ILLINOIS POLLUTION CONTROL BOARD
October 4, 2012

IN THE MATTER OF:	)	
	)	
PROPOSED AMENDMENTS TO	)	R08-18
GROUNDWATER QUALITY STANDARDS	)	(Rulemaking - Public Water Supply)
(35 ILL. ADM. CODE 620)	)	

Adopted Rule. Final Order.

OPINION AND ORDER OF THE BOARD (by T.A. Holbrook):

Today the Board adopts final amendments to the Part 620 groundwater quality rules (35 Ill. Adm. Code 620). The rules include updates based upon new scientific data, federal amendments, and technical references. The amendments add groundwater quality standards or "GQS" for chemical constituents detected in Illinois groundwater that have established toxicity values or that have groundwater remediation objectives under the Tiered Approach to Corrective Action Objectives (TACO) (35 Ill. Adm. Code 742). In all, 39 chemical constituents are added. Additionally, revision is made to the Class I groundwater quality standard for arsenic. The final amendments adopted today are substantively unchanged from those proposed by the Board at first and second notice.

This rulemaking was initiated when the Illinois Environmental Protection Agency (Agency) filed a proposal with the Board under Section 27 of the Environmental Protection Act (Act) (415 ILCS 5/27 (2010)). After conducting two public hearings and considering the entire record, including public comments and Agency *errata* sheets, the Board adopted for first notice the amendments ultimately proposed by the Agency, with minor modifications. Publication of the first-notice amendments in the *Illinois Register* (35 Ill. Reg. 18502 (Nov. 14, 2011)) began a 45-day public comment period, during which the Board received no public comments. The Board adopted the proposed amendments for second notice on August 9, 2012. The Board's second-notice amendments reflected only several minor changes to the rule amendments proposed at first notice.

On September 11, 2012, the Joint Committee on Administrative Rules (JCAR) issued a certification of no objection concerning the amendments proposed by the Board at second notice. With this final adoption, the Board makes only several minor changes to the second-notice rule amendments at the suggestion of JCAR. The Board now files the adopted amendments with the Secretary of State for publication in the *Illinois Register* as final rules.

In this opinion, the Board first sets forth the procedural history of the rulemaking. The Board then gives background on the existing groundwater quality rules. Next, the Board discusses the proposal adopted today, along with the key issues raised during this rulemaking and how the Board resolved them. The final amendments themselves are set forth in the order following this opinion.

PROCEDURAL HISTORY

The Agency filed its rulemaking proposal on February 19, 2008, which included a "Statement of Reasons" (SOR). On March 20, 2008, the Board accepted the Agency's proposal for hearing. The Agency filed five *errata* sheets, each proposing rule language changes to its proposal. *Errata* sheet number one was filed on April 11, 2008 (*Errata* 1); *errata* sheet number two on May 29, 2008 (*Errata* 2); *errata* sheet number three on July 11, 2008 (*Errata* 3); *errata* sheet number four on September 11, 2008 (*Errata* 4); and *errata* sheet number five on February 17, 2011 (*Errata* 5).

The Board held two public hearings, each of which was preceded by the pre-filing of testimony pursuant to hearing officer order. The first hearing took place in Chicago on June 18, 2008 (Tr.1). Two persons testified, both on behalf of the Agency: (1) Richard Cobb, licensed professional geologist and Deputy Manager of the Division of Public Water Supplies of the Agency's Bureau of Water; and (2) Thomas Hornshaw, PhD, Manager of the Agency's Toxicity Assessment Unit. The hearing officer entered three exhibits into the record at the first hearing, including the pre-filed testimony of Mr. Cobb (Cobb PFT1) and Dr. Hornshaw (Hornshaw PFT1). On July 11, 2008, the Agency filed a motion to correct the first hearing's transcript, which the hearing officer granted on the record at the second hearing. Tr.2 at 36; *see also id*. at 36-37 (hearing officer's further correction of transcript).

The second hearing took place in Springfield on July 16, 2008 (Tr.2). All those who testified at the first hearing also testified at the second hearing. In addition, the Agency presented the testimony of Gary King, then Acting Chief for the Agency's Bureau of Land. On July 11, 2008, the Agency pre-filed the collective testimony of Mr. King, Mr. Cobb, and Dr. Hornshaw (Agency PFT2). Also at the Springfield hearing was Brian H. Martin, who testified on behalf of the Site Remediation Advisory Committee (SRAC) and the Illinois Environmental Regulatory Group (IERG).[1] Mr. Martin, a Consulting Environmental Scientist at Ameren Services, represents the Illinois Manufacturers' Association as Chairman of SRAC and is the Chairman of the IERG Corrective Action Work Group. The hearing officer entered four exhibits into the record at the second hearing: Agency map entitled "CWS [Community Water System] Facilities Currently Exceeding the New Arsenic MCL [Maximum Contaminant Level] of 0.010 mg/L" (Exh. 4); "Distribution of Arsenic in the Mahomet Aquifer of Central Illinois, USA," Wilson, Kelly, Roadcap, & Holm, Illinois State Water Survey, Groundwater Section (Exh. 5);

[1] SRAC was established under Section 58.11(a) of the Act (415 ILCS 5/58.11(a) (2010)) as a 10-member committee appointed by the Governor to, among other things, "[r]eview, evaluate, and make recommendations regarding State laws, rules, and procedures that relate to site remediations." 415 ILCS 5/58.11(b)(1) (2010). SRAC members are from the Illinois Chamber of Commerce, the Illinois Manufacturers' Association, the Chemical Industry Council of Illinois, the Consulting Engineers Council of Illinois, the Illinois Bankers Association, the Community Bankers Association of Illinois, the Illinois Association of Realtors, and the National Solid Waste Management Association. IERG is a not-for-profit Illinois corporation affiliated with the Illinois Chamber of Commerce and is composed of 56 member companies in the environmental regulated community.

Agency response to IERG comments (Exh. 6); and the pre-filed testimony of Mr. Martin (Martin PFT2). On August 11, 2008, the Agency filed a motion to correct the second hearing's transcript, which the hearing officer granted by order of September 5, 2008.

As required by Section 27(b) of the Act (415 ILCS 5/27(b) (2010)), the Board requested that the Department of Commerce and Economic Opportunity (DCEO) conduct an economic impact study on this rulemaking. The Board's request, dated March 26, 2008, was placed in this rulemaking's docket. DCEO did not respond to the Board's request. At the first hearing, the hearing officer noted the Board's request and DCEO's lack of response, on which no one chose to testify. Tr.1 at 64-65.

The Board received two public comments. The Agency filed a public comment on September 11, 2008 (PC1). IERG filed a public comment on September 12, 2008 (PC2). On February 17, 2011, the Agency filed a motion to amend its proposal (Mot.). In a May 2, 2011 order, the hearing officer granted the motion.

On October 20, 2011, the Board adopted its first-notice opinion and order. The amendments proposed for first notice were published in the *Illinois Register* on November 14, 2011, which began the 45-day public comment period. *See* 31 Ill. Reg. 18502 (Nov. 14, 2011). The Board received no public comments after the first-notice publication. On August 9, 2012, the Board adopted its opinion and order for second notice. On September 11, 2012, JCAR issued a certification of no objection concerning the second-notice rule amendments to Part 620.

BACKGROUND ON GROUNDWATER QUALITY STANDARDS

The Board's Part 620 groundwater quality rules (35 Ill. Adm. Code 620) implement provisions of both the Act (415 ILCS 5 (2010)) and the Illinois Groundwater Protection Act (IGPA) (415 ILCS 55 (2010)). In the IGPA, the General Assembly states that:

> it is the policy of the State of Illinois to restore, protect, and enhance the groundwaters of the State, as a natural and public resource. The State recognizes the essential and pervasive role of groundwater in the social and economic well-being of the people of Illinois, and its vital importance to the general health, safety, and welfare. It is further recognized as consistent with this policy that the groundwater resources of the State be utilized for beneficial and legitimate purposes; that waste and degradation of the resources be prevented; and that the underground water resource be managed to allow for maximum benefit of the people of the State of Illinois. 415 ILCS 55/2(b) (2010).

The Board's groundwater quality rules were originally adopted in November 1991 pursuant to the IGPA and the Act. *See* Groundwater Quality Standards (35 Ill. Adm. Code 620), R89-14(B) (Nov. 7, 1991) (R89-14(B) GQS). Generally, the rules include groundwater classifications, nondegradation provisions, groundwater quality standards, and various procedures and protocols to manage and protect groundwater. *See* 35 Ill. Adm. Code 620.105.

In its final opinion of R89-14(B) GQS, the Board observed that "it expects from the Agency regular updates of the groundwater standards." *See* R89-14(B) GQS, slip op. at 19. The Agency has likewise noted in this rulemaking that:

> to prevent waste and degradation of the resource and manage groundwater so that the People of the State may continue to get the maximum benefit from the resource, it is periodically necessary to amend the Groundwater Quality Standards to account for new scientific data, update the groundwater standards that have been amended at the federal level, update technical references that are in the Incorporations by Reference, and address any additional groundwater parameters that have been discovered. SOR at 2.

To that end, the Agency stated that the purpose of its proposed amendments here is to "keep the regulations current as the science and technical data behind the standards evolves." *Id*.

Before filing this proposal, the Agency conducted two "outreach sessions" to allow for input on the Agency's draft amendments. SOR at 2. The first session was attended by consultants, environmental groups, other State agencies, and representatives of the Groundwater Advisory Council and the Interagency Coordinating Committee on Groundwater. *Id*. at 2-3. The Groundwater Advisory Council and the Interagency Coordinating Committee on Groundwater were established under the IGPA.[2] The second session was attended by members of IERG. *Id*. at 3.

The Board has amended the groundwater quality rules five times over the years. The rules were last amended in 2002, at which time the Board added standards for methyl tertiary-butyl ether (MTBE). *See* Proposed MTBE and Compliance Determination Amendments to Groundwater Quality Standards: 35 Ill. Adm. Code 620, R01-14 (Jan. 24, 2002). Before that, the Board in 1997 adopted amendments to conform the groundwater quality rules to the Site Remediation Program (SRP). *See* Site Remediation Program (Brownfields) and Groundwater Quality (35 Ill. Adm. Code 740 and 35 Ill. Adm. Code 620), R97-11 (June 5, 1997).

OVERVIEW OF THE BOARD'S MAIN FINDINGS AT FIRST NOTICE

The Board's first-notice findings, which were unchanged and adopted at second notice, remain unchanged and are adopted at final notice. To keep the Part 620 groundwater quality rules current with the latest science and technical data, the Board proposed amendments for first notice, most notably adding groundwater quality standards for 39 chemicals constituents and revising the Class I standard for arsenic to reflect the updated federal Maximum Contaminant

[2] The Groundwater Advisory Council is comprised of environmental, business, public water supply, county and municipal government, regional planning, and water well driller interest group representatives. The Interagency Coordinating Committee on Groundwater is chaired by the Agency and consists of the Illinois Department of Public Health, the Illinois Department of Natural Resources, the Illinois Department of Agriculture, the Illinois State Fire Marshal, the Department of Commerce and Economic Opportunity, and the Illinois Emergency Management Agency. *See* 415 ILCS 55/4, 5 (2010).

Level (MCL). The following is a brief summary of the main findings made by the Board in its first-notice opinion of October 20, 2011. *See* Proposed Amendments to Groundwater Quality Standards (35 Ill. Adm. Code 620), R08-18 (Oct. 20, 2011) (R08-18 GQS).

First, the Board found that the Agency appropriately relied upon the revised toxicity hierarchy of the United States Environmental Protection Agency (USEPA) to account for new scientific data in proposing updates to the Board's groundwater quality standards. *See* R08-18 GQS, slip op. at 9-11. Next, the Board found that the addition to Part 620 of 39 chemical constituents detected in Illinois groundwater that have established toxicity values or groundwater remediation objectives in TACO is consistent with the IGPA (415 ILCS 55 (2010)) and the Act. *Id.* at 11-12. In response to concerns expressed by IERG about monitoring for chemicals that may be uncommon in Illinois groundwater, the Board found that a primary purpose behind the IGPA and the Act is to protect groundwater, which requires being preventive and avoiding degradation, not waiting until contaminants are widespread. *Id*. at 12-14.

The Board also found that the bases upon which the Agency proposed the Class I and Class II groundwater quality standards are well justified in USEPA's MCL, toxicity databases, and other sources. *See* R08-18 GQS, slip op. at 14-17. IERG expressed concern regarding the Agency's reliance upon the National Academy of Sciences' 1972 *Water Quality Criteria* document in basing some Class II standards upon livestock watering or irrigation factors. The Board found that the Agency properly relied upon the 1972 document because some Class II standards are based upon support of a use other than potability (*e.g.*, livestock watering, irrigation, industrial use) where the different use requires a more stringent standard. *Id.* at 18.

Finally, IERG, the most active regulated community participant in this rulemaking, stated that "[m]any of the concerns raised by IERG members [with the Agency's proposal] will be addressed if the solubility basis for deriving standards is removed . . . and if molybdenum is removed from the proposal." PC2 at 1. The Agency eventually withdrew both the water-solubility basis and molybdenum from its proposal. *See* R08-18 GQS, slip op. at 26. The Board found that basing groundwater quality standards upon water solubility would cause unintended consequences by resulting in TACO remediation objectives not based upon risk. *Id*. at 18. In addition, the Board found that by removing molybdenum from the proposal, the risk of negatively impacting corrective actions and landfill programs, as well as the beneficial use of coal combustion by-products, would be avoided, while providing the opportunity to better assess the health effects and natural occurrence of the chemical. *Id*. at 21. The Board also proposed changing the Class I groundwater quality standard for arsenic from 0.050 milligrams per liter (mg/L) to 0.010 mg/L to reflect USEPA's updated arsenic MCL of 10 parts per billion (ppb). *Id*. at 21-22

Finally, the Board found that based upon this record, the amendments proposed at first notice would not impose an economic or technical burden significantly different from that resulting from prior Part 620 rulemakings or have an adverse economic impact upon the people of Illinois. *See* R08-18 GQS, slip op. at 26.

DISCUSSION

Here, the Board discusses in detail the first-notice proposal, as well as the most significant issues for this rulemaking, all of which were raised prior to the Board adopting its first-notice opinion and order. The Board's findings at first notice were unchanged at second notice and they remain unchanged here at final adoption. The Board reiterates that (1) no public comments have been filed since publication of the first-notice amendments; (2) at second notice, the Board adopted the first-notice rule language without any substantive changes; and (3) now the Board adopts, as final amendments, the second-notice rule language without any substantive changes.

This portion of the opinion has four main parts. First, the Board provides an overview of the first-notice proposal. Second, the Board discusses how it addressed the key issues raised at hearing and in public comment: (1) toxicity information hierarchy; (2) additional chemical constituents proposed; (3) bases for the proposed Class I standards; (4) bases for proposed Class II standards; (5) Class I and Class II standards based upon water solubility versus risk; (6) Class II standards based upon irrigation and livestock watering; and (7) beneficial use of coal combustion by-products containing molybdenum or other metals. Third, the Board briefly discusses some minor revisions to the Agency's proposal made at first notice. Fourth and finally, the Board discusses the findings made at first notice regarding the proposed amendments' economic reasonableness and technical feasibility.

Overview of the First-Notice Proposal

The Board's first-notice proposal made no substantive changes to the Agency's original proposal, as amended through five Agency *errata* sheets. The changes in rule language proposed at first notice would update Part 620 (35 Ill. Adm. Code 620) based upon new scientific data, federal amendments, and technical references. Groundwater quality standards were added for 39 chemical constituents, while the Class I arsenic standard was revised. Also included at first notice were amendments to various definitions, provisions for preventive response levels, compliance determinations, monitoring and analytical requirements, and health advisories, along with amendments to Part 620 Appendices A through D.

Wellhead Protection Area (WHPA)

Among definitional changes for first notice was a newly-added definition of "Wellhead Protection Area" or "WHPA." The definition, which comes from the Board's Primary Drinking Water Standards (35 Ill. Adm. Code 611.101), read as follows:

> the surface and subsurface recharge area surrounding a community water supply well or well field, delineated outside of any applicable setback zones (pursuant to Section 17.1 of the Act (415 ILCS 5/17.1)), and pursuant to Illinois' Wellhead Protection Program, through which contaminants are reasonably likely to move toward such well or well field. *See* proposed Section 620.110.

Mr. Cobb testified that a WHPA "represents a CWS [Community Water System] well's recharge area delineated beyond an applicable setback zone." Cobb PFT1 at 9, citing 415 ILCS 5/17.1(a)(2) (2010) (also referred to as a "contributing recharge area" or "capture zone"). The proposed WHPA definition is used in connection with two documents newly proposed for incorporation by reference: "Guidance Document for Groundwater Protection Needs Assessments"; and "The Illinois Wellhead Protection Program Pursuant to Section 1428 of the Federal Safe Drinking Water Act." *See* proposed Section 620.125. Both documents and the WHPA definition would be used to enhance hydrogeologic assessments for compliance determinations under proposed Section 620.505(a)(5)(A). Cobb PFT1 at 9-10.

The definition of "Wellhead Protection Program" or "WHPP," likewise taken from the Primary Drinking Water Standards, was also proposed for addition at first notice. Mr. Cobb explained that the WHPP definition "elaborates" upon the WHPA definition and the two new incorporations by reference and "provides the nexus between a WHPP and a groundwater protection needs assessment." Cobb PFT1 at 9. The Board further discusses WHPAs and WHPPs below in the section on compliance determinations.

Preventive Response Activities

At first notice, the Board proposed to add preventive response levels based upon a statistically significant increase above background for chemical constituents with proposed Class I standards but not classified as carcinogens. Cobb PFT1 at 10. The chemicals follow: acenaphthene; acetone; anthracene; benzoic acid; carbon disulfide; 2-butanone (MEK); dicamba; dichlorodifluoromethane; 1,1-dichloroethane; diethylphthalate; di-n-butyl phthalate; fluoranthene; fluorine; isopropylbenzene (cumene); MCPP (mecoprop); 2-methylnaphthalene; 2-methylphenol; naphthalene; pyrene; trichlorofluoromethane; and vanadium. *See* proposed Section 620.310(a)(3)(A)(ii).

Groundwater Quality Standards

The Board's first-notice amendments:

1. Added Class I (Potable Resource Groundwater[3]) and Class II (General Resource Groundwater) groundwater quality standards for two additional inorganic chemical constituents and 29 additional organic chemical constituents;

2. Revised the existing Class I groundwater quality standard for arsenic from 0.05 mg/L to 0.010 mg/L;

[3] "Potable" means "generally fit for human consumption in accordance with accepted water supply principles and practices." 35 Ill. Adm. Code 620.110, quoting 415 ILCS 5/3.65 (2010); *see also* 415 ILCS 55/3(h) (2010) (same).

