BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	PCB R89-
GROUNDWATER QUALITY STANDARDS	)	
(35 ILL. ADM. CODE 620)	)	

STATEMENT OF REASONS

Pursuant to 35 Ill. Adm. Code 102.120(b), the Illinois Environmental Protection Agency ("Agency") hereby submits to the Illinois Pollution Control Board ("Board") a statement of reasons in support of the attached proposal of regulations.

I. STATUTORY AUTHORITY

Section 2(b) of the Illinois Groundwater Protection Act ("IGPA") (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 7452(b)) sets forth 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.

To further this statutory purpose, Section 4 of the IGPA (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 7454) establishes within State government the Interagency Coordinating Committee on Groundwater. The Committee consists of ten agencies[1] and is required to review and evaluate State groundwater activities.

In addition, Section 5 of the IGPA (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 7455) creates the Groundwater Advisory Council. The Council consists of 9 public members appointed by the Governor and provides an independent review and evaluation of State groundwater activities.

Section 8(a) of the IGPA (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 7458(a)) requires the Agency (after consultation with the Interagency Coordinating Committee on Groundwater and the Groundwater Advisory Council) to propose, and the Board to adopt within two years:

> . . . comprehensive water quality standards for the protection of groundwater. In preparing such regulations, the Agency shall address, to the extent feasible, those contaminants which have been found in groundwaters of the State and which are known to cause, or suspected of causing cancer, birth defects, or any other adverse effect

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[1] The Illinois Environmental Protection Agency, Illinois Department of Energy and Natural Resources, Illinois Department of Public Health, Department of Mines and Minerals, Office of the State Fire Marshall, Division of Water Resources of the Illinois Department of Transportation, Illinois Department of Agriculture, Illinois Emergency Services and Disaster Agency, Illinois Department of Nuclear Safety, and Illinois Department of Commerce and Community Affairs.

> on human health according to nationally accepted guidelines . . .

Based upon the broad statutory mandate contained in the IGPA and the extraordinary measures provided in that law for interagency communication and cooperation, it is clear that the IGPA requires the Board to adopt "comprehensive water quality standards for the protection of groundwater" that apply even to such activities that may have in the past been primarily regulated by another State agency, department, or office. To be truly "comprehensive," the groundwater standards must be a body of regulations that form a regulatory "umbrella" under which these other State programs must operate. This point is further supported by the fact that the Board mandate to adopt the "comprehensive water quality standards for the protection of groundwater" was not merely added as an amendment to the Environmental Protection Act ("Act") (Ill. Rev. Stat. 1987, ch. 111 1/2, pars. 1001 et seq.), but rather was set forth in the IGPA, a free-standing body of statute containing its own stated policies and purposes.

While the IGPA does not directly specify the subject matter to be contained in the proposed regulations, Section 8(b) of the IGPA (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 7458(b)) does list the factors that the Board must consider when adopting these regulations:

> 1. recognition that groundwaters differ in many important respects from surface waters, including water quality, rate of movement,

direction of flow, accessibility, susceptibility to pollution, and use;

2. classification of groundwaters on an appropriate basis, such as their utility as a resource or susceptibility to contamination;

3. preference for numerical water quality standards, where possible, over narrative standards, especially where specific contaminants have been commonly detected in groundwaters or where Federal drinking water levels or advisories are available;

4. application of nondegradation provisions for appropriate groundwaters, including notification limitations to trigger preventive response activities;

5. relevant experiences from other states where groundwater programs have been implemented; and

6. existing methods of detecting and quantifying contaminants with reasonable analytical certainty.

Using this list as a guide, the Agency developed the regulations set forth in 35 Ill. Adm. Code 620.

II. REGULATORY DEVELOPMENT

In the development of 35 Ill. Adm. Code 620, the Agency actively invited comments and suggestions regarding the proposal from other State agencies, public interest groups, and the general public.

On February 2, 1988, the Interagency Coordinating Committee on Groundwater met in Springfield. At that meeting the Agency distributed a draft of the Issues/Options Paper for Comprehensive Water Quality Standards for Groundwater. The Agency provided a detailed explanation of

the paper and solicited comments from the Committee (see Exhibit 1).

On May 9, 1988, the Agency met with the Groundwater Advisory Council in Springfield. At that meeting the Agency distributed a draft of the Issues/Options Paper for Comprehensive Water Quality Standards for Groundwater. The Agency provided a detailed explanation of the paper and solicited comments from the Council (see Exhibit 2).

