one devoted to an overview of pollution sources of groundwater and surface water in the state (Panno et al., 2011).

Digital Data Submission, Archival, and Retrieval of Operators Reports – The ISWS, under contract to the Illinois EPA, initiated a project to allow CWS operators to submit their required monthly operating reports in digital format to a secure location. Called eMOR, for “electronic Monthly Operators Report,” the eMOR SharePoint site allows operators to upload their monthly (spreadsheet) reports to a folder for their particular facility. Illinois EPA personnel can download those reports as needed, or review on-line. The site can be accessed via the Web site below, but requires a log-in for access: <https://h2odocs.isws.illinois.edu/sites/epa/sdwis/>. Additionally, access control structures are in place containing users, groups, and roles to ensure facility operators are able to view only the systems for which they are responsible, while allowing Illinois EPA oversight personnel access to all facilities. As technical glitches are found and fixed, only a selected set of community operators are currently using the site, with the intent to make the site available to all communities within the coming year.

Statewide and Regional Water Supply Planning – A three-year pilot program for comprehensive regional water-supply planning and management was initiated in July 2006 under the direction of Executive Order #1-2006. Two areas were selected for pilot planning: an 11-county region in northeast Illinois and a 15-county region in east-central Illinois. Two regional stakeholder planning committees were created, a 35-member Northeastern Illinois RWSPC and a 12-member East-Central Illinois RWSPC, to make recommendations about meeting their region’s water supply demands to the year 2050. The ISWS and ISGS served as technical lead agencies to the two regional stakeholder planning committees. Third-year funding (FY09) for the ISWS and ISGS, amounting to \$1.5M, was cut completely from the state budget. Extraordinary efforts were made by local stakeholder agencies to assemble “gap-funding” for the ISWS and ISGS, who also contributed significant internal resources to complete the effort.

The ISGS compiled existing information about the hydrogeology of northeastern and east-central Illinois and made it available to the two regional planning groups. Additional data were collected from scientific test drilling and geophysical exploration within the Fox River watershed in northeastern Illinois and in the Mahomet Aquifer region in east-central Illinois. These data were collected for projects other than the water-supply planning. The data were analyzed and used in 3D mapping to delineate and characterize the geologic materials from land surface to bedrock in order to better delineate and understand the groundwater resources of each region. Existing down-hole geophysical logs of the bedrock were compiled for the northeastern Illinois water-supply planning region. The logs were analyzed for properties of the bedrock that would help better characterize the hydraulic parameters of the rock, such as porosity and permeability, the presence and orientation of fractures and joints. The ISGS maintains the Web site for the East-Central Illinois RWSPC <http://www.rwspc.org> and the MAC <http://www.mahometaquiferconsortium.org>. Reports describing the hydrogeologic framework and analyzing the impacts of future water demands for both the northeastern and the east-central Illinois water-supply planning regions are in preparation by the ISWS and ISGS.

Aquifer Mapping and Characterization – During the 2010-2011 reporting period, ISGS scientists and support staff were involved with several studies mapping the distribution and characterizing the geologic and hydrologic properties of aquifers in Illinois. Aquifer mapping and characterization project areas were focused primarily in northeastern and east-central Illinois. In northeastern Illinois, project areas included Kendall, Lake and McHenry counties, while in east-central Illinois, the project area includes a 30 township area centered near Champaign-Urbana. Other projects studying aquifer distribution and characterization included an analysis of analytic element modeling and a study on the potential of groundwater source geothermal heat pump technology.

Northeastern Illinois – The ISGS 3-D mapping study of aquifer distribution in Kendall County continued during 2010 and 2011. Preliminary results of the study clarify the distribution and thickness of previously mapped sand and gravel deposits but did not identify any significant, previously unmapped sand and gravel aquifers east and south of the Fox River. The preliminary results also provide a more detailed understanding of the character of the Sandwich Fault Zone, and clarify where Silurian bedrock is at or near land surface though the southern half of the county. Insights from this project were used by the ISWS in their study of groundwater flow in Kendall County. The final maps from this 3-D hydrogeologic mapping study will assist the county in identifying, characterizing, managing, and protecting its groundwater resources.

The ISGS 3-D mapping study of the distribution and characterization of glacial deposits in Lake County continued in 2010 and 2011. Preliminary results of this study document the complexity of sediments, particularly in the western half of the county where sand and gravel aquifers are most common. Lake County has the Fox River valley on its western edge and Lake Michigan on its eastern edge. The succession of subtle ridges formed between these two features as the last glaciers melted and left behind widely varying thicknesses of fine-grained lake deposits and moraines, and coarse-grained river, delta and beach deposits. The geometries and intersections of these deposits play a significant role in directing groundwater flow through these deposits and affect the rates and variations in recharge to the underlying Silurian bedrock aquifer. Results of this 3-D mapping project will be used to develop improved maps of shallow aquifer distribution, maps highlighting intersections of these aquifers and intersections with streams, rivers and quarries. Custom map and model products will be developed through discussions with county and municipal officials, to assist in the protection and management of the county's water resources.

The ISGS study of the distribution and character of aquifers and non-aquifers in McHenry County also continued in 2010 and 2011. During this period, ISGS researchers continued work with County officials on development of a 3-D hydrogeologic map to assist the County with water supply management and planning. A generalized version of the 3-D hydrogeologic map was provided to ISWS researchers for their use in a groundwater flow modeling study of the County. In addition, ISGS researchers are working with County officials to identify their needs for decision support tools derived from the 3-D map. To date, the ISGS has drilled, cored and logged 17 controlled boreholes, installing groundwater observation wells in 14 of these boreholes, collected 51 kilometers of shallow seismic reflection profiles and 39 kilometers of high-resolution resistivity profiles to describe the character and distribution of glacial sediments and the location of the bedrock surface. ISGS researchers have also helped County officials and U.S. Army Corps of Engineers staff on the location, collection and logging of 14 borings and construction of 27 groundwater observation wells in a related groundwater well network study, and collaborated with USGS researchers in making several of the ISGS groundwater wells available for inclusion in the USGS real-time network of groundwater levels (<http://waterdata.usgs.gov/il/nwis/current/?type=gw>). The ISGS is scheduled to complete the 3-D map and a draft report in early 2012.

East-Central Illinois – The Mahomet Aquifer is the major groundwater resource in east and central Illinois, extending from the Indiana state line to the Illinois River. Investigation of the hydrogeology of the Mahomet Aquifer and the aquifers overlying it continued to be a high priority at the ISGS in 2010 and 2011. During this period, ISGS researchers continued a study funded by the Illinois American Water Company, to develop a 3-D geologic map of a portion of the Mahomet Valley and overlying sediments. The study area for this project includes an area roughly centered on Champaign-Urbana and the recently developed Illinois American Water Company well field. ISGS provided controlled drilling for several boreholes during this period and collected several miles of seismic reflection and high-resolution resistivity profiles across portions of the study area. These results were combined with other data to help develop a new understanding of the geologic framework of the sediments overlying the Mahomet Bedrock Valley. A generalized 3-D geologic map from this study was provided to researchers at the ISWS who are using it to assist in groundwater flow modeling of this area. The 3-D geologic mapping and associated results are being compiled in a report to the water company in 2011.

Analytic Element Modeling of Groundwater – In 2010, the ISGS published a report documenting the use of an analytical element groundwater flow model to improve predictions of groundwater recharge, and to improve the understanding of both groundwater-surface water interactions, and variations in the hydrogeologic characteristics (Mehnert 2010). The study showed that an analytical element groundwater flow model of the Blackberry Creek watershed in Kane and Kendall Counties was useful for improving estimates of groundwater recharge and for partitioning the watershed into regions of varying geologic complexity and different patterns in groundwater-surface water interaction. Estimates of these hydrologic parameters can be obtained rapidly through analytic element modeling and can serve as valuable input parameters in numerical modeling efforts of groundwater flow.

Geothermal Heat Pumps – Groundwater source geothermal heat pump systems, also called open-loop systems, are very efficient for space heating and cooling, refrigeration, and industrial process cooling. These systems, if properly designed, can result in increased energy efficiencies compared to closed-loop geothermal systems. Information concerning the local hydrogeologic conditions is necessary for successful implementation of open-loop systems. The ISGS is working with the Illinois Sustainable Technology Center and the ISWS on a pilot project that will evaluate the availability of groundwater

resource and existing wells within a representative urban and rural setting in terms of its potential as a geothermal resource. Maps will be developed for the Metro-East area and Mason County that will delineate the availability of groundwater and an optimal density of thermal extraction or thermal rejection in terms of kilowatt/square mile. This project is an initial step towards state-wide and regional maps that characterize the potential of low temperature geothermal resources and the areas that are most favorably situated for geothermal resource development.

Evaluating Geological Sequestration of Carbon Dioxide – The Mt. Simon Sandstone is the basal sandstone reservoir in the Illinois Basin and has an estimated capacity to store 27 to 109 billion metric tons of carbon dioxide (CO₂). This storage capacity is sufficient to sequester 88 to 360 years of current CO₂ emissions from the basin's stationary sources (e.g., coal-fired power plants). Thus, geologic carbon sequestration (GCS) offers a viable solution for removing carbon dioxide from the atmosphere with the goal of mitigating climate change.

As part of assessing the long-term viability of the geologic sequestration of CO₂, the potential of the stored CO₂ to affect the quality of groundwater in aquifers above the target CO₂ storage reservoir is being evaluated at several demonstration sites in the Illinois Basin. At these locations, the quality of groundwater samples and the gas concentrations in monitoring wells are used to assess any impact on shallow groundwater of injected CO₂ (Wimmer et al., 2009).

In a separate effort, a flow and transport model has been developed to evaluate the feasibility of future, commercial-scale, GCS within the basin. The goal of the numerical modeling effort is to evaluate the migration of injected CO₂ and assess the pressure changes in this open reservoir in response to future developments. Two key questions to be addressed by this effort are: “Will the resulting pressure increases negatively affect the natural gas storage operations currently utilizing the Mt. Simon?” and “Will fresh water resources at the basin periphery be affected by future geologic sequestration?”

ISGS researchers have developed a basin-scale GCS model using TOUGH2-MP and are currently revising the geologic model (e.g., porosity, permeability, geometry) based on data collected recently from wells in Macon County. TeraGrid/XSEDE computational resources have been used to run this large model (1.2 million elements). In addition, ISGS and ISWS researchers are evaluating ways to pass information between the ISGS GCS model and the ISWS regional groundwater flow model which includes the bedrock aquifers in northeastern Illinois. The goal of this effort is to better understand the possible interaction of GCS in central Illinois and groundwater pumping in northern Illinois.

Groundwater Development Support Services

Groundwater Development Assistance – For over 50 years, the ISGS has provided support to individuals, municipalities, and private companies seeking assistance on a range of problems related to the siting, suitability, development, maintenance, protection and closure of groundwater supply wells. Advice on the hydrogeologic suitability and characteristics of the aquifers at specific locations is a particular focus of the service. Well types range from small domestic water supply wells to high-capacity municipal water supply wells. This service responds to hundreds of requests per year and can be reached at 217-244-2458.

ILWATER Interactive Mapping Service – Since 2004, the ISGS has provided an on-line interactive mapping service called ILWATER that allows access to a database of over 300,000 Illinois water-well and related records. The information provided through ILWATER is compiled from water-well and other records available at the ISGS. By using ILWATER, anyone with access to the Internet can readily retrieve information

from the ISGS database through an interactive map Web site at <http://www.isgs.illinois.edu/maps-data-pub/wwdb/launchims.shtml>.

Using a point and click technique with the ILWATER interactive map service, users can navigate to specific areas in Illinois, or define an area of interest and find out what wells are in the area. By clicking on individual well locations, more information about the well location can be viewed in addition to drillers' logs, well construction, and water levels. A driller's log may provide descriptions of the geologic materials (sand, gravel, silt, clay, limestone, sandstone, shale, etc.) that were drilled through for the well as well as the depth of the top and bottom of each layer of geologic material. Information from coal test borings and engineering test borings is also available. Geographic references, such as highways, county and township boundaries, lakes, municipalities, and air photos, make ILWATER relatively easy to use. Maps of aquifers, bedrock topography, drift thickness, and land-surface topography are part of ILWATER. Limited data on outcrops are also part of the ILWATER reference map layers. The ILWATER Web site continues to provide a valuable service, especially to engineers, well drillers, and homeowners. In 2010 and 2011 approximately 500 visitors per month accessed information through ILWATER. The brochure describing ILWATER and how it is used has proven to be a valuable aid to prospective users of this Web site.

ISGS Visualization Lab – In 2010, the ISGS completed construction on a new high-resolution 3-D visualization lab. The Earth Systems Visualization Laboratory (ESVL) is housed in the main ISGS building, and supports a 14'x8' rear-projected screen, high-resolution 9000 lumen projector, two high-end graphics workstations, an 18Terrabyte data store, and a suite of 3-D mapping, visualization and analysis software packages. The ESVL was built to provide critical visualization and analysis support to a range of 3-D geologic mapping efforts at the ISGS. Since its construction, the ESVL has become a critical resource for geologists working on the aquifer delineation and characterization projects outlined in this report. The ESVL is an ideal environment for individual researchers looking to explore their data in a new way and provides an excellent collaborative space for teams of between two and 15 researchers who are interested in an immersive, high-resolution environment. To date, researchers associated with the ESVL have developed a proto-type visualization tool for visualizing and analyzing large MODFLOW groundwater flow modeling projects, and are working through a U.S. Department of Energy -funded project to expand this capability to include a range of geologic model types and oil and gas reservoir simulation packages.

Illinois Natural Resources Geospatial Data Clearinghouse – On-line since 1997, the Illinois Natural Resources Geospatial Data Clearinghouse provides access to geographic map data and remote sensing resources. The Illinois Clearinghouse serves as a gateway to topographic maps, orthoimagery collections, historic aerial photography, infrastructure and natural resource data, and scientific data for aquifers and aquifer sensitivity to contamination. Access to a variety of interactive map services, including the popular Illinois water wells site, ILWATER, is also supported. All data and services are available on-demand and free-of-charge to on-line customers. The Illinois Natural Resources Geospatial Data Clearinghouse may be found at <http://www.isgs.illinois.edu/nsdihome>.

Illinois Height Modernization Program – The ISGS and Illinois Department of Transportation (IDOT) are leading a consortium of federal and state agencies, and private organizations to upgrade the statewide network of survey benchmarks and to develop a statewide high-resolution Digital Elevation Model (DEM) data set. The long-term goals for the project are to establish a datum-consistent vertical and horizontal statewide network of survey benchmarks, a statewide high-resolution DEM of the Earth's surface based upon the updated network of survey benchmarks, and an outlet for distribution of high-resolution elevation data for Illinois. The initial focus of the project is northern

Illinois, extending from the Chicago metro area westward to the Mississippi River Valley.

USGS Illinois River Basin National Water Quality Studies – As part of the National Water Quality Assessment (NAWQA) program, the USGS is assessing both the Lower and Upper Illinois River Basins (LIRB and UIRB, respectively) (see Figure 9). A summary report of the LIRB activities through 1998 is available (USGS Circular 1209); a similar summary of the UIRB activities through 2001 is also available (USGS Circular 1230). Water quality and water-level data continues to be collected.

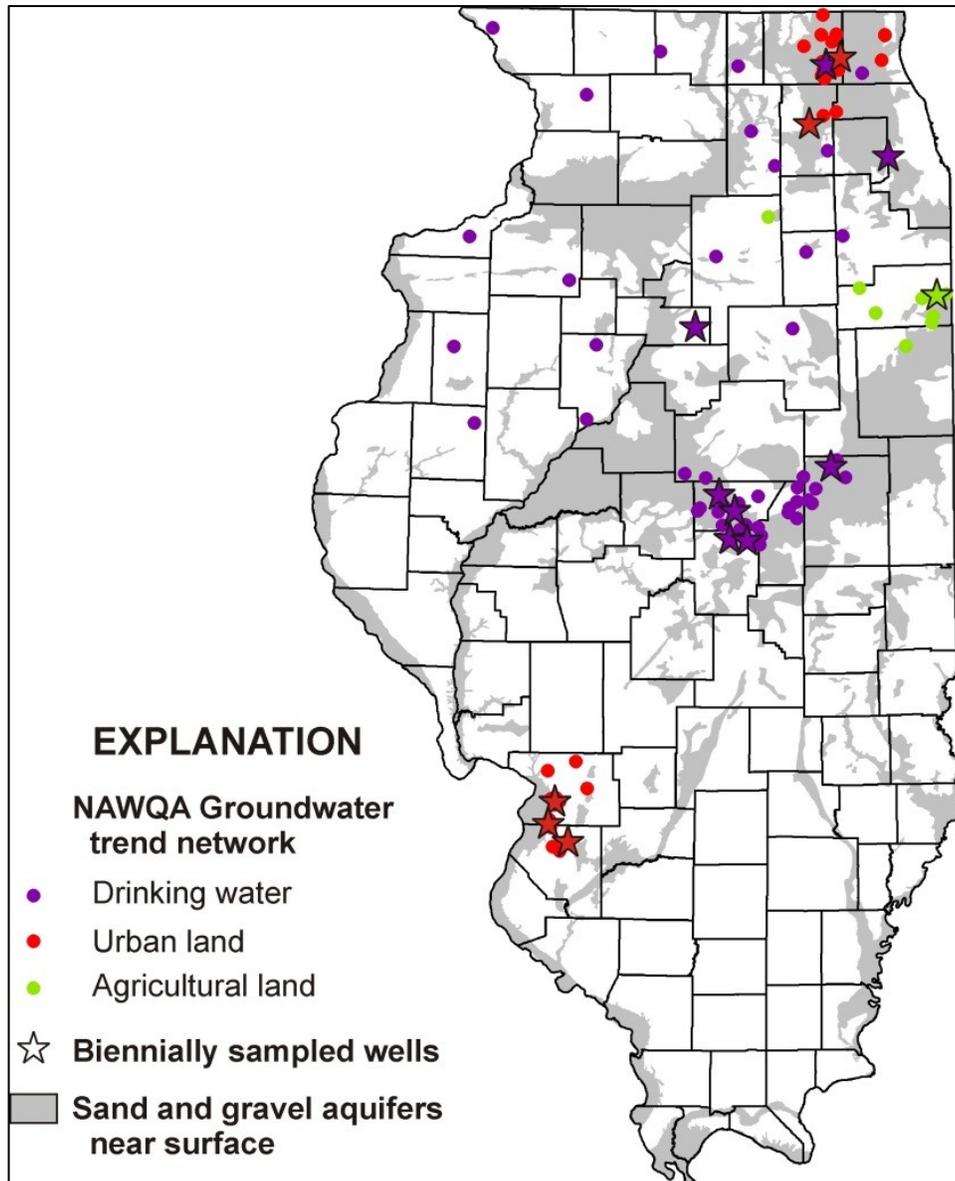


Figure 9. U.S. Geological Survey NAWQA Water-Quality Network Wells

In 2010 the 30-well network in a urban land-use study near Chicago was sampled for a large suite of pesticides, trace elements, and VOCs. In 2012, a 30-well network in the agricultural land-use study near Kankakee will be sampled for a similar suite of

constituents. The wells are mostly monitoring wells in the shallow aquifer system. In years when the full network of wells (approx. 30 wells) are not sampled, then a subset of five wells is re-sampled for assessing changes and trends (biennial samples). Every year since 2005, water levels have been collected at all 111 wells that are part of the NAWQA trends network (table below). The Cambrian-Ordovician network was initiated in 2007 and water levels have been collected every year since it was initiated. The sampling plans for the NAWQA networks in Illinois are summarized in Table 6 below.