3. Added a new category of chemical constituents (with corresponding Class I and Class II groundwater quality standards) called "explosive constituents," of which there would be eight;

4. Added the eight explosive constituents for which the Class IV (Other Groundwater) groundwater quality standards within a previously mined area would be the existing concentrations of the constituents; and

5. Provided alternative groundwater quality standards for the eight explosive constituents after completion of reclamation at a coal mine.

The following 39 chemical constituents and associated Class I and Class II groundwater quality standards were added at first notice:

Groundwater Quality Standards For Newly-Added Constituents[4]		
Constituent	**Class I Standard (mg/L)**	**Class II Standard (mg/L)**
1. Perchlorate	0.0049	0.0049
2. Vanadium	0.049	0.1
3. Acenaphthene	0.42	2.1
4. Acetone	6.3	6.3
5. Anthracene	2.1	10.5
6. Benzo(a)anthracene*	0.00013	0.00065
7. Benzo(b)fluoranthene*	0.00018	0.0009
8. Benzo(k)fluoranthene*	0.00017	0.006
9. Benzoic acid	28.0	28.0
10. 2-Butanone (MEK)	4.2	4.2
11. Carbon disulfide	0.7	3.5
12. Chloroform*	0.07	0.35
13. Chrysene*	0.012	0.06
14. Dibenzo(a,h)anthracene*	0.0003	0.0015
15. Dicamba	0.21	0.21
16. Dichlorodifluoromethane	1.4	7.0
17. 1,1-Dichloroethane	1.4	7.0
18. Diethyl phthalate	5.6	5.6
19. Di-n-butyl phthalate	0.7	3.5
20. Fluoranthene	0.28	1.4
21. Fluorene	0.28	1.4
22. Indeno(1,2,3-cd)pyrene*	0.00043	0.0022
23. Isopropylbenzene (Cumene)	0.7	3.5
24. MCPP (Mecoprop)	0.007	0.007

[4] Though the Class I standard for arsenic was proposed for revision, arsenic is not in this table because the chemical is already in Part 620.

25. 2-Methylnaphthalene	0.028	0.14
26. 2-Methylphenol	0.35	0.35
27. Naphthalene	0.14	0.22
28. P-Dioxane*	0.0077	0.0077
29. Pyrene	0.21	1.05
30. alpha-BHC (Alpha-Benzene hexachloride)*	0.00011	0.00055
31. Trichlorofluoromethane	2.1	10.5
32. 1,3-Dinitrobenzene[a]	0.0007	0.0007
33. 2,4-Dinitrotoluene*[a]	0.0001	0.0001
34. 2,6-Dinitrotoluene*[a]	0.00031	0.00031
35. HMX (High Melting Explosive, Octogen)[a]	1.4	1.4
36. Nitrobenzene[a]	0.014	0.014
37. RDX (Royal Demolition Explosive, Cyclonite)[a]	0.084	0.084
38. 1,3,5-Trinitrobenzene[a]	0.84	0.84
39. 2,4,6-Trinitrotoluene (TNT)[a]	0.014	0.014

* Denotes a carcinogen.
[a] Denotes an explosive constituent.
See proposed Sections 620.410(a)-(c), 620.420(a)-(c).

Groundwater Within a Previously Mined Area, Class IV: Other Groundwater

During various phases of mining, explosives are used. Mr. Cobb testified that it is not expected that explosive contaminant residuals will be detectable after completing reclamation of a mine (*e.g.*, excavation left after coal seam removal). Cobb PFT1 at 18. The Agency and the Office of Mines and Minerals (OMM) of the Illinois Department of Natural Resources (DNR) believe, however, that establishing a Class IV standard for explosive constituents within a "previously mined area"[5] (*see* proposed Section 620.440(c)) is important because it "moves the compliance point from the pit of the mine to the boundary of the permitted area." *Id.*; *see also* Agency PFT2 at 8-9. Consistent with monitoring programs under other Board regulations, this would establish a monitoring point to assess "the potential for off-site contamination of resource groundwater beyond the permitted boundary." Cobb PFT1 at 18. The standards would be the existing concentrations of the explosive chemicals.

[5] "Previously mined area" is defined as "land disturbed or affected by coal mining operations prior to February 1, 1983." 35 Ill. Adm. Code 620.110. The Board note attached to the definition reads: "BOARD NOTE: February 1, 1983, is the effective date of the Illinois permanent program regulations implementing the Surface Coal Mining Land Conservation and Reclamation Act [225 ILCS 720] as codified in 62 Ill. Adm. Code 1700 through 1850." *Id.*

Alternative Groundwater Quality Standards: Coal Reclamation

At first notice, explosive contaminants were added to alternative groundwater quality standards and, more specifically, to coal reclamation groundwater standards. *See* proposed Section 620.450(b)(3)(D). The existing concentrations of these contaminants, if present after reclamation, would be the applicable standards within the permitted area.

Compliance Determinations

To determine compliance with the Board's groundwater quality standards, "appropriate monitoring points are selected based on the ability to represent groundwater quality accurately." Cobb PFT1 at 19. In support of the proposed amendments to Section 620(a)(5)(A) based upon WHPAs, Mr. Cobb testified that when the Board originally adopted Part 620:

> the Groundwater Protection Needs Assessment ("GPNA") provisions of the Act (415 ILCS 5/17.1) had not been fully developed or implemented. In addition, Illinois' WHPP had not yet been approved by [USEPA]. Further, not much progress had been made with delineations during subsequent groundwater standards update proceedings. However, as a result of the source water assessment requirements and grant funding available under the 1996 SDWA amendments, over 300 WHPA's have been delineated beyond the applicable setback zones for CWS wells. These delineations have been conducted based on Illinois' *Guidance Document for Conducting Groundwater Protection Needs Assessments* and Illinois' approved WHPP. Therefore, this proposed amendment is intended to utilize this new hydrogeologic data where it is available. Cobb PFT1 at 19.

A WHPA, also known as a "contributing recharge area" or "capture zone," is the outline of groundwater flow pathlines that contribute recharge to a pumping well, which is "a subset of an overall aquifer recharge area supplying groundwater to a well." Cobb PFT1 at 20. As discussed above, proposed for first notice were definitions of "WHPA" and "WHPP" and incorporations by reference of the "Guidance Document for Groundwater Protection Needs Assessments" and the "Illinois Wellhead Protection Program." The "Guidance Document" is used to provide technical assistance in conducting WHPA modeling pursuant to Section 17.1(i) of the Act (415 ILCS 5/17.1(i) (2010)). *Id*. at 23. The proposed amendment to Section 620.505(a)(5)(A) would allow the use of "the hydrologeologic information where WHPAs have been delineated for CWS wells according to the hydrogeologic procedures" in the "Guidance Document." *Id*.

Monitoring and Analytical Requirements

Procedures for collecting samples and analytical methodologies for chemical constituent analyses were updated based upon new incorporations by reference. *See* proposed Section 620.510(b); *see also* proposed Section 620.125 (incorporations by reference).

Health Advisories

At first notice, the Board proposed to amend Section 620.605(b)(2) on the contents of Agency-issued health advisories. Specifically, if the chemical at issue is a carcinogen, the "one-in-one-million cancer risk concentration" (*i.e.*, 10^{-6} cancer risk) would have to be taken into account when establishing the guidance level for the chemical.

***Federal Register* to Code of Federal Regulations**

Numerous references in the rules to the *Federal Register* were updated to the relevant Code of Federal Regulations. *See* proposed Sections 620.110, 620.605, 620.Appendix A.

Key Issues Raised

Toxicity Information Hierarchy

Dr. Hornshaw described changes in the USEPA hierarchy for selecting the most appropriate toxicity information when evaluating a chemical. Hornshaw PFT1 at 2. On December 5, 2003, USEPA issued a memorandum concerning "Human Health Toxicity Values in Superfund Risk Assessments" (OSWER Directive 9285.7-53), which revised the hierarchy for selecting human health toxicity values. *Id*. at 2; *see* Agency PFT2 at 9, Attach. 2. The original hierarchy was issued in 1989, specifying first the use of values from USEPA's Integrated Risk Information System (IRIS), if available, or otherwise values from the most recent Health Effects Assessment Summary Tables (HEAST). If no toxicity value was available from IRIS or HEAST, then the hierarchy specified that values could be derived from literature or a request could be made to USEPA's National Center for Environmental Assessment (NCEA) for a provisional toxicity value. Hornshaw PFT1 at 2-3.

The revised hierarchy issued in 2003 still specifies the IRIS database as the first option for toxicity values, but now the second tier is USEPA's Provisional Peer Reviewed Toxicity Values (PPRTV). Hornshaw PFT1 at 3. Dr. Hornshaw noted that USEPA has moved HEAST to a third tier resource. *Id*. HEAST has not been updated since 1997. *Id*.; Tr.1 at 47. For this rulemaking, the Agency's Toxicity Assessment Unit decided to propose standards only if the chemical constituent has a reference dose (RfD) or oral slope factor (SFo) in IRIS or PPRTV.[6]

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[6] "Reference dose" is "[a]n estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. *** Generally used in EPA's noncancer health assessments." USEPA IRIS Glossary, http://www.epa.gov/iris/help_gloss.htm#c (last updated July 26, 2011). "Oral Slope Factor" is "[a]n upper bound, approximating a 95% confidence limit, on the increased cancer risk from a lifetime oral exposure to an agent. This estimate . . . is generally reserved for use in the low-dose region of the dose-response relationship, that is, for exposures corresponding to risks less than 1 in 100." *Id*.

Tr.1 at 47-48. The third tier HEAST database values are more readily subject to modification. Tr.1 at 61-62. The Agency did not rely directly upon HEAST. Tr.1 at 47.[7]

Dr. Hornshaw noted that one of the concerns with the new hierarchy of toxicity values stems from USEPA "retiring" entries on the PPRTV. Hornshaw PFT1 at 3. Originally, the Agency's Toxicity Assessment Unit decided to continue using the PPRTV toxicity information even after the retirement of a chemical. The Toxicity Assessment Unit understood that PPRTV database entries are assigned a time limit, after which the entries would be removed from the database. Besides the time limit, the Toxicity Assessment Unit was unaware of why USEPA retired chemicals from the PPRTV database, but believed retirement was not based upon the quality of the supporting data. Agency PFT2 at 9; Hornshaw PFT1 at 3; Tr.1 at 58. However, after further internal discussion and communications with USEPA, the Toxicity Assessment Unit determined that it would no longer rely upon retired PPRTVs. Mot. at 1-2. To that end, through a February 17, 2011 motion, the Agency removed di-n-octyl phthalate from its proposal because the chemical had been retired from the PPRTV.

The Board observed at first notice that USEPA's IRIS and PPRTV databases are the first and second tiers, respectively, of USEPA's latest hierarchy for toxicity information. These are nationally-accepted and peer-reviewed criteria. Agency PFT2 at 10; *see also* 415 ILCS 55/8(a) (2010) (Agency to address contaminants "which are known to cause, or are suspected of causing, cancer, birth defects, or any other adverse effect on human health according to nationally accepted guidelines"). For purposes of updating the Part 620 groundwater quality standards to account for new scientific data, the Board found in its first-notice opinion that the Agency appropriately relied upon the USEPA's revised toxicity hierarchy.

Additional Chemical Constituents Proposed

Mr. Cobb testified that "[e]ssentially the [IGPA] mandates to us to develop Groundwater Quality Standards for contaminants that have been detected and confirmed in Illinois groundwater." Tr.1 at 41. The Agency proposed amendments to the groundwater quality standards to address additional chemical constituents determined since the latest rule revisions to be present in Illinois groundwater. SOR at 2. Based upon the coordinated efforts of its Bureau of Water and Bureau of Land programs for landfill monitoring, Resource Conservation and Recovery Act (RCRA) monitoring, and federal cleanups, the Agency discovered "a substantial database of contaminants that are being found in Illinois groundwater and confirmed and quantified in Illinois groundwater that did not have groundwater quality standards." Tr.1 at 10-11.

Dr. Hornshaw stated that the Agency's Bureau of Land reviewed analytical results from many remediation activities to determine which chemical constituents had been detected in Illinois groundwater. Hornshaw PFT1 at 5. A data query was conducted for approximately 300 constituents not included in the groundwater quality standards. The data set spanned from April 1984 to April 2004. The Agency also evaluated confirmed groundwater contaminants at various

[7] HEAST was used to derive some TACO objectives. Agency PFT2 at 3.

cleanup sites. Cobb PFT1 at 8. A "master list" was developed that contained chemical constituents detected in Illinois groundwater and confirmed by re-sampling. Hornshaw PFT1 at 5. The master list consisted of chemicals detected primarily at sites involved with RCRA, solid waste disposal, the Department of Defense, or Superfund. *Id*. This list was then cross-referenced with toxicity data to determine if sufficient toxicity information was available to support developing a new groundwater quality standard. *Id*. The Agency's Toxicity Assessment Unit then determined that any chemical on the master list for which a toxicity value was available in IRIS or PPRTV (see discussion above) should be included in the proposed GQS. *Id*; Agency PFT2 at 10.

The Board found at first notice that it is consistent with the IGPA and the Act to supplement the groundwater quality standards with chemical constituents from the Agency's master list for which toxicity information is available in USEPA's nationally-accepted and peer-reviewed IRIS or PPRTV, with the exception of molybdenum, which is discussed below. Using these criteria, the following chemicals were added: 2-butanone (methyl ethyl ketone, MEK); dicamba; dichlorodifluoromethane; p-dioxane; 1,3-dinitrobenzene; HMX (high melting explosive, octogen); isopropylbenzene (cumene); mecoprop (MCPP); 2-methylnaphthalene; perchlorate; RDX (royal demolition explosive, cyclonite); trichlorofluoromethane; 1,3,5-trinitrobenzene; and 2,4,6-trinitrotoluene (TNT). Hornshaw PFT1 at 5.

The Agency also determined that it would be appropriate to include any chemical from the master list that has a groundwater remediation objective in TACO (35 Ill. Adm. Code 742.Appendix B, Table E[8]), but presently lacks Class I and Class II groundwater quality standards. Hornshaw PFT1 at 5-6. At the first hearing, Alec Davis, General Counsel for IERG, questioned why the Agency proposed adding new chemical constituents to the GQS based upon the chemicals having groundwater remediation objectives in TACO. Tr.1 at 41. The Agency explained that the Bureau of Land permit programs and federal cleanup programs do not always use the TACO rules, but instead look to the Board's groundwater quality standards. Tr.1 at 42. Dr. Hornshaw emphasized that the Agency's approach would ensure that the groundwater quality standards and the TACO rules are consistent. Hornshaw PFT1 at 5.

In its first-notice opinion, the Board found the Agency's reliance upon TACO to be sound and noted that IERG had not raised this matter since the first hearing. Using TACO in this fashion, the following chemicals were added: acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzoic acid; alpha-BHC (alpha-benzene hexachloride); carbon disulfide; chloroform; chrysene; dibenzo(a,h)anthracene; di-n-butyl phthalate; diethyl phthalate; 2,4-dinitrotoluene; 2,6-dinitrotoluene; fluoranthene; fluorene; indeno(1,2,3-c,d)pyrene; 2-methyiphenol; naphthalene; nitrobenzene; pyrene; and vanadium. Hornshaw PFT1 at 6.

IERG did remain concerned, however, over the procedure the Agency used to define contaminants as being "commonly detected" in Illinois groundwater. Martin PFT2 at 3. At the second hearing, Mr. Martin testified that IERG is:

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[8] Referring to the TACO table providing the "Tier 1 Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route."

> curious as to whether [the Agency's] database looks at contaminated sites such as mines, landfills, remediation sites, UST [underground storage tank] sites, things like that, or if the suggestion that these compounds are commonly occurring is suggestive that it somehow represents groundwater in the state and this is a wider-spread issue. Tr.2 at 29.

IERG agreed with the Agency's decision to consider a chemical constituent to be "commonly detected" if it had ten or more detections in the Agency's database of Illinois groundwater during the past 20 years. PC2 at 7-8. IERG suggested, however, that that the "diversity of locations" must also be taken into account because some chemicals only occur at sites of unique character. PC2 at 8. For example, IERG stated that "some of the chemicals added in the proposal have been detected only at federal cleanup sites (such as detection of explosive contaminants at military sites)." *Id*. IERG was concerned that requiring Statewide monitoring for such chemicals would be an economic burden with no corresponding environmental benefit. Instead, IERG suggested that such chemicals be regulated on a site-specific basis. PC2 at 8, 13-14.

The Agency responded to IERG's concern by noting that the purpose of the groundwater quality standards, including nondegradation, is to protect groundwater. Exh. 6 at 1. The Agency stressed that it is bound by Section 8(a) of the IGPA, which reads:

> The Agency . . . shall propose regulations establishing comprehensive water quality *standards which are specifically for the protection of groundwater*. In preparing such regulations, the Agency shall address, to the extent feasible, *those contaminants which have been found in the groundwaters of the State* and which are known to cause, or are suspected of causing, cancer, birth defects, or any other adverse effect on human health according to nationally accepted guidelines. Exh. 6 at 1, quoting 415 ILCS 55/8(a) (2010) (emphasis by Agency); *see also* Tr.2 at 14-15.

The Agency further commented that "[w]hen new community water system ('CWS') wells are proposed, one of the key provisions under the Act (see 415 ILCS 5/15 and 5/16) and the Board regulations (see 35 Ill. Adm. Code 601.101) is obtaining the water from the best source." PC1 at 5. When test wells are drilled, samples are taken and analyzed to determine compliance with the Board's Class I groundwater quality standards. The Agency emphasized that some contaminants found in Illinois groundwater are not being analyzed because they are not included among the Board's Class I GQS. *Id*. The Agency also drew attention to "private, semi-private, and public non-community drinking water system wells," noting that such wells are not afforded the protection of the federal drinking water standards. *Id*. The Agency urged that adopting groundwater quality standards for "contaminants that are or have been detected" in Illinois groundwater is therefore "critical." *Id*.