On July 7, 1988, the Interagency Coordinating Committee on Groundwater met in Springfield. At that meeting the Agency discussed the comments received from the Groundwater Advisory Council and from the Illinois Regulatory Group on the draft Issues/Options Paper for Comprehensive Water Quality Standards for Groundwater. Also the Agency solicited additional comments from the Committee (see Exhibit 3).

On September 12, 1988, the Interagency Coordinating Committee on Groundwater and the Groundwater Advisory Council met in Springfield. At that meeting the Agency discussed a draft of the Issues/Options Paper for Comprehensive Water Quality Standards for Groundwater (see Exhibit 4).

On November 14, 1988, the Interagency Coordinating Committee on Groundwater met in Springfield and the Agency discussed the comments received on the draft Issues/Options

Paper for Comprehensive Water Quality Standards for Groundwater (see Exhibit 5).

On December 1, 1988, the Groundwater Advisory Council sponsored a groundwater protection policy forum in Naperville. At this meeting the Agency participated in an overview of the Issues/Options Paper for Comprehensive Water Quality Standards for Groundwater that was presented by a panel of Groundwater Advisory Council members. In addition, implementation of groundwater quality standards in other States was discussed by representatives from several other states (see Exhibits 6 and 7).

On December 2, 1988, the Groundwater Advisory Council met with the Agency in Naperville and discussed the Council's response to the Issues/Options Paper for Comprehensive Water Quality Standards for Groundwater (see Exhibit 8).

On January 10, 1989, the Interagency Coordinating Committee on Groundwater met in Springfield. The Agency announced the establishment of an Interagency Groundwater Standards Technical Team to be comprised of members from other State agencies to assist in the development of 35 Ill. Adm. Code 620, and discussed the development of a Discussion Document for Comprehensive Groundwater Quality Standards (see Exhibits 9 and 10).

On January 11, 1989, the Interagency Groundwater Standards Technical Team met in Springfield. The Agency prepared a table of over 400 compounds that were known or suspected to occur in Illinois groundwater, and the Team discussed the table extensively. In addition, the Agency and the Team discussed the development of a Discussion Document for Comprehensive Groundwater Quality Standards and the basis for developing groundwater standards (see Exhibits 11 and 12).

On January 24, 1989, the Agency met with the Groundwater Advisory Council in Naperville. The Agency discussed the development of a Discussion Document for Comprehensive Groundwater Quality Standards, and responded to questions concerning the Issues/Options Paper for Comprehensive Water Quality Standards for Groundwater (see Exhibit 13).

On February 10, 1989, the Interagency Groundwater Standards Technical Team met in Springfield. The Agency described the statutory authority under the IGPA and the rationale behind the proposed groundwater classification system.

On February 21, 1989, the Interagency Groundwater Standards Technical Team met in Springfield. The Team provided comments on the compounds and criteria that should

be addressed in a draft Discussion Document for Comprehensive Groundwater Quality Standards.

On March 7, 1989, the Interagency Coordinating Committee on Groundwater met in Springfield. The Agency distributed a copy of the draft Discussion Document for Comprehensive Groundwater Quality Standards to the Committee, and provided a detailed explanation of the document (see Exhibit 14).

On March 8 and 16, 1989, the Interagency Groundwater Standards Technical Team met in Springfield. At these meetings the Agency explained the draft Discussion Document for Comprehensive Groundwater Quality Standards and solicited comments from the Team.

On April 21, 1989 the Agency met with the Groundwater Advisory Council in Springfield. At the meeting the Agency provided a detailed explanation of the final draft of the Discussion Document on Comprehensive Groundwater Quality Standards and solicited comments from the Council (see Exhibits 15 and 16).

On April 24, 1989, the Agency conducted a public rulemaking development session in Springfield. At this session the Agency described the content of the Discussion Document on Comprehensive Groundwater Quality Standards and solicited comments.

On May 3, 9, and 11, 1989, the Agency conducted open public workshops in Elgin, Springfield, and Collinsville respectively. At those workshops the Agency described the Discussion Document For Comprehensive Groundwater Quality Standards and solicited comments.

On May 8, 1989, the Interagency Coordinating Committee on Groundwater met in Springfield. At that meeting the Agency described the comments received from the Groundwater Advisory Council and the rulemaking development session, and solicited comments from the Committee (see Exhibit 17).