Area of Illinois	Principal aquifer	Network type	Number Of Active Wells	Initial Network Sample	Decadal Network Sample	Biennial Sampling (5-well subset of full network)
Lower Illinois River Basin	glacial aquifer system	urban land use	26	2005	2015	2013, 2011, 2009, 2007
Lower Illinois River Basin	glacial aquifer system	drinking water resource	30	1996	2007	2013, 2011, 2009, 2005, 2002
Upper Illinois River Basin	Cambrian-Ordovician	drinking water resource	31	2007	2017	2013, 2011, 2009
Upper Illinois River Basin	glacial aquifer system	urban land use	26	2000	2010	2013, 2011, 2009, 2007, 2005, 2003
Upper Illinois River Basin	glacial aquifer system	agricultural land use	29	1999	2012	2013, 2011, 2009, 2007, 2005, 2003

Table 6, NAWQA Networks Sampling Plans

The data are available in the NAWQA data warehouse Web site that provides for data delivery and mapping <http://infotrek.er.usgs.gov/traverse/f?p=NAWQA:HOME:0>. Additionally, the data is being summarized by principal aquifer, such as the glacial aquifer system, and water-quality data from over 150 wells in the UIRB and LIRB are included in this regional synthesis. Reports and interactive maps of the regional data, including Illinois data, can be found at: <http://water.usgs.gov/nawqa/studies/praq/>.

Groundwater Observation Network – In addition to the NAWQA water-level data, water levels were collected in several project studies and in two USGS groundwater networks (Climate Response Network and Statewide Observation Network). Climate response network continues as described with one continuous monitoring site and plans to add up to seven additional wells in 2012. Real-time water-level data is collected at the Statewide Observation Network in approximately 13 of the 15 wells in the network. There are also approximately 10 additional wells that are measured several times a year at regular intervals, with some having continuous data loggers scattered throughout the state. A Web mapping display showing the locations of all observation and the water-level measurements can be found at: <http://groundwaterwatch.usgs.gov/StateMaps/IL.html>.

McHenry County Network – In addition to the NAWQA water-quality data, groundwater samples from a network of 42 wells in McHenry County were sampled in 2010-11 (see Figure 10). Some of these wells are nested meaning the wells have sample points at more than one elevation at the same well location. These samples were analyzed for specific conductance and field parameters, but many sites included analyses for nutrients and

other parameters. Data for the continuous monitoring of specific conductance and temperature is being collected, but is not yet available online. Water-quality data is available online at: <http://il.water.usgs.gov/>. This work was done in conjunction with McHenry County as part of their County Groundwater Resources Management Plan; see Chapter VIII, Section 1 for a summary of these efforts.

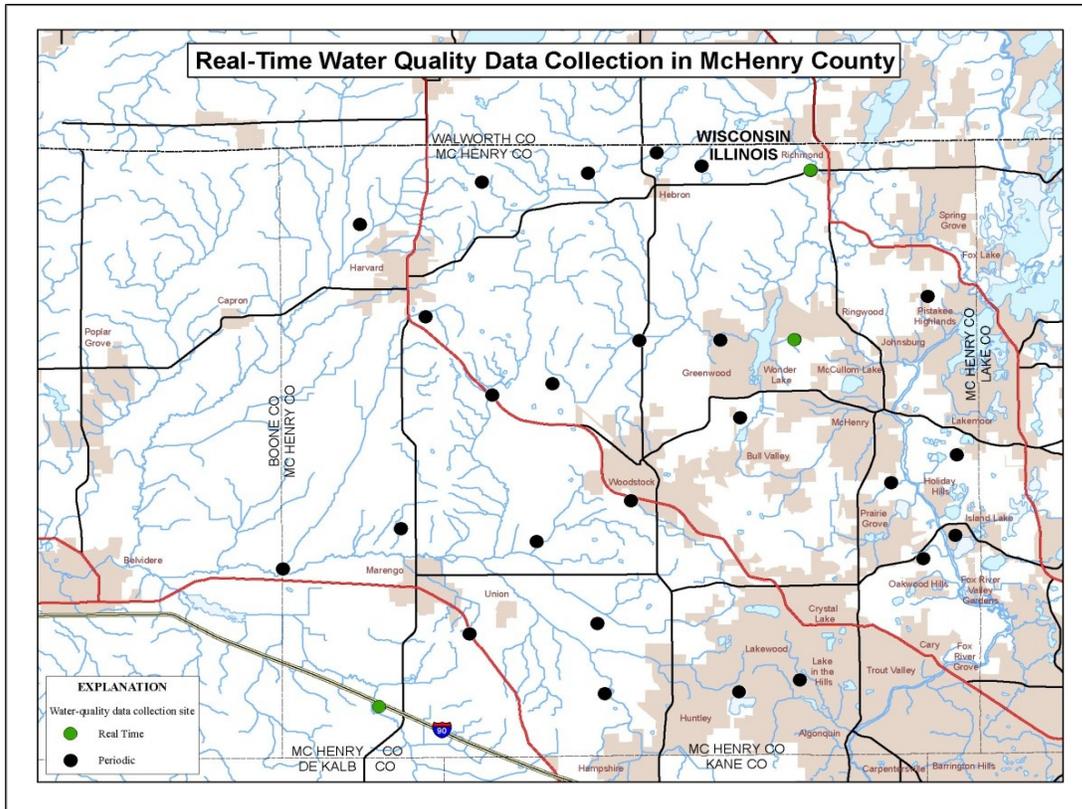


Figure 10. McHenry County Groundwater Monitoring Well Network

Section 2. Strive to implement monitoring for emerging contaminants.

Perfluorinated Compounds (PFCs) – Illinois EPA BOW is participating in a pilot study with the U.S. EPA’s National Exposure Research Laboratory to determine the extent of PFCs in surface water resources in the Upper Mississippi River Basin. PFCs are a family of chemicals that have been utilized for about the last 50 years in an array of household and industrial products such as nonstick cookware, firefighting foams, cosmetics, lubricants, fabrics, cleaners, and wrappers in fast food restaurants in order to make items more resistant to heat, water, oils, stains, and grease. PFCs are resistant to degradation and have been found to be ubiquitous worldwide as an environmental contaminant in air, surface water, groundwater, soil, sewage effluent, wildlife, and humans. As a result of this cooperative, recent monitoring has indicated the presence of PFCs in surface water in the Upper Mississippi River Basin and the Upper Illinois River Basin with the highest concentration of PFCs in the vicinity of a former major manufacturer of PFCs near Cordova, Illinois. The Illinois EPA Groundwater Section has joined in the testing for PFCs by sampling the groundwater at CWS wells of Cordova and Albany, which are the nearest upstream and downstream CWS facilities to the industrial facility. Preliminary groundwater monitoring results indicate PFC compounds were detected at low levels. Currently, follow-up plans are being formulated for additional investigation to assess the extent of PFC contamination in the groundwater in that area.

Chromium-6 (hexavalent chromium) – A report in 2011 by the Environmental Working Group raised questions about chromium-6 in drinking water supplies at various locations around the country. Chromium-6 has been classified by the U.S. EPA as a carcinogen by inhalation, and may also be proposed as a likely carcinogen when ingested. There currently is no drinking water Maximum Contaminant Level (MCL) for chromium-6, but there is an MCL of 100 ug/L for total chromium. The total chromium MCL covers all forms of chromium which also includes chromium-6 and the more commonly found chromium-3. Chromium-6 has not been routinely analyzed by most water systems due to the stringent time requirements, the instability of chromium-6, and the limited number of labs available to analyze the samples.

Chromium is a naturally occurring element in rocks, soil, plants, and animals with chromium-3 and chromium-6 as the most common forms. Chromium-3 is an essential element to human health and is not considered toxic except at very high levels. Although chromium-6 can occur naturally, it is fairly rare and easily converted to chromium-3 through contact with organic matter. Chromium-3 and chromium-6 can also convert back and forth in water and in the human body under certain conditions. Chromium-6 can be found naturally through erosion of chromium-3 deposits, but in general, when chromium-6 is found in any significant amounts, it is the product of industrial processes at steel and pulp mills. Uses of chromium-6 include chrome plating, dyes and pigments, leather and wood preservation. The Illinois EPA requires CWS to monitor for total chromium under the federal SDWA. A review of total chromium monitoring results from both untreated and treated drinking water samples from Illinois' CWS indicates that there are no CWS in Illinois that violate the current MCL or drinking water standard of 100 ug/L for total chromium.

The Illinois EPA has prepared a fact sheet entitled "[Assessment of Total Chromium in Illinois Community Water Supplies](#)" which references data for drinking water quality for total chromium, as well as source water quality for total chromium from surface water and groundwater sources.

The Illinois EPA is currently working with the USGS to design a chromium-6 monitoring network that would be representative of all surface and groundwater supplies in the state. Once the randomly stratified monitoring network is designed, it will include a subset of the Probabilistic Network wells and a representative number of CWS surface water intakes. If funding can be secured, it is envisioned that this statistically based network will be conducted over a 12 month period, beginning in the spring 2012.

Dedicated Monitoring Well Network for Illinois Generic Management Plan for Pesticides in Groundwater – The IDA, under authority of the Illinois Pesticide Act (415 ILCS 60/1 et seq.) and a performance partnership grant agreement with U.S. EPA regarding the Federal Insecticide, Fungicide and Rodenticide Act, is the state lead agency for the regulation of pesticide use in Illinois. The IDA is responsible for managing pesticide use to prevent adverse effects to human health and the environment.

U.S. EPA's approach for addressing concerns about pesticides in groundwater is the nationwide regulation of pesticide use, supported by strong state and tribal roles in the local management of pesticide use to protect groundwater. Illinois, like many states, is voluntarily implementing the U.S. EPA-recommended provisions of pesticide management plans to protect groundwater. In June 2000 under the leadership of the IDA, the Pesticide Subcommittee of the ICCG approved the *Illinois Generic Management Plan for Pesticides in Groundwater*. The management plan, which was revised in 2006 (IDA 2006), describes the framework to be used by the State of Illinois for addressing the risks of groundwater contamination by pesticides.

The Illinois management plan relies on the IDA's groundwater monitoring well network and the Illinois EPA's public water supply well pesticide-monitoring sub-network to determine the occurrence of pesticides in groundwater and whether there are significant, spatial or temporal trends in pesticide concentrations. The management plan requires action by the IDA when pesticides are reported at concentrations greater than 10 percent of the groundwater reference value (or the minimum reporting level (MRL) if 10 percent of the reference value is less than the MRL). If pesticides are present at concentrations greater than the "action level" the IDA will conduct, with assistance from the Interagency Committee on Pesticides, the ICCG, the registrant, and other state and federal agencies, an evaluation to determine the appropriate course of action. At the very least, the presence of a pesticide in groundwater in concentrations greater than the action level would initiate a cause investigation. The components of the response plan in the *Illinois Generic Management Plan for Pesticides in Groundwater* that apply to the groundwater monitoring network are:

- Notify pesticide registrant;
- Identify cause;
- Perform vulnerability assessment and define response areas;
- Expand monitoring;
- Encourage adoption of voluntary best management practices;
- Impose use restrictions; and
- Prohibit use.

The *Illinois Generic Management Plan for Pesticides in Groundwater* targets areas where aquifer materials occur within 50 feet of land surface (Figure 11). These aquifers have been demonstrated to be vulnerable to contamination by pesticides as a result of labeled uses (Goetsch, Bicki and McKenna 1992; Schock and others 1992). As described by McKenna and Keefer (1991), the distinction between aquifer materials and aquifers is that aquifer materials have the hydrogeologic characteristics to be classified as aquifers, but the materials may not be saturated. Aquifers, as defined in the IGPA, are saturated. In Illinois, the water table generally occurs within 20 feet from ground surface. Below this depth, aquifer materials are generally saturated and capable of yielding water to a well. Sand and gravel greater than five feet thick, sandstone greater than 10 feet thick and fractured carbonates (limestone and dolomite) greater than 20 feet thick are considered to be aquifer materials. Loess, glacial till, shale, and non-fractured carbonate rocks have relatively low hydraulic conductivities and generally will not provide a sufficient volume of water to a drilled well and are not considered aquifer materials.

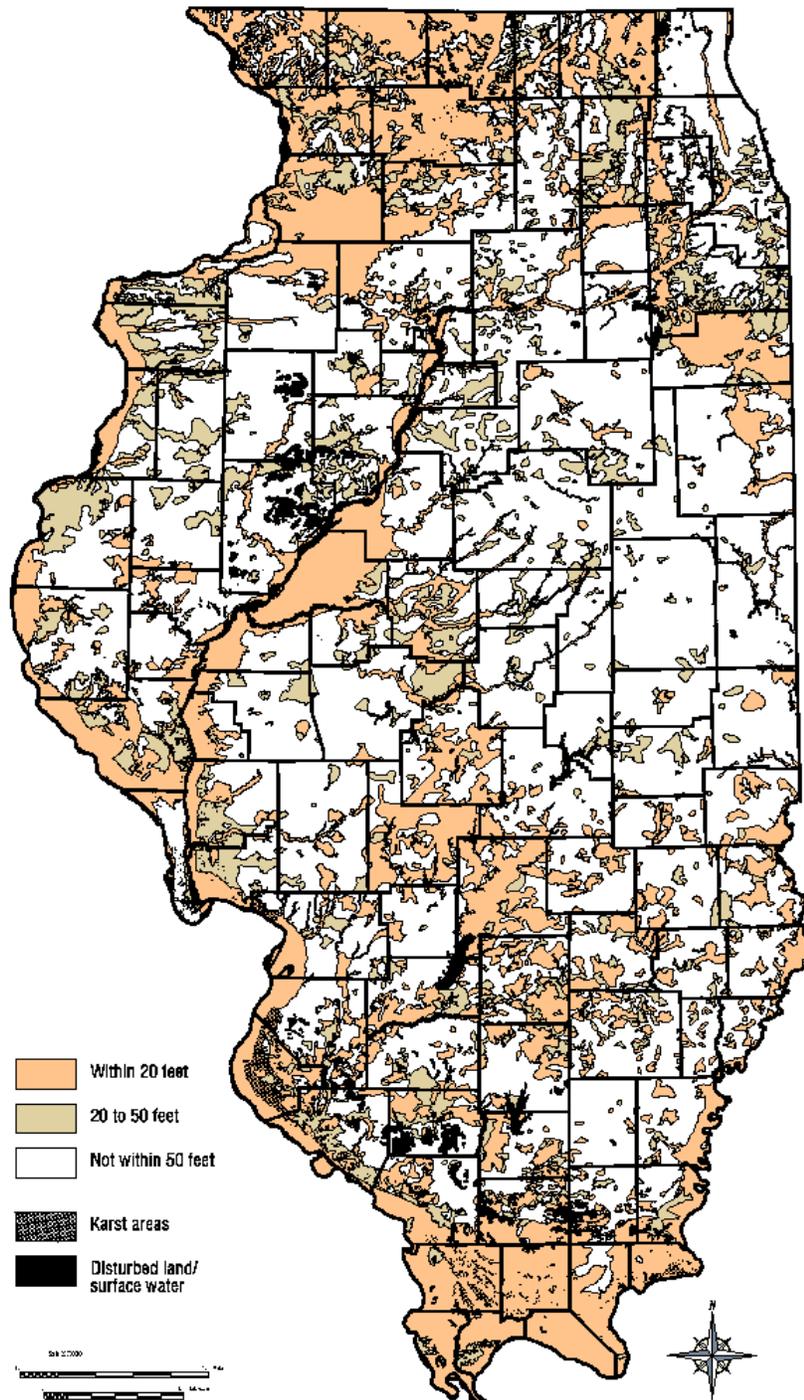


Figure 11. Depth to Uppermost Aquifer within 50 Feet of Land Surface (Keefer 1995)

In 1995, the IDA contracted with the ISGS and the ISWS to construct a statewide dedicated groundwater monitoring well network for use with future pesticide management plans. The monitoring well network is designed to provide statistically reliable estimates on the occurrence of selected pesticides in groundwater within shallow aquifers (depth to the top of aquifer material less than 50 feet below land surface) in areas of corn and soybean production. Occurrence is defined as the presence of a specific pesticide at a concentration above the MRL.

The network was designed to determine the regional impacts of pesticide leaching from nonpoint sources, not the impacts of site-specific point sources. The network is not a research program, but a tool for the management of pesticides in Illinois. Consequently, the pesticides selected as analytes are those with high use in Illinois that were previously detected in groundwater in Illinois or other Midwestern states. Also reflecting the management tool approach is the decision to set MRLs at a maximum of 5 percent of the groundwater reference value when possible, but not to expend limited laboratory resources on determining the presence of pesticides at very low concentrations. The

monitoring well network and the IDA's pesticide laboratory operate in compliance with U.S. EPA-approved quality assurance project plans.