At first notice, the Board observed initially that the term "commonly detected" comes from the IGPA, which simply states a "preference for numerical water quality standards, where possible, over narrative standards, especially where specific contaminants have been *commonly detected* in groundwater . . . ." 415 ILCS 55/8(b)(3) (2010) (emphasis added). The Board

explained that in its original groundwater quality standards rulemaking, R89-14(B) GQS, one of the criteria considered by the Board was the detection of chemical constituents in public water supply wells. In the context of cost analysis, the Board stated:

> By using data on existing incidence of groundwater contamination, the EcIS [economic impact study] investigators further assumed that costs [of remedial action for contaminated sites] could be higher for three reasons. These are that although the Agency did not report an incidence for inorganic contamination of public water supply facilities, it is highly probable that the incidence would be greater than zero. Also, since the regulations could include a greater number of VOC's [volatile organic compounds] than the Safe Drinking Water Act MCLs, a greater incidence of contamination can be expected. Lastly, the EcIS investigators believe that the actual number of cleanups required would more likely be closer to the number of facilities that exceed the detection limit than the number that exceed an MCL. The statement is based on their belief that once a contaminant is detected, groundwater contamination is already likely to exceed enforcement or potable use standards somewhere at the site[]. R89-14(B) GQS, slip op. at 22-23.

The Board also noted:

> EcIS investigators believe that the economic impact of trigger limits which would be somewhere between detection levels and potable use standards would not result in cost savings due to early detection of contamination. That is, they believe that once there is detection, there would most likely already be contamination above potable use standards somewhere on the site, which would require remediation. R89-14(B) GQS, slip op. at 23, n.19.

As the Board observed in its final opinion of R89-14(B) GQS, "these are groundwater quality standards and not cleanup standards." R89-14(B) GQS, slip op. at 24. The rules are "directed toward an early alert to, and staving off of, any increase in contamination in the sensitive groundwater/potential source situations." *Id*. at 16; *see also* 415 ILCS 5/12(a) (2010); 35 Ill. Adm. Code 620.301(a). The Board found at first notice that a primary purpose behind the IGPA and the Act, as the Agency argued (Exh. 6 at 1; Tr.2 at 15), is to protect groundwater, which requires being preventive and avoiding degradation, not waiting until contaminants are widespread. *See*, *e.g.*, 415 ILCS 5/12(a), 55/2, 8(a) (2010).

Bases for Proposed Class I Standards

As discussed below, the Board at first notice found the bases for the proposed Class I groundwater quality standards to be well justified. For each inorganic chemical, volatile organic compound (VOC), semi-VOC, pesticide, and explosive contaminant with a proposed Class I GQS, the Agency provided the basis of the corresponding proposed standard. Cobb PFT1 at 12-17; Agency PFT2 at 3-4. The Agency listed the basis for each proposed Class I standard as one of the following:

- Board and USEPA MCL
- USEPA MCL Goal (MCLG)
- IRIS RfD
- TACO groundwater remediation objective (based upon HEAST RfD)
- TACO groundwater remediation objective (based upon IRIS RfD)
- PPRTV RfD
- TACO groundwater remediation objective (based upon PPRTV RfD)
- TACO groundwater remediation objective (based upon Acceptable Detection Limit (ADL), equivalent to Practical Quantitation Limit (PQL))
- Water solubility (The Agency later withdrew this basis, as discussed below.)
- 10^{-6} cancer risk[9] (based upon California Environmental Protection Agency SFo)
- 10^{-6} cancer risk (based upon IRIS SFo)

Cobb PFT1 at 12-13, 17; Agency PFT2 at 2-4; Tr.1 at 44.

Mr. Cobb testified that:

> [m]ost of the original groundwater standards for organic compounds were based on U.S. EPA MCLs. Best Available Treatment ("BAT") technology removal efficiencies are published in the CFR [Code of Federal Regulations] and 35 Ill. Adm. Code 611 [Primary Drinking Water Standards], Subpart F [MCLs and BAT]. However, none of the contaminants in this proposal, with the exception of arsenic standard, has a codified MCL. Thus, the Illinois EPA used some of the same factors used by U.S. EPA to develop BAT surrogates.[10] Cobb PFT1 at 14.

The Agency provided the values for the RfD and SFo used as a basis for some of the proposed Class I standards. Agency PFT2 at 3-4. The Agency also listed the values for the RfD and SFo that were used to derive the TACO groundwater remediation objectives, which were in turn used as the basis for some of the proposed groundwater standards. *Id*. The Agency clarified that where the health-based numbers were below the PQL, the Agency used the TACO objectives based upon the PQL. *Id*. at 5. The ADL mentioned above and in the Agency's pre-filed testimony for the second hearing (Agency PFT2) is equivalent to the PQL described by the Agency.

Among the updates proposed at first notice was substituting Class I groundwater standards based upon the 10^{-6} cancer risk level for those based upon PQLs for carcinogens that do not have MCLs. The Agency noted that the PQLs were used in the 1980's, but since 1991, the 10^{-6} cancer risk level has become widely accepted and is used in the Board's TACO regulations. Cobb PFT1 at 11; Tr.1 at 17.

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[9] 10^{-6} risk equals 1-in-1,000,000 risk.

[10] "Best available technology" or "BAT" means "the best technology, treatment techniques, or other means that USEPA has found are available for the contaminant in question. BAT is specified in Subpart F of this Part [611]." 35 Ill. Adm. Code 611.101.

The proposed Class I standard of 0.07 mg/L for chloroform is based upon the MCLG instead of the 10^{-6} cancer risk. The latter would result in a value of 0.0027 mg/L. Agency PFT2 at 2. The IRIS RfD was used by USEPA as the basis for promulgating a final MCLG of 0.07 mg/L in the "Stage 2 Disinfectants and Disinfectants Byproducts Rule." *Id*. Even though the MCLG is the greater of the two values (0.07 vs. 0.0027 mg/L), the Agency prefers the MCLG to the 10^{-6} cancer risk because the MCLG was taken from a promulgated federal rule and is considered by USEPA to be protective against cancer and non-cancer effects. Tr.2 at 24-25; Agency PFT2 at 2.[11]

Bases for Proposed Class II Standards

As discussed below, the Board at first notice found the bases for the proposed Class II groundwater quality standards to be well supported in the record. For each inorganic chemical, VOC, semi-VOC, pesticide, and explosive contaminant with a proposed Class II groundwater quality standard, the Agency provided the basis of the corresponding proposed standard. Cobb PFT1 at 14, 16-17; Agency PFT2 at 3-4. The Agency listed the basis for each proposed Class II standard as one of the following:

- Irrigation (discussed below)
- 1X Class I (also denoted as "0X")
- 5X Class I
- Treatment factor
- TACO groundwater remediation objective (based upon IRIS RfD)
- Water solubility (The Agency later withdrew this basis, as discussed below.)

Cobb PFT1 at 14, 16-17; Agency PFT2 at 3-4.

Several of the proposed Class II standards are based upon treatability (1X Class I, 5X Class I). The Agency explained that the notations "0X", "1X", and "5X" refer to the treatability or treatment factor, which represents a multiple of the Class I standard. Mr. Cobb recited a portion of the Board's final opinion in R89-14(B) GQS: "'Among the factors considered in determining the Class II numbers are the capabilities of treatment technologies to bring Class II waters to qualities suitable for potable use . . . . Thus, many Class II standards are based on MCL's as modified to reflect treatment capabilities.'" Cobb PFT1 at 13-14, quoting R89-14(B) GQS, slip op. at 19. Mr. Cobb testified that the Agency generally uses an 80% value, corresponding to a five-fold treatability factor ("5X"), as an economically reasonable value even though treatability of these constituents might be closer to 99%. Mr. Cobb noted that where "0X" appears, he should have used "1X," *i.e.*, for those constituents listed with a treatability factor of "0X," there is currently no BAT technology, so the Class II groundwater standard is the same as the Class I standard. Tr.1 at 31-33.

[11] The National Primary Drinking Water Regulations, Stage 2 Disinfectants and Disinfection Byproducts Rule can be found at 40 C.F.R. Parts 9, 141, and 142. Tr.2 at 24; PC1 at 3. The rulemaking was published at 71 Fed. Reg. 387-493 (Jan. 4, 2006) and 74 Fed. Reg. 30953-59 (June 29, 2009).

The 5X treatability factor was applied to organic compounds with a partition or sorption coefficient (K_{oc}) value greater than ethylbenzene's (363 liters/kilogram (L/kg) at 20^{o} C) or a Henry's Law Constant (H') greater than methylene chloride's (8.98×10^{-2} unitless at 20^{o} C). These values were used as benchmarks for treatability. Treatment by carbon adsorption is contingent upon a contaminant's K_{oc}, which correlates to the amount of contaminant that can be adsorbed by carbon. Treatment by air stripper is contingent upon a contaminant's Henry's Law Constant, which correlates to the difficulty in removing contaminants. Cobb PFT1 at 14-16; *see also* PC1 at 7. The Agency elaborated that the same treatability factors were considered in deriving the TACO Class II groundwater objectives. Tr.1 at 52-53; Agency PFT2 at 6.

Although the Agency's original proposal used the 5X treatability factor to derive a Class II GQS for mecoprop (MCPP), the Agency later stated that the 5X factor was not applicable and therefore revised the value. *Errata* 4; PC1 at 7. The Agency explained that if the K_{oc} is greater than 320 L/kg or the H' is greater than 9.02E-02, then the chemical is considered treatable, and the Class II groundwater quality standard should be 5X the Class I standard. Because the K_{oc} is 18.4 L/kg and the H' is 7.E-09 for MCPP, it is not considered treatable, and the Class II GQS for the chemical should equal the Class I standard. PC1 at 7.

The 1X treatability factor was applied to all of the proposed explosive compounds because no BAT studies were available for these contaminants. Tr.1 at 56; Agency PFT2 at 8.

Class I and Class II Standards Based upon Water Solubility Versus Risk

For contaminants where the 10^{-6} cancer risk level exceeds water solubility, the Agency's initial proposal included a provision for the water solubility to be the basis for the Class I and Class II groundwater quality standards. The Agency explained that basing standards upon water solubility was intended to address organic chemicals that might be present in a "two-phase system." Cobb PFT1 at 11. Where concentrations of an organic chemical in groundwater exceed its solubility, the Agency pointed out that a two-phase system might exist and that the behavior and migration of the chemical is difficult to predict. *Id*. The Agency indicated that contaminant transport models used to establish cleanup objectives do not accommodate two-phased contaminants. Tr.1 at 12, 17.

IERG was concerned that basing standards upon water solubility rather than contaminant health risks would have "unintended, but significant, consequences" for cleanups under TACO (35 Ill. Adm. Code 742). Martin PFT2 at 3-4. SRAC informed the Agency that using water solubility rather than chemical health risks would result in TACO remediation objectives not based upon a risk-based approach. Tr.2 at 10. As the Agency explained:

> The concern is that where groundwater quality standards are based on contaminant solubility rather than contaminant health risks[,] the TACO groundwater *and soil* remediation objectives for those contaminants will no longer have a risk-based approach. *** For example, for the contaminant anthracene, the existing [TACO] Tier 1 soil remediation objective ("RO") for residential properties for the soil component of the groundwater ingestion exposure route is 12,000 mg/l, which would protect drinking water uses in Class I

> groundwater. If the groundwater quality standard is based on solubility (.043 mg/l) instead of risk to drinking water users (2.1 mg/1), then the calculated Tier 1 soil RO would drop two orders of magnitude from 12,000 mg/kg to 43 mg/kg. Agency PFT2 at 7 (emphasis in original).

Mr. King acknowledged that TACO and the Part 620 groundwater quality standards are closely related, and that changes in this rulemaking would be incorporated into proposed amendments for TACO. Tr.2 at 9. The Agency explained the "close nexus" between TACO and Part 620, noting that the groundwater remediation objectives in TACO were generally taken from Part 620 or were developed using Part 620 methodologies to protect groundwater users. Agency PFT2 at 7. As the Part 620 standards have changed over the years, corresponding changes have also been made to TACO. *Id*.

Additionally, Mr. King observed that one of the reasons the TACO rules have been so effective in allowing cleanups to move forward is because the rules take a risk-based approach to remediation, as embodied in Tiers 1, 2, and 3 of TACO. Tr.2 at 8-9; Agency PFT2 at 6-7. The risk-based principle allows remediation objectives to be "tailored" to the specific contaminant risks at a site. Agency PFT2 at 7. The Agency commented on another principle of the TACO rules that has contributed to their effectiveness since they were adopted in 1997: the "speed bump" of Subpart C of the TACO rules. *Id*. The speed bump principle provides a means for the contaminant source materials to be removed from a site (*e.g.* requiring that free product be removed before groundwater can be excluded as a pathway). *Id*.

In response to the concerns raised by IERG and SRAC, Mr. King agreed that the proposal to base groundwater quality standards upon water solubility would cause unintended consequences by resulting in TACO remediation objectives not based upon risk. The Agency decided that "TACO should continue the risk-based approach it has followed to date." Agency PFT2 at 7. The Agency accordingly removed all references in its proposal to using water solubility as a basis for GQS. Tr.2 at 10; Agency PFT2 at 7-8. To avoid the unintended and undesirable impacts to TACO described above, the Board at first notice based no groundwater quality standards upon water solubility.

Class II Standards Based upon Irrigation and Livestock Watering

For Section 620.420(a), the Agency proposed adding Class II groundwater quality standards for the following inorganic chemical constituents: molybdenum; perchlorate; and vanadium. These proposed Class II standards were based upon irrigation and livestock watering factors from the National Academy of Sciences, 1972, *Water Quality Criteria*. Cobb PFT1 at 14; Agency PFT2, Attach. 1. IERG raised concerns about the Agency relying upon the 1972 *Water Quality Criteria* document to determine the suitability of groundwater for such uses in Illinois. Martin PFT2 at 7.

The Board found at first notice that the Agency properly relied upon the 1972 *Water Quality Criteria*. The Board noted that some current Class II groundwater standards were based upon livestock or irrigation factors using the 1972 *Water Quality Criteria* document, including arsenic, beryllium, boron, cadmium, chromium, cobalt, lead, manganese, mercury, nickel,

nitrate, and zinc. Tr.2 at 16-18; Exh. 6 at 2. As the Agency observed, the Board's final opinion in R89-14(B) GQS stated:

> Section 620.420 establishes standards for Class II: General Resource Groundwater. Because groundwaters are placed in Class II because they are quality-limited, quantity-limited, or both . . ., *it is necessary that the standards that apply to these waters reflect this range of possible attributes*. Among the factors considered in determining the Class II numbers are the capabilities of treatment technologies to bring Class II waters to qualities suitable for potable use . . . . Thus, many Class II standards are based on MCLs as modified to reflect treatment capabilities. *For some parameters[,] the Class II standards are based on support of a use other than potability (e.g., livestock watering, irrigation, industrial use) where the different use requires a more stringent standard . . . .* Exh. 6 at 2, quoting R89-14(B) GQS, slip op. at 19-20 (emphasis by Agency).

Regarding the metal molybdenum, IERG questioned why the Agency proposed the Class I standard as the Class II standard. Tr.1 at 29. The Agency explained that because the magnitude of the proposed Class I standard of 0.035 mg/L is not significantly different from the irrigation criterion of 0.01 mg/L, the Agency proposed 0.035 mg/L as the Class II standard. Agency PFT2 at 6. IERG remained concerned with the impact that a molybdenum GQS could have upon corrective action and landfill programs, as well as the use of coal combustion by-products. IERG also argued that the health effects and natural presence of molybdenum are still uncertain. PC2 at 2. As discussed below, the Agency responded to IERG's concerns by removing molybdenum from the proposed amendments. *Errata* 4.

Beneficial Use of Coal Combustion By-Products Containing Molybdenum or Other Metals

IERG was concerned that the Agency's proposed groundwater quality standards for molybdenum would hinder the use of coal combustion by-product (CCB) "in certain instances where such use is environmentally practical and makes good sense." PC1 at 6. IERG pointed out that Section 3.135 of the Act (415 ILCS 5/3.135 (2010)) regulates the beneficial use of coal combustion waste (CCW) as CCB. Of particular concern to IERG were certain beneficial uses for which the Act requires that "CCB shall not exceed Class I Groundwater Standards for metals . . . ." Martin PFT2 at 4-5, quoting 415 ILCS 5/3.135(a-5)(B) (2010). According to IERG, such uses include:

- CCB used in accordance with the Illinois Department of Transportation (IDOT) standard specifications, but not for IDOT projects;
- "Bottom ash used in non-IDOT pavement sub-base or base, pipe bedding, or foundation backfill;"
- "Structural fill, when used in an engineered application or combined with cement, sand, or water to produce a controlled strength fill material and covered with 12 inches of soil unless infiltration is prevented by the material itself or other cover material;" and
- "Mine subsidence, mine fire control, mine sealing, and mine reclamation."

> Martin PFT2 at 5, citing 415 ILCS 5/3.135(a)(3)(A) (2010), quoting 415 ILCS 5/3.135(a)(7)-(9) (2010).

IERG stated that leachate from CCB might exceed the proposed Class I GQS for molybdenum and possibly other metals. IERG suggested that amendments to the Class I GQS for metals might severely restrict the beneficial uses of CCB listed above, and, in turn, impact the use of Illinois coal. Martin PFT2 at 4-6.

IERG provided leachate data for molybdenum and arsenic in various coal combustion materials. PC2 at 8-11. IERG indicated that the data available were very limited, and no data were available for vanadium. *Id*. at 9-10. In addition, because the detection limits used were often greater than the proposed standards, in many instances the data did not provide insight into whether certain materials would be capable of meeting the proposed standards. *Id*. According to IERG, the limited data indicated that the results (or detection limits) exceeded the proposed groundwater quality standards for both arsenic and molybdenum. *Id*. at 10. For arsenic, possibly 15 of the 25 coal combustion materials tested exceeded the proposed Class I standard. For molybdenum, the results exceeded the proposed Class I standard for all seven of the coal combustion materials analyzed. *Id*. IERG concluded that the data are insufficient to definitively determine the effect of the proposal on CCB use. *Id*. at 10-11.

To assess the potential economic impact that would result if CCB was no longer able to be used, IERG gathered and reviewed information from "a subset of industrial coal burners in the state" regarding the quantities of CCB currently put to use. PC2 at 11. These entities consumed approximately 34.7 million tons of coal annually (Illinois and western coal), generating roughly 2.13 million tons of CCB per year. *Id*. CCB uses included:

> "returned to mine as mine fill," "land applied," "goes to limestone quarry as fill," "sold as product," "to reclaim an abandoned coal mine as alternative fill," "as direct replacement for cement," "structural fill," "road bed," "roofing materials," "traction control," "to solidify sludge generated on site," and "abrasive blast media," . . . . *Id*.

Estimated costs of alternatives to current CCB uses "ranged from $7 to $10 per ton for company owned disposal (which is only an alternative where property availability is not an issue) to $19 to $45 per ton for disposal to a landfill." *Id*. at 12. IERG concluded that based upon the data from this subset of industrial coal burners, the "minimum impact could range from a low of $14.9 million to $95 million." *Id*.