On May 30, 1989, the Interagency Groundwater Standards Technical Team met in Springfield. At that meeting the Agency discussed the comments received from the Interagency Coordinating Committee on Groundwater, Groundwater Advisory Council, rulemaking development session, and public workshops. In addition, the Department of Public Health and the Agency's Office of Chemical Safety discussed the research they had done on the groundwater quality criteria.

On July 12, 1989, the Agency met with the McHenry County Defenders and Citizens for A Better Environment in Springfield. At that meeting the Agency described options under consideration and solicited comments.

On July 17, 1989, the Interagency Coordinating Committee on Groundwater met in Springfield. At that meeting the Agency provided a detailed description of a

draft of 35 Ill. Adm. Code 620 and solicited comments from the Committee.

On August 8, 1989, the Agency met with the Illinois Environmental Regulatory Group in Springfield. At that meeting the Agency described a draft of 35 Ill. Adm. Code 620 and solicited comments.

On August 9, 1989, the Agency conducted a public rulemaking development session in Springfield. At that meeting the Agency described a draft of 35 Ill. Adm. Code 620 and solicited comments.

On August 15, 1989, the Agency met with the Illinois Coal Association and the Illinois Department of Mines and Minerals in Springfield. At that meeting the Agency described a draft of 35 Ill. Adm. Code 620 and solicited comments.

The Agency made numerous revisions to 35 Ill. Adm. Code 620 in response to the comments and suggestions received as a result of these public participation efforts.

III. DESCRIPTION OF THE PROPOSAL

A. Subpart A

Subpart A sets forth the general provisions applicable to the entire part.

Section 620.101 sets forth the purpose of Part 620. This expressed purpose is consistent with the mandate contained in Section 8 of the IGPA.

Section 620.102 contains the definitions that are applicable to Part 620.

Section 620.103 requires persons to comply with the Act and Board regulations.

Section 620.104 describes the documents that are incorporated by reference into Part 620.

Section 620.105 provides that groundwater is not required to meet the general use standards and public and food processing standards contained in Subparts B and C of 35 Ill. Adm. Code 302. This section clarifies the relationship between 35 Ill. Adm. Code 302 and 35 Ill. Adm. Code 620.

Section 620.106 excludes the listed activities from Subparts C and D of Part 620. These excluded activities include certain types of man-made conduits and certain types of dewatering operations. The discharge to surface waters from such activities are regulated under 35 Ill. Adm. Code: Subtitle C.

B. Subpart B

Subpart B establishes the groundwater classification system and sets forth procedures for reclassification of groundwater.

Section 620.201 describes the four classes of groundwater:

1. Class I: Potable Resource Groundwater
2. Class II: General Resource Groundwater
3. Class III: Remedial Groundwater
4. Class IV: Naturally Limited Groundwater

All groundwater within the State falls into one of these four classes.

Class I: Potable Resource Groundwater is groundwater within a certain specified distance from a community water supply well or other potable water supply well. As set forth in Section 620.201(b), this distance may vary depending on the type of well and the hydrogeology of the area around the well.

Class II: General Resource Groundwater is all groundwater that is not otherwise contained in one of the other three classes.

Class III: Remedial Groundwater is groundwater that due to contamination cannot meet the groundwater criteria set forth in Subpart C for an extended period of time. This

class includes groundwater contaminated by National Priorities List sites, State Remedial Action Priorities List sites, leaking underground storage tank sites, sites subject to corrective action approved by the Agency under 35 Ill. Adm. Code: Subtitle G, sites undergoing corrective action under 35 Ill. Adm. Code 615 or 616, permitted coal mining sites, or coal mining sites that were mined prior to current State land reclamation regulations.

It should be noted that under Section 620.303 remediation or reclamation efforts on Class III: Remedial Groundwater must result in such groundwater meeting Class II: General Resource Groundwater criteria on-site and meeting whatever criteria that is appropriate to the class of groundwater located off-site (i.e., Class I: Potable Resource Groundwater or Class II: General Resource Groundwater). It should also be noted that the status of groundwater as Class III: Remedial Groundwater ends when remediation or reclamation is completed.

Class IV: Naturally Limited Groundwater is groundwater that contains more than 10,000 mg/l of total dissolved solids due to natural conditions, or groundwater that the Board has designated as an exempted aquifer pursuant to 35 Ill. Adm. Code 730.104.