The network currently consists of 141 shallow groundwater-monitoring wells located throughout the state (Figure 12) at well depths varying from 10 to 81.5 feet. Wells are constructed of two-inch inside diameter polyvinyl chloride well casing. Most wells have a five-foot long slotted well screen. All wells are located in public rights-of-way adjacent to row-crop fields, and are installed in areas where aquifer materials occur within 50 feet of land surface.

Each well in the network is sampled once during a two-year period. The ISGS and ISWS conducted a one-time sampling of the network beginning in the fall of 1998 and sampled the network from September 2000 through June 2001. IDA assumed responsibility for all sampling in July 2001.

Six rounds of sampling of the monitoring wells have been completed (Table 7). During these periods, MRLs have varied. In order to allow comparison between the sampling periods, the data on the frequency of occurrence reflect the

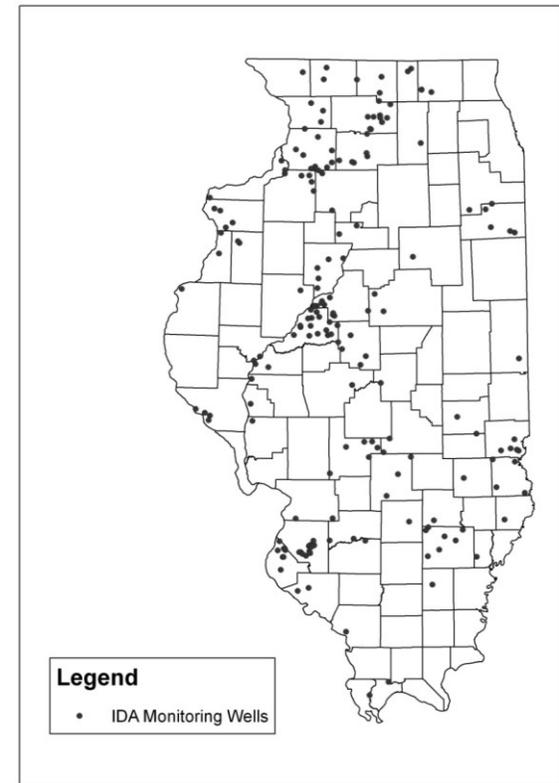


Figure 12. Location of Illinois Department of Agriculture Dedicated Pesticide Monitoring Wells

presence of a pesticide at or above the MRLs used in the most recent sampling round (Table 8). The overall frequency of occurrence refers to the presence of any pesticide, or multiple pesticides, from a single groundwater sample. For example, the occurrence of two pesticides present in a single well sample at concentrations above the MRL is considered a single detection above the MRL.

Sampling period	Parent pesticides	Atrazine metabolites	Chloroacetanilide metabolites
1998-1999	6.3±3.8	N/A	N/A
2000-2002	3.4	N/A	N/A
2002-2004	2.1	18.4±6.4	N/A
2004-2006	5.8±3.9	14.5±5.9	58.0±8.2
2006-2008	3.0	11.9±5.5	58.5±8.3
2008-2010	7.9±4.7	19.0±6.9	53.8±8.5

Table 7. Summary of Frequency of Occurrence of Pesticides with 95 Percent Confidence Intervals (Note: Confidence interval not calculated if frequency of occurrence is less than 3.6 percent.)

Analyte	Minimum reporting level (ug/L)	Frequency of occurrence and 95% C.I.	Maximum concentration (ug/L)	Groundwater reference value (ug/L)
acetochlor	0.10	0.8	0.10	
acetochlor ESA	0.30	5.3±3.8	4.4	
acetochlor OXA	0.30	0.8	0.61	
alachlor	0.10	0	--	2 ¹
alachlor ESA	0.30	19.7±6.8	8.9	
alachlor OXA	0.30	0	--	
atrazine	0.15	4.0±3.4	0.50	3 ¹
desethylatrazine (DEA)	0.15	12.7±5.8	0.68	
desisopropylatrazine (DIA)	0.15	3.2	0.99	
desethyl-desisopropylatrazine (DEDIA)	0.15	15.9±6.4	1.7	
metolachlor	1.0	2.3	18	700 ²
metolachlor ESA	0.30	47.0±8.5	65	
metolachlor OXA	0.30	11.4±5.4	71	
metribuzin	1.0	0	--	70 ²
prometon	1.0	0	--	100 ²
simazine	.40	0.8	1.5	4 ¹
total chlorotriazines	NA	19.0±6.9	2.7	37.5 ^{3,4}

Table 8. Minimum Reporting Levels, Frequency of Occurrence with 95 Percent Confidence Intervals, Maximum Concentrations, and Groundwater Reference Values for Analytes during 2008-2010

(Note: Confidence interval not calculated if frequency of occurrence is less than 3.6 percent.)

- 1) Groundwater Quality Standards for Class I: Potable Resource Groundwater, Illinois Administrative Code Part 620.410
- 2) U.S. EPA lifetime health advisory level. An HA is an estimate of acceptable drinking water levels for a chemical substance based on health effects information; a health advisory is not a legally enforceable federal standard, but serves as technical guidance to assist federal, state and local officials. <http://www.epa.gov/waterscience/drinking/standards/dwstandards.pdf>
- 3) U.S. EPA Office of Pesticide Programs
- 4) Total chlorotriazines are reported as the sum of the concentrations of atrazine, DEA, DIA, DEDIA and simazine.

Results of the most recent sampling period (132 samples collected from October 2008 through September 2010) indicate that parent pesticides were detected in ten of the

samples (7.9 percent). Atrazine was detected in five samples, metolachlor was detected in three samples, and acetochlor and simazine were each detected in one sample. Three of those samples had concentrations above levels of concern. One or more of the atrazine degradation products was present above the MRL in 19.0 percent of the samples. One or more of the metabolites of the chloroacetanilide herbicides was detected in 53.8 percent of the samples. None of those samples had concentrations above levels of concern.

Pesticides are more likely to be present in monitoring wells in areas where aquifer materials occur within 20 feet of the land surface than in areas where aquifer materials are more than 20 feet below land surface (Figure 13).

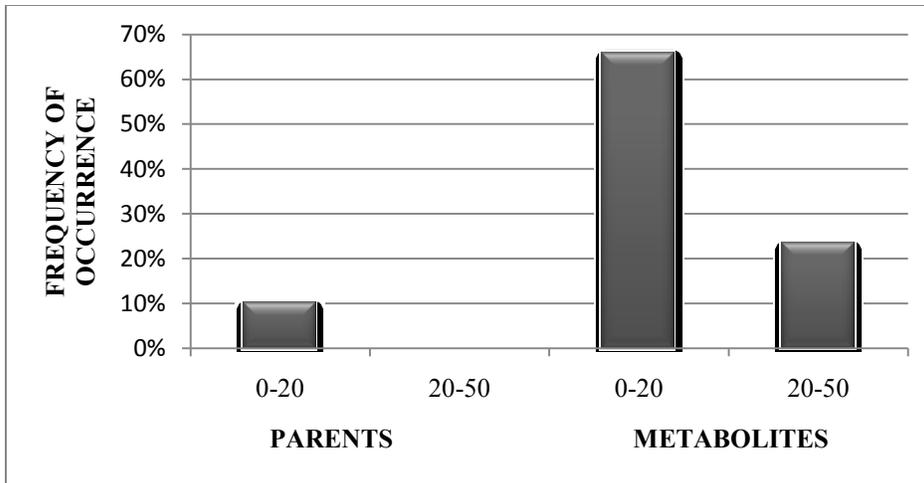


Figure 13. Comparison of the Effect of Depth to Aquifer Materials on the Frequency of Occurrence of Parent Pesticides and Metabolites (2008-2010)

The *Illinois Generic Management Plan for Pesticides in Groundwater* requires the IDA to conduct an investigation of the cause if pesticides are detected at concentrations greater than the action level. If selected, pesticides for which preventive notification is required under the IGPA are detected in groundwater, (e.g., atrazine) the IDA is required to resample the well within 30 days of receipt of laboratory results. Since U.S. EPA concurrence with the Pesticide Management Plan in February 2001, four monitoring well samples have contained a pesticide at a concentration greater than the action level (atrazine parent compound and simazine). The IDA re-sampled the wells and found the concentrations to be less than the action level. The IDA also notified the registrant and conferred with the IDPH. IDA intends to continue to follow the sampling and analysis plan laid out in the generic management plan and the quality assurance project plan for the foreseeable future.

CHAPTER V. RIGHT-TO-KNOW INITIATIVES

Section 1. Continue efforts of providing notification for off-site potable resource groundwater users threatened by groundwater contamination.

Illinois EPA continued to issue CWS well-centric RTK notices in coordination with the IDPH. A total of eight well-centric notifications were completed pursuant to the 2002 RTK requirements (adopted in 415 ILCS 55/9.1) during this reporting period. The 2002 RTK law was developed to notify private well owners based on detection of VOCs in public water supply wells. The assumption used when developing this legislation was that public water supplies were already covered under existing monitoring, compliance, public notice, consumer confidence reporting, and enforcement requirements under the federal SDWA, whereas private wells are not.

Figure 14 provides a list of notifications performed since 2002, and shows the location of each of these supplies. The eight public water supplies notified during the past two-year reporting period are depicted on the Figure 14 with black dots and are italicized in the list of supplies in the legend. A summary of each notification listed is provided under the RTK Web page at <http://www.epa.state.il.us/right-to-know/>.

A total of 81 percent of the well-centric notices, issued since 2002, were based on detections of perchloroethylene or its break down products (i.e., trichloroethylene; cis 1,2 dichloroethylene; trans 1,2 dichloroethylene; 1,1 dichloroethylene; and vinyl chloride).

The RTK notification issued on August 13, 2008, to “potential” private well owners in the vicinity of the Village of Crestwood, triggered by detections of vinyl chloride in what was thought to be their emergency well, led to an issue which attracted national media attention.

As a result of this issue, Governor Quinn, the Attorney General’s Office (AGO) and the Illinois EPA worked on development of the new RTK law. The changes included in Public Act 96-603 increase both responsibility and accountability of a public water supply to notify water customers of water quality issues that could have potential health concerns.

Five major changes result from this new law:

1. Requires owners or operators of CWSs to maintain, on their premises for Illinois EPA inspection, all records, reports, and other documents required for the operation of the public water supply for a minimum of 10 years, including but not limited to all billing records and other documents related to the purchase of water from other CWSs.
2. Requires the Illinois EPA to provide public notice within two days, via press release and the posting of information on the Illinois EPA’s Web site, if: (1) the Illinois EPA refers a CWS-related matter to the AGO for enforcement; (2) the Illinois EPA issues a seal order for such a facility; or (3) the Illinois EPA determines that there exists any groundwater contamination that poses a threat of exposure to the public above the Class I GWQS.

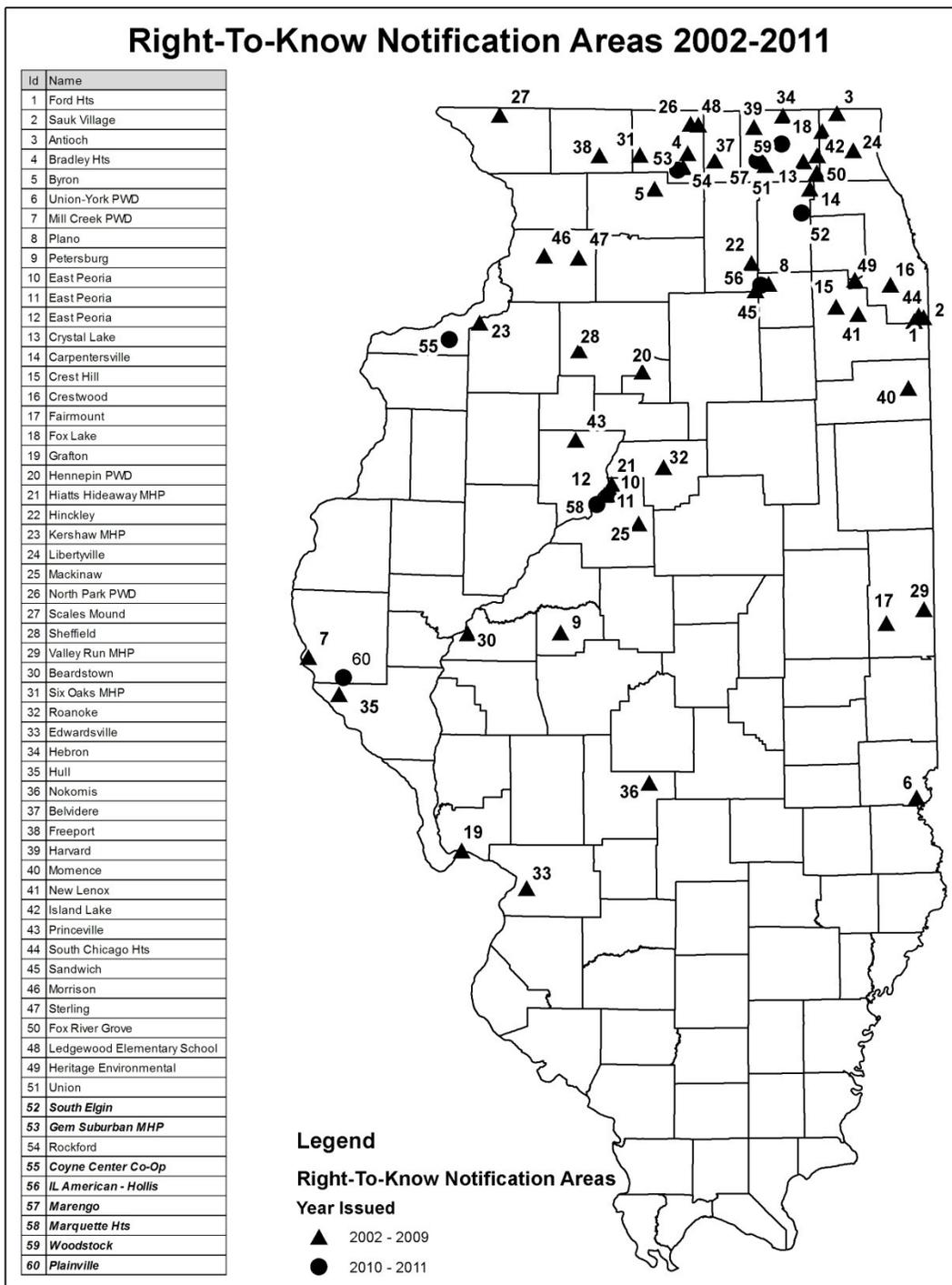


Figure 14. Well-Centric Right-to-Know Notifications

3. Requires the Illinois EPA to provide the written notice described above to the CWS, as well as to all CWSs connected to the system at issue, within five days of:
 - (1) the Illinois EPA referring a CWS-related matter to the AGO for enforcement;
 - (2) the Illinois EPA issuing a seal order for the CWS; or
 - (3) the Illinois EPA determines that there exists any groundwater contamination that poses a threat of

- exposure to the public above the Class I GWQS, regardless of whether or not the threat of exposure has been eliminated. Sets forth the form and content of such notice to be sent.
4. Within 5 business days of receiving such a notice from the Illinois EPA, requires the CWS to provide notice (either by first-class mail or email, or, if approved by the Illinois EPA, by postcard, email, text message, or telephone) to all of its affected customers as well as to the owners and operators of any connected CWSs. Where the notice sent is not written, requires the CWS to include a copy of the notice sent by the Illinois EPA to its customers in their next water bills. Sets forth the form and content of such notice to be sent. Within seven days after sending its customers the notice, requires the CWS to provide proof to the Illinois EPA that it has done so.
 5. Makes it Class 4 felony for any person to knowingly make any false, fictitious, or fraudulent or material statement (either orally or in writing) to either the Illinois EPA or a unit of local government that has a delegation agreement with the Illinois EPA that is used for the purpose of compliance with ANY provision of the Act, any federal law or regulation for which the Illinois EPA has responsibility for enforcing, or any permit condition there under. Makes any such second or subsequent conviction of such an offense a Class 3 felony.

A companion MCL Prevention law (Public Act 96-1366) became effective on July 28, 2010, requiring community water supplies to develop a corrective action plan for carcinogenic VOCs that threaten exceedence of standards at the entry point to the distribution system.

Press releases issued pursuant to the RTK law are available at <http://www.epa.state.il.us/water/drinking-water-watch/pws-well-contamination/index.html>.

CHAPTER VI. GROUNDWATER QUALITY REGULATIONS

Section 1. Continue with proposed changes to the groundwater quality standards and continue efforts of protecting future beneficial uses of drinking water.

Groundwater Standards Amendments – The Illinois EPA proposed to the Board on February 19, 2008, amendments to the GWQS (Docket R2008-018). This proposal recommended groundwater standards for 39 new contaminants. Subsequent amendments have eliminated Molybdenum and Di-n-octyl phthalate from the proposal. Therefore, the current proposal includes the addition of 37 new contaminants and modification of the existing arsenic groundwater standard to be parallel with the drinking water standard. The Board has not yet gone to first notice on this proposal. For further information on these amendments, see:

<http://www.ipcb.state.il.us/COOL/external/PendingRulemakings.asp>.

Class III Groundwater Designations – To protect groundwater that is particularly sensitive and ecologically vital, the IDNR has continued efforts to delineate the areas contributing groundwater to a dedicated nature preserve (DNP). During this two-year period, nine new areas were designated. The Illinois Nature Preserve Commission has petitioned the Illinois EPA to designate the groundwater recharge areas associated with six additional DNPs as Class III Groundwater. The six proposed Class III areas contribute groundwater to Cotton Creek Marsh, George B. Fell, Gladstone Fen, Goose Lake Prairie, Spring Grove Fen and Trout Park Fen Nature Preserves. Figure 15 illustrates the Class III areas established since 1991 and the proposed Class III areas located in Cook, Grundy, Kane, Lake, McHenry, and Ogle Counties.