IERG recognized that where CCB does not meet the Class I groundwater quality standards for metals, the Act allows for beneficial use determinations by the Agency or, for sites governed by the federal Surface Mining Control and Reclamation Act of 1977, by the OMM of DNR. Martin PFT1 at 6, citing 415 ILCS 5/3.135(b) (2010); *see also* PC2 at 12. IERG suggested, however, that obtaining such a beneficial use determination is difficult, requiring an expensive and detailed site-specific analysis, which may provide a disincentive to putting CCB to beneficial use. PC2 at 12-13; Martin PFT2 at 6 (reducing "incentive to accept CCW from coal burners"). IERG related the experiences of four applicants in seeking beneficial use

determinations for CCB that does not meet the Class I metals standards. According to IERG, one applicant found that letters sent to the Agency were unanswered; a second found some success working with OMM, but is still in the early stages of the process; a third withdrew the request after numerous revisions did not result in an approval; and a fourth withdrew the request because compliance was "nearly impossible." PC2 at 12-13. One applicant, IERG continues, attempted to follow the Agency's initial guidelines, but "the informational requirements seemed to change with each subsequent submittal." PC2 at 13. IERG members have suggested that if their ability to use or sell their CCW or return their CCW to a mine is impacted, their alternatives are to dispose of the CCW (see discussion above) or "seek alternatives to Illinois coal." Martin PFT2 at 6; PC2 at 12.

According to the Agency, Scott Fowler of the DNR's OMM explained that DNR does not yet have regulations outlining a specific process for beneficial use determinations. PC1 at 2. Mr. Fowler indicated to the Agency that DNR has only made two beneficial use determinations. *Id*.; Tr.2 at 21. The Agency also pointed out that under Section 3.135(b) of the Act, the Board is to "adopt rules establishing standards and procedures for the Agency's issuance of beneficial use determinations . . . ." PC1 at 2-3, quoting 415 ILCS 5/3.135(b) (2010). The Board notes that it has received no proposal for beneficial use determination rules and until the Board adopts such rules, the Act authorizes the Agency to make beneficial use determinations in accordance with the criteria of Section 3.135(b). *See* 415 ILCS 5/3.135(b) (2010). The Act also gives authority to the Agency to "prepare and distribute guidance documents" relating to the Agency's administration of Section 3.135(b). *Id*. The Agency submitted the draft guidance it currently provides to applicants for beneficial use determinations. PC1 at 3, Attach. 1.

The Agency and IERG met after the second hearing to discuss the continued beneficial use of CCB and, in particular, the effect of including molybdenum in the GQS amendments. Although Section 3.135(b) of the Act provides another mechanism to approve the beneficial use of CCB without being subject to the Section 3.135(a-5)(B) restriction of meeting the Class I standards for metals, IERG observed that beneficial use determinations are not applicable to using CCB for reclamation at abandoned mines. PC2 at 6-7. Beneficial use determinations for CCB exceeding a Class I metals standard are limited to the uses set forth in subsections (a)(3)(A) and (a)(7) through (a)(9) of Section 3.135. *See* 415 ILCS 5/3.135(b) (2010). The Agency stated that neither the OMM at DNR nor the Agency regulates abandoned mines with regard to CCB. PC1 at 6-7; *see also* PC2 at 6-7. Therefore, the Agency recognized that including standards for molybdenum in the rules would preclude the use of CCB for reclamation of abandoned mine sites. PC1 at 6-7. IERG maintained that such use is "both environmentally practical and practicable, because waters beneath such abandoned mine sites have been disturbed by mining operations." PC2 at 6. The Agency subsequently deleted molybdenum from its proposed amendments. *Errata* 4 at 1.

Accordingly, after originally proposing to add molybdenum and associated groundwater quality standards to Part 620, the Agency withdrew the constituent from its proposal based upon concerns raised during this rulemaking. At first notice, the Board found that by removing molybdenum from the amendments, the risk of negatively impacting corrective actions and landfill programs, as well as the beneficial use of CCB, would be avoided, while providing the opportunity to better assess the health effects and natural occurrence of the chemical. The first-

notice amendments did not include molybdenum. The Board added that it has not adopted TACO remediation objectives for molybdenum, though it has for arsenic and vanadium, which are discussed below.

As noted, the Class I groundwater quality standard proposed at first notice for arsenic may have been exceeded in 15 of 25 leachate samples from various coal combustion materials. PC2 at 9-11. The Board observed at first notice that unlike molybdenum, however, arsenic has a federal MCL. On January 22, 2001, USEPA adopted a new standard for arsenic in drinking water of 10 ppb (0.010 mg/L), replacing the old standard of 50 ppb. The date for public water systems to comply with the new standard was January 23, 2006. The Board's primary drinking water standards at 35 Ill. Adm. Code 611.301 were amended to reflect the new federal standard. *See* SDWA Update, USEPA Amendments (January 1, 2001 through June 30, 2001; Arsenic Rule), R02-5 (Feb. 21, 2002). Consistent with this amendment, the Agency proposed changing the Class I arsenic GQS from 0.050 mg/L to 0.010 mg/L. Cobb PFT1 at 8. At first notice, the Board found that it is bound by the National Primary Drinking Water Regulations (NPDWRs), which contain the revised arsenic MCL as the highest level allowed in drinking water. *See* 40 CFR 141; *see also* 415 ILCS 5/7.2, 17.5 (2010). The Board also noted that its primary drinking water standards are reflected in the Class I GQS. The Board's first-notice proposal therefore updated the arsenic Class I standard in accord with the MCL.

IERG also listed vanadium among the metals in coal combustion material leachate that might exceed the Agency's proposed standards. PC2 at 9-10. IERG stated, however, that no analytical results were available for vanadium. PC2 at 10. The Board noted at first notice that although no MCL had been established for vanadium, the Board did adopt TACO groundwater remediation objectives for vanadium. *See* 35 Ill. Adm. Code 742.Appendix B, TABLE E. As discussed above, the Board's first-notice opinion found it proper to add Part 620 GQS for constituents detected in Illinois groundwater. The Board found that adding vanadium to the groundwater quality standards would further the purposes of the IGPA and the Act and provide consistency between TACO and Part 620. In the first-notice proposal, the Class I standard for vanadium was based upon the TACO groundwater remediation objective (HEAST RfD), and the Class II standard was based upon irrigation.

Minor Revisions to Agency Proposal

Below, the Board explains some minor revisions made to the Agency's proposal at first notice.

Source Note

The current source note for Part 620, repeated in the Agency proposal, contains a typographical error when identifying a Board rulemaking docket in which past amendments were made. The note refers to R96-10 instead of the correct docket, R96-18. The Board corrected this error at first notice.

Definitions

In the Board's pending TACO rulemaking, Tiered Approach to Corrective Action Objectives (TACO) (Indoor Inhalation): Amendments to 35 Ill. Adm. Code 742, R11-9 (R11-9 TACO), the Board at first notice proposed adding a definition of "saturated zone" to Part 742. *See* R11-9 TACO, slip op. at 14, 15 (Apr. 19, 2012). The Part 620 rules do not define "saturated zone," though the term is used in the current "groundwater" definition: *"'Groundwater' means underground water which occurs within the saturated zone and geologic materials where the fluid pressure in the pore space is equal to or greater than atmospheric pressure."* 35 Ill. Adm. Code 620.110, quoting 415 ILCS 5/3.64 (2010); *see also* 415 ILCS 55/3(g) (2010) (same).

The Board found at first notice of this R08-18 GQS rulemaking that the proposed "saturated zone" definition from the R11-9 TACO rulemaking further illuminates the meaning of "groundwater" and therefore would be an appropriate addition to the Part 620 rules. Accordingly, for first notice in this docket, the Board proposed adding the following definition to Section 620.110: "Saturated zone" means "a subsurface zone in which all the interstices or voids are filled with water under pressure greater than that of the atmosphere. *See* proposed Section 620.110.

Incorporations by Reference

The Agency's proposed new subsection (b) of Section 620.125 identified various provisions of the Code of Federal Regulations (CFR) but did not state that those provisions were to be incorporated by reference. To effectuate the Agency's intent (Cobb PFT1 at 10), the Board at first notice added the CFR references to subsection (a) of Section 620.125, which is the listing of documents incorporated by reference. *See* 35 Ill. Adm. Code 620.125(a) ("The Board incorporates the following material by reference"). The Agency's proposed re-lettering of subsection (b) to subsection (c) of Section 620.125 was therefore found to be unnecessary. *See* proposed Section 620.125.

Names for Chemicals

At the Board's request, the Agency provided the chemical names for various common acronyms used in the Agency's proposal to identify constituents. Tr.1 at 50; Agency PFT2 at 5. For ease of understanding, the first-notice proposal included the chemical names where the acronyms would appear in Part 620 as follows:

- Proposed Sections 620.410(b) and 620.420(b)
  Alpha-BHC (alpha-Benzene hexachloride)*

- Proposed Sections 620.410(c), 620.420(c), 620.440(c), and 620.450(b)
  HMX (High Melting Explosive, Octogen)
  RDX (Royal Demolition Explosive, Cyclonite)

Asterisk to Denote Carcinogen

The Agency and IERG noted that arsenic (in the current rules) and dibenzo(a,h)anthracene (in the Agency proposal) are not consistently marked with an asterisk to reflect that the chemicals are carcinogens. Tr.1 at 33-34; Agency PFT2 at 5. The Board did so at first notice. *See* proposed Sections 620.410(a), (b), 620.420(a), (b).

Health Advisory

With the removal of the water-solubility basis from the Agency's proposal, the Agency properly deleted Section 620.605(c). *Errata* 3. At first notice, the Board therefore removed the corresponding language ("Except as specified in Section 620.605(c)") from the Agency's proposed revisions at Sections 620.605(b)(1) and (2).

Nitrobenzene

The predecessor to the R11-9 TACO rulemaking was Proposed Amendments to Tiered Approach to Corrective Action Objectives (TACO): 35 Ill. Adm. Code 742, R09-9 (R09-9 TACO). On the Agency's motion for voluntary withdrawal, the Board dismissed the Agency's R09-9 proposal and closed the docket. *See* R09-9 TACO, slip op. at 2 (Nov. 18, 2010). However, in R09-9 TACO, Dr. Hornshaw testified that:

> the revised Rfd [for nitrobenzene] will require a change in the proposed updates to the Part 620 Groundwater Standards [R08-18 GQS], in which the proposed new standards of 0.0035 mg/l for both Class I and II groundwater should be changed to 0.014 mg/l for both classes. R09-9 TACO, Hornshaw PFT at 2 (Feb. 23, 2009).

This particular update was not proposed by the Agency in R08-18 GQS, but the Board at first notice made the change suggested by Dr. Hornshaw. *See* proposed Sections 620.410(c), 620.420(c).

Technical Feasibility and Economic Reasonableness

As the Board observed in its first-notice opinion, when promulgating substantive environmental regulations under the Act, the Board must take into account the "technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution." *See* 415 ILCS 5/27(a) (2010). The Board must also determine "whether the proposed rule has any adverse economic impact on the people of the State of Illinois." 415 ILCS 5/27(b) (2010).

At the first hearing in this rulemaking, IERG suggested that pursuant to Section 8(d) of the IGPA (415 ILCS 55/8(d) (2010)), DNR may have to conduct an economic impact study on the Agency's proposal. Tr.1 at 20, 23. The Board found at first notice, however, that it is plain from the statutory language that the requirement for this study no longer applies. Section 8(a) of the IGPA required the Agency to propose by July 1, 1989, regulations establishing

"comprehensive water quality standards which are specifically for the protection of groundwater." 415 ILCS 55/8(a) (2010). Section 8(d) of the IGPA tasked DNR with conducting "a study of the economic impact of the regulations developed pursuant to this Section," requiring that DNR submit the economic impact study to the Board "no later than 60 days after the proposed regulations are filed with the Board." *See* 415 ILCS 55/8(d) (2010). In the R08-18 GQS first-notice opinion, the Board agreed with the Agency (Tr.1 at 20-21, 23-25; PC1 at 4) that while the Board was required to request that DCEO conduct an economic impact study on the proposed rules pursuant to Section 27(b) of the Act (415 ILCS 5/27(b) (2010)),[12] the requirement of Section 8(d) of the IGPA applied only to the initial promulgation of Part 620,[13] *i.e.*, not to subsequent amendments, such as those proposed here. *See, e.g.*, Proposed MTBE and Compliance Determination Amendments to Groundwater Quality Standards: 35 Ill. Adm. Code 620, R01-14, slip op. at 7 (Sept. 6, 2001) (DCEO requested to conduct economic impact study on proposed amendments to GQS). IERG did not again raise the issue of a DNR economic impact study.

As the Board noted at first notice, the Agency characterized the economic impact of the proposed numeric groundwater quality standards as "not significant," adding that the Board:

> evaluated the economic impact of groundwater standards on three separate occasions (not including the original groundwater standards included in 1971 (R71-14)). First, on November 25, 1991, the Board's groundwater quality standards, mandated by 415 ILCS 55/8, became effective. Those regulations included numerical standards for 60 contaminants. The Board took into consideration the technical feasibility and economical reasonableness and concluded that the adoption of 60 Class I and Class II standards would not have a significant economic impact (R89-14(B) at p. 25). ***
>
> Second, the Board also added 16 additional Class I and II standards by the adoption of R93-27. The regulation was adopted as a final rule on August 11, 1994. The addition of the 16 new groundwater standards at 1/4 of the magnitude of the original 60 constituents also did not have an economic impact.
>
> Third, the Board adopted new groundwater standards for MTBE on January 24, 2002 (R01-14). The Board did not determine that a negative economic impact would occur due to the adoption of the groundwater standards even though MTBE is an extremely difficult contaminant to remove from groundwater. In contrast, the Board emphasized the environmental benefit of adopting a groundwater standard for MTBE even though USEPA had not established an MCL. SOR at 4.

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[12] The Board did so here. *See* page 3 of this opinion. DCEO "may within 30 to 45 days of such request produce a study of the economic impact of the proposed rules." 415 ILCS 5/27(b) (2010).

[13] DNR performed an economic impact study in the original rulemaking. *See* R89-14(B) GQS, slip op. at 1.

Still, according to IERG, the limit on the availability of CCB leachate data "underscores the uncertainty behind the economic impact of the proposed amendments." PC2 at 10-11. The Board observed at first notice, however, that the Agency removed from the proposal IERG's primary concerns, namely, standards for molybdenum and standards based upon water solubility. Further, as the Agency stated, the proposed revisions would not create new corrective action or monitoring programs, and TACO remediation objectives have already been established for most of the chemicals at issue here. SOR at 3. Further, as the Board's first-notice opinion noted, the Agency indicated that the revised standards would be phased into existing programs over time on a "site-by-site basis":

> For example, RCRA facilities will incorporate the new groundwater quality standards as modifications to existing permits are made pursuant to 35 Ill. Adm. Code 702.184 and modifications to closure plans and post-closure plans are made pursuant to 35 Ill. Adm. Code 725.212 and 725.218, respectively. *Id.*

The Board at first notice agreed with the Agency that in this way, the economic impact of applying the revised standards in other programs should be "incremental." SOR at 4.

The Board added that in the IGPA, the General Assembly found "contamination of Illinois groundwater will . . . adversely impact the economic viability of the State" and "protection of groundwater is a necessity for future economic development in this State." 415 ILCS 5/2(a) (2010). The Board also indicated the economic benefits that would result from adopting groundwater standards: "reduction of carcinogenic health risks; reduced expenses for treatment of water at wellheads; and reduced expenses for obtaining water supplies." SOR at 4, citing R89-14(B) GQS, slip op. at 26. The Board found the first-notice amendments to be designed for furthering the General Assembly's intent of protecting groundwater not only for the health of Illinois citizens, but also for their economic well-being.

The Board found at first notice that this record contained no information suggesting that the amendments would impose an economic or technical burden significantly different from that resulting from prior Part 620 rulemakings. *See* 415 ILCS 5/27(a) (2010). Based upon the record, the Board determined that the first-notice amendments would not have an adverse economic impact on the people of Illinois. *See* 415 ILCS 5/27(b) (2010).

CONCLUSION

To keep Illinois' groundwater quality standards current with the latest science and technical data, the Board adopts final amendments to Part 620 (35 Ill. Adm. Code 620). These amendments include adding GQS for 39 chemicals constituents and revising the Class I standard for arsenic to reflect the updated federal MCL.

The Board at first notice adopted the amendments ultimately proposed by the Agency, with minor modifications. The Board has not received any public comments since first-notice publication of the proposed amendments in the *Illinois Register*. The Board's first-notice findings, described in detail above, were adopted for second notice and are again adopted today here at final notice. For final adoption, the Board makes no substantive changes, and only

several minor revisions, to the second-notice rule language.

ORDER

The Board adopts the following amendments to the groundwater quality standards (35 Ill. Adm. Code 620) and directs the Clerk to submit the amendments to the Secretary of State for publication in the *Illinois Register* as final rules. Adopted additions to the rules are underlined; adopted deletions to the rules appear stricken.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE F: PUBLIC WATER SUPPLIES
CHAPTER I: POLLUTION CONTROL BOARD

PART 620
GROUNDWATER QUALITY

SUBPART A: GENERAL

Section
620.105 Purpose
620.110 Definitions
620.115 Prohibition
620.125 Incorporations by Reference
620.130 Exemption from General Use Standards and Public and Food Processing Water Supply Standards
620.135 Exclusion for Underground Waters in Certain Man-Made Conduits

SUBPART B: GROUNDWATER CLASSIFICATION

Section
620.201 Groundwater Designations
620.210 Class I: Potable Resource Groundwater
620.220 Class II: General Resource Groundwater
620.230 Class III: Special Resource Groundwater
620.240 Class IV: Other Groundwater
620.250 Groundwater Management Zone
620.260 Reclassification of Groundwater by Adjusted Standard

SUBPART C: NONDEGRADATION PROVISIONS FOR APPROPRIATE GROUNDWATERS

Section
620.301 General Prohibition Against Use Impairment of Resource Groundwater
620.302 Applicability of Preventive Notification and Preventive Response Activities
620.305 Preventive Notification Procedures
620.310 Preventive Response Activities

SUBPART D: GROUNDWATER QUALITY STANDARDS

Section
620.401 Applicability
620.405 General Prohibitions Against Violations of Groundwater Quality Standards
620.410 Groundwater Quality Standards for Class I: Potable Resource Groundwater
620.420 Groundwater Quality Standards for Class II: General Resource Groundwater
620.430 Groundwater Quality Standards for Class III: Special Resource Groundwater
620.440 Groundwater Quality Standards for Class IV: Other Groundwater
620.450 Alternative Groundwater Quality Standards

SUBPART E: GROUNDWATER MONITORING AND ANALYTICAL PROCEDURES

Section
620.505 Compliance Determination
620.510 Monitoring and Analytical Requirements

SUBPART F: HEALTH ADVISORIES

Section
620.601 Purpose of a Health Advisory
620.605 Issuance of a Health Advisory
620.610 Publishing Health Advisories
620.615 Additional Health Advice for Mixtures of Similar-Acting Substances

620.APPENDIX A Procedures for Determining Human Threshold Toxicant Advisory Concentration for Class I: Potable Resource Groundwater
620.APPENDIX B Procedures for Determining Hazard Indices for Class I: Potable Resource Groundwater for Mixtures of Similar-Acting Substances
620.APPENDIX C Guidelines for Determining When Dose Addition of Similar-Acting Substances in Class I: Potable Resource Groundwaters is Appropriate
620.APPENDIX D Confirmation of an Adequate Corrective Action Pursuant to 35 Ill. Adm. Code 620.250(a)(2)

AUTHORITY: Implementing and authorized by Section 8 of the Illinois Groundwater Protection Act [415 ILCS 55/8] and authorized by Section 27 of the Illinois Environmental Protection Act [415 ILCS 5/27].