Section 620.202 sets forth the procedures by which the Board may reclassify groundwater by a site-specific rule.

For example, groundwater classified under this proposal as Class II: General Resource Groundwater may be reclassified by site-specific rule as Class I: Potable Resource Groundwater if the petitioner can demonstrate that the groundwater meets the standard set forth in Section 620.201(b)(5).

Section 620.203 sets forth the procedures by which the Board may reclassify certain groundwater by an adjusted standard. Under Section 620.201(b)(3) and (b)(4), within a specified period of time the area that is designated as Class I: Potable Resource Groundwater around certain community water supply wells will automatically increase to 3000 feet from the wellhead. Under Section 620.203, the Board must grant an adjusted standard resulting in an extension of Class I: Potable Resource Groundwater beyond 3000 feet from the wellhead if the petitioner demonstrates that the requested extension is within a "proximate aquifer" as defined in Section 620.203(e).

Section 620.204 authorizes the owner of a potable water supply well (other that a community water supply well) to obtain from an adjacent landowner a waiver of a Class I: Potable Resource Groundwater designation for groundwater contained on the adjacent site under certain specified conditions. This waiver process is similar in concept to the waiver provisions set forth in Section 14.2(b) of Act.

C. Subpart C

Subpart C sets forth the groundwater quality criteria for Class I: Potable Resource Groundwaters, Class II: General Resource Groundwater, Class III: Remedial Groundwater, and Class IV: Naturally Limited Groundwater.

The Agency based the health-related groundwater quality criteria in Subpart C on the Maximum Contaminant Levels ("MCLs") developed by the United States Environmental Protection Agency ("USEPA"). Where USEPA has proposed an MCL for a contaminant for which there is no existing MCL or where USEPA has proposed to modify an existing MCL, the Agency based its groundwater criteria on the proposed MCL. If USEPA adopts the proposed MCL as a final rule prior to the Board's adoption of this proposal, the Agency recommends that the Board adopt the MCL contained in USEPA's final rule, even if the MCL contained in the final rule differs from USEPA's proposed MCL.

Section 620.301 contains the inorganic and organic chemical constituents that are applicable to Class I: Potable Resource Groundwater. The inorganic constituent criteria for gross alpha and lead are based on USEPA's MCLs. Arsenic, barium, cadmium, chromium, copper, mercury, nitrate-nitrogen, and selenium are based on USEPA's proposed MCLs. The criteria for cyanide, manganese, and silver are based on the Maximum Allowable Concentration ("MAC") set forth in 35 Ill. Adm. Code 604.202. USEPA is proposing to

delete the MCL for silver and in its place adopt a Secondary Maximum Contaminant Level ("SMCL"). The criteria for chloride, iron, sulfate, and total dissolved solids are based on the 95 percent confidence concentration level from all of the groundwater monitoring conducted by the Agency from community water supply wells.

The organic chemical constituent criteria for benzene, carbon tetrachloride, endrin, para-dichlorobenzene, 1,2-dichloroethane, 1,1-dichloroethylene, 1,1,1-trichloroethane, trichloroethylene, and vinyl chloride are based on USEPA's MCLs. The organic chemical constituent criteria for alachlor, alidicarb, atrazine, carbofuran, chlordane, heptachlor, heptachlor epoxide, lindane, 2,4-D, ortho-dichlorobenzene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, ethylbenzene, methoxychlor, monochlorobenzene, pentachlorophenol, polychlorinated biphenyls, styrene, 2,4,5-TP, tetrachloroethylene, toluene, [illegible]ene, and xylenes are based on USEPA's proposed MCLs.

USEPA proposed dual criteria for styrene because of the uncertainty of its carcinogenicity classification. The Agency utilized the less stringent criteria since USEPA's discussion of the uncertainty factors appears to support the less stringent criteria.

The complex organic chemical mixture criteria for gasoline, diesel fuel or heating fuel were selected

consistent with USEPA model procedures for effluent limitations. Benzene is used as a main pollutant of concern because of its solubility and because it is a carcinogen. Benzene can also be used as an indicator parameter for the removal of other related chemicals (e.g., propylene and naphthalene). The aggregate parameter of benzene, ethylbenzene, toluene, and the xylenes ("BETX") was also selected as an indicator since BETX is often used as the petroleum industry standard. The criteria for benzene was based on a USEPA MCL. The complex organic chemical mixture criteria for BETX was based on the summation of the USEPA's MCLs and proposed MCLs for benzene, ethylbenzene, toluene, and xylenes.