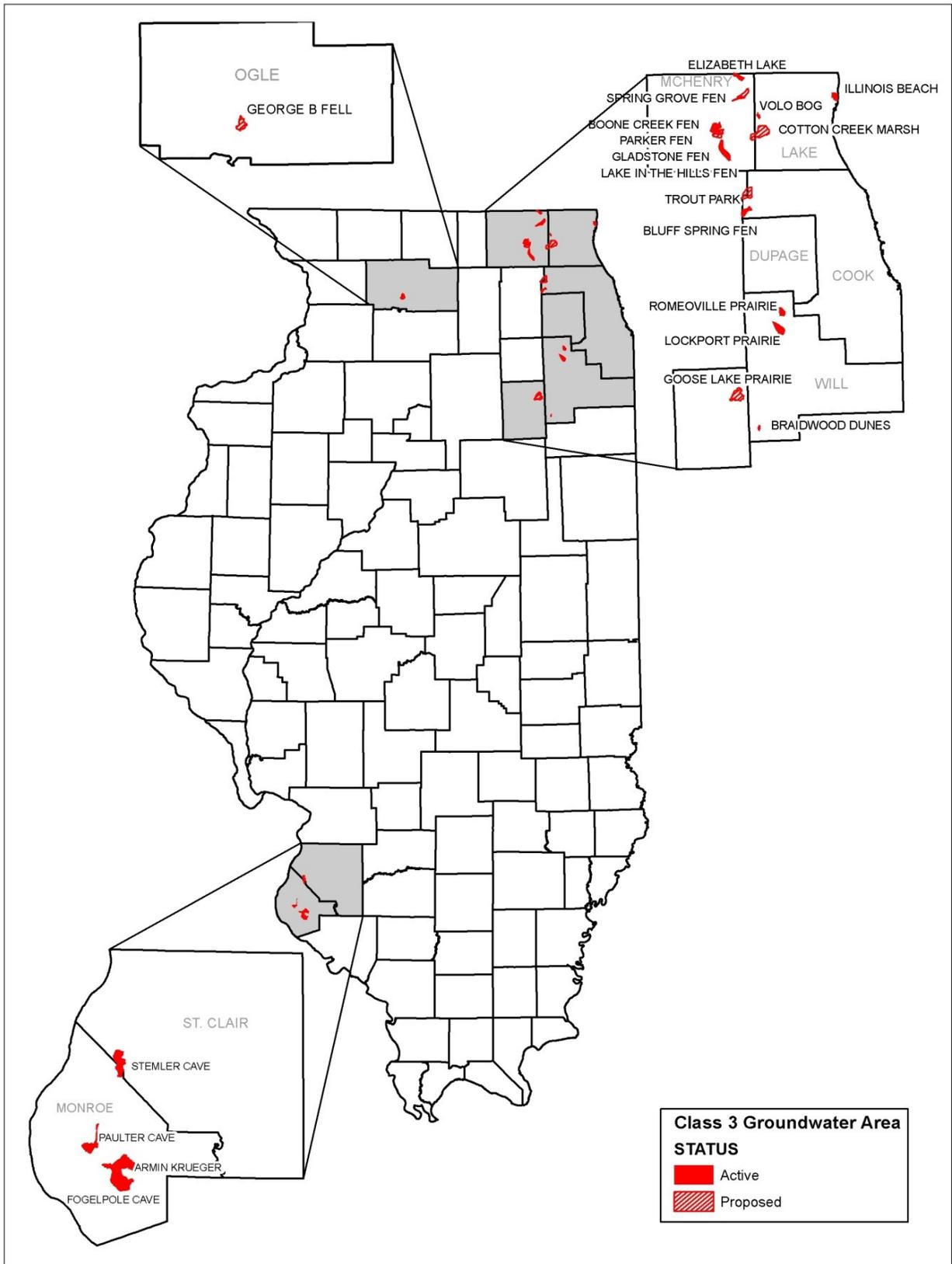


Figure 15. Class III: Special Resource Groundwater for Dedicated Nature Preserve Designations

Groundwater Compliance Activities – The Illinois EPA Groundwater Section continues to monitor the following contaminated sites:

Amoco Creve Coeur, Tazewell County – The BOW Groundwater Section approved BP's Remedial Action Completion Report. BP was issued a letter stating that the requirements of the Corrective Action Plan have been met, allowing redevelopment of the site within the requirements of the adopted institutional controls. BP has a five-year, post closure monitoring period.

BP Pipeline Company Hydrocarbon Release, Henderson County – BP continues to perform interim remedial actions (free product removal when present) and monitor contaminant concentrations. BP has also completed a video survey of the section of pipeline where the known release occurred, to determine if other minor leaks may be present. Prior to the survey BP removed residual water and oil from the pipeline. The Illinois EPA approved a remedial action plan. Initiation of final corrective actions has been slowed by a third party lawsuit.

Prince Agri Products Commercial Pesticide Storage, Adams County – Prince completed post-closure monitoring pursuant to 35 Ill. Admin. Code 616. Prince was issued a letter stating the required activities have been completed.

Bluff City Materials Inc., Cook County – Bluff City Materials began stockpiling up to 50,000 tons of road salt in an uncovered, non-impervious storage yard during the summer of 2010. The bulk transfer area is located adjacent to Bluff Springs Fen Nature Preserve and within an area designated as Class III groundwater pursuant to 35 Ill. Admin. Code 620.230. The Class III groundwater is part of the delineated groundwater contribution area for the Bluff Springs Fen, Nature Preserve. Due to the eminent threat to Bluff Springs Fen and the groundwater that contributes to the fen, the Illinois EPA requested the AGO to seek injunctive relief under Section 43 of the Act. Subsequent groundwater monitoring conducted in February 2011 detected concentrations of chloride and total dissolved in excess of Class I groundwater standards. Bluff City Materials moved the stored road salt to a paved area further from the fen, cleaned up residual road salt from the surface of the former storage area and has indicated they will no longer act as a bulk transfer station for road salt at this location. Bluff City Materials will continue regular groundwater monitoring to assure that chloride levels decrease. No additional remedial activities are expected to be necessary. Final details of a consent order are pending at the AGO.

General Chemical LLC, St. Clair County – A Violation Notice was issued to General Chemical, on June 2011 for exceedences of GWQS. A Notice of Intent to Pursue Legal Action was provided to General Chemical in December of 2011. General Chemical is developing a Corrective Action Plan for the site.

Exelon Nuclear Plants at Braidwood, Byron, and Dresden – Final Consent Orders were filed on March 11, 2010, for the Dresden and Braidwood, Exelon nuclear power generating facilities located in Grundy and Will County, respectively. Work has continued on tritium groundwater contamination incidents which occurred at these facilities. Progress is being made at the Braidwood facility on the groundwater impacts caused by multiple releases of waste water mixed with tritium, which was released from leaking vacuum breaker vaults along a blow down line to the Kankakee River. Past leaks of tritium from underground piping resulted in groundwater contamination at Exelon's Dresden Station. Exelon has addressed leaks from underground piping at Dresden and groundwater monitoring continues. At Exelon's Byron Station, groundwater monitoring continues at vacuum breaker vaults along a blow down line where groundwater was contaminated with tritium.

Exelon Nuclear Plant at LaSalle – On July 1, 2010, a release which resulted in groundwater contamination was reported at Exelon’s LaSalle County Nuclear Station. The source of the release was identified as a leak in an above ground storage tank. Exelon completed repairs on the leaking storage tank on July 20, 2010.

Macoupin Energy Shay #1 Mine, Macoupin County – A Violation Notice was issued to Macoupin Energy in June 2011 for exceedences of GWQS both on-site and off-site at the mine. The Illinois EPA has approved Macoupin Energy’s CCA, with remedial activities scheduled for implementation over the next few years.

Springfield Coal Company LLC Crown Mine III, Macoupin and Montgomery Counties – A Violation Notice was issued to Springfield Coal in October 2011 for exceedences of GWQS at the mine.

Consolidated Coal Company Rend Lake Mine, Franklin County – Consolidated submitted a Site Characterization Plan which was approved by the Illinois EPA. After collecting at least one year of quarterly monitoring data for assessment, Consolidated will provide an assessment to the Illinois EPA.

Black Beauty Coal Company Vermilion Grove Portal, Vermilion County – Total dissolved solids concentrations have become consistently below the groundwater quality standard. Chloride has declined with time, but exceeds the groundwater standard seasonally. Monitoring will continue until chloride concentrations are consistently in compliance with groundwater standards.

Coal Ash Impoundment Strategy – Illinois was one of the first states in the country to have and apply groundwater standards (1971), groundwater monitoring requirements, and corrective actions to ash impoundments (e.g., *Central Illinois Public Service Company v. Pollution Control Board*, 116 Ill.2d 397, approved Groundwater Management Zones (GMZs) at Havana⁴, Wood River and Hennepin, etc.). Illinois EPA chose to make further improvements in response to the massive coal ash spill at a Tennessee Valley Authority facility in Kingston, Tennessee. The strategy was initiated with an aggressive assessment of ash impoundments at coal fired power plants. Since the early 1990s, new ash ponds (surface impoundments) have been required to be lined and groundwater monitoring wells have been installed at many of these new ash impoundments.

An inventory of power plants with surface impoundments permitted by the Illinois EPA under the National Pollutant Discharge Elimination System permit program has been created. There are 24 power plants in Illinois with a total of 83 ash impoundments. Table 9 below indicates the number of impoundments that were active, those that had low permeability liners, and those that had groundwater monitoring as of February 1, 2009.

Total Impoundments	Active Impoundments	Inactive Impoundments	Lined Impoundments	Impoundments with Groundwater Monitoring
83	68	15	31	28

Table 9. Number of Impoundments that are Active, have Low Permeability Liners, and Groundwater Monitoring Systems

⁴ The GMZ implemented at Havana has resulted in restoring groundwater quality to meet the Board standards.

The geologic vulnerability of groundwater at the 24 power plants was assessed using the Illinois’ “Potential for Aquifer Recharge” map which classifies the potential for precipitation to infiltrate the surface and reach the water table. This map can also be used to determine the potential for groundwater contamination on a regional scale. Figure 16 shows the location of each power plant and the potential for aquifer recharge at each plant. This information, along with the presence of potable wells identified near the plants, was used to determine the potential contamination threat to those wells. The contamination potential ranges from “very high” to “low.”

The aforementioned criteria were used to develop assessment priorities for these facilities under an action-oriented strategic plan. The plan was finalized and implementation began on February 26, 2009.

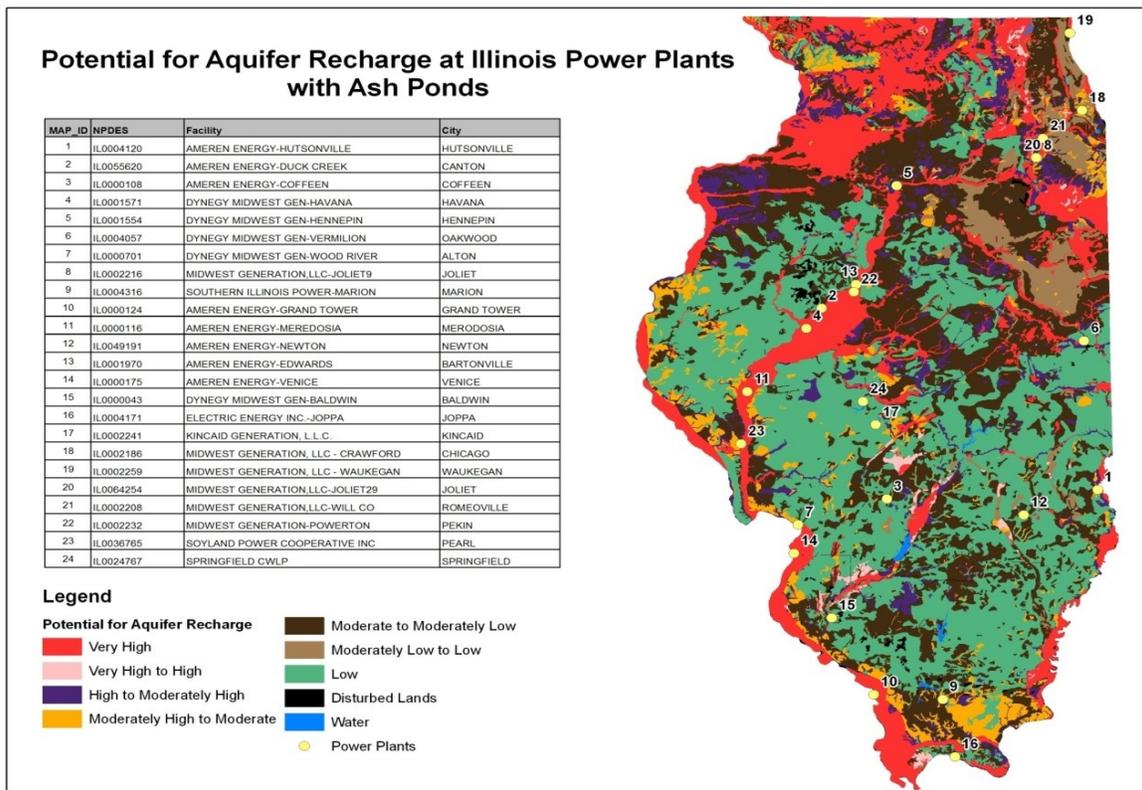


Figure 16. Illinois Power Plants with Ash Impoundments

Priority 1 facilities (i.e., high potential for aquifer recharge, and existing or future potable uses) were requested, under a modified BOW permit, to conduct a potable well survey to field verify the presence/absence of off-site drinking water supply wells, install a groundwater monitoring well system, implement a monitoring program⁵, and submit electronic compliance reports to the Illinois EPA. This information was requested at these ten facilities, identified in Table 10, because they did not have groundwater monitoring systems. Additionally, the five facilities classified as Priority 2 because of the low potential for aquifer recharge and existing or future potable uses in the area, were requested to assess the potential for contaminant migration at their respective sites.

⁵ Statistically based monitoring programs are required by Illinois EPA to determine naturally occurring compounds (inorganic compound numerical standards apply except due to natural causes) and background concentrations. To take into account spatial and temporal variations a years worth of data is generally required.

Priority 1	Priority 2
Ameren - Edwards Station, IL0001970	City Water Light and Power, IL0024767
Ameren - Grand Tower Station, IL0000124	Kincaid Generation, IL0002241
Ameren - Meredosia Station, IL0000116	Ameren - Newton Station, IL0049191
Ameren - Venice Station, IL0000175	Midwest Generation EME - Crawford Station, IL0002186
Dynegy Midwest - Baldwin Energy Center, IL0000043	Midwest Generation EME - Waukegan Station, IL0002259
Electric Energy Inc., IL0004171	
Midwest Generation EME - Powerton, IL0002232	
Midwest Generation EME - Joliet 29, IL0064254	
Midwest Generation EME - Will County Station, IL0002208	
Prairie Power Inc., IL0036765	

Table 10. Priority 1 and 2 under Illinois EPA’s Ash Impoundment Strategy

Potable well surveys have been conducted at all facilities to field verify the proximity of drinking water supply wells off-site. These surveys have shown that currently there appear to be no drinking water supply wells that are being threatened down gradient of these sites. In general, Illinois EPA would request a Section 43 referral to the AGO if there was an imminent threat to public health or the environment.

Illinois EPA has also coordinated with the IDNR, Office of Dam Safety. All structures that meet the definition of a dam, as defined in the Illinois Administrative Code, are regulated by the IDNR. If a dam is unpermitted, it is because the regulation that applies to the dam does not require a permit. Of the 1600+ dams in the state that clearly fall under the regulations, only about 650 have an active permit. The rest are low hazard dams that do not require active permits, but are still regulated.

Progress

The following provides a summary of the progress for each of the Priority 1 and 2 facilities:

Priority 1

- Ameren Facilities – Hydrogeologic assessment plans for Edwards Station, Meredosia Station, and Grand Tower have been approved and are being implemented. Initial groundwater monitoring results have been reviewed, and Illinois EPA is waiting on the next round of quarterly samples to further assess conditions at these sites.

Grand Tower – Groundwater flows towards the river, and will therefore not impact any of the potable water supply wells identified proximate to the ash ponds. A letter has been sent to Ameren stating that if elevated

levels of contaminants are confirmed, Illinois EPA will require further investigation and appropriate remedial activities where necessary.

Meredosia – Illinois EPA analyzed groundwater flow direction based on the initial sampling event at the on-site monitoring wells at Meredosia. Groundwater flows towards the river, and will therefore not impact any of the potable water supply wells identified proximate to the ash ponds. A letter has been sent to Ameren stating that if elevated levels of contaminants are confirmed, Illinois EPA will require further investigation and appropriate remedial activities where necessary.

Venice – The groundwater GMZ was approved for this site to limit recharge through the contaminants leaching to groundwater by covering the ash ponds with a low permeability synthetic membrane (cover). The well inventory required by Illinois EPA and completed by Ameren confirms that there is no use of groundwater for potable or industrial uses down gradient of the ash ponds. The area just south of the plume will be beneath the proposed I-70 bridge, virtually eliminating any potential use of the groundwater. Therefore, contaminated groundwater will not be pumped to control migration. The contaminated groundwater will slowly discharge into the river by subsurface seepage. Ameren analyzed the concentration of boron that would enter the river through seepage. The result was a concentration of 0.0019 mg/L in the river. This concentration is protective of human health and aquatic life. After the synthetic cover is in place, storm water that runs off the cover and has not been in contact with ash will be pumped into the river. The ash ponds do not appear to be the source of the arsenic found east of the ponds. Leachate samples from the ponds have concentrations of arsenic lower than detected east of the ponds. Since groundwater flow is predominantly to the west another source of the arsenic is likely. The area around the ponds has been heavily industrialized for many years, including wood treatment, which utilizes arsenic.

- Dynergy Midwest, Baldwin Energy Center – A hydrogeologic assessment plan has been submitted and approved. Initial groundwater monitoring results have been reviewed. Illinois EPA met with Dynergy Midwest to discuss elevated levels of contaminants at the site. Dynergy Midwest will be doing further investigation to better define groundwater impacts at the site.
- Electric Energy, Joppa Station – A hydrogeologic assessment plan for this facility has been submitted and approved. Illinois EPA met with Electric Energy to discuss elevated levels of contaminants at the site and appropriate remedial alternatives. No private wells appear to have the potential for impact.
- Prairie Power, Pearl Station – A hydrogeologic assessment plan has been submitted and approved. Preliminary groundwater sampling results have been received indicating potential groundwater impacts. Additional sampling data is being collected to establish background water quality at the site. The initial monitoring indicates that groundwater flow is primarily towards the river. Potential to impact potable wells is minimal. Confirmation of elevated levels of contaminants will require further investigation and appropriate remedial activities where necessary.
- Midwest Generation Facilities – Hydrogeologic assessments plans which include groundwater monitoring for Will County Station, Powerton Station and Joliet 29

Station have been approved. Groundwater monitoring results have been received and are under review.