SOURCE: Adopted in R89-14(B) at 15 Ill. Reg. 17614, effective November 25, 1991; amended in R89-14(C) at 16 Ill. Reg. 14667, effective September 11, 1992; amended in R93-27 at 18 Ill. Reg. 14084, effective August 24, 1994; amended in R96-18 at 21 Ill. Reg. 6518, effective May 8, 1997; amended in R97-11 at 21 Ill. Reg. 7869, effective July 1, 1997; amended in R01-14 at 26 Ill. Reg. 2662, effective February 5, 2002; amended in R08-18 at 36 Ill. Reg. _____, effective _____.

SUBPART A: GENERAL

Section 620.110 Definitions

The definitions of the Environmental Protection Act [415 ILCS 5] and the Groundwater Protection Act [415 ILCS 55] apply to this Part. The following definitions also apply to this Part.

"Act" means the Environmental Protection Act [415 ILCS 5].

"Agency" means the Illinois Environmental Protection Agency.

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

"BETX" means the sum of the concentrations of benzene, ethylbenzene, toluene, and xylenes.

"Board" means the Illinois Pollution Control Board.

"*Carcinogen" means a contaminant that is classified as a Category A1 or A2 Carcinogen by the American Conference of Governmental Industrial Hygienists; or a Category 1 or 2A/2B carcinogen by the World Health Organization's International Agency for Research on Cancer; or a "Human carcinogen" or "Anticipated Human Carcinogen" by the United States Department of Health and Human Service National Toxicological Program; or a Category A or B1/B2 Carcinogen by the United States Environmental Protection Agency in Integrated Risk Information System or a Final Rule issued in a Federal Register notice by the USEPA.* [415 ILCS 5/58.2]

"Community water supply" means a public supply which serves or is intended to serve at least 15 service connections used by residents or regularly serves at least 25 residents. [415 ILCS 5/3.145 ~~3.05~~]

"Contaminant" means any solid, liquid, or gaseous matter, any odor, or any form of energy, from whatever source. [415 ILCS 5/3.165 ~~3.06~~]

"Corrective action process" means those procedures and practices that may be imposed by a regulatory agency when a determination has been made that contamination of groundwater has taken place, and are necessary to address a potential or existing violation of the standards set forth in Subpart D.

"Cumulative impact area" means the area, including the coal mine area permitted under the Surface Coal Mining Land Conservation and Reclamation Act [225 ILCS 720] and 62 Ill. Adm. Code 1700 through 1850, within which impacts

resulting from the proposed operation may interact with the impacts of all anticipated mining on surface water and groundwater systems.

"Department" means the Illinois Department of Natural Resources.

"Detection" means the identification of a contaminant in a sample at a value equal to or greater than the:

> "Method Detection Limit" or "MDL" means the minimum concentration of a substance that can be measured as reported with 99 percent confidence that the true value is greater than zero, pursuant to 40 CFR 136, appendix B (2006) ~~56 Fed. Reg. 3526-3597~~, incorporated by reference at Section 620.125; or
>
> "Method Quantitation Limit" or "MQL" means the minimum concentration of a substance that can be measured and reported pursuant to "Test Methods for Evaluating Solid Wastes, Physical/ Chemical Methods", incorporated by reference at Section 620.125.

"Groundwater" means underground water which occurs within the saturated zone and geologic materials where the fluid pressure in the pore space is equal to or greater than atmospheric pressure. [415 ILCS 5/3.210 ~~3.64~~]

"Hydrologic balance" means the relationship between the quality and quantity of water inflow to, water outflow from, and water storage in a hydrologic unit such as a drainage basin, aquifer, soil zone, lake, or reservoir. It encompasses the dynamic relationships among precipitation, runoff, evaporation, and changes in ground and surface water storage.

"IGPA" means the Illinois Groundwater Protection Act~~.~~ [415 ILCS 55].

"LOAEL" or "Lowest observable adverse effect level" means the lowest tested concentration of a chemical or substance that produces a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control. LOAEL may be determined for a human population (LOAEL-H) or an animal population (LOAEL-A).

"Licensed Professional Engineer" or "LPE" *means a person, corporation, or partnership licensed under the laws of the State of Illinois to practice professional engineering.* [415 ILCS 5/57.2]

"Licensed Professional Geologist" or "LPG" *means an individual who is licensed under the* Professional Geologist Licensing Act *to engage in the practice of professional geology in Illinois.* ~~(Professional Geologist Licensing Act~~ [225 ILCS 745/15]~~)~~

"NOAEL" or "No observable adverse effect level" means the highest tested concentration of a chemical or substance that does not produce a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control. NOAEL may be determined for a human population (NOAEL-H) or an animal population (NOAEL-A).

"Non-community water supply" means a public water supply that is not a community water supply. [415 ILCS 5/3.145 ~~3.05~~]

"Off-site" means not on-site.

"On-site" means on the same or geographically contiguous property that may be divided by public or private right-of-way, provided the entrance and exit between properties is at a crossroads intersection and access is by crossing as opposed to going along the right-of-way. Noncontiguous properties owned by the same person but connected by a right-of-way that he controls and that the public does not have access to is also considered on-site property.

"Operator" means the person responsible for the operation of a site, facility or unit. "Owner" means the person who owns a site, facility or unit or part of a site, facility or unit, or who owns the land on which the site, facility or unit is located.

"Potable" means generally fit for human consumption in accordance with accepted water supply principles and practices. [415 ILCS 5/3.340 ~~3.65~~]

"Potential primary source" means any unit at a facility or site not currently subject to a removal or remedial action which:

> *Is utilized for the treatment, storage, or disposal of any hazardous or special waste not generated at the site; or*
>
> *Is utilized for the disposal of municipal waste not generated at the site, other than landscape waste and construction and demolition debris; or*
>
> *Is utilized for the landfilling, land treating, surface impounding or piling of any hazardous or special waste that is generated on the site or at other sites owned, controlled or operated by the same person; or*
>
> *Stores or accumulates at any time more than 75,000 pounds above ground, or more than 7,500 pounds below ground, of any hazardous substances.* [415 ILCS 5/3.345 ~~3.59~~]

"Potential route" means abandoned and improperly plugged wells of all kinds, drainage wells, all injection wells, including closed loop heat pump wells, and any excavation for the discovery, development or production of stone, sand or

gravel. This term does not include closed loop heat pump wells using USP (U.S. Pharmacopeia) *food grade propylene glycol.* [415 ILCS 5/3.350 ~~3.58~~]

"Potential secondary source" means any unit at a facility or a site not currently subject to a removal or remedial action, other than a potential primary source, which:

Is utilized for the landfilling, land treating, or surface impounding of waste that is generated on the site or at other sites owned, controlled or operated by the same person, other than livestock and landscape waste, and construction and demolition debris; or

Stores or accumulates at any time more than 25,000 but not more than 75,000 pounds above ground, or more than 2,500 but not more than 7,500 pounds below ground, of any hazardous substance; or

Stores or accumulates at any time more than 25,000 gallons above ground, or more than 500 gallons below ground, of petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance; or

Stores or accumulates pesticides, fertilizers, or road oils for purposes of commercial application or for distribution to retail sales outlets; or

Stores or accumulates at any time more than 50,000 pounds of any de-icing agent; or

Is utilized for handling livestock waste or for treating domestic wastewaters other than private sewage disposal systems as defined in the Private Sewage Disposal Licensing Act [225 ILCS 225]. [415 ILCS 5/3.355 ~~3.60~~]

"Practical Quantitation Limit" or "PQL" means the lowest concentration or level that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions in accordance with "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", EPA Publication No. SW-846, incorporated by reference at Section 620.125.

"Previously mined area" means land disturbed or affected by coal mining operations prior to February 1, 1983.

BOARD NOTE: February 1, 1983, is the effective date of the Illinois permanent program regulations implementing the Surface Coal Mining Land Conservation and Reclamation Act [225 ILCS 720] as codified in 62 Ill. Adm. Code 1700 through 1850.

"Property class" means the class assigned by a tax assessor to real property for purposes of real estate taxes.

BOARD NOTE: The property class (rural property, residential vacant land, residential with dwelling, commercial residence, commercial business, commercial office, or industrial) is identified on the property record card maintained by the tax assessor in accordance with the Illinois Real Property Appraisal Manual (February 1987), published by the Illinois Department of Revenue, Property Tax Administration Bureau.

"Public water supply" means all mains, pipes and structures through which water is obtained and distributed to the public, including wells and well structures, intakes and cribs, pumping stations, treatment plants, reservoirs, storage tanks and appurtenances, collectively or severally, actually used or intended for use for the purpose of furnishing water for drinking or general domestic use and which serve at least 15 service connections or which regularly serve at least 25 persons at least 60 days per year. A public water supply is either a "community water supply" or a "non-community water supply". [415 ILCS 5/3.365 ~~3.28~~]

"Regulated entity" means a facility or unit regulated for groundwater protection by any State or federal agency.

"Regulatory agency" means the Illinois Environmental Protection Agency, Department of Public Health, Department of Agriculture, the Office of Mines and Minerals in the Department of Natural Resources, and the Office of State Fire Marshal.

"Regulated recharge area" means a compact geographic area, as determined by the Board pursuant to Section 17.4 of the Act, *the geology of which renders a potable resource groundwater particularly susceptible to contamination*. [415 ILCS 5/3.390 ~~3.67~~]

"Resource groundwater" means groundwater that is presently being, or in the future is capable of being, put to beneficial use by reason of being of suitable quality. [415 ILCS 5/3.430 ~~3.66~~]

"Saturated zone" means a subsurface zone in which all the interstices or voids are filled with water under pressure greater than that of the atmosphere.

"Setback zone" means a geographic area, designated pursuant to this Act, containing a potable water supply well or a potential source or potential route having a continuous boundary, and within which certain prohibitions or regulations are applicable in order to protect groundwaters. [415 ILCS 5/3.450 ~~3.61~~]

'Site" means any location, place, tract of land and facilities, including but not limited to, buildings and improvements used for the purposes subject to regulation or control by the Act or regulations thereunder. [415 ILCS 5/3.460 ~~3.43~~]

"Spring" means a natural surface discharge of an aquifer from rock or soil.

"Threshold dose" means the lowest dose of a chemical at which a specified measurable effect is observed and below which it is not observed.

"Treatment" means the technology, treatment techniques, or other procedures for compliance with 35 Ill. Adm. Code, Subtitle F.

"Unit" means any device, mechanism, equipment, or area (exclusive of land utilized only for agricultural production). [415 ILCS 5/3.515 ~~3.62~~]

"USEPA" means the United States Environmental Protection Agency.

"Wellhead protection area" or "WHPA" means the surface and subsurface recharge area surrounding a community water supply well or well field, delineated outside of any applicable setback zones (pursuant to Section 17.1 of the Act [415 ILCS 5/17.1]), and pursuant to Illinois' Wellhead Protection Program, through which contaminants are reasonably likely to move toward such well or well field.

"Wellhead Protection Program" or "WHPP" means the wellhead protection program for the State of Illinois, approved by USEPA under 42 USC 300h-7.

BOARD NOTE: Derived from 40 CFR 141.71(b) (2003). The wellhead protection program includes the "groundwater protection needs assessment" under Section 17.1 of the Act [415 ILCS 5/17.1] and 35 Ill. Adm. Code 615-617.

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.125 Incorporations by Reference

a) The Board incorporates the following material by reference:

ASTM International. 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959 (610) 832-9500. ~~ASTM. American Society for Testing and Materials, 1976 Race Street, Philadelphia, Pa. 19103 (215) 299-5585~~

"Standard Practice for Classification of Soils for Engineering Purposes (Unified Classification System)" ASTM D2487-06. ~~"Standard Practice for Description and Identification of Soils (Visual Manual Procedure)" D2488-84~~

CFR (Code of Federal Regulations). Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (202) 783-3238.

Method Detection Limit Definition, appendix B to Part 136, 40 CFR 136, appendix B (2006).

Control of Lead and Copper, general requirements, 40 CFR 141.80 (2006).

Maximum contaminant levels for organic contaminants, 40 CFR 141.61 (2006).

Maximum contaminant levels for inorganic contaminants, 40 CFR 141.62 (2006).

Maximum contaminant levels for radionuclides, 40 CFR 141.66 (2006).

GPO. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20401, (202) 783-3238).

~~Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Final Rule, 56 Fed. Reg. 26460-26564 (June 7, 1991).~~

~~National Primary Drinking Water Regulations, Final Rule, 56 Fed. Reg. 3526-3597 (January 30, 1991).~~

~~National Primary Drinking Water Regulations, Final Rule, 57 Fed. Reg. 31776-31849 (July 17, 1992).~~

USEPA Guidelines for Carcinogenic Risk Assessment, 51 Fed. Reg. 33992-34003 (September 24, 1986).

Illinois Environmental Protection Agency, 1020 North Grand Avenue East, P.O. Box 19276, Springfield, IL 62794-9276 (217) 785-4787.

"Guidance Document for Groundwater Protection Needs Assessments," Agency, Illinois State Water Survey, and Illinois State Geologic Survey Joint Report, January 1995.

"The Illinois Wellhead Protection Program Pursuant to Section 1428 of the Federal Safe Drinking Water Act," Agency, # 22480, October 1992.

NCRP. National Council on Radiation Protection, 7910 Woodmont Ave., Bethesda, MD (301) 657-2652.~~(301) 657-6252~~

"Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure", NCRP Report Number 22, June 5, 1959.

NTIS. National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 605-6000~~(703) 487-4600~~.

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b) This Section incorporates no later editions or amendments.

(Source: Amended at 36 Ill. Reg._____, effective _____)

SUBPART B: GROUNDWATER CLASSIFICATION

Section 620.210 Class I: Potable Resource Groundwater

Except as provided in Sections 620.230, 620.240, or 620.250, Potable Resource Groundwater is:

a) Groundwater located 10 feet or more below the land surface and within:

1) The minimum setback zone of a well which serves as a potable water supply and to the bottom of such well;

2) Unconsolidated sand, gravel or sand and gravel which is 5 feet or more in thickness and that contains 12 percent or less of fines (i.e. fines which pass through a No. 200 sieve tested according to ASTM Standard Practice D2487-06 ~~D2488-84~~, incorporated by reference at Section 620.125);

3) Sandstone which is 10 feet or more in thickness, or fractured carbonate which is 15 feet or more in thickness; or

4) Any geologic material which is capable of a:

A) Sustained groundwater yield, from up to a 12 inch borehole, of 150 gallons per day or more from a thickness of 15 feet or less; or

B) Hydraulic conductivity of 1×10^{-4} cm/sec or greater using one of the following test methods or its equivalent:

i) Permeameter;

ii) Slug test; or

iii) Pump test.

b) Any groundwater which is determined by the Board pursuant to petition procedures set forth in Section 620.260, to be capable of potable use.

BOARD NOTE~~(Board Note~~: Any portion of the thickness associated with the geologic materials as described in subsections 620.210(a)(2), (a)(3) or (a)(4) should be designated as Class I: Potable Resource Groundwater if located 10 feet or more below the land surface.~~)~~

(Source: Amended at 36 Ill. Reg._____, effective _____)

SUBPART C: NONDEGRADATION PROVISIONS FOR APPROPRIATE GROUNDWATERS

Section 620.302 Applicability of Preventive Notification and Preventive Response Activities

a) Preventive notification and preventive response as specified in Sections 620.305 through 620.310 applies to:

1) Class I groundwater under Section 620.210(a)(1), (a)(2), or (a)(3) that~~which~~ is monitored by the persons listed in subsection (b); or

2) Class III groundwater that~~which~~ is monitored by the persons listed in subsection (b).

b) For purposes of subsection (a), the persons that conduct groundwater monitoring are:

1) An owner or operator of a regulated entity for which groundwater quality monitoring must be performed pursuant to State or Federal law or regulation (e.g., section~~Section~~ 106 and 107 of the Comprehensive Environmental Response, Compensation and Liability Act (42 USC~~U.S.C.~~ 9601, et seq.); sections~~Sections~~ 3004 and 3008 of the Resource Conservation and Recovery Act (42 USC~~U.S.C.~~ 6901, et seq.); sections~~Sections~~ 4(q), 4(v), 12(g), 21(d), 21(f), 22.2(f), 22.2(m) and 22.18 of the Act; 35 Ill. Adm. Code 724, 725, 730, 731, 750, 811 and 814);

2) An owner or operator of a public water supply well who conducts groundwater quality monitoring;

3) A State ~~state~~ agency that ~~which~~ is authorized to conduct, or is the recipient of, groundwater quality monitoring data (e.g., Illinois Environmental Protection Agency, Department of Public Health, ~~Department of Conservation, Department of Mines and Minerals,~~ Department of Agriculture, Office of State Fire Marshal or Department of ~~Energy and~~ Natural Resources); or

4) An owner or operator of a facility that conducts groundwater quality monitoring pursuant to State or federal judicial or administrative order.

c) If a contaminant exceeds a standard set forth in Section 620.410 or Section 620.430, the appropriate remedy is corrective action and Sections 620.305 and 620.310 do not apply.

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.310 Preventive Response Activities

a) The following preventive assessment must be undertaken:

1) If a preventive notification under Section 620.305(c) is provided by a community water supply:

   A) The Agency shall notify the owner or operator of any identified potential primary source, potential secondary source, potential route, or community water supply well that is located within 2,500 feet of the wellhead.