Section 620.302 contains the inorganic and organic criteria that are applicable to Class II: General Resource Groundwater. The general basis for the inorganic criteria in this section are the levels recommended to USEPA in "Water Quality Criteria: 1972, by the National Academy of Sciences - National Academy of Engineering.

The inorganic chemical constituent criteria for arsenic, cobalt, copper, cyanide, fluoride, lead, and mercury are based on recommended limits for livestock water supply. The inorganic chemical constituent criteria for cadmium and chromium are based on recommended water quality criteria for both livestock and irrigation concerns. The inorganic criteria for boron, selenium, and zinc are based

on recommended water quality criteria for intermittent irrigation on tolerant crops. These are similar to the conditions under which irrigation is used in Illinois. The inorganic constituent criteria for total dissolved solids are based on the 95 percent confidence concentration level from all of the groundwater monitoring conducted by the Agency at community water supply wells.

The organic chemical constituent criteria are based on a calculation that takes USEPA's MCLs or proposed MCLs and increases that level by a factor derived from either an 80% removal efficiency or USEPA's most cost-effective best available treatment ("BAT") removal percentage levels, with the exception of phenols[2] and xylenes[3]. Therefore, the upper limit for Class II: General Resource Groundwater would never exceed a treatable level for any organic constituent having a health-based Class I: Potable Resource Groundwater criteria.

The organic criteria for alachlor, aldicarb, atrazine, benzene, carbofuran, carbon tetrachloride, chlordane, endrin, heptachlor, heptachlor epoxide, lindane, 2,4-D, para-dichlorobenzene, 1,2-dichloroethane, 1,1-dichloroethylene, trans-1,2-dichloroethylene, methoxychlor monochlorobenzene, pentachlorophenol, polychlorinated

[2] The criteria established for phenols is based on 35 Ill. Adm. Code 302.208.
[3] The criteria for all three of the xylenes is based on USEPA's proposed MCL for any single xylene.

biphenyls, styrene, 2,4,5-TP, tetrachloroethylene, toxaphene, 1,1,1-trichloroethane, trichloroethylene, and vinyl chloride is derived from a 80 percent removal efficiency rate. The criteria established for ortho-dichlorobenzene is derived from a 40 percent removal efficiency rate. The criteria established for cis-1,2-dichloroethylene is derived from a 65 percent removal efficiency rate. The criteria established for ethylbenzene is derived from a 30 percent removal efficiency rate. The criteria established for toluene is derived from a 60 percent removal efficiency rate.

The complex organic chemical mixture criteria of gasoline and fuels is derived from the criteria established for each individual chemical. The criteria for BETX is based on adding the criteria for benzene, ethylbenzene, toluene, and xylenes as described above.

The alternate total dissolved solids ("TDS") criteria is based upon the maximum concentration of the ambient TDS concentration level resulting from past surface coal mining, but not to exceed 3000 mg/l. Such a TDS level will still allow the water to be used for irrigation, livestock watering, and other beneficial general uses. In addition, this level also corresponds to the lower limit established by USEPA as an exempt aquifer pursuant to 35 Ill. Adm. Code 730.104. Also, where coal mining activity creates groundwater where no significant resource groundwater

existed prior to mining, the TDS criteria for such groundwater is based upon the maximum concentration of the ambient TDS concentration level resulting from past surface coal mining, but not to exceed 5000 mg/l.

Section 620.303 establishes the groundwater quality criteria for Class III: Remedial Groundwater. This criteria is based on the existing concentration of contaminants in the groundwater underlying a site. The criteria that apply on-site after remediation or closure are the criteria for Class II: General Resource Groundwater. The criteria that applies off-site are the criteria appropriate to the class of groundwater off-site.

Section 620.304 establishes the procedures for determining compliance with the groundwater criteria. Section 620.304 describes where each criteria apply and describes the points where monitoring data can be obtained to determine compliance.

In general, criteria for a particular class of groundwater applies to that groundwater unless the groundwater is located on-site. All groundwater on-site must meet the criteria for Class II: General Resource Groundwater.

Groundwater criteria shall only apply down gradient of a contamination source or at the boundary of other structures (e.g., buildings). This exclusion recognizes

that monitoring and removal of contaminants under certain structures may not be feasible. In addition, appropriate criteria always apply off-site unless a waiver is provided under Section 620.204.