Powerton – Due to the presence of artificial lakes, the ash ponds and the river, groundwater flow is variable. Due to the potential for off-site movement Midwest Generation has been instructed that if elevated levels of contaminants are confirmed, Illinois EPA will require further investigation and appropriate remedial activities where necessary.

Joliet 29 – A hydrogeologic assessment plan has been submitted and approved. Groundwater sampling results have been received indicating potential groundwater impacts. Additional sampling data is being collected to establish background water quality at the site. The initial monitoring indicates that groundwater flow is primarily towards the river. No private wells appear to have the potential for impact. Confirmation of elevated levels of contaminants will require further investigation and appropriate remedial activities where necessary.

Will County Station – A hydrogeologic assessment plan has been submitted and approved. Groundwater sampling results have been received indicating potential groundwater impacts. Additional sampling data is being collected to establish background water quality at the site. The initial monitoring indicates that groundwater flow is primarily towards the river. No private wells appear to have the potential for impact. Confirmation of elevated levels of contaminants will require further investigation and appropriate remedial activities where necessary.

Priority 2

- Ameren Facility – Hydrogeologic assessments plans for Newton Station have been submitted and approved. Preliminary groundwater sampling results have been received indicating potential groundwater impacts. Additional sampling data is being collected to establish background water quality at the site.
- City Water Light and Power (CWLP)-Dallman Station – A hydrogeologic assessment for Dallman has been received and is currently under review. CWLP met with the Illinois EPA to discuss potential impact to the adjacent stream and the potential for off-site movement of contaminants. CWLP will be doing further investigation to better define groundwater impacts at the site. No private wells appear to have the potential for impact.
- Kincaid Generation – An assessment plan which includes the construction of monitor wells has been received and has been approved. Initial monitoring results have been submitted and are under review. There appears to be minimal potential for impact to potable wells.
- Midwest Generation Facilities – Hydrogeologic assessments plans which include groundwater monitoring for Waukegan Station and Crawford Station have been approved. Groundwater monitoring results have been received and are under review.

Waukegan – Groundwater flow at Waukegan appears to be highly dependent on the water level in the ash ponds. Due to the potential for off-site movement, Midwest Generation has been instructed to complete some additional investigations to more fully evaluate contaminant movement. Confirmation of elevated levels of contaminants will require further investigation and appropriate remedial activities where necessary. No potable wells appear to have the potential for impact.

Crawford – A hydrogeologic assessment plan has been submitted and approved. Groundwater sampling results have been received indicating potential groundwater impacts. Additional sampling data is being collected to establish background water quality at the site. No private wells appear to have the potential for impact. Confirmation of elevated levels of contaminants will require further investigation and appropriate remedial activities where necessary.

Sites With On-going Work

In addition to the priorities described above, Illinois EPA has worked with or concurrently continues to work with the eight facilities listed in Table 11 below to assess and remediate groundwater impacts (corrective action). A site specific rule has been adopted by the Board for the Ameren-Hutsonville site. This rule specifies the steps which are required to be taken to close out the inactive ash impoundment. Ameren is in the process of fulfilling its obligations required under the site specific rule. The closure requirements are consistent with, if not more stringent than, U.S. EPA's proposed Coal Combustion Residual (CCR) requirements for CCRs under either the Subtitle C or D options.

- Dynegy Midwest-Havana Station – A GMZ was established in 1994 at this site. Groundwater at this site has returned to compliance with the numerical groundwater standards.
- Midwest Generation-Joliet 9 (Lincoln Stone Quarry) – Lincoln Stone Quarry is a permitted facility subject to the regulations of 35 Ill. Admin. Code 814 Subpart C and referenced portions of 35 Ill. Admin. Code. Because Lincoln Stone Quarry was a pre-existing facility with unique characteristics, the facility did not meet the design requirements intended for a 35 Ill. Admin. Code 811 landfill. In order to be permitted under the solid waste program, the facility had to receive an adjusted standard from the Board for relief from specific regulations and design requirements including the applicable GWQS. The applicable GWQS is a statistically derived value based on data sets that are unaffected by the facility. The site specific data set represents ambient background, which often does not reflect any 620 Class standards. (e.g., ambient background may be naturally above or below the numbers listed under 35 Ill. Admin. Code 620.)

The Board granted an adjusted standard that included 35 Ill. Admin. Code 620 Class II groundwater standards for several parameters north of the facility. The GWQS is applicable to the remaining wells at the facility. Subsequent to receiving the adjusted standard, the Illinois EPA permitted the facility in 1999.

Groundwater pumping in the area of the facility subsequently changed groundwater flow direction in the shallow zone such that impacts have been seen in a limited area in the southeast corner of the facility. The Illinois EPA approved a corrective action for that area in 2009 along with additional groundwater assessment. In 2011, the Illinois EPA approved the assessment reports and continues to work with the facility to establish an interim GMZ for the southeast area of the facility, along with a proposal for additional, preventative, corrective action along the south side of the landfill. Groundwater assessment and evaluation continues at the site.

Illinois EPA staff, in cooperation with Will County Health Department, sampled private wells east of this facility and all inorganic compounds were consistent with ambient background concentrations. The private wells were not impacted by this facility.

Table 11. Facilities with On-Going Groundwater Assessment and Remediation Activities

Facility	Status
Ameren - Coffeen Station, IL0000108	Further Assessment Underway
Ameren - Duck Creek Station, IL0055620	Remedial Action Under Development
Ameren - Hutsonville Station, IL0004120	Work is proceeding under the Site Specific Rule Adopted by the Board. The requirements in this site specific regulation are consistent with if not more stringent than what U.S. EPA is currently proposing for CCR in surface impoundments modeled after 40 CFR 258.
Dynergy Midwest - Hennepin Station, IL0001554	Approved GMZ
Dynergy Midwest - Vermilion Station, IL0004057	<p>Remedial Action Plan Under Development - There are three impoundments at this site. One is currently in use and lined. One unlined impoundment is in use as part of the waste stream under their National Pollutant Discharge Elimination System permit, although it rarely discharges. The third impoundment is unlined and no longer in use. There is currently no indication of contamination from the lined impoundment in use. Surface water monitoring of the Middle Fork of the Vermilion River does not currently indicate impairment for any potential contaminant. Groundwater monitoring results indicate there are potential contamination issues related to the two older unlined impoundments. Contaminants of concern include boron, sulfate, manganese, iron, total dissolved solids, and pH. An initial assessment conducted by the Illinois EPA in early 2009, using internal databases, identified 20 potential private wells within 1 mile of the site. The Illinois EPA then requested a survey of private wells within 2,500 feet of the site be conducted by Dynergy. This survey was completed June 15, 2009. The results of this survey verified one potable well up-gradient of the ash impoundments, the well used by the facility itself, and no private wells located down-gradient of the impoundments. A groundwater monitoring plan has been approved for the site. The results of the initial one year of monitoring, a GMZ application, and a Corrective Action Plan (including a Closure Work Plan) to deal with contamination issues at the site are due April 1, 2012.</p> <p>The closed pond referenced at the site is not permitted by IDNR. IDNR is only aware of 1 active coal combustions waste storage pond, which is directly East of the power plant and is permitted. There is a pond on the North side of the property which receives runoff from the capped area of the old pond(s). The large lake on the site is used for cooling water, not coal combustions waste storage. All the structures on the site are in compliance with IDNR regulations.</p>

Table 11 (cont'd)	
Facility	Status
Dynegy Midwest - Wood River Station, IL0000701	Approved GMZ
Midwest Generation EME - Joliet 9, Landfill IL0002216 Lincoln Stone Quarry	In 2011, the Illinois EPA approved the assessment reports and continues to work with the facility to establish an interim GMZ for the southeast area of the facility.
Southern Illinois Power (SIP), IL0004316	Further assessment is underway, and a meeting has been requested to discuss results.

Groundwater samples were analyzed for the full spectrum of inorganic parameters at these sites. The constituents listed in Table 12 were identified as contaminants of concern at one or more these facilities.

Boron
Sulfate
Chloride
Iron
Manganese
Total Dissolved Solids (TDS)

Table 12. Contaminants of Concern

CHAPTER VII. WELLHEAD PROTECTION PROGRAM

Section 1. Amend rules to require the development of source water protection and planning (unless already developed) considering the current state of the art.

New Well Permit Applications – The Illinois EPA continues to utilize construction and operating permit applications for new CWS wells to obtain enhanced hydrogeologic

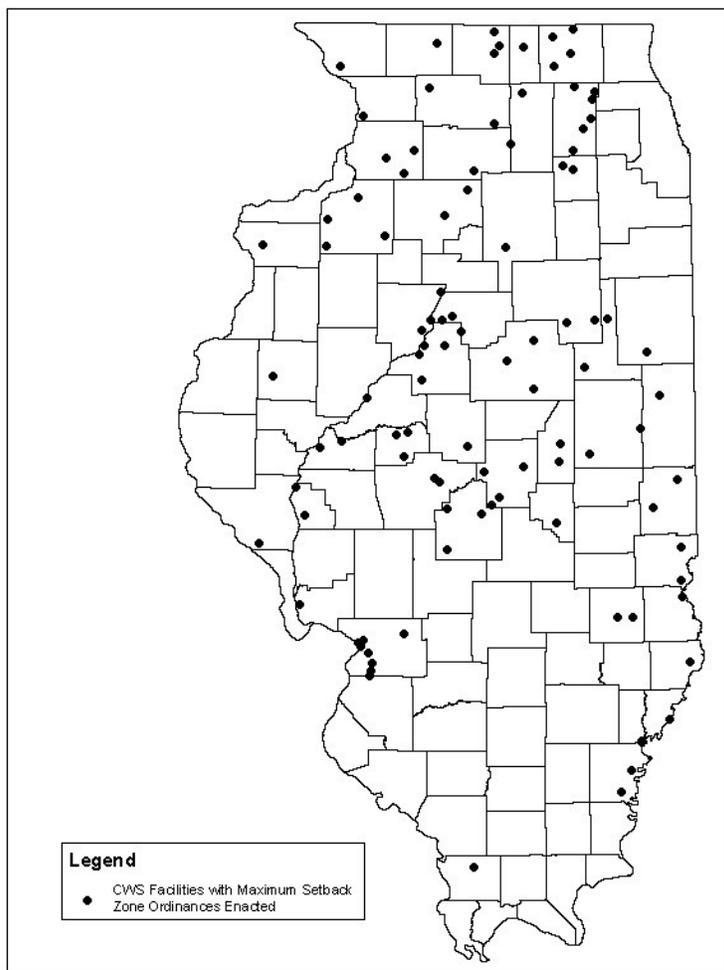


Figure 17. Maximum Setback Zones Adopted

information to assist in the delineation of WHPAs and assure a safe source of water. This information includes well log boring information and aquifer property data, which can be used to construct groundwater flow models for determining the capture zone for wells utilizing unconfined aquifers. The C-I construction permit application can be found on the Web site at <http://www.epa.state.il.us/water/permits/drinking-water/forms/schedule-c-i-well-construction.pdf>.

expenses may be avoided with additional protection. The Illinois EPA and IRWA have provided maximum setback zone educational information during CWS site visits and at professional conventions.

Maximum Setback Zones – A maximum setback zone is used to expand protection to a CWS well and lower potential for groundwater contamination. Maximum setback zone protection is becoming increasingly important because of RTK legislation. Due to the increasing trend of VOC contamination, the voluntary wellhead protection approach pays off, and costly, un-needed protection approach pays off, and costly, un-needed

The locations of the CWSs that have adopted maximum setback zones are shown on the map in Figure 17. A total of 111 CWSs with a total of 360 active wells have maximum setback zone protection. During this two-year reporting period, Caterpillar Trails Public Water District, Cowden, Geneseo, Illiopolis, Lake in the Hills, Mazon, and Ridge Farm have pursued adopting maximum setback zones for 23 CWS wells. Additionally, Albion, Assumption, Curran-Gardner Public Water District, Earlville, Hoopston, Toluca, Tonica, and Wenona are pursuing maximum setback zone adoption for 18 CWS wells. Fayette Water Company is pursuing maximum setback zones through the Board for six CWS wells. Another 15 community water supplies are beginning the application process

towards maximum setback zone protection for 39 wells. The Illinois EPA and IRWA have provided maximum setback zone technical assistance to the majority of these CWSs.

McHenry County Regulated Recharge Areas – The McHenry County Department of Planning and Development’s Groundwater Task Force has developed a subcommittee to investigate the degree of interest in adopting regulated recharge areas in McHenry County. The subcommittee hopes to determine if a county wide regulated recharge has support or if individual communities would prefer to adopt their own. McHenry County is completely dependent on groundwater as its source of drinking water.

WHPA Delineations – Historically, completion of these delineations has focused on CWS wells located within Illinois’ priority groundwater protection planning regions and under vulnerability monitoring waiver programs as allowed by the SDWA to encourage groundwater protection program implementation. All unconfined supplies for which reasonably available data exist have completed delineations. The total number of facilities with completed delineations is 252, representing 976 wells. Further evaluation of available hydrogeologic data for other unconfined CWS wells is being conducted to determine the recharge area delineation potential for these supplies. New CWS wells continue to be evaluated. Illinois EPA has conducted groundwater modeling to delineate contributing recharge areas or WHPAs beyond applicable setback zones for seven new CWSs, and 42 CWS WHPA delineations were updated during this two-year reporting period.

Water Well Decommissioning – The Illinois Water Well Decommissioning Program allows 12 well sealing projects per year in each local soil and water conservation district and permits the sealing of abandoned irrigation wells at a higher cost-share rate than cost-share for traditional well sealing projects. In addition, a special projects category is still available through the Partners for Conservation Program for cost-sharing high priority environmentally-friendly projects. This category provides an opportunity to fund well decommissioning projects beyond the statewide docket limit of twelve well projects per year in each soil and water conservation district.

Section 2. Implement principles developed under the national Source Water Protection Collaborative (e.g., “Marketing for Change”) as part of outreach efforts.

The concepts of “Marketing for Change” were promoted as part of the source water protection Webinar and workshops sponsored by the Illinois EPA, Illinois Section-AWWA and IRWA. However, significant efforts of applying “Marketing for Change” concepts are needed to enhance source water protection in Illinois.

CHAPTER VIII. REGIONAL GROUNDWATER PROTECTION PLANNING PROGRAM

Illinois EPA continues to work very closely with the regional priority groundwater protection planning committees to establish groundwater protection programs at the local level. Although each region has specific priorities and areas of concern, most have adopted specific mission goals and objective statements to advocate groundwater protection practices and procedures to municipal, county, state, and other local units of government. These goals and objectives are useful in the prioritization and development of local groundwater protection programs, many of which are described in this chapter.

GOALS:

1. Provide education materials and programs regarding general groundwater protection.
2. Promote the use of groundwater protection tools to county and other local units of government that implement groundwater protection programs throughout the region.
3. Assist the state jurisdictions in accomplishing specific regional groundwater protection programs.
4. Provide a forum for the development of recommendations that address committee recognized regional protection needs.

Section 17.2 of the IGPA requires Illinois EPA to establish a regional groundwater protection planning program. Illinois EPA utilized recharge area mapping (completed in 1990 by IDNR), groundwater pumpage data, population affected, water supply characteristics, solid waste planning efforts, and other factors to select the four existing priority groundwater protection planning regions (see Figure 18).

OBJECTIVES:

1. Maintain an ongoing general education subcommittee to work with citizen groups, schools, governing agencies, and other interested parties on the importance of groundwater protection.
2. Promote the use of voluntary best management and pollution prevention programs for businesses and residences located within groundwater recharge areas.
3. Work with county, municipal, and other special units of local government to implement groundwater protection tools such as local zoning, maximum setback zones, technology control regulations, and defining recharge areas.

A committee is appointed for each priority region by the Director of the Illinois EPA and includes a cross-section of representatives from within the region including county and municipal officials, owners or operators of public water supplies which use groundwater, at least three members of the general public who have an interest in groundwater protection. Staff from the Illinois EPA and other state agencies, as appropriate, serve as technical advisors to the committees.

The Northern and Central Groundwater Protection Planning Committees were first established in 1991, followed thereafter by the Southern Groundwater Protection Committee in 1992. The Northeastern Groundwater Protection Planning Committee was initially appointed in 1995 and later amended to include DuPage County in 2001.