   B) The owner or operator notified under subsection (a)(1)(A) shall, within 30 days after the date of issuance of such notice, sample each water well or monitoring well for the contaminant identified in the notice if the contaminant or material containing such contaminant is or has been stored, disposed of, or otherwise handled at the site. If a contaminant identified under Section 620.305(a) is detected, then the well must be resampled within 30 days of the date on which the first sample analyses are received. If a contaminant identified under Section 620.305(a) is detected by the resampling, preventive notification must be given as set forth in Section 620.305.

   C) If the Agency receives analytical results under subsection (a)(1)(B) that show a contaminant identified under Section 620.305(a) has been detected, the Agency shall:

      i) Conduct a well site survey pursuant to 415 ILCS 5/17.1(d), if such a survey has not been previously conducted within the last 5 years; and

      ii) Identify those sites or activities that represent a hazard to the continued availability of groundwaters for public use unless a groundwater protection needs assessment has been prepared pursuant to 415 ILCS 5/17.1(d).

2) If a preventive notification is provided under Section 620.305(c) by a non-community water supply or for multiple private water supply wells, the Department of Public Health shall conduct a sanitary survey within 1,000 feet of the wellhead of a non-community water supply or within 500 feet of the wellheads for multiple private water supply wells.

3) If a preventive notification under Section 620.305(b) is provided by the owner or operator of a regulated entity and the applicable standard in Subpart D has not been exceeded:

   A) The appropriate regulatory agency shall determine if any of the following occurs for Class I: Potable Resource Groundwater:

i) The levels set forth below are exceeded or are changed for pH:

Constituent	Criteria (mg/L)
Para-Dichlorobenzene	0.005
Ortho-Dichlorobenzene	0.01
Ethylbenzene	0.03
Methyl Tertiary-Butyl Ether (MTBE)	0.02
Phenols	0.001
Styrene	0.01
Toluene	0.04
Xylenes	0.02

ii) A statistically significant increase occurs above background (as determined pursuant to other regulatory procedures (e.g., 35 Ill. Adm. Code 616, 724, 725 or 811)) for arsenic, beryllium, cadmium, chromium, cyanide, lead, mercury, ~~or~~ thallium, or vanadium (except due to natural causes); or for acenaphthene, acetone, aldicarb, anthracene, atrazine, benzoic acid, carbon disulfide, carbofuran, dalapon, 2-butanone (MEK), dicamba, dichlorodifluoromethane, 1,1-dichloroethane, diethyl phthalate, di-n-butyl phthalate, dinoseb, endrin, endothall, fluoranthene, fluorine, hexachlorocyclopentadiene, isopropylbenzene (cumene), lindane (gamma-hexachloro cyclohexane), 2,4-D,1,1-dichloroethylene, cis-1, 2-dichloroethylene, trans-1,2-dichloroethylene, MCPP (mecoprop), 2-methylnaphthalene, methoxychlor, 2-methylphenol, monochlorobenzene, naphthalene, picloram, pyrene, simazine, 2,4,5-TP (s~~S~~ilvex), 1,2,4-trichloro-benzene, 1,1,2-trichloroethane, ~~and~~ 1,1,1-trichloroethane, and trichlorofluoromethane.

iii) For a chemical constituent of gasoline, diesel fuel, or heating fuel, the constituent exceeds the following:

Constituent	Criterion (mg/L)
BETX	0.095

iv) For pH, a statistically significant change occurs from background.

BOARD NOTE: Constituents that are carcinogens have not been listed in subsection (a)(3)(A) because the standard is set at the PQL and any exceedence thereof is a violation subject to corrective action.

B) The appropriate agency shall determine if, for Class III: Special Resource Groundwater, the levels as determined by the Board are exceeded.

C) The appropriate regulatory agency shall consider whether the owner or operator reasonably demonstrates that:

i) The contamination is a result of contaminants remaining in groundwater from a prior release for which appropriate action was taken in accordance with laws and regulations in existence at the time of the release;

ii) The source of contamination is not due to the on-site release of contaminants; or

iii) The detection resulted from error in sampling, analysis, or evaluation.

D) The appropriate regulatory agency shall consider actions necessary to minimize the degree and extent of contamination.

b) The appropriate regulatory agency shall determine whether a preventive response must be undertaken based on relevant factors including, but not limited to, the considerations in subsection (a)(3).

c) After completion of preventive response pursuant to authority of an appropriate regulatory agency, the concentration of a contaminant listed in subsection (a)(3)(A) in groundwater may exceed 50 percent of the applicable numerical standard in Subpart D only if the following conditions are met:

1) The exceedence has been minimized to the extent practicable;

2) Beneficial use, as appropriate for the class of groundwater, has been assured; and

3) Any threat to public health or the environment has been minimized.

d) Nothing in this Section shall in any way limit the authority of the State or of the United States to require or perform any corrective action process.

(Source: Amended at 36 Ill. Reg._____, effective _____)

SUBPART D: GROUNDWATER QUALITY STANDARDS

Section 620.410 Groundwater Quality Standards for Class I: Potable Resource Groundwater

a) Inorganic Chemical Constituents
Except due to natural causes or as provided in Section 620.450, concentrations of the following chemical constituents must not be exceeded in Class I groundwater:

Constituent	Units	Standard
Antimony	mg/L	0.006
Arsenic*	mg/L	0.010~~0.05~~
Barium	mg/L	2.0
Beryllium	mg/L	0.004
Boron mg/L	2.0	
Cadmium	mg/L	0.005
Chloride	mg/L	200.0
Chromium	mg/L	0.1
Cobalt mg/L	1.0	
Coppermg/L	0.65	
Cyanide	mg/L	0.2
Fluoride	mg/L	4.0
Iron mg/L	5.0	
Lead mg/L	0.0075	
Manganese	mg/L	0.15
Mercury	mg/L	0.002
Nickel mg/L	0.1	
Nitrate as N	mg/L	10.0
Perchlorate	mg/L	0.0049
Radium-226	pCi/l	20.0
Radium-228	pCi/l	20.0
Selenium	mg/L	0.05
Silver mg/L	0.05	
Sulfate mg/L	400.0	
Thallium	mg/L	0.002
Total Dissolved Solids (TDS)	mg/L	1,200
Vanadium	mg/L	0.049
Zinc mg/L	5.0	

*Denotes a carcinogen.

b) Organic Chemical Constituents
Except due to natural causes or as provided in Section 620.450 or subsection (d)

~~(c)~~, concentrations of the following organic chemical constituents shall not be exceeded in Class I groundwater:

Constituent	Standard (mg/L)
Acenaphthene	0.42
Acetone	6.3
Alachlor*	0.002
Aldicarb	0.003
Anthracene	2.1
Atrazine	0.003
Benzene*	0.005
Benzo(a)anthracene*	0.00013
Benzo(b)fluoranthene*	0.00018
Benzo(k)fluoranthene*	0.00017
Benzo(a)pyrene*	0.0002
Benzoic acid	28.0
2-Butanone (MEK)	4.2
Carbofuran	0.04
Carbon Disulfide	0.7
Carbon Tetrachloride*	0.005
Chlordane*	0.002
Chloroform*	0.07
Chrysene*	0.012
Dalapon	0.2
Dibenzo(a,h)anthracene*	0.0003
Dicamba	0.21
Dichlorodifluoromethane	1.4
1,1-Dichloroethane	1.4
Dichloromethane*	0.005
Di(2-ethylhexyl)phthalate*	0.006
Diethyl Phthalate	5.6
Di-n-butyl Phthalate	0.7
Dinoseb	0.007
Endothall	0.1
Endrin	0.002
Ethylene Dibromide*	0.00005
Fluoranthene	0.28
Fluorene	0.28
Heptachlor*	0.0004
Heptachlor Epoxide*	0.0002
Hexachlorocyclopentadiene	0.05
Indeno(1,2,3-cd)pyrene*	0.00043
Isopropylbenzene (Cumene)	0.7
Lindane (Gamma-Hexachlorocyclohexane)	0.0002
2,4-D	0.07

ortho-Dichlorobenzene	0.6
para-Dichlorobenzene	0.075
1,2-Dibromo-3-Chloropropane*	0.0002
1,2-Dichloroethane*	0.005
1,1-Dichloroethylene	0.007
cis-1,2-Dichloroethylene	0.07
trans-1,2-Dichloroethylene	0.1
1,2-Dichloropropane*	0.005
Ethylbenzene	0.7
MCPP (Mecoprop)	0.007
Methoxychlor	0.04
2-Methylnaphthalene	0.028
2-Methylphenol	0.35
Methyl Tertiary-Butyl Ether (MTBE)	0.07
Monochlorobenzene	0.1
Naphthalene	0.14
P-Dioxane*	0.0077
Pentachlorophenol*	0.001
Phenols	0.1
Picloram	0.5
Pyrene	0.21
Polychlorinated Biphenyls (PCBs) (as decachloro- biphenyl)*	0.0005
alpha-BHC (alpha-Benzene hexachloride)*	0.00011
Simazine 0.004	
Styrene 0.1	
2,4,5-TP (Silvex)	0.05
Tetrachloroethylene*	0.005
Toluene 1.0	
Toxaphene* 0.003	
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
1,2,4-Trichlorobenzene	0.07
Trichloroethylene*	0.005
Trichlorofluoromethane	2.1
Vinyl Chloride*	0.002
Xylenes 10.0	

*Denotes a carcinogen.

c) Explosive Constituents

Concentrations of the following explosive constituents must not exceed the Class I groundwater standard:

Constituent	Standard (mg/L)

1,3-Dinitrobenzene	0.0007
2,4-Dinitrotoluene*	0.0001
2,6-Dinitrotoluene*	0.00031
HMX (High Melting Explosive, Octogen)	1.4
Nitrobenzene	0.014
RDX (Royal Demolition Explosive, Cyclonite)	0.084
1,3,5-Trinitrobenzene	0.84
2,4,6-Trinitrotoluene (TNT)	0.014

*Denotes a carcinogen.

d)~~e)~~ Complex Organic Chemical Mixtures
Concentrations of the following chemical constituents of gasoline, diesel fuel, or heating fuel must not be exceeded in Class I groundwater:

Constituent	Standard (mg/L)
Benzene*	0.005
BETX	11.705

*Denotes a carcinogen.

e)~~d)~~ pH
Except due to natural causes, a pH range of 6.5 - 9.0 units must not be exceeded in Class I groundwater.

f)~~e)~~ Beta Particle and Photon Radioactivity

1) Except due to natural causes, the average annual concentration of beta particle and photon radioactivity from man-made radionuclides shall not exceed a dose equivalent to the total body organ greater than 4 mrem/year in Class I groundwater. If two or more radionuclides are present, the sum of their dose equivalent to the total body, or to any internal organ shall not exceed 4 mrem/year in Class I groundwater except due to natural causes.

2) Except for the radionuclides listed in subsection (f)~~(e)~~(3), the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalent must be calculated on the basis of a 2 liter per day drinking water intake using the 168-hour data in accordance with the procedure set forth in NCRP Report Number 22, incorporated by reference at ~~in~~ Section 620.125(a).

3) Except due to natural causes, the average annual concentration assumed to produce a total body or organ dose of 4 mrem/year of the following chemical constituents shall not be exceeded in Class I groundwater:

Constituent	Critical Organ	Standard (pCi/L)
Tritium	Total body	20,000.0
Strontium-90	Bone marrow	8.0

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.420 Groundwater Quality Standards for Class II: General Resource Groundwater

a) Inorganic Chemical Constituents

1) Except due to natural causes or as provided in Section 620.450 or subsection (a)(3) or (e) ~~(d)~~ of this Section, concentrations of the following chemical constituents must not be exceeded in Class II groundwater:

Constituent	Standard (mg/L)
Antimony	0.024
Arsenic*	0.2
Barium	2.0
Beryllium	0.5
Cadmium	0.05
Chromium	1.0
Cobalt	1.0
Cyanide	0.6
Fluoride	4.0
Lead	0.1
Mercury	0.01
Nitrate as N	100.0
Perchlorate	0.0049
Thallium	0.02
Vanadium	0.1

*Denotes a carcinogen.

2) Except as provided in Section 620.450 or subsection (a)(3) or (e) ~~(d)~~ of this Section, concentrations of the following chemical constituents must not be exceeded in Class II groundwater:

Constituent	Standard (mg/L)
Boron	2.0
Chloride	200.0
Copper	0.65
Iron	5.0
Manganese	10.0
Nickel	2.0
Selenium	0.05
Total Dissolved Solids (TDS)	1,200.0
Sulfate	400.0
Zinc	10.0

3) The standard for any inorganic chemical constituent listed in subsection (a)(2) of this Section, for barium, or for pH does not apply to groundwater within fill material or within the upper 10 feet of parent material under such fill material on a site not within the rural property class for which:

A) Prior to November 25, 1991, surficial characteristics have been altered by the placement of such fill material so as to impact the concentration of the parameters listed in subsection (a)(3) of this Section, and any on-site groundwater monitoring of such parameters is available for review by the Agency.

B) On November 25, 1991, surficial characteristics are in the process of being altered by the placement of such fill material, that proceeds in a reasonably continuous manner to completion, so as to impact the concentration of the parameters listed in subsection (a)(3) of this Section, and any on-site groundwater monitoring of such parameters is available for review by the Agency.

4) For purposes of subsection (a)(3) of this Section, the term "fill material" means clean earthen materials, slag, ash, clean demolition debris, or other similar materials.

b) Organic Chemical Constituents

1) Except due to natural causes or as provided in Section 620.450 or subsection (b)(2) or (e) ~~(d)~~ of this Section, concentrations of the following organic chemical constituents must not be exceeded in Class II groundwater:

Constituent	Standard (mg/L)

Acenaphthene	2.1
Acetone	6.3
Alachlor*	0.010
Aldicarb	0.015
Anthracene	10.5
Atrazine	0.015
Benzene*	0.025
Benzo(a)anthracene*	0.00065
Benzo(b)fluoranthene*	0.0009
Benzo(k)fluoranthene*	0.006
Benzo(a)pyrene*	0.002
Benzoic acid	28.0
2-Butanone (MEK)	4.2
Carbon Disulfide	3.5
Carbofuran	0.2
Carbon Tetrachloride*	0.025
Chlordane*	0.01
Chloroform*	0.35
Chrysene*	0.06
Dalapon	2.0
Dibenzo(a,h)anthracene	0.0015
Dicamba	0.21
Dichlorodifluoromethane	7.0
1,1-Dichloroethane	7.0
Dichloromethane*	0.05
Di(2-ethylhexyl)phthalate*	0.06
Diethyl Phthalate	5.6
Di-n-butyl Phthalate	3.5
Dinoseb	0.07
Endothall	0.1
Endrin	0.01
Ethylene Dibromide*	0.0005
Fluoranthene	1.4
Fluorene	1.4
Heptachlor*	0.002
Heptachlor Epoxide*	0.001
Hexachlorocyclopentadiene	0.5
Indeno(1,2,3-cd)pyrene*	0.0022
Isopropylbenzene (Cumene)	3.5
Lindane (Gamma-Hexachloro cyclohexane)	0.001
2,4-D	0.35
Ortho-Dichlorobenzene	1.5
Para-Dichlorobenzene	0.375
1,2-Dibromo-3-Chloropropane*	0.002

1,2-Dichloroethane*	0.025
1,1-Dichloroethylene	0.035
cis-1,2-Dichloroethylene	0.2
Trans-1,2-Dichloroethylene	0.5
1,2-Dichloropropane*	0.025
Ethylbenzene	1.0
MCPP (Mecoprop)	0.007
Methoxychlor	0.2
2-Methylnaphthalene	0.14
2-Methylphenol	0.35
Methyl Tertiary-Butyl Ether (MTBE)	0.07
Monochlorobenzene	0.5
Naphthalene	0.22
P-Dioxane*	0.0077
Pentachlorophenol*	0.005
Phenols	0.1
Picloram	5.0
Pyrene	1.05
Polychlorinated Biphenyls (PCBs) (as decachloro-biphenyl)*	0.0025
alpha-BHC (alpha-Benzene hexachloride)*	0.00055
Simazine	0.04
Styrene	0.5
2,4,5-TP	0.25
Tetrachloroethylene*	0.025
Toluene	2.5
Toxaphene*	0.015
1,1,1-Trichloroethane	1.0
1,2,4-Trichlorobenzene	0.7
1,1,2-Trichloroethane	0.05
Trichloroethylene*	0.025
Trichlorofluoromethane	10.5
Vinyl Chloride*	0.01
Xylenes	10.0

*Denotes a carcinogen.

2) The standards for pesticide chemical constituents listed in subsection (b)(1) of this Section do not apply to groundwater within 10 feet of the land surface, provided that the concentrations of such constituents result from the application of pesticides in a manner consistent with the requirements of the Federal Insecticide, Fungicide and Rodenticide Act (7 USC 136 et seq.) and the Illinois Pesticide Act [415 ILCS 60].

c) Explosive Constituents

Concentrations of the following explosive constituents must not exceed the Class II groundwater standard:

Constituent	Standard (mg/L)
1,3-Dinitrobenzene	0.0007
2,4-Dinitrotoluene*	0.0001
2,6-Dinitrotoluene*	0.00031
HMX (High Melting Explosive, Octogen)	1.4
Nitrobenzene	0.014
RDX (Royal Demolition Explosive, Cyclonite)	0.084
1,3,5-Trinitrobenzene	0.84
2,4,6-Trinitrotoluene (TNT)	0.014

*Denotes a carcinogen.

d)~~c)~~ Complex Organic Chemical Mixtures
Concentrations of the following organic chemical constituents of gasoline, diesel fuel, or heating fuel must not be exceeded in Class II groundwater:

Constituent	Standard (mg/L)
Benzene*	0.025
BETX	13.525

*Denotes a carcinogen.

e)~~d)~~ pH
Except due to natural causes, a pH range of 6.5 - 9.0 units must not be exceeded in Class II groundwater that is within 5 feet of the land surface.

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.440 Groundwater Quality Standards for Class IV: Other Groundwater

a) Except as provided in subsection ~~subsections~~ (b) or (c), Class IV: Other Groundwater standards are equal to the existing concentrations of constituents in groundwater.

b) For groundwater within a zone of attenuation as provided in 35 Ill. Adm. Code 811 and 814, the standards specified in Section 620.420 must not be exceeded, except for concentrations of contaminants within leachate released from a permitted unit.

c) For groundwater within a previously mined area, the standards set forth in Section 620.420 must not be exceeded, except for concentrations of TDS, chloride, iron, manganese, sulfates, ~~or~~ pH, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, HMX (high melting explosive, octogen), nitrobenzene, RDX (royal demolition explosive, cyclonite), 1,3,5-trinitrobenzene, or 2,4,6-trinitrotoluene (TNT). For concentrations of TDS, chloride, iron, manganese, sulfates, ~~or~~ pH, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, HMX, nitrobenzene, RDX, 1,3,5-trinitrobenzene, or 2,4,6-trinitrotoluene (TNT), the standards are the existing concentrations.