The criteria applies at appropriate wells or springs. An appropriate well is one permitted by a State regulatory agency or constructed (or reconstructed) in accordance with applicable codes or rules. In addition, monitoring wells must meet the specified technical criteria. These requirements are consistent with the Department of Public Health standards. The Department of Public Health is developing a monitoring well code. When the Department of Public Health codifies a monitoring well code, it is the Agency's intent to be consistent with those rules.

In addition, a spring discharging groundwater from an aquifer is a permissible monitoring point to determine compliance. This is not intended to allow seeps or other minor groundwater discharges as a monitoring point.

The technical requirements proposed in this section for wells and springs helps assure representative groundwater samples. The procedures standardize the monitoring locations, and better define the specific criteria applicable to those groundwaters.

Section 620.305 details groundwater monitoring, analytical, and reporting requirements. This section

establishes standards for a representative sample collection point for drinking water wells, wells other than drinking water wells, monitoring wells, and springs. Groundwater samples must be collected from drinking water wells and wells other than drinking water wells prior to any treatment. This section also requires that groundwater collected from a monitoring well or spring be filtered for inorganic chemical constituent analyses.

Section 620.305 also details sample collection procedures, water level collection requirements, and analytical laboratory methods. For organic compounds that are listed as carcinogens, the analytical standard requires the use of a methodology which has a practical quantification level ("PQL") at or below the groundwater criteria. In addition, all analytical methodology must be consistent with the methodologies incorporated by reference under Section 620.104.

Further, Section 620.305 sets forth specific groundwater monitoring information reporting requirements. The reporting requirements contained in this section do not apply to activities subject to Subpart B of 35 Ill. Adm. Code 615 or 616, or units subject to Subpart F of 35 Ill. Adm. Code 724.

D. Subpart D

Subpart D details groundwater non-degradation and preventive management procedures.

Section 620.401 describes the general regulation prohibiting the downgrading of a groundwater class. Thus, for example, Class I: Potable Resource Groundwater must not be degraded to non-potable use, while Class II: General Resource Groundwater must not be degraded to Class III: Remedial Groundwater.

Section 620.402 requires that preventative management procedures apply to new sites within Class I: Potable Resource Groundwater and Class II: General Resource Groundwater, and to existing sites within a setback zone. This section differentiates between new and existing sites. The requirements for new sites are more stringent than the requirements for existing sites. This approach is consistent with the application of nondegradation to "appropriate groundwaters" as described in Section 8(b)(4) of the IGPA (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 7458(b)(4)). By distinguishing between new and existing sites in the application of nondegradation requirements, Subpart D results in a gradual and manageable phase-in of these more rigorous requirements. This regulation is also consistent with 35 Ill. Adm. Code 615 and 616, and the IGPA

which prescribe more stringent provisions for those activities or sources that are not already in existence.

Section 620.402 describes when a preventative management response must be initiated for Class I: Potable Resource Groundwater and Class II: General Resource Groundwater. If a constituent listed in this section is detected by a regulated entity or regulatory agency or department, a preventative management response must be undertaken. This generally requires that the detection of a constituent be confirmed by additional monitoring.

In addition, Section 620.402 describes the person or entity that may determine a detection. A detection may be determined by a State regulatory agency or department, or by the owner and operator of a regulated entity for which groundwater monitoring is required pursuant to State or Federal law. Also, definitions are provided for terms used in this section.

Section 620.403 sets forth the preventative management response procedure responsibilities of regulated entities, the Agency, and the Department of Public Health. This section requires that a detection at a monitoring well or drinking water well must be resampled by a regulated entity or State agency or department and, if confirmed, the appropriate agency must be notified.

In addition under Section 620.403, the owner and operator of a regulated entity that has been notified must sample each of their own monitoring wells or drinking water wells if the site stores, disposes, or otherwise handles material containing the constituent that was detected. If the same constituent is detected again, the monitoring or drinking water well must be resampled and the results must be reported to the Agency. The results of monitoring under Section 620.403 is used to determine the nature, extent, and source of any contamination.

Section 620.403 also requires the Agency to conduct a well site survey if it receives notice that a contaminant has been detected, unless a well site survey has been conducted within the last 3 years or a groundwater protection needs assessment has been conducted. This information will help determine if sources, routes, or activities might be a possible cause of the contamination.