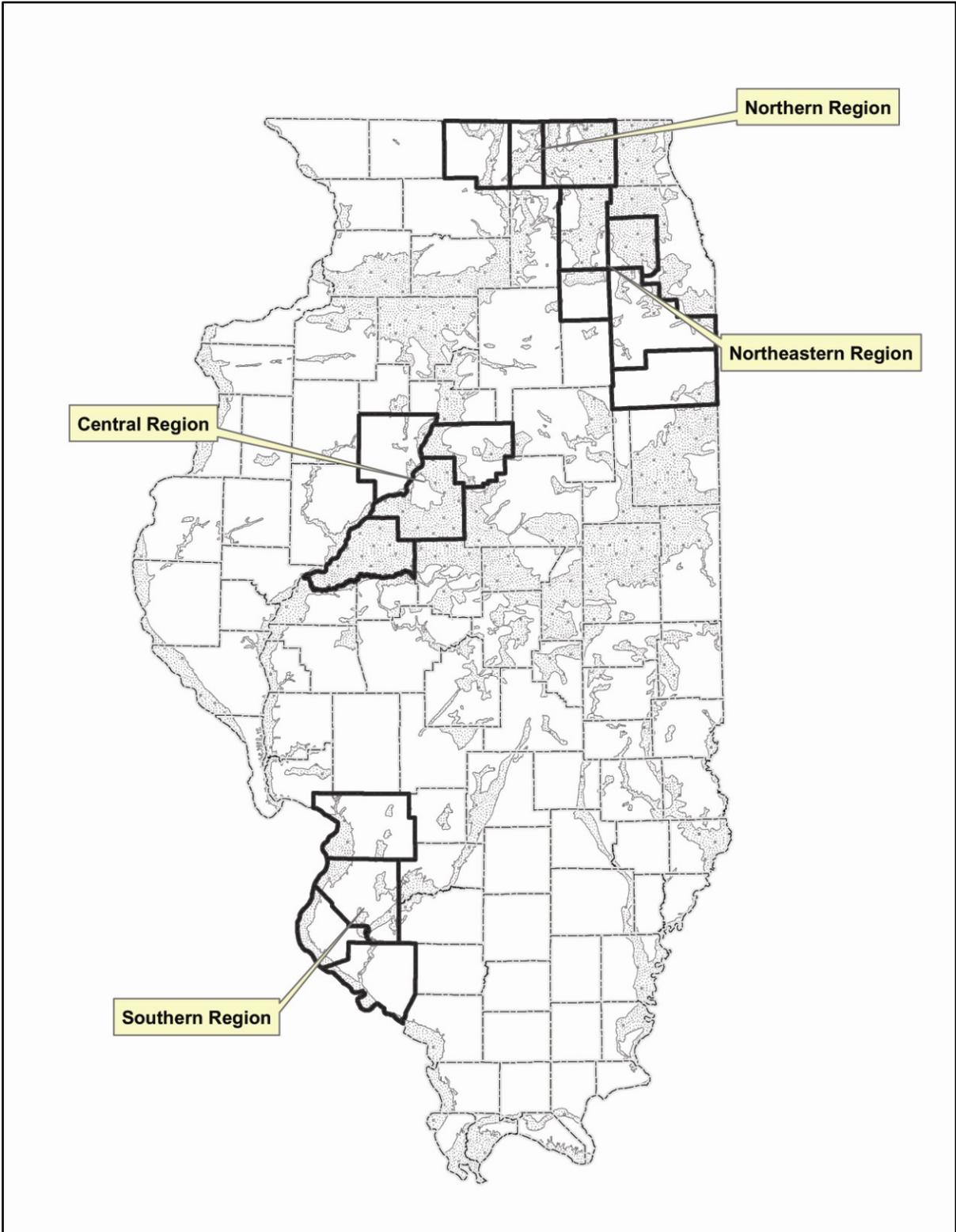


Figure 18. Priority Groundwater Protection Planning Regions

The regional groundwater protection process has resulted in successful local coordination and outreach efforts that have benefited both private citizens and businesses in these high priority areas of the state (e.g., pollution prevention interns, groundwater protection field days, well sealing demonstrations and low-cost well sealing programs).

Cooperative efforts with entities such as the Groundwater Guardian program has assisted the regional groundwater protection process by providing national attention and recognition to CWSs developing groundwater protection programs.

Illinois EPA continues to promote the Groundwater Foundation's Groundwater Guardian Affiliate program. Each of the four priority groundwater protection planning committee's are encouraged to become Groundwater Guardian Affiliates and to commit to a series of result-oriented services. These result-oriented services include working with communities within their respective regions to implement local source water protection programs and trying to recruit new Groundwater Guardian communities.

During the past two years, Illinois EPA and members of the priority groundwater protection planning committees have met with local stakeholders to encourage the development of groundwater protection programs and to implement activities to protect CWS recharge areas. The following information provides a summary of community outreach programs that the regional committees have targeted for groundwater protection efforts.

Illinois EPA's Nonpoint Source Management Plan was amended to create more opportunity for projects and programs to increase the number of groundwater wells sampled; to educate and inform the general public about the various ways in which NPS pollution problems in shallow, rural wells and in groundwater can be reduced; that increase the number of investigations, which assist in the identification of alternative best management practices that help minimize surface runoff and leaching of pesticides.

Illinois EPA has worked with University of Illinois to integrate source water assessments and protection areas into geographic information system (GIS) layers to be incorporated into the Resource Management Mapping Service (RMMS). The RMMS contains information on where nonpoint source best management practices have been implemented.

Section 1. Continue to assist and advocate local groundwater protection, education, and marketing.

Northern Groundwater Protection Planning Region (Winnebago, Boone, and McHenry Counties) – The Northern Groundwater Protection Planning Committee (Northern Committee) has assessed their efforts, and provided the following summary of these actions:

City of Loves Park – The City of Loves Park in conjunction with the Rockford Park District properly abandoned 36 private water supply wells during this reporting period. These properties were affected by a groundwater contamination plume related to the Sand Park landfill. In an effort to close the wells, the City of Loves Park created a Groundwater Restricted Use Ordinance prohibiting the use of groundwater as a potable

STRATEGIES:

1. Act as a catalyst for implementation of groundwater protection tools including presentations or meeting with local officials and businesses.
2. Conduct groundwater protection and education workshops/field days for the general public or target audiences.
3. Focus on educating middle school teachers on the importance of incorporating groundwater science into their curricula.
4. Perform an annual self-evaluation review of program effectiveness.

water supply within the groundwater ordinance boundary area. The Groundwater Restricted Use Ordinance was submitted to and approved by the Illinois EPA, BOL. The private wells were located within the plume of an abandoned municipal landfill, now owned by the Rockford Park District. The private properties were connected to Loves Park's municipal water system with no connection fees levied to the property owners. This project eliminated hazardous drinking water being consumed at thirty-six private properties in Loves Park. Since this project was first initiated in 2002, the City of Loves Park and the Rockford Park District have properly sealed over 259 abandoned wells.

McHenry County Groundwater Resources Management – According to a 2006 study by Baxter and Woodman, McHenry County Aquifers can provide 120 million gallons of water per day. While this may seem more than adequate to meet the need, water isn't necessarily where the people are. Much of the water is in rural areas and not in the county's more densely populated southeast corner. The study further predicts by 2030, Algonquin and Grafton townships' water demands could far outstrip their supply. Further, the study concluded that if every municipality realizes the full potential of what their comprehensive plans allow, the daily demand would jump to 164 million gallons per day, far exceeding what aquifers can provide.

In an effort to plan for the future and guard against supply shortages, McHenry County engaged in a comprehensive effort to study its Groundwater. In 2007, McHenry County hired a Water Resource Manager and initiated the development of a comprehensive water resources plan. The Water Resources Action Plan (WRAP) is predicated on the importance of cooperative planning and the significance of building a strong base of scientific knowledge. This comprehensive water resources plan has three primary focus areas and includes: (1) development of the WRAP; (2) enhanced scientific understanding through research; and (3) education and outreach.

(1) Water Resources Action Plan Development

On October 18, 2011, the McHenry County Board unanimously approved the McHenry County WRAP. This plan was developed over a two and a half year time period using a consensus building approach with McHenry County municipalities, townships, and other interested stakeholders. The plan underwent an additional two years of review by the County Board's Natural and Environmental Resources Committee. The Plan is vitally important because the County is solely dependent on groundwater for all of its potable water needs, with no other options available. The WRAP identifies and addresses the best management practices that can be employed to protect the county's shared water resources. To date, the WRAP has also been accepted by the seventeen municipalities within McHenry County.

(2) Enhanced Scientific Understanding through Research

In order to be successful in implementing the WRAP across multi-jurisdictional boundaries, it is of the utmost importance to have the science to support the development of best management practices and model ordinances that can be incorporated at the local level. Over the past several years, McHenry County has invested nearly 2 million dollars of county, state, and federal funds to enhance their understanding of groundwater and water resources. Four projects were identified as critical to the understanding of the extent of the aquifer resources, the sensitivity/ vulnerability of these resources, and the interconnectedness of the surface and groundwater resources. These projects include: 3-D hydrogeological modeling (ISGS), groundwater flow modeling (ISWS), installation and real-time telemetry of 41 observation wells, two stream gauges, precipitation gauges (United States Army Corps of Engineers, USGS, and ISGS), and water quality sampling (USGS). In March 2011, the USGS launched the McHenry County Hydrologic Information Web site to track the real-time information from the

Observation Wells and Stream Gauges, see: <http://il.water.usgs.gov/data/McHenry/index.php>. The data are collected and transmitted on an hourly basis to record the short and long-term hydrological condition of the County. The data gathered from this project will be used to develop and refine a groundwater-flow model to assist with future groundwater management planning.

(3) Education and Outreach

The Division of Water Resources is currently developing an education and social marketing program to teach children, residents, businesses, and elected officials about the significance of water. The Water Resources Web site currently serves as the hub of information available and contains lesson plans for teachers, children's activities, brochures, model policies and ordinances, and much more.

Additionally, the Division has developed a training and certification program on winter snow and ice operations and is currently developing programs for turf management and water conservation. The McHenry County Groundwater Protection Task Force has recently convened a subcommittee to evaluate the use of Regulated Recharge Areas for groundwater protection. More information on the status of these projects can be found at www.mchenryh2o.com under Groundwater Studies – McHenry County Update on Water Studies, June 2010.

Youth Groundwater Festival – The 17th annual Youth Groundwater Festival was held March 16, 2011, at Rock Valley College. More than 500 4th and 5th graders from eight schools (22 classes) within the greater Rockford area attended the free-of-charge festival. Several presentations were part of the festival, including demonstration of a Groundwater Flow Model, Dripal Pursuit, Water Testing and The Incredible Journey enabling students to identify where drinking water comes from, common contaminants in drinking water, some screening methods for water testing, observations of microorganisms through a microscope, and modern methods of water supply protection. Prior to the festival, the EnviroScape model was demonstrated at 32 classrooms by health professionals and Retired Senior Volunteers to introduce the students to nonpoint source water pollution.

Approximately 114 people volunteered to help support the Youth Groundwater Festival, including, area educators, two high school science departments, and various environmental agencies and groups. The Burpee Museum of Natural History, Winnebago County Health Department, Northern Regional Groundwater Protection Planning Committee, the Rock Valley College Foundation, League of Women Voters and Rock Valley College sponsored the one-day festival. The Northern Committee would like to conduct a similar festival next year in McHenry County.

Water Table Management Structure – The Northern Committee helped support a water table management structure along with the Boone County Conservation District. The purpose for this project was to install a practice that will demonstrate the benefits of managing the shallow water table for crops, wildlife, increased groundwater recharge, and improved water quality. A special project grant from the IDA was awarded to remedy the damages caused by last year's heavy rainfall events. Recently, eroded areas have been re-graded, a culvert stream crossing has been removed, and a Texas style ford type crossing has been installed according to the United States Department of Agriculture's Natural Resource Conservation Service designed plans. The special project grant had also included funds to install additional drain tile, but the extremely wet spring precluded the tile work from being completed in time, and the balance of the funds had to be returned to the IDA. Additional tile work is planned to be completed during 2012.

Chicago Metropolitan Agency for Planning – CMAP formed a Regional Water Supply Planning Group. Their goal was to develop water demand scenarios to 2050; generate water management options; and do outreach and education. CMAP is the delegated

authority for the region's area-wide water quality management plan. Thus, CMAP is obligated to outline management strategies for eliminating point and nonpoint source pollution, protecting groundwater, and disposing of wastewater throughout the seven-county region. The draft Water 2050 Plan was approved by CMAP on January 26, 2010 and includes more than 200 recommendations directed at state, regional, county, municipal and other public agencies.

Some committee members continue to participate by attending meetings, reviewing and commenting on draft documents, and distributing CMAP and Water 2050 updates to the Northern Committee members. To learn more about CMAP's water quality related initiatives see: <http://www.cmap.illinois.gov/water-2050>

School Outreach Program in Partnership with the Illinois Section-AWWA – Northern Committee members have volunteered to work on the development of a partnership with the Illinois Section-AWWA and the Northeastern Regional Groundwater Protection Planning Committee to get “water” into the classrooms. Outreach efforts are being developed for area teachers and schools with offers of field trips and in-class demonstrations on water-related issues including, watershed protection programs, demonstration of groundwater flow models, and basic water chemistry lessons.

Rockford Well Abandonment Program – The Winnebago County Health Department and multiple agencies participated in a “Hope VI” grant several years ago to provide money and resources to low income housing for the installation of public water to a known bacterial contamination area. This area consisted of several blocks located in the 61102 area code of Rockford, Illinois. Once the properties were connected to the public water supply, there were no funds allocated to sealing the existing private water supply wells. In 2008, the Winnebago County Health Department did an investigation to determine how many abandoned wells existed as a result of connecting these properties to public water. The results of this investigation revealed a total of 21 properties participated in this grant, of which only two of the wells appeared to be properly sealed.

In 2009, the Winnebago County Health Department determined through county records that seven of the 19 properties were “tenant-occupied”. Public Health Notices were mailed to the owners requiring the wells to be sealed pursuant to IDPH Code, and as a result, all seven wells were sealed. In 2010, the remaining 12 wells were determined to be “owner-occupied” and were in need of financial assistance. With financial assistance provided by the Northern Committee, three wells were sealed. In 2011, the committee has provided additional assistance and three more wells are in the process of being sealed. A total of six abandoned wells remain and may be addressed by the Northern Committee during 2012.

McHenry County Field Day – A Groundwater Protection Field Day was held on May 4, 2011, at the McHenry County Soil and Water Conservation District facilities site in Woodstock. Jason Thomason, a geologist with the ISGS talked briefly about McHenry County geology and its effect on groundwater recharge. Mr. Thomason also displayed the entire 200 feet of soil cores taken from one of McHenry County’s monitoring wells. Students were able to see first-hand what the soil looks like in the aquifers that contain groundwater supplies of McHenry County. Cassandra McKinney, McHenry County Water Resource Manager, was on hand to explain what the county was doing as far as ground water protection policies are concerned. She presented a summary of the county groundwater protection plan and offered suggestions to the students on how to do their part in groundwater protection and conservation. Finally, a representative from the USGS discussed the many instruments used in groundwater monitoring for both water quantity and quality. Approximately 60 students and ten facilitators attended the field day.

Northeastern Groundwater Protection Planning Region (Kane, Kendall, DuPage, Will, and Kankakee Counties) – The Northeastern Groundwater Protection Planning Committee (Northeastern Committee) has assessed their efforts, and provides the following summary of these actions:

Abandoned Well Sealing Program – The Northeastern Groundwater Protection Planning Committee has developed a well sealing program to promote and assist with the proper abandonment of inactive water supply wells. Well abandonment guidelines and a tracking spreadsheet have been created to facilitate the implementation of this program. In addition, advertising brochures have been printed and distributed to each of the county health departments to assist in promoting this effort. Furthermore, the Committee has provided each county health department with up to \$300 to promote/publish the well sealing program or to offer free/reduced prices for a well sealing permit. The well sealing program involves the purchase of large amounts of bentonite, at a reduced cost, and providing it to private well owners at cost, or free of charge, to seal their well. Any monies collected are then used to purchase additional bentonite such that the program becomes self-supporting. The Committee also maintains an adequate inventory of bentonite at each county health department so that materials are readily available. The tracking spreadsheet provides minimal statistics to document the success of this program on a county-by-county level. To date, steady progress has been observed, and recent activities and management changes should help to further promote this program.

2010 Batavia IL Green Walk – The Northeastern Committee, in partnership with the City of Batavia and the Illinois Section-AWWA, successfully presented groundwater protection and conservation information to the general public during the Batavia Green Walk in Batavia, Illinois, in April 2010. Hundreds of local citizens, many of them schoolchildren, visited the booth during the event. The Committee focused on local communities' efforts to manage its groundwater supplies at a personal level. Northeastern Committee volunteers emphasized wellhead protection, the water cycle, and the region's dependence on its groundwater resources.

2011 Will County Landfill Management Workshop – In June 2011, the Committee held a successful informational workshop for health department employees and others on the operation and management of a local landfill. The day included a discussion of the methods used to construct the landfill to protect the underlying aquifer, an overview of groundwater monitoring techniques and results, and a tour of the facility. The meeting received high marks on the evaluation forms obtained from the 40 attendees.

Groundwater Education Lending Libraries – The Northeastern Committee continues its effort to maintain high-quality groundwater education materials and to keep its lending libraries up to date. Currently, the two available lending libraries of the Committee are housed at the Kendall County Health Department. The Northeastern Committee continues to promote the availability of the libraries to the region's teachers, its soil and water conservation districts, and the public. Members of the committee also developed an inventory of the groundwater education materials to provide to the press and other media outreach mechanisms, for listing in monthly newsletters, and to feature in public service announcements.

Groundwater Research Student Grant Program – The Northeastern Committee continues to provide financial assistance to students whose research area or residence is within the five-county priority groundwater region as a continuing contribution to the region and the state.

Northeast Regional Water Supply Planning Group/CMAP – To consider the future water supply needs of Northeastern Illinois and develop plans and programs to guide future use that provide adequate and affordable water for all users, including support for economic development, agriculture and the protection of our natural ecosystems, a regional water

supply planning group was formed in 2006. The Northeastern Committee continues to monitor the workings of the planning group and additional related efforts being conducted by CMAP and assist with its efforts to quantify future regional water demand and to determine the proper courses of action to ensure the viability of the region's water resources. To learn more about CMAP's water quality related initiatives see: <http://www.cmap.illinois.gov/water-2050>.

Community Outreach – Many Northeastern Committee members participated in regional or community outreach efforts by promoting groundwater awareness through the following events:

- Posting information such as Illinois EPA and committee brochures in public places such as libraries, county, and township buildings;
- Community events such as the Kendall County Natural Resource Tour;
- The Kendall County Private Well Education and Mapping Project (see discussion below);
- School group meetings in Kankakee, Kane, and Will Counties;
- Earth Day and Arbor Day celebrations; and
- Creation of a Facebook page for the Committee.

Members of the Northeastern Committee have access to groundwater flow models, an EnviroScape, tables, a display board showing an interactive water cycle, and other printed materials. Brochures have been developed that provides contact information and describes the resources our committee has available to promote our mission. These resources were distributed at all outreach events and also provided to local health departments for county-wide distribution. The Committee has also purchased various giveaways (recycled pens, pencils, note pads, etc.) to increase the public awareness of our committee and our groundwater protection endeavors.