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.450 Alternative Groundwater Quality Standards

a) Groundwater Quality Restoration Standards

1) Any chemical constituent in groundwater within a groundwater management zone is subject to this Section.

2) Except as provided in subsections (a)(3) or (a)(4) ~~below~~, the standards as specified in Sections 620.410, 620.420, 620.430, and 620.440 apply to any chemical constituent in groundwater within a groundwater management zone.

3) Prior to completion of a corrective action described in Section 620.250(a), the standards as specified in Sections 620.410, 620.420, 620.430, and 620.440 are not applicable to such released chemical constituent, provided that the initiated action proceeds in a timely and appropriate manner.

4) After completion of a corrective action as described in Section 620.250(a), the standard for such released chemical constituent is:

A) The standard as set forth in Section 620.410, 620.420, 620.430, or 620.440, if the concentration as determined by groundwater monitoring of such constituent is less than or equal to the standard for the appropriate class set forth in those Sections~~sections~~; or

B) The concentration as determined by groundwater monitoring, if such concentration exceeds the standard for the appropriate class set forth in Section 620.410, 620.420, 620.430, or 620.440 for such constituent, and:

i) To the extent practicable, the exceedence has been minimized and beneficial use, as appropriate for the class of groundwater, has been returned; and

ii) Any threat to public health or the environment has been minimized.

5) The Agency shall develop and maintain a listing of concentrations derived pursuant to subsection (a)(4)(B) ~~above~~. This list shall be made available to the public and be updated periodically, but no less frequently than semi-annually. This listing shall be published in the Environmental Register.

b) Coal Reclamation Groundwater Quality Standards

1) Any inorganic chemical constituent or pH in groundwater, within an underground coal mine, or within the cumulative impact area of groundwater for which the hydrologic balance has been disturbed from a permitted coal mine area pursuant to the Surface Coal Mining Land Conservation and Reclamation Act [225 ILCS 720] and 62 Ill. Adm. Code 1700 through 1850, is subject to this Section.

2) Prior to completion of reclamation at a coal mine, the standards as specified in Sections 620.410(a) and (e) ~~(d)~~, 620.420(a) and (e) ~~(d)~~, 620.430 and 620.440 are not applicable to inorganic constituents and pH.

3) After completion of reclamation at a coal mine, the standards as specified in Sections 620.410(a) and (e) ~~(d)~~, 620.420(a), 620.430, and 620.440 are applicable to inorganic constituents and pH, except:

A) The concentration of total dissolved solids (TDS) must not exceed:

i) The post-reclamation concentration or 3000 mg/L, whichever is less, for groundwater within the permitted area; or

ii) The post-reclamation concentration of TDS must not exceed the post-reclamation concentration or 5000 mg/L, whichever is less, for groundwater in underground coal mines and in permitted areas reclaimed after surface coal mining if the Illinois Department of Mines and Minerals and the Agency have determined that no significant resource groundwater existed prior to mining (62 Ill. Adm. Code 1780.21(f) and (g)); and

B) For chloride, iron, manganese and sulfate, the post-reclamation concentration within the permitted area must not be exceeded.

C) For pH, the post-reclamation concentration within the permitted area must not be exceeded within Class I: Potable Resource Groundwater as specified in Section 620.210(a)(4).

D) For 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, HMX (high melting explosive, octogen), nitrobenzene, RDX (royal demolition explosive, cyclonite), 1,3,5-trinitrobenzene, and 2,4,6-trinitrotoluene (TNT), the post-reclamation concentration within the permitted area must not be exceeded.

4) A refuse disposal area (not contained within the area from which overburden has been removed) is subject to the inorganic chemical constituent and pH requirements of:

A) 35 Ill. Adm. Code 302.Subparts B and C, except due to natural causes, for such area that was placed into operation after February 1, 1983, and before the effective date of this Part, provided that the groundwater is a present or a potential source of water for public or food processing;

B) Section 620.440(c) for such area that was placed into operation prior to February 1, 1983, and has remained in continuous operation since that date; or

C) Subpart D of this Part for such area that is placed into operation on or after the effective date of this Part.

5) For a refuse disposal area (not contained within the area from which overburden has been removed) that was placed into operation prior to February 1, 1983, and is modified after that date to include additional area, this Section applies to the area that meets the requirements of subsection (b)(4)(C) and the following applies to the additional area:

A) 35 Ill. Adm. Code 302.Subparts B and C, except due to natural causes, for such additional refuse disposal area that was placed into operation after February 1, 1983, and before the effective date of this Part, provided that the groundwater is a present or a potential source of water for public or food processing; and

B) Subpart D for such additional area that was placed into operation on or after the effective date of this Part.

6) A coal preparation plant (not located in an area from which overburden has been removed) which contains slurry material, sludge or other precipitated process material, is subject to the inorganic chemical constituent and pH requirements of:

A) 35 Ill. Adm. Code 302.Subparts B and C, except due to natural causes, for such plant that was placed into operation after February 1, 1983 and before the effective date of this Part, provided that the groundwater is a present or a potential source of water for public or food processing;

B) Section 620.440(c) for such plant that was placed into operation prior to February 1, 1983, and has remained in continuous operation since that date; or

C) Subpart D for such plant that is placed into operation on or after the effective date of this Part.

7) For a coal preparation plant (not located in an area from which overburden has been removed) which contains slurry material, sludge or other precipitated process material, that was placed into operation prior to February 1, 1983, and is modified after that date to include additional area, this Section applies to the area that meets the requirements of subsection (b)(6)(C) and the following applies to the additional area:

A) 35 Ill. Adm. Code 302.Subparts B and C, except due to natural causes, for such additional area that was placed into operation after February 1, 1983, and before the effective date of this Part, provided that the groundwater is a present or a potential source of water for public or food processing; and

B) Subpart D for such additional area that was placed into operation on or after the effective date of this Part.

c) Groundwater Quality Standards for Certain Groundwater Subject to a No Further Remediation Letter under Part 740. While a No Further Remediation Letter is in effect for a region formerly encompassed by a groundwater management zone established under 35 Ill. Adm. Code 740.530, the groundwater quality standards for "contaminants of concern", as defined in 35 Ill. Adm. Code 740.120, within such area shall be the groundwater objectives achieved as documented in the approved Remedial Action Completion Report.

(Source: Amended at 36 Ill. Reg._____, effective _____)

SUBPART E: GROUNDWATER MONITORING AND ANALYTICAL PROCEDURES

Section 620.505 Compliance Determination

a) Compliance with standards at a site is to be determined as follows:

1) For a structure (e.g., buildings), at the closest practical distance beyond the outermost edge for the structure.

2) For groundwater that underlies a potential primary or secondary source, the outermost edge as specified in Section 620.240(e)(1).

3) For groundwater that underlies a coal mine refuse disposal area, a coal combustion waste disposal area, or an impoundment that contains sludge, slurry, or precipitated process material at a coal preparation plant, the outermost edge as specified in Section 620.240(f)(1) or location of monitoring wells in existence as of the effective date of this Part on a permitted site.

4) For a groundwater management zone, as specified in a corrective action process.

5) For groundwater, any point~~,~~ where monitoring is conducted using a water well, or a monitoring well that meets one of the following conditions:

   A) For a potable water supply well if geologic logs~~log(s)~~ exist for this well or geologic logs in the immediate 1,000-foot area of this well are representative of the hydrogeologic materials encountered by this well as determined by a licensed professional geologist or a licensed professional engineer or a WHPA has been delineated outside of an applicable setback zone of a community water well or well field in accordance with the "Guidance Document for Conducting Groundwater Protection Needs Assessments," incorporated by reference at Section 620.125, and "The Illinois Wellhead Protection Program," incorporated by reference at Section 620.125.

   B) For a potable water supply well other than a community water supply well, a construction report has been filed with the Department of Public Health for such potable well, or such well has been located and constructed (or reconstructed) to meet the Illinois Water Well Construction Code [415 ILCS 30] and 77 Ill. Adm. Code 920.

   C) For a potable water supply well that was constructed prior to August 20, 1965, the enactment of the Illinois Water Well Construction Code [415 ILCS 30], and meets all of the following criteria:

      i) Construction must be done in a manner that will enable the collection of groundwater samples that represent in situ groundwater conditions;

ii) Casings and screens must be made from durable material resistant to expected chemical or physical degradation that do not interfere with the quality of groundwater samples being collected; and

iii) The annular space opposite the screened section of the well (i.e., the space between the bore hole and well screen) must be filled with gravel or sand if necessary to collect groundwater samples. The annular space above and below the well screen must be sealed to prevent migration of water from adjacent formations and the surface to the sampled depth.

D) For a community water supply well, such well has been permitted by the Agency, or has been constructed in accordance with 35 Ill. Adm. Code 602.115.

E) For a water well other than a potable water supply well (e.g., a livestock watering well or an irrigation well), a construction report has been filed with the Department of Public Health or the Office of Mines and Minerals in the Department of Natural Resources for such well, or such well has been located and constructed (or reconstructed) to meet the Illinois Water Well Construction Code [415 ILCS 30] and 35 Ill. Adm. Code 920.

F) For a monitoring well, such well meets the following requirements:

i) Construction must be done in a manner that will enable the collection of groundwater samples;

ii) Casings and screens must be made from durable material resistant to expected chemical or physical degradation that do not interfere with the quality of groundwater samples being collected; and

iii) The annular space opposite the screened section of the well (i.e., the space between the bore hole and well screen) must be filled with gravel or sand if necessary to collect groundwater samples. The annular space above and below the well screen must be sealed to prevent migration of water from adjacent formations and the surface to the sampled depth.

6) Monitoring shall not be conducted for compliance determinations pursuant to subsection (a) of this Section:

A) For a water well that is:

i) Less than 15 feet in total depth from the land surface,

ii) bored or dug,

iii) constructed of permeable materials (e.g., cement, tile, stone or brick), and

iv) 36 inches or more in diameter.

B) For a water well with water quality problems due to damaged well construction materials or poorly-designed well construction;

C) For a water well in a basement or pit; or

D) For a water well water from a holding tank.

b) For a spring, compliance with this Subpart shall be determined at the point of emergence.

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.510 Monitoring and Analytical Requirements

a) Representative Samples
A representative sample shall be taken from locations as specified in Section 620.505.

b) Sampling and Analytical Procedures

1) Samples must be collected in accordance with the procedures set forth in the documents pertaining to groundwater monitoring and analysis "Methods for Chemical Analysis of Water and Wastes," "Methods for the Determination of Inorganic Substances in Environmental Samples," "Methods for the Determination of Metals in Environmental Samples," "Methods for the Determination of Organic Compounds in Drinking Water," "Methods for the Determination or Organic Compounds in Drinking Water, Supplement I," "Methods for the Determination of Organic Compounds in Drinking Water, Supplement II," "Methods for the Determination of Organic Compounds in Drinking Water, Supplement III," "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions," "Radiochemical Analytical Procedures for Analysis of Environmental Samples," "Radiochemistry Procedures Manual," "Practical Guide for Ground Water

Sampling," "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (SW-846), 40 CFR 136, appendix B, 40 CFR 141.80, 40 CFR 141.61, and 40 CFR 141.62, "Techniques of Water Resources Investigations of the United States Geological Survey, Guidelines for Collection and Field Analysis of Ground Water Samples for Selected Unstable Constituents," ~~"Methods for Chemical Analysis of Water and Wastes," "Methods for the Determination of Organic Compounds in Drinking Water,"~~ "Practical Guide for Ground-Water Sampling," ~~"Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (SW-846), 56 Fed. Reg. 3526-3597, 56 Fed. Reg. 26460-26564, 57 Fed. Reg. 31776-31849,~~ "Techniques of Water Resources Investigations of the United States Geological Survey, Guidelines for Collection and Field Analysis of Ground-Water Samples for Selected Unstable Constituents," incorporated by reference at Section 620.125 or other procedures adopted by the appropriate regulatory agency.

2) Groundwater elevation in a groundwater monitoring well must be determined and recorded when necessary to determine the gradient.

3) The analytical methodology used for the analysis of constituents in Subparts C and D must be consistent with both of the following:

A) The methodology must have a PQL at or below the preventive response levels of Subpart C or groundwater standard set forth in Subpart D, whichever is applicable; and

B) "Methods for Chemical Analysis of Water and Wastes," "Methods for the Determination of Inorganic Substances in Environmental Samples," "Methods for the Determination of Metals in Environmental Samples," "Methods for the Determination of Organic Compounds in Drinking Water," "Methods for the Determination of Organic Compounds in Drinking Water, Supplement I," "Methods for the Determination of Organic Compounds in Drinking Water, Supplement II," "Methods for the Determination of Organic Compounds in Drinking Water, Supplement III," "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions," "Radiochemical Analytical Procedures for Analysis of Environmental Samples," "Radiochemistry Procedures Manual," "Practical Guide for Ground Water Sampling," "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (SW-846), 40 CFR 136, appendix B, 40 CFR 141.80, 40 CFR 141.61, and 40 CFR 141.62, "Techniques of Water Resources Investigations of the United States Geological Survey, Guidelines for Collection and

Field Analysis of Ground Water Samples for Selected Unstable Constituents," ~~The methodology must be consistent with methodologies contained in "Methods for Chemical Analysis of Water and Wastes", "Methods for the Determination of Organic Compounds in Drinking Water~~", "Practical Guide for Ground-Water Sampling", ~~"Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (SW-846),~~ "Techniques of Water Resources Investigations of the United States Geological Survey, Guidelines for Collection and Field Analysis of Ground-Water Samples for Selected Unstable Constituents", incorporated by reference at Section 620.125.

c) Reporting Requirements
At a minimum, groundwater monitoring analytical results must include information, procedures and techniques for:

1) Sample collection (including but not limited to name of sample collector, time and date of the sample, method of collection, and identification of the monitoring location);

2) Sample preservation and shipment (including but not limited to field quality control);

3) Analytical procedures (including but not limited to the method detection limits and the PQLs); and

4) Chain of custody control.

(Source: Amended at 36 Ill. Reg._____, effective _____)

SUBPART F: HEALTH ADVISORIES

Section 620.605 Issuance of a Health Advisory

a) The Agency shall issue a Health Advisory for a chemical substance if all of the following conditions are met:

1) A community water supply well is sampled and a substance is detected and confirmed by resampling;

2) There is no standard under Section 620.410 for such chemical substance; and

3) The chemical substance is toxic or harmful to human health according to the procedures of Appendix A, B, or C.

b) The Health Advisory must contain a general description of the characteristics of the chemical substance, the potential adverse health effects, and a guidance level to be determined as follows:

1) If disease or functional impairment is caused due to a physiological mechanism for where there is a threshold dose below which no damage occurs, the guidance level for any such substance shall be the Maximum Contaminant Level Goal (~~"~~MCLG~~"~~), adopted by USEPA for such substance, 40 CFR 136, appendix B, 40 CFR 141.80, 40 CFR 141.61, and 40 CFR 141.62 ~~56 Fed. Reg. 26460-26564, 56 Fed. Reg. 3526-3597, and 57 Fed. Reg. 31776-31849~~, incorporated by reference at Section 620.125. If there is no MCLG for the substance, the guidance level is the Human Threshold Toxicant Advisory Concentration for such substance as determined in accordance with Appendix A, unless the concentration for such substance is less than the lowest appropriate PQL specified in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", EPA Publication No. SW-846 (SW-846), incorporated by reference at Section 620.125 for the substance. If the concentration for such substance is less than the lowest appropriate PQL for the substance specified in SW-846, incorporated by reference at Section 620.125, the guidance level is the lowest appropriate PQL.

2) If the chemical substance is a carcinogen, the guidance level for any such chemical substance is the one-in-one-million cancer risk concentration, unless the concentration for such substance is less than the lowest appropriate PQL specified in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," EPA Publication No. SW-846 (SW-846), ~~lowest appropriate PQL specified in SW-846,~~ incorporated by reference at Section 620.125 for such substance. If the concentration for such substance is less than the lowest appropriate PQL for the substance specified in SW-846, the guidance level is the lowest appropriate PQL. The one-in-one-million cancer risk concentration, the Human Nonthreshold Toxicant Advisory Concentration (HNTAC), shall be determined according to the following equation:

$$\text{HNTAC (mg/l)} = \frac{\text{TR} \times \text{BW} \times \text{AT} \times 365 \text{ days/year}}{\text{SFo} \times \text{IR} \times \text{EF} \times \text{ED}}$$

Where:

TR = Target Risk = 1.0E-06
BW = Body Weight = 70 kg
AT = Averaging Time = 70 years
SFo = Oral Slope Factor = Chemical-specific
IR = Daily Water Ingestion Rate = 2 liters/day
EF = Exposure Frequency = 350 days/year

ED = Exposure Duration = 30 years

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.APPENDIX A Procedures for Determining Human Threshold Toxicant Advisory Concentration for Class I: Potable Resource Groundwater

a) Calculating the Human Threshold Toxicant Advisory Concentration For those substances for which USEPA has not adopted a Maximum Contaminant Level Goal (~~"~~MCLG~~"~~), the Human Threshold Toxicant Advisory Concentration is calculated as follows:

HTTAC = RSC x ADE/W

Where:

HTTAC = Human Threshold Toxicant Advisory Concentration in milligrams per liter (mg/L)

RSC = Relative contribution of the amount of the exposure to a chemical via drinking water when compared to the total exposure to that chemical from all sources. Valid chemical-specific data shall be used if available. If valid chemical-specific data are not available, a value of 20% (=0.20) must be used;

ADE = Acceptable Daily Exposure of substance in milligrams per day (mg/d) as determined pursuant to subsection (b); and

W = Per capita daily water consumption equal to 2 liters per day (L/d).

b) Procedures for Determining Acceptable Daily Exposures for Class I: Potable Resource Groundwater

1) The Acceptable Daily Exposure (ADE) represents the maximum amount of a threshold toxicant in milligrams per day (mg/d) which if ingested daily for a lifetime results in no adverse effects to humans. Subsections (b)(2) through (b)(6) list, in prescribed order, methods for determining the ADE in Class I: Potable Resource Groundwater.

2) For those substances for which the USEPA has derived a Verified Oral Reference Dose for humans, USEPA's Reference Dose given in milligrams per kilogram per day (mg/kg/d), as determined in accordance with methods provided in National Primary and Secondary Drinking Water Regulations~~,~~; 40 CFR 136, appendix B, 40 CFR 141.80, 40 CFR 141.61, and 40 CFR 141.62 ~~Final Rule, 56 Fed. Reg. 3526-3597, (January 30, 1991)~~, incorporated by reference at Section 620.125, must be used. The ADE equals the product of multiplying the Reference Dose by

70 kilograms (kg), which is the assumed average weight of an adult human.