Section 620.404 specifies the conditions and criteria which trigger applicable corrective action at sites that are subject to the preventive management procedures of Section 620.402. This section is a specific response to Section 8(b)(4) of the IGPA (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 7458(b)(4)). The applicable corrective action is that which is required by other law or regulations governing the regulated entity that is a source of the contamination. In other words, this section establishes a groundwater

"trigger" for corrective action under other State or Federal programs.

Section 620.404(a) describes the corrective action trigger for Class I: Potable Resource Groundwater. Applicable corrective action must be undertaken in Class I: Potable Resource Groundwater if (1) the Secondary Maximum Contaminant Level ("SMCL") are exceeded for the seven listed constituents which have organoleptic thresholds less than the health-based threshold of the Class I: Potable Resource Groundwater criteria, (2) a carcinogen denoted in Section 620.301(c) or (d) is exceeded, (3) benzene exceeds 0.005 mg/l or BETX exceeds 0.095 mg/l[4] for fuels, or (4) a statistically significant increase above background for any other constituent listed in the Class I: Potable Resource Groundwater criteria (i.e, Section 620.301).

Exceeding an SMCL will trigger potable groundwater protection at the first indication of taste or odor impacts upon the groundwater. Triggering corrective action whenever a PQL is exceeded for constituents denoted as carcinogens in Section 620.301(c) or (d) essentially requires corrective action whenever one of these constituents can be quantified. The statistically significant increase trigger is consistent with the requirements set forth in 35 Ill. Adm. Code 616 and 724.

[4] Note that the value of 0.095 mg/l for BETX was derived from the sum of the SMCLs for ethylbenzene, toluene, and xylenes.

Section 620.404(b) describes the corrective action trigger for Class II: General Resource Groundwater. Applicable corrective action must be undertaken in Class II: General Resource Groundwater if the Class I: Potable Resource Groundwater criteria (Section 620.301) for organics, complex organic chemical mixtures and selected inorganics are exceeded. This trigger for Class II: General Resource Groundwater is intended to help assure that groundwaters of this class which already comply with Class I: Potable Resource Groundwater criteria are maintained at this better water quality level. Detection of constituents exceeding this criteria would cause preventative management procedures and corrective action to be initiated.

The exceptions set forth in Section 620.404(c) provide regulatory relief if the regulated entity can demonstrate that the source of the contamination is due to background or due to sampling error. In addition, this subsection grandfathers all levels established by appropriate prior corrective action, thus assuring that final determinations that were previously made regarding prior closure actions will be recognized. This subsection requires that the demonstration thereunder must be made to the Agency.

Section 620.405 provides for an adjusted standard from applicable corrective action. If a regulated entity is subject to applicable corrective action the owner or operator can file a petition with the Board and the State

regulatory agency or department that issued the notice of corrective action. The Board must issue an adjusted standard if the owner and operator of a regulated entity demonstrates that significant adverse economic and social impacts will result from implementation of the corrective action, and that the residual environmental or health risks posed by the contaminants are not a significant hazard. This section does not allow an adjusted standard option for any regulated entity that is the subject of corrective action under 35 Ill. Adm. Code 724 or 725, or under the Resource Conservation and Recovery Act of 1976 (P.L. 94-580, 42 USCS §6901 et seq., as amended).

E. Subpart E

Subpart E establishes procedures for developing and issuing a Health Advisory. A Health Advisory is a means for the Agency to establish a guidance level for a chemical substance or a mixture of chemical substances for which criteria have not yet been set under Section 620.301. This advisory process is intended to mirror the procedure used by USEPA to account for substances detected in groundwater that do not have promulgated criteria. Also, it should be noted that this Subpart codifies existing practice by the Agency.

The Health Advisory procedure will begin when such a chemical substance or mixture of chemical substances is detected in a community water supply. The Agency will then

develop a guidance level for this chemical substance or mixture of chemical substances using the procedures described in Appendices A, B, and C. These procedures are derived from USEPA's guidelines for assessing risk to human health, including guidelines on developing Maximum Contaminant Level Goals ("MCLGs") and Oral Reference Doses (RfD_O), and National Academy of Sciences' guidelines for assessing adverse effects to human health from drinking water contaminants. The Agency will publish the Health Advisories in documents which will be available to the public.