The Northeastern Committee believes that groundwater protection begins with educating the public so we are always looking for ways to communicate our message. Our participation at these functions involve explaining the nature and occurrence of groundwater, existing protection efforts at all levels, and how we all can help with these efforts. Feedback from visitors who attended the various functions was positive in that many questions were asked for further information. Feedback from event organizers was also positive in that invitations were extended for future events. Teachers, leaders and children also provided positive and constructive feedback regarding groundwater presentations to smaller groups.

Kendall County Private Well Education and Mapping Project – With financial assistance from the Northeastern Committee, the Kendall County Health Department initiated the Private Well Education and Mapping Project. The focus of the project is the protection of our region's groundwater supply through homeowner education, wellhead protection and GIS mapping. In this ongoing effort, health department staff walks door-to-door in older unincorporated areas of the county to deliver well and septic maintenance materials to homeowners. The health department personnel also request permission to add the well location to the countywide GPS database using a handheld GPS receiver. The well locations are then stored in a database developed by the health department's GPS Coordinator. During the site visit, any private well code violations noted by staff are discussed with property owners if they are available. If no one is available letters are mailed to the property owner with more detailed information. Follow-up site visits for complaints or further consultations are conducted when necessary.

This project will continue as time and funding allow through 2012 and beyond. The health department has presented details of the program at the Groundwater Foundation's 2011 National Groundwater Guardian Conference in Omaha, Nebraska, and at the Illinois Groundwater Association's October 2011 conference at Starved Rock State Park.

Central Groundwater Protection Planning Region (Peoria, Tazewell, Woodford and Mason Counties) – The Central Groundwater Protection Planning Committee (Central Committee) has assessed their efforts, and provides the following summary of these actions:

2010 and 2011 Clean Water Celebration – The annual Clean Water Celebration (CWC), held in Peoria, Illinois, incorporates a variety of programs for students, teachers, and the public, with over 3,000 attendees yearly. A “Parade of Waters” kicks off the Celebration at the Gateway Building on the Peoria river front. Mayors, village presidents, and other community leaders bring water, drawn from the Illinois River and lakes and streams in and near their communities, and symbolically pour their waters together, declaring their communities’ commitment to clean water.

The 2010 CWC keynote speaker was Dr. Rainy Shorey, Caterpillar’s lead environmental manager. She presented for our theme “Water and Wildlife” and spoke about her personal field research experience that included Kenya and the northern slopes of Alaska. Dr. Shorey stated that her experience brought a personal message that was beyond the local level of research. She was able to relate water quality/quantity issues on a global scale for the attending students. Governor Pat Quinn also attended the event and spoke to the assembled students as the first keynote speaker. It was the first time a governor of Illinois had attended and spoke at this event.

The 2011 CWC keynote presentation consisted of a panel of presenters around our theme “From your Gutter to your Gulf.” The panel addressed how what we do in Illinois effects communities downstream, focusing on the issues in the Gulf of Mexico. Topics covered were from the environmental impacts associated with hurricane Katrina/Rita to the recent BP Gulf oil spill. The panel included the following presenters: Dr. Denise Reed, Geologist and Geophysicist at the University of New Orleans; Dennis Stroughmatt, renowned musician and historian; Diane Rudin, The Nature Conservancy; Alley Ringhausen, Executive Director of Great Rivers Land Trust; and Joe Mitchell, IDPH.

Test Your Well Days – This event invites private well owners to collect and bring samples of their well water to participating local health departments to be tested, at no charge, for the presence of nitrates. Events are often held in the evenings or Saturday mornings and are sometimes combined with other events. In 2010, the Tazewell County Health Department hosted a Test Your Well event at the Delavan Fall Festival (Delavan, Illinois) and offered nitrate and arsenic screening. The nitrate screening was a simple test strip assay to determine the level of nitrate in homeowners’ private drinking water wells. The arsenic screening was developed with the assistance of the ISWS. With testing data provided by ISWS, we used an ammonia test strip and a colorimeter for sulfate to determine if arsenic was present in the water supply at levels greater or less than the MCL. Naturally occurring arsenic is prevalent in the southeast portion of Tazewell County (although it has been identified in all areas of the county). Delavan was chosen because it was a smaller southern community in Tazewell County. This let us target our message to the population that could be at a greater risk for arsenic exposure in their private water wells. The health department staff encouraged additional testing (ISWS) to have laboratory confirmation for nitrate and arsenic levels of the samples provided at this event. The Mason County Soil and Water Conservation District also had a Test Your Well screening event offered during a fall festival in October 2010, in Havana, Illinois. They offered private drinking water well screening and similar information provided at the event in Delavan.

These events also provide well owners with educational material about groundwater protection, nonpoint source pollution, the importance of water quality, and pollution prevention practices. In addition, volunteers learn about the importance of environmental health and better understand their roles in safeguarding drinking water quality.

Unwanted Pharmaceutical Collection – Since 2009, the Central Committee has been coordinating with Illinois American Water Company and the Pekin Police Department to establish a permanent drop-off site for unwanted pharmaceuticals. In November of 2009, this was accomplished and there has been an active site since that date. This drop site consists of a simple drop box that is in the lobby of the Pekin Police Department. Because of its secure location, the site can accept both controlled and non-controlled substances. With the work of a local pharmacist volunteering his own time, we are able to separate the controlled vs. non-controlled substances as they are collected. The pharmaceuticals that represent the majority of the collected items (>90 percent) are the non-controlled items. These are collected by the Veolia Company which delivers them to an Illinois EPA approved incinerator for proper destruction. In 2010 and 2011, the permanent drop-off site has generated four collections by the Veolia Company (each collection consisting of two 33 gallon drums filled with collected pharmaceuticals).

Green Matters – Green Matters is a program intended to educate and improve environmental practices in businesses and organizations in the region of Tazewell, Peoria, Woodford and Mason Counties. In 2010, Green Matters received funding from the Central Committee as well as the Illinois American Water Company. This money was used for the Pekin Streets CLEAN UP project implemented on May 22, 2010. The focus of this project was on areas compounded by problems of excessive litter and antiquated combined sewage overflow issues. The targeted area of this cleanup effort extended from 3rd Street east to 5th Street and from Market Street south to Elizabeth Street. The project sponsors included the Green Matters program, City of Pekin, and Pekin Main Street Business. In the fall of 2010, the remainder of the funds was utilized for an exhibit booth at the Pekin Marigold Festival to educate the public on the harm related to littering and our water resources. Promotional materials were presented as prizes for those that participated in a water conservation game. Attendees of all ages enjoyed the “River Clean Up” game, an activity that reinforces the concept of not littering, as well as to appreciate the impact we can have on our water quality by cleaning up litter we do see. Projected attendance at the Pekin Marigold Festival was estimated at 7,000 people.

In 2011, the Green Matters program is focusing attention towards reducing the concentration of chlorides in regional groundwater supplies. A steady and noticeable increase in chloride levels in shallow wells has set a feared irreversible trend. Prior to 1970, 80 percent of shallow groundwater supply wells in Illinois, defined as being 200 feet or less in depth, had chloride levels less than 15 mg/L. After 1990, of wells less than 200 feet deep, 37 percent exceeded 50 mg/L, and 14 percent exceeded 100 mg/L. Groundwater supply wells that are 100 feet or less in depth were even more impacted, with 66 percent exceeding 50 mg/L and 34 percent exceeding 100 mg/L (Illinois EPA, Illinois Integrated Water Quality Report and Section 303(d) List –2008). Additionally, water quality monitoring data suggests a rise in chloride levels of 1 mg/L per year for the Illinois River in Peoria (ISWS).

Winter Snow and Ice Operators Conference – To address the rising chloride trends and increase public awareness of the measures that can be implemented to reduce environmental impacts, in 2011 the Central Committee co-sponsored their first Winter Snow and Ice Operators Conference in Peoria, Illinois. The conference was held on October 28, 2011, at the Par-A-Dice Hotel and Casino. There were 90 people in attendance. The training focused on techniques to apply the appropriate amount of salt given the road conditions, snow, ice and wind factors, and atmospheric conditions. Nationally recognized experts including, Mark DeVries - McHenry County Division of Transportation, Dr. Wilfrid Nixon - University of Iowa, and Bret Hodne - City of West Des Moines spoke about the concern for excessive road salt application. They have designed and implemented programs in their respective regions to reduce chloride usage. Mr. DeVries has travelled to many foreign countries to participate in conferences as well.

Melissa Eaton from Tri-County Regional Planning Commission also spoke on the nature of the Illinois River ecosystem and the impacts of the steadily rising chloride levels in the Illinois River. The training ended with a hands-on session to educate attendees on the proper way to calibrate and maintain their trucks so as to dispense the appropriate amount and concentration of road salt. The day concluded with a test and participants received a Green Matters certification.

Southern Groundwater Protection Planning Committee (Madison, Monroe, St. Clair, and Randolph Counties) – The Southern Groundwater Protection Planning Committee (Southern Committee) has assessed their efforts, and provides the following summary of these actions:

Well Sealing Campaign – The Southern Committee has continued purchasing bentonite to assist in the sealing of private water wells in conjunction with the Water Well Abandonment Program launched by IDA and the Madison County Soil and Water Conservation District. The well sealing materials are provided at no cost to program participants in the four-county region. There is an emphasis placed on the abandoned wells located within the immediate proximity of a CWS well. In addition, the use of the bentonite is also available for sinkhole stabilization projects, which in turn benefit both surface and groundwater quality within portions of the karst-terrain area of southwestern Illinois.

Well Screening Effort – The Southern Committee purchased immunoassay kits to test for the occurrence of pesticides in private well water. The program targets farmers and rural homeowners that live in areas that are predominately agricultural land. The program is biannual and occurs in the fall and spring to coincide with the time farmers are planting and fertilizing. Private well water samples will be screened for triazines (of which atrazine is a common form) using immunoassay-testing methods. Atrazine is a common herbicide used in the control of grasses and broadleaf weeds in crops. It is anticipated that testing for nitrate, coliform, and triazines will give most homeowners the ability to know more about their source of drinking water. In addition, the Madison County Health Department laboratory conducts all screenings, and the Southern Committee is compiling the results for review and use for future educational planning efforts.

2011 Groundwater Protection Field Day – The Southern Committee sponsored a groundwater field day event on September 26, 2011, at the Environmental Resources Training Center on the campus of SIU-Edwardsville. The purpose of this field day was to educate the public and professionals on groundwater protection and emergency preparedness. Field day topics and presentations included: a video entitled, “It can happen here: Earthquakes in the Midwest”; preparedness for a Midwest earthquake with a lesson of the geology of earthquakes; drinking water protection; human waste and trash disposal; and a demonstration on proper well sealing procedures. There was also a discussion regarding water testing for both community water supplies and private water wells that included a comprehensive tour of a local lab and water treatment facility.

Groundwater Lending Library – The Southern Committee has an ongoing goal of encouraging local stakeholders to become more aware of, and active in, groundwater protection strategies throughout the southern region. To this end, an informational campaign continues to collect and develop materials regarding groundwater protection and education programs to be utilized by various governmental and local agencies. As part of the lending library, the Southern Committee has incorporated a display board and a ten-foot banner that can be used by members, and loaned to various local agencies to support groundwater protection/educational outreach efforts at area conferences, community functions, and county fairs.

Festival of the Bluffs – The Southern Committee has had a presence in the four-county area by continually attending and participating in festivals and conferences. In 2010 and 2011 the Southern Committee manned a booth at the Festival of the Bluffs which was held in Monroe County. The day consisted of talks and hands-on projects that were geared toward the unique Southwestern Illinois ecosystem and the splendor of the towering Mississippi River bluff lands.

CHAPTER IX. NON-COMMUNITY AND PRIVATE WELL PROGRAM

Section 1. Continue to implement the Wellhead Protection Program and assist with implementing the technology control and groundwater quality standards regulations.

IDPH has primary responsibility for inspections of approximately 3,850 non-community public water supplies (NCPWSs), which are performed at least once every two years. The NCPWSs in Illinois serve a population of approximately 491,092 citizens. These are water systems that serve 25 or more people for at least 60 days per year; for example, schools, restaurants, factories, power generating stations, office buildings, campgrounds, state parks, and rest stops.

At the time of the inspection of a NCPWS, IDPH and local health departments inspect the area surrounding the wellhead for sources of contamination. Permits for new construction, modification or an extension of an existing NCPWS will continue to be required.

Section 2. Complete the source water assessments of all non-community public water supplies.

As required by amendments to the SDWA, IDPH has essentially completed source water assessments of all NCPWSs and will continue these assessments for all new NCPWSs. Approximately 3,400 water supply wells and 18 surface water sources serve as the sources of water to these systems. These wells and surface water sources were identified and evaluated for vulnerability to potential contamination from sources such as sewage systems, abandoned wells, buried fuel tanks and chemical storage areas. The vulnerability assessments conducted in the past were confined to an area within a 200-foot radius around the well which was amended to a 1,000-foot radius.

NCPWS well locations were digitized from registered aerial photographs and then converted into a GIS coverage. During the field survey for the well, potential sources of contamination within 1,000 feet are identified and drafted onto the photograph. Each site is described on a standardized coding form and is then entered into Illinois EPA's Proteus database.

This project brought together resources from IDOT, Illinois EPA, IDPH, and local health departments. IDOT provided aerial photographic maps of the area surrounding each supply and Illinois EPA entered the data into a GIS data system. This project began in 1998 and took three years to assess supplies that were listed as active at that time. Federal funding through U.S. EPA supported this effort. Local health departments were compensated through federal funding through U.S. EPA for conducting the assessments. IDPH regional staff conducted assessments at all IDPH licensed supplies and for those supplies located in counties without local health departments. IDPH utilized the source water assessment data to write a susceptibility assessment for each supply, taking into consideration land use, previous sampling data and geological data. From the information, the susceptibility report determined if the supply is susceptible to contamination. IDPH submitted copies of completed assessment reports to Illinois EPA and the water supply. Currently, source water assessments are being completed as new supplies are added to the non-community program.

Section 3. Continue GIS coverage for all new non-community public water supplies.

The digitizing of all existing NCPWS wells has been completed. This was accomplished by taking aerial photographs, which have been drafted with well locations from field surveys, and registering them against the county road coverage. Once registered, in real world coordinates, the photos are displayed and the well location is digitized into a statewide coverage from its drafted location on the photograph. The process of digitizing all new NCPWS wells will continue.

Section 4. Continue certification training of non-transient non-community public water supply operators.

In accordance with amendments to the federal SDWA and U.S. EPA drinking water regulations, all non-transient NCPWSs must be directly supervised and operated by personnel who have been certified by IDPH or have received certification as a public water supply operator (A, B, C, or D) by the Illinois EPA. Each non-transient NCPWS must designate a person who is the responsible operator in charge of the water system. Approximately 415 NCPWSs currently require certified operators. These operators must be initially certified and then be re-certified every three years by attending IDPH approved training courses that address new technology and new drinking water regulations.

During 2010 and 2011, three courses have been offered for operator certification. Since the onset of these classes, 1,579 individuals have attended initial operator courses to become IDPH-certified operators. Currently, 54 operators are certified through Illinois EPA and registered with IDPH, which allows them to operate non-transient NCPWSs. The grant IDPH had through U.S. EPA to reimburse eligible operators for costs associated with taking these classes has ended. The grant was originally awarded in 2001 and extended through 2011. All grant funds have been exhausted.

In June of each year, operators are sent a letter advising them of their expiring certificates, and are provided instructions on how to complete the renewal course. In late 2005, IDPH selected the Operators Basics Program, developed by the Montana Water Center in cooperation with Illinois EPA, as the renewal course. Operators can order the CD version of this course from either the National Environmental Services Center or IDPH. As a viable source of education, feedback on the course remains positive. The IRWA sponsored an IDPH-approved operator recertification course on August 5, 2009. In addition, IDPH utilized its operator certification grant funds to sponsor through IRWA a recertification course on April 10, 2010. Approximately 1,959 operators have successfully completed the required training and have renewed their certifications.

Section 5. Continue to inspect and perform laboratory analyses on water samples collected from non-community water supplies.

The IDPH continues to inspect and monitor NCPWSs. As part of these evaluations, the systems under IDPH regulatory authority are continually evaluated for water quality concerns and potential sources of contamination within their respective WHPA. To date, the IDPH has authority over 3,843 NCPWSs of which 415 are classified as non-transient (those systems that serve at least 25 of the same individuals at least six months of the year). While monitoring varies depending on population and system type (transient or non-transient), all of these systems are routinely evaluated for bacterial and nitrate contamination. Furthermore, non-transient NCPWSs, like schools and workplaces, must monitor for an additional 70 contaminants including VOCs, synthetic organic compounds, and IOC.

Section 6. Continue to issue permits for the construction, modification or extension of existing non-community public water supplies.

During 2010 and 2011, IDPH issued 110 and 81 permits, respectively, for the construction, modification or an extension of an existing NCPWS. Since 1996, the number of permits issued increased annually and peaked during 2008 (Figure 19). From 2000 through 2005, there was a gradual decline with one anomaly in 2002. From 2006 through 2011, the trend has increased and leveled off to at least 80 permits per year.