3) For those substances for which a no observed adverse effect level for humans (NOAEL-H) exposed to the substance has been derived, the ADE equals the product of multiplying one-tenth of the NOAEL-H given in milligrams of toxicant per kilogram of body weight per day (mg/kg/d) by the average weight of an adult human of 70 kilograms (kg). If two or more studies are available, the lowest NOAEL-H must be used in the calculation of the ADE.

4) For those substances for which only a lowest observed adverse effect level for humans (LOAEL-H) exposed to the substance has been derived, one-tenth the LOAEL-H must be substituted for the NOAEL-H in subsection (b)(3).

5) For those substances for which a no observed adverse effect level has been derived from studies of mammalian test species (NOAEL-A) exposed to the substance, the ADE equals the product of multiplying 1/100 of the NOAEL-A given in milligrams toxicant per kilogram of test species weight per day (mg/kg/d) by the average weight of an adult human of 70 kilograms (kg). Preference will be given to animal studies having High Validity, as defined in subsection (c), in the order listed in that subsection. Studies having a Medium Validity must be considered if no studies having High Validity are available. If studies of Low Validity must be used, the ADE must be calculated using 1/1000 of the NOAEL-A having Low Validity instead of 1/100 of the NOAEL-A of High or Medium Validity, except as described in subsection (b)(6). If two or more studies among different animal species are equally valid, the lowest NOAEL-A among animal species must be used in the calculation of the ADE. Additional considerations in selecting the NOAEL-A include:

   A) If the NOAEL-A is given in milligrams of toxicant per liter of water consumed (mg/L), prior to calculating the ADE the NOAEL-A must be multiplied by the average daily volume of water consumed by the mammalian test species in liters per day (L/d~~l/d~~) and divided by the average weight of the mammalian test species in kilograms (kg).

   B) If the NOAEL-A is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the ADE, the NOAEL-A must be multiplied by the average amount in kilograms of food consumed daily by the mammalian test species (kg/d) and divided by the average weight of the mammalian test species in kilograms (kg).

C) If the mammalian test species was not exposed to the toxicant each day of the test period, the NOAEL-A must be multiplied by the ratio of days of exposure to the total days of the test period.

D) If more than one equally valid NOAEL-A is available for the same mammalian test species, the best available data must be used.

6) For those substances for which a NOAEL-A is not available but the lowest observed adverse effect level (LOAEL-A) has been derived from studies of mammalian test species exposed to the substance, one-tenth of the LOAEL-A may be substituted for the NOAEL-A in subsection (b)(5). The LOAEL-A must be selected in the same manner as that specified in subsection (b)(5). One-tenth the LOAEL-A from a study determined to have Medium Validity may be substituted for a NOAEL-A in subsection (b)(3) if the NOAEL-A is from a study determined to have Low Validity, or if the toxicity endpoint measured in the study having the LOAEL-A of Medium Validity is determined to be more biologically relevant than the toxicity endpoint measured in the study having the NOAEL-A of Low Validity.

c) Procedures for Establishing Validity of Data from Animal Studies

1) High Validity Studies

A) High validity studies use a route of exposure by ingestion or gavage, and are based upon:

i) Data from animal carcinogenicity studies with a minimum of 2 dose levels and a control group, 2 species, both sexes, with 50 animals per dose per sex, and at least 50 percent survival at 15 months in mice and 18 months in rats and at least 25 percent survival at 18 months in mice and 24 months in rats;

ii) Data from animal chronic studies with a minimum of 3 dose levels and a control group, 2 species, both sexes, with 40 animals per dose per sex, and at least 50 percent survival at 15 months in mice and 18 months in rats and at least 25 percent survival at 18 months in mice and 24 months in rats, and a well-defined NOAEL; or

iii) Data from animal subchronic studies with a minimum of 3 dose levels and control, 2 species, both sexes, 4 animals per dose per sex for non-rodent species or 10 animals per dose per sex for rodent species, a duration of at least 5% of the test species' lifespan, and a well-defined NOAEL.

B) Supporting studies which reinforce the conclusions of a study of Medium Validity may be considered to raise such a study to High Validity.

2) Medium Validity Studies

Medium validity studies are based upon:

A) Data from animal carcinogenicity, chronic, or subchronic studies in which minor deviations from the study design elements required for a High Validity Study are found, but which otherwise satisfy the standards for a High Validity Study;

B) Data from animal carcinogenicity and chronic studies in which at least 25 percent survival is reported at 15 months in mice and 18 months in rats (a lesser survival is permitted at the conclusion of a longer duration study, but the number of surviving animals should not fall below 20 percent per dose per sex at 18 months for mice and 24 months for rats), but which otherwise satisfy the standards for a High Validity Study;

C) Data from animal subchronic or chronic studies in which a Lowest Observable Adverse Effect Level (LOAEL) is determined, but which otherwise satisfy the standards for a High Validity Study; or

D) Data from animal subchronic or chronic studies which have an inappropriate route of exposure (for example, intraperitoneal injection or inhalation) but which otherwise satisfy the standards for a High Validity Study, with correction factors for conversion to the oral route.

3) Low Validity Studies

Low validity studies are studies not meeting the standards set forth in subsection (c)(1) or (c)(2).

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.APPENDIX B Procedures for Determining Hazard Indices for Class I: Potable Resource Groundwater for Mixtures of Similar-Acting Substances

a) This appendix describes procedures for evaluating mixtures of similar-acting substances which may be present in Class I: Potable Resource Groundwaters. Except as provided otherwise in subsection (c), subsections (d) through (h)

describe the procedure for determining the Hazard Index for mixtures of similar-acting substances.

b) For the purposes of this appendix, a "mixture" means two or more substances which are present in Class I: Potable Resource Groundwater which may or may not be related either chemically or commercially, but which are not complex mixtures of related isomers and congeners which are produced as commercial products (for example, PCBs or technical grade chlordane).

c) The following substances listed in Section 620.410 are mixtures of similar acting substances:

1) Mixtures of ortho-Dichlorobenzene and para-Dichlorobenzene. The Hazard Index ("HI") for such mixtures is determined as follows:

HI = [ortho-Dichlorobenzene]/ 0.6+
[para-Dichlorobenzene]/ 0.075

2) Mixtures of 1,1-Dichloroethylene and 1,1,1-trichloroethane. The Hazard Index ("HI") for such mixtures is determined as follows:

HI = [1,1-Dichloroethylene]/ 0.007 +
[1,1,1-trichloroethane]/ 0.2

d) When two or more substances occur together in a mixture, the additivity of the toxicities of some or all of the substances will be considered when determining health-based standards for Class I: Potable Resource Groundwater. This is done by the use of a dose addition model with the development of a Hazard Index for the mixture of substances with similar-acting toxicities. This method does not address synergism or antagonism. Guidelines for determining when the dose addition of similar-acting substances is appropriate are presented in Appendix C.

The Hazard Index is calculated as follows:

HI = [A]/ALA + [B]/ALB + . . . [I]/ALI

Where:

HI = Hazard Index, unitless.

[A], [B], [I] = Concentration of each similar-acting substance in groundwater in milligrams per liter (mg/L).

ALA, ALB, ALI = The acceptable level of each similar-acting substance in the mixture in milligrams per liter (mg/L).

e) For substances thatwhich are considered to have a threshold mechanism of toxicity, the acceptable level is:

1) The standards listed in Section 620.410; or

2) For those substances for which standards have not been established in Section 620.410, the Human Threshold Toxicant Advisory Concentration (HTTAC) as determined in Appendix A.

f) For substances thatwhich are carcinogens, the acceptable level is:

1) The standards listed in Section 620.410; or

2) For those substances for which standards have not been established under Section 620.410, the one-in-one-million cancer risk concentration, unless the concentration for such substance is less than the lowest appropriate PQL specified in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," EPA Publication No. SW-846, incorporated by reference at Section 620.125, for the substance, in which case the lowest appropriate PQL shall be the acceptable level. the lowest appropriate PQL of USEPA-approved analytical methods specified in SW-846, incorporated by reference at Section 620.125, for each substance.

g) Since the assumption of dose addition is most properly applied to substances that induce the same effect by similar modes of action, a separate HI must be generated for each toxicity endpoint of concern.

h) In addition to meeting the individual substance objectives, a Hazard Index must be less than or equal to 1 for a mixture of similar-acting substances.

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.APPENDIX C Guidelines for Determining When Dose Addition of Similar-Acting Substances in Class I: Potable Resource Groundwaters is Appropriate

a) Substances must be considered similar-acting if:

1) The substances have the same target in an organism (for example, the same organ, organ system, receptor, or enzyme).

2) The substances have the same mode of toxic action. These actions may include, for example, central nervous system depression, liver toxicity, or cholinesterase inhibition.

b) Substances that have fundamentally different mechanisms of toxicity (threshold toxicants vs. carcinogens) must not be considered similar-acting. However,

carcinogens which also cause a threshold toxic effect should be considered in a mixture with other similar-acting substances having the same threshold toxic effect. In such a case, an Acceptable Level for the carcinogen must be derived for its threshold effect, using the procedures described in Appendix A.

c) Substances which are components of a complex mixture of related compounds which are produced as commercial products (for example, PCBs or technical grade chlordane) are not mixtures, as defined in Appendix B. Such complex mixtures are equivalent to a single substance. In such a case, the Human Threshold Toxicant Advisory Concentration may be derived for threshold effects of the complex mixture, using the procedures described in Appendix A, if valid toxicological or epidemiological data are available for the complex mixture. If the complex mixture is a carcinogen, the Health Advisory Concentration is the one-in-one-million cancer risk concentration, unless the concentration for such substance is less than the lowest appropriate PQL specified in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," EPA Publication No. SW-846, incorporated by reference at Section 620.125, for the substance, in which case the lowest appropriate PQL shall be the Health Advisory Concentration. ~~lowest appropriate PQL of USEPA-approved analytical methods specified in SW-846, incorporated by reference at Section 620.125.~~

(Source: Amended at 36 Ill. Reg._____, effective _____)

Section 620.APPENDIX D Confirmation of an Adequate Corrective Action Pursuant to 35 Ill. Adm. Code 620.250(a)(2)

Pursuant to 35 Ill. Adm. Code 620.250(a) if an owner or operator provides a written confirmation to the Agency that an adequate corrective action, equivalent to a corrective action process approved by the Agency, is being undertaken in a timely and appropriate manner, then a groundwater management zone may be established as a three-dimensional region containing groundwater being managed to mitigate impairment caused by the release of contaminants from a site. This document provides the form in which the written confirmation is to be submitted to the Agency.

Note 1. Parts I and II are to be submitted to IEPA at the time that the facility claims the alternative groundwater standards. Part III is to be submitted at the completion of the site investigation. At the completion of the corrective process, a final report is to be filed which includes the confirmation statement included in Part IV.

Note 2. The issuance of a permit by IEPA's Division of Air Pollution Control or Water Pollution Control for a treatment system does not imply that the Agency has approved the corrective action process.

Note 3. If the facility is conducting a cleanup of a unit which is subject to the requirements of the Resource Conservation and Recovery Act (RCRA) or the 35

Ill. Adm. Code 731 regulations for Underground Storage Tanks, this confirmation process is not applicable and cannot be used.

Note 4. If the answers to any of these questions require explanation or clarification, provide such in an attachment to this document.

Part I. Facility Information

Facility Name _____

Facility Address _____

County _____

Standard Industrial Code (SIC) _____

1. Provide a general description of the type of industry, products manufactured, raw materials used, location and size of the facility.

2. What specific units (operating or closed) are present at the facility which are or were used to manage waste, hazardous waste, hazardous substances or petroleum?

	YES	NO
Landfill	_____	_____
Surface Impoundment	_____	_____
Land Treatment	_____	_____
Spray Irrigation	_____	_____
Waste Pile	_____	_____
Incinerator	_____	_____
Storage Tank (above ground)	_____	_____
Storage Tank (underground)	_____	_____
Container Storage Area	_____	_____
Injection Well	_____	_____
Water Treatment Units	_____	_____
Septic Tanks	_____	_____
French Drains	_____	_____
Transfer Station	_____	_____

Other Units (Please describe)

_____

_____

3. Provide an extract from a USGS topographic or county map showing the location of the site and a more detailed scaled map of the facility with each waste management unit identified in Question 2 or known/suspected source clearly

identified. Map scale must be specified and the location of the facility must be provided with respect to Township, Range and Section.

4. Has the facility ever conducted operations which involved the generation, manufacture, processing, transportation, treatment, storage or handling of "hazardous substances" as defined by the Illinois Environmental Protection Act? Yes ____ No ____ If the answer to this question is "yes" generally describe these operations.

5. Has the facility generated, stored or treated hazardous waste as defined by the Resource Conservation and Recovery Act? Yes____ No ____ If the answer to this question is "yes" generally describe these operations.

6. Has the facility conducted operations which involved the processing, storage or handling of petroleum? Yes ____ No ____ If the answer to this question~~questions~~ is "yes" generally describe these operations ~~operation~~.

7. Has the facility ever held any of the following permits?

   a. Permits for any waste storage, waste treatment or waste disposal operation. Yes ____ No ____ If the answer to this question is "yes", identify the IEPA permit numbers.

   b. Interim Status under the Resources Conservation and Recovery Act (filing of a RCRA Part A application). Yes ____ No ____ If the answer to this question is "yes", attach a copy of the last approved Part A application.

   c. RCRA Part B Permits. Yes ____ No ____ If the answer to this question is "yes", identify the permit log number.

8. Has the facility ever conducted the closure of a RCRA hazardous waste management unit? Yes ____ No ____

9. Have any of the following State or federal government actions taken place for a release at the facility?

   a. Written notification regarding known, suspected or alleged contamination on or emanating from the property (e.g., a Notice pursuant to Section 4(q) of the Environment Protection Act)? Yes ____ No ____If the answer to this question is "yes", identify the caption and date of issuance.

   b. Consent Decree or Order under RCRA, CERCLA, EPAct Section 22.2 (State Superfund), or EPAct Section 21(f) (State RCRA). Yes ____ No ____

c. If either of Items a or b were answered by checking "yes", is the notice, order or decree still in effect? Yes ____ No ____

10. What groundwater classification will the facility be subject to at the completion of the remediation?
Class I ____ Class II ____ Class III ____ Class IV____
If more than one Class applies, please explain.

11. Describe the circumstances which the release to groundwater was identified.

Based on my inquiry of those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true and accurate.

_____	_____
Facility Name	Signature of Owner/Operator
_____	_____
Location of Facility	Name of Owner/Operator
_____	_____
EPA Identification Number	Date

PART II: Release Information

1. Identify the chemical constituents release to the groundwater. Attach additional documents as necessary.

Chemical Description	Chemical Abstract No.
_____	_____
_____	_____
_____	_____

2. Describe how the site will be investigated to determine the source or sources of the release.

3. Describe how groundwater will be monitored to determine the rate and extent of the release.

4. Has the release been contained on-site at the facility?

5. Describe the groundwater monitoring network and groundwater and soil sampling protocols in place at the facility.

6. Provide the schedule for investigation and monitoring.

7. Describe the laboratory quality assurance program utilized for the investigation.

8. Provide a summary of the results of available soil testing and groundwater monitoring associated with the release at the facility. The summary of results should provide the following information: dates of sampling; types of samples taken (soil or water); locations and depths of samples; sampling and analytical methods; analytical laboratories used; chemical constituents for which analyses were performed; analytical detection limits; and concentrations of chemical constituents in ppm (levels below detection should be identified as "ND").

Based on my inquiry of those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of knowledge and belief, true and accurate and confirm that the actions identified herein will be undertaken in accordance with the schedule set forth herein.

_____	_____
Facility Name	Signature of Owner/Operator
_____	_____
Location of Facility	Name of Owner/Operator
_____	_____
EPA Identification Number	Date

Part III: Remedy Selection Information

1. Describe the selected remedy.

2. Describe other remedies which were considered and why they were rejected.

3. Will waste, contaminated soil or contaminated groundwater be removed from the site in the course of this remediation? Yes ____ No ____ If the answer to this question is "yes", where will the contaminated material be taken?

4. Describe how the selected remedy will accomplish the maximum practical restoration of beneficial use of groundwater.

5. Describe how the selected remedy will minimize any threat to public health or the environment.

6. Describe how the selected remedy will result in compliance with the applicable groundwater standards.

7. Provide a schedule for design, construction and operation of the remedy, including dates for the start and completion.

8. Describe how the remedy will be operated and maintained.

9. Have any of the following permits been issued for the remediation?

   a. Construction or Operating permit from the Division of Water Pollution Control. Yes ____ No ____

   b. Land treatment permit from the Division of Water Pollution Control. Yes ____ No ____ If the answer to this question is "yes", identify the permit number.

   c. Construction or Operating permit from the Division of Air Pollution Control. Yes ____ No ____ If the answer to this question is "yes", identify the permit number.

10. How will groundwater at the facility be monitored following completion of the remedy to ensure that the groundwater standards have been attained?

Based on my inquiry of those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true and accurate and confirm that the actions identified herein will be undertaken in accordance with the schedule set forth herein.

_____	_____
Facility Name	Signature of Owner/Operator
_____	_____
Location of Facility	Name of Owner/Operator
_____	_____
EPA Identification Number	Date

PART IV: Completion Certification

This certification must accompany documentation which includes soil and groundwater monitoring data demonstrating successful completion of the corrective process described in Parts I-III.

Facility Name _____
Facility Address _____
_____
_____

County _____
Standard Industrial Code (SIC) _____
Date _____

Based on my inquiry of those persons directly responsible for gathering the information, I certify that an adequate corrective action, equivalent to a corrective action process approved by the Agency, has been undertaken and that the following restoration concentrations are being met:

Chemical Name	Chemical Abstract No.	Concentration (mg/L~~l~~)
_____	_____	_____
_____	_____	_____
_____	_____	_____

_____ _____
Facility Name Signature of Owner/Operator

_____ _____
Location of Facility Name of Owner/Operator

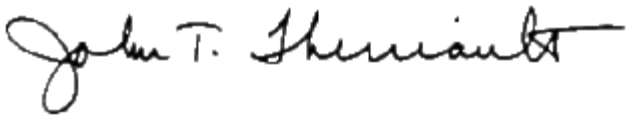
_____ _____
EPA Identification Number Date

(Source: Amended at 36 Ill. Reg._____, effective _____)

IT IS SO ORDERED.

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2010); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, John T. Therriault, Assistant Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on October 4, 2012, by a vote of 4-0.



John T. Therriault, Assistant Clerk
Illinois Pollution Control Board