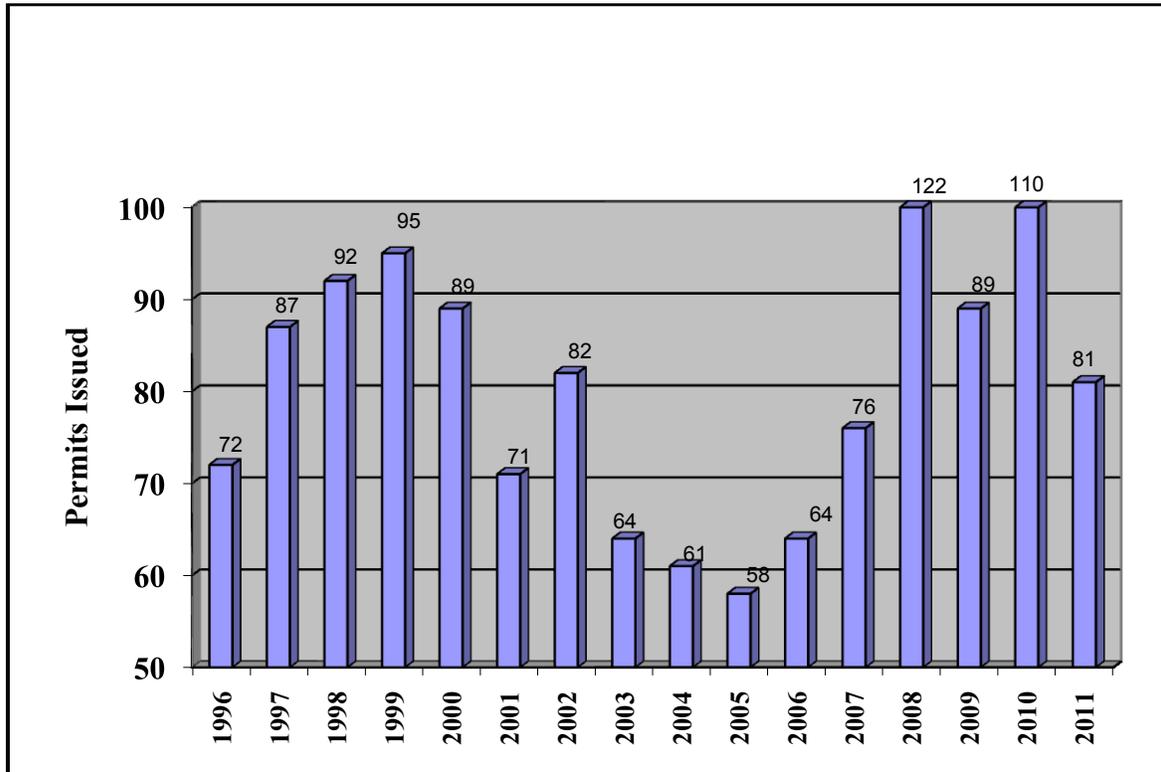


Figure 19. Permits Issued to Construct, Alter or Extend a Non-Community Public Water Supply

Section 7. Continue the issuance of permits for all types of water wells with the exception of community water supply wells.

During 2010 and 2011, IDPH and local health departments issued approximately 4,200 permits to construct private, semi-private, non-community, and non-potable wells. Figure 20 illustrates the number of water wells permitted during 1990 through 2011. Since 2003, the number of well permits issued has steadily declined. All new wells are inspected to ensure that location and construction specifications have been met in accordance with the requirements of the Illinois Water Well Construction and Pump Installation Codes. To meet the requirements of the IGPA, all new wells must be located at least 200 feet away from all primary and secondary sources of contamination and all potential routes. Additionally, water samples from new wells are analyzed by certified laboratories for the presence of coliform bacteria and nitrate concentration.

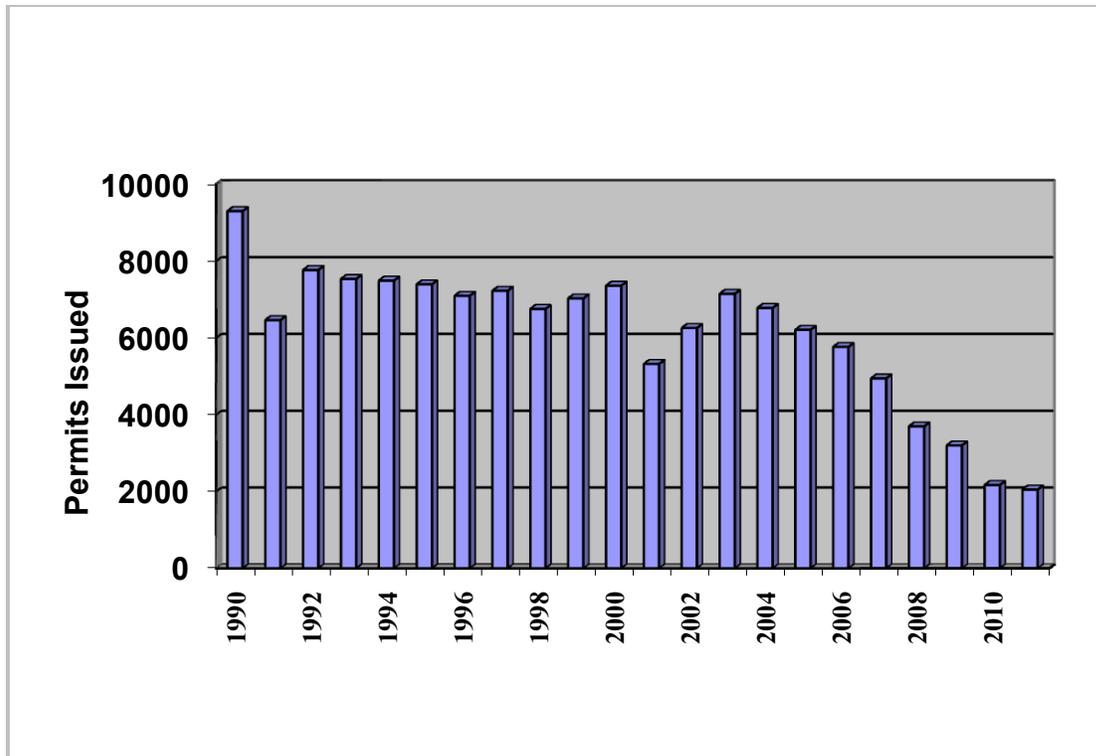


Figure 20. Water Well Construction Permits Issued

During the years 2010 and 2011, water well sealing records reveal that approximately 3,800 abandoned water wells were sealed. This represents a decline of 12 percent compared to the number of wells sealed during 2008 and 2009. Local health departments and IDPH inspect the sealing of abandoned wells to ensure they are properly sealed in accordance with the Illinois Water Well Construction Code. Figure 21 illustrates the number of water wells sealed during 1990 through 2011.

Section 8. Continue certification and registration of closed-loop well contractors, and the permitting of the construction of closed-loop wells.

On August 15, 2011, House Bill 308 was signed into law as Public Act 97-363. It amended the Water Well and Pump Installation Contractor’s License Act, creating the Closed-loop Well Contractors Certification Board. Provisions call for the new Board to advise and aid the Director of IDPH in (1) preparing subject matter for continuing education sessions relating to closed-loop wells; (2) preparing examinations for the certification of closed-loop well contractors, relating to the construction, installation, repair, and abandonment of closed-loop wells and the rules of IDPH adopted for closed-loop wells; (3) adopting rules related to closed-loop wells; (4) holding examinations; (5) holding hearings; (6) submitting recommendations to the Director; (7) grading all tests and examinations; (8) performing other duties; and (9) conferring with the Water Well and Pump Installation Contractor’s Licensing Board regarding registration/certification of closed-loop well contractors and the installation of closed-loop wells.

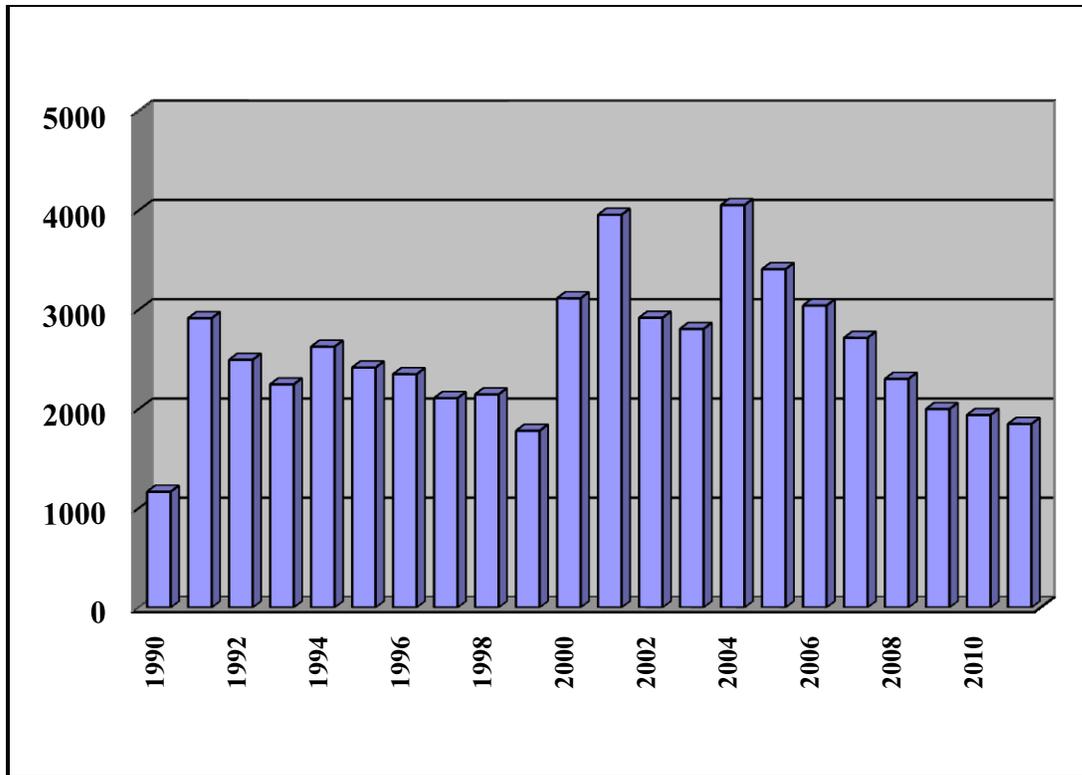


Figure 21. Water Wells Sealed

It amended the Illinois Water Well Construction Code, creating a provision for IDPH, by rule, to require the registration of closed-loop well contractors. To become registered, an applicant must pass the IDPH certification examination, and, shall be certified by an organization approved by the IDPH for its appropriateness in determining the knowledge and expertise as a closed-loop well contractor. As an additional provision, IDPH shall, by rule, require a one-time fee for permits for the construction, modification, or abandonment of closed-loop wells. It further prohibits all closed-loop contractors who are certified from engaging in the occupation of closed-loop well contractor unless he or she is registered with the IDPH.

Lastly, the legislation established the requirement for a permit to modify or abandon water wells on top of the requirement already in place for permitting the construction of new water wells and the deepening of existing water wells.

Section 9. Continue to update the Illinois Water Well Construction and Pump Installation Codes to reflect legislation, new technology, industry and public health standards.

The proposed amendments to the Water Well Construction Code would: clarify the requirements for grouting drilled wells and sealing abandoned wells; establish requirements for bored well construction materials; update and clarify the requirements for constructing closed-loop wells; clarify the setback requirements between closed-loop wells, water wells, and sources of contamination; establish requirements for the certification and registration of closed-loop well contractors; and the permitting of closed-loop well systems. This would ensure that the installation of water wells and closed-loop wells meet state groundwater protection and public health standards.

Section 10. Continue supporting education training sessions for licensed water well and pump installation contractors.

The Water Well and Pump Installation Contractor's License Act requires all licensed water well and pump installation contractors to attend a six-hour continuing education session every two years. In order to renew a license, a contractor must provide proof of attending a continuing education session, such as a certificate from the organization that sponsored the training.

Plumbers who install or repair water well pumps and pumping equipment must be licensed as water well pump installation contractors, but they are not required to take the water well pump installation contractor's license examination or to pay the license fee. However, they are required to attend a six-hour continuing education session every two years.

IDPH-approved training sessions are intended to increase a contractor's knowledge by providing new industry information and updates, as well as to allow health officials to bring current problems to the attention of the industry. Topics for the sessions included construction of closed-loop well systems, below ground carbon sequestration, business and personnel management, groundwater contamination, grouting, water treatment, water well pumps, water well construction and pump installation codes, water well drilling methods, work safety, and transportation regulations. Approximately 726 water well and water well pump installation contractors, licensed by IDPH, are required to attend these training sessions. Nine training sessions were held throughout the state during 2010 and 2011. Nearly all sessions were conducted through the Illinois Association of Groundwater Professionals.

Section 11. Continue to conduct training sessions pertaining to both the non-community water supply and private water programs for local health department and Illinois Dept. of Public Health water program staff.

During 2010 and 2011, the Illinois Association of Groundwater Professionals, IDPH, Illinois Groundwater Association, and local health departments sponsored approximately 38 water program training sessions approved for water program staff from 96 local health departments and IDPH. Nine of the sessions coincided with the above sessions for licensed water well and pump installation contractors. Some of the major topics at these training sessions included NCPWS coliform reporting and sanitary surveys, closed-loop well construction, closed-loop well legislation, groundwater contamination, water well grouting, water well pump installation, and groundwater flow. The sessions met the annual water program-training requirement for local health department water program staff under the Local Health Protection Grant Rules (77 Ill. Admin. Code 615).

Section 12. Continue implementation of Public Notification for Private Water Supply Potential Contamination.

Amendments made in 2002 to the IGPA require Illinois EPA to notify IDPH of the discovery of a VOC in excess of the MCL. Within 60 days of this notice, IDPH, in coordination with the local health department, shall notify the owners of any private, semi-private, or NCPWS public water system within a potentially affected area of concern of the need to test the water system for possible contamination. The notice shall be published for three consecutive weeks by means of local media. Illinois EPA must notify the unit of local government affected to take any appropriate action, such as informing any homeowner who potentially could be adversely affected, within a reasonable time after notification by Illinois EPA.

Upon receipt of notification from Illinois EPA of the discovery of a VOC in excess of the MCL or a groundwater standard in a particular area, IDPH notifies the appropriate local health department in writing. The notification explains the legal background for the

requirement to provide notification of actual or potential contamination as specified through Section 9.1 of the IGPA. In this notice, IDPH requests the local health department to notify any owners of private or semi-private water systems within the potentially affected area that a VOC in excess of standards has been detected and of the need for owners to test their water systems for possible contamination. The public notice must be made within 30 days after informing the local health department of the contamination.

The essential elements of the public notice include the following:

- Identify the contaminant(s) of concern;
- Delineate the area of contamination based on the information provided by Illinois EPA by one of several methods, e.g., specifying the area of a contamination plume or listing the public roads encompassing the area of contamination;
- Inform the water system owner of the need to test the system for possible contamination;
- State that a list of certified laboratories is available upon request;
- State that fact sheets pertaining to the contaminant are available upon request; and
- Provide IDPH or local health department's contact person.

From July of 2002 through July of 2011, IDPH and local health departments processed 59 public notices of such contamination.

Section 13. Continue implementation of the Safe Drinking Water Information System for compliance monitoring of non-community public water supplies.

IDPH contracted the company that developed the Safe Drinking Water Information System (SDWIS) to convert and migrate Illinois EPA's old database. IDPH began using SDWIS 8.0 as its sole database and uploaded historical data in late 2004. Since then, all new inventory, sampling, and violation data have been entered into this system. In December 2010, IDPH upgraded the SDWIS 8.0 to the newer Web-based SDWIS 2.3 system.

CHAPTER X. GROUNDWATER QUALITY PROTECTION RECOMMENDATIONS AND FUTURE DIRECTIONS

The following groundwater protection efforts are recommended for the next two years (2012 and 2013) based on the results of the self-assessment and environmental indicators presented in this report. In some tasks, the priority may be shifted due to funding constraints. The following recommendations are organized by the results provided in the preceding chapters.

Interagency Coordinating Committee on Groundwater Operations

- Work with the Interagency Coordinating Committee on Groundwater and regional groundwater protection committees to sponsor a Groundwater Protection Policy Forum.
- Continue to assist the Groundwater Advisory Council in the review and development of recommendations pertaining to groundwater quality and quantity issues.
- Continue the policy discussion concerning the integration of wellhead protection areas with Tiered Approach for Corrective Action Objectives.
- Continue the subcommittee led by the Illinois Department of Public Health to discuss tracking and registering groundwater monitoring wells.

Groundwater Advisory Council Operations

- Conduct policy-related meetings in order to review and make recommendations regarding groundwater issues and policies.
- Provide input to programs, plans, regulatory proposals, and reports, as appropriate.

Education Program for Groundwater Protection

- Market the American Water Works Association source water protection standards.
- Conduct source water protection workshops.
- Integrate groundwater education efforts into other state environmental planning and protection programs.

Groundwater Evaluation Program

- Continue to conduct a program of basic and applied groundwater research programs that allow decisions to be made on sound scientific principles.
- Strive to implement monitoring for emerging contaminants, including but not limited to chromium-6 and Perfluorinated chemicals.
- Update source water assessment fact sheets with information from Right-to-Know, Groundwater Rule evaluations, and field inspections.
- Evaluate trend data collected from ambient community water supply network to publish in the Integrated Report, and summarize the data in the next Illinois Groundwater Protection Act Biennial Report.

Right-to-Know Initiatives

- Continue efforts of providing notification for potable resource groundwater users threatened by groundwater contamination.

Groundwater Quality Regulations

- Continue with proposed changes to the groundwater quality standards and continue efforts of protecting future beneficial uses of drinking water.

Wellhead Protection Program

- Continue the process of stakeholder input and amend rules to require the development of source water protection planning.
- Continue to integrate groundwater into watershed plans.
- Pilot closure of Class V Motor Vehicle underground injection wells within wellhead protection areas.

Regional Groundwater Protection Planning Program

- Continue to assist and advocate local groundwater protection, education, and marketing.

Non-Community and Private Well Program

- Continue to implement the Wellhead Protection Program and assist with implementing the technology control and groundwater quality standards regulations.
- Continue the source water assessments for new non-community public water supplies.
- Continue geographic information system coverage for all new non-community public water supplies.
- Continue certification training of non-transient non-community public water supply operators.
- Continue to inspect and perform laboratory analyses on water samples collected from non-community public water supplies.
- Continue to issue permits for the construction, modification or extension of existing non-community public water supplies.
- Continue the issuance of permits for all types of water wells with the exception of community water supply wells.
- Continue to update the Illinois Water Well and Pump Installation Codes to reflect new technology, industry, and public health standards.
- Continue supporting education training sessions for licensed water well and pump installation contractors.
- Begin the certification and registration of closed-loop well contractors.
- Begin the permitting and inspection of the construction of closed-loop well systems.
- Continue to conduct training sessions pertaining to both the non-community public water supply and private-water program for local health department and Illinois Department of Public Health water program staff.
- Continue implementation of Public Notification for Private Water Supply Potential Contamination.
- Continue implementation of the Safe Drinking Water Information System database for compliance monitoring of non-community public water supplies.

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