Section 620.501 states that the guidance level developed from the Health Advisory process will be used by the Agency in setting groundwater cleanup or action levels and proposing new or revised groundwater quality criteria to the Board. The Health Advisory guidance level will also be used by the Agency to determine whether the community water supply is being taken from the best available raw water source as required by 35 Ill. Adm. Code 604.501(a).

Section 620.502 states that a Health Advisory will be issued if a chemical substance or mixture of chemical substances is found in a community water supply well as no criteria under Section 620.301, and is harmful to human health.

The Health Advisory guidance level will be equal to the MCLG, if it exists, for noncarcinogens or the PQL for carcinogens. If the chemical substance does not have an established MCLG or a mixture of chemical substances is present, the guidance level is determined using the procedures specified in Appendices A, B, and C.

Section 620.503 states that the full text of the Health Advisory will be published and made available to the public.

F. Appendices

Appendix A sets forth specific procedures for calculating Human Threshold Toxicant Advisory Concentrations for a chemical substance for which the Board has not adopted a groundwater standard for Class I: Potable Resource Groundwater and for which USEPA has not adopted an MCLG. These procedures reflect the preference stated in the IGPA for the use of "nationally accepted guidelines" in implementing that act.

Subsection (a) of Appendix A describes the calculation of the Human Threshold Toxicant Advisory Concentration. The methodology is identical to the procedures used by USEPA to calculate Lifetime Health Advisories for drinking water. The Human Threshold Toxicant Advisory Concentration is calculated from an estimation of the Acceptable Daily Exposure (determined in subsection (b)), which is then distributed into the normal amount of drinking water

consumed by humans. There is an adjustment made to this acceptable concentration for the relative contribution of the amount of a person's exposure to a chemical from drinking water when compared to their exposure to that chemical from all other sources. Chemical-specific information on the relative contribution of drinking water and all other sources of exposure to a chemical must be used, if available. If such data are not available, the default value specified is the default value used by USEPA to develop its drinking water Health Advisories.

Subsection (b) of Appendix A lists procedures for determining the Acceptable Daily Exposure to be used in calculating the Human Threshold Toxicant Advisory Concentration in subsection (a). Subsection (b)(1) describes the Acceptable Daily Exposure as the maximum amount of a threshold toxicant, in units of milligrams per day, which if ingested daily for a lifetime is expected to result in no adverse effects to humans. Subsections (b)(2) through (b)(6) describe methods for deriving the Acceptable Daily Exposure. Preference is given to the use of USEPA's Verified Oral Reference Dose where available. This value is a peer-reviewed estimate of the human no-effect "dose", developed by USEPA for chemicals which cause toxic effects for which there are identifiable thresholds for the toxic effects. For chemicals which lack a Verified Oral Reference Dose, preference is given in descending order to health

effects data from: investigations of human exposures in which a No Adverse Effect Level is identified; investigations of human exposures in which a Lowest Adverse Effect Level is identified; animal studies in which a No Adverse Effect Level is identified; and animal studies in which a Lowest Adverse Effect Level is identified. Guidance is also provided for animal studies to convert study results into the form (i.e., in units of milligrams per kilogram per day) required to be used in subsection (a), if necessary, and to correct for less-than-full time exposure. When animal studies must be used, preference is given to studies determined to have High Validity, as specified in subsection (c).

Subsection (c) of Appendix A outlines procedures for establishing the validity of data from animal studies. A rating of High Validity is given to animal studies in which the animals are exposed to the chemical for their lifetime, or, if the study design calls for less-than-lifetime exposure, in which a No Observable Adverse Effect Level may be identified for the chemical. Minimum requirements for various aspects of the study designs are also specified for a study of High Validity. Studies in which minor deviations from the requirements of a High Validity study are found, but which satisfy all other requirements for a study of High Validity, are considered to have Medium Validity. Low

Validity studies are those not meeting the requirements for High or Medium Validity studies.

Appendix B describes procedures for calculating the Hazard Index for mixtures of similar-acting substances in Class I: Potable Resource Groundwater. The Hazard Index calculations rely on procedures very similar to those used by USEPA to assess the potential health hazards from mixtures of chemical substances. The Hazard Index is an estimator of the combined effect of two or more similar acting substances in a mixture on human health.

In subsection (b) of Appendix B, "mixture" is defined as two or more substances which may or may not be related chemically or commercially, but which are not complex mixtures of closely related chemicals which are intentionally produced as a commercial product, such as PCBs or technical grade chlordane.

Subsection (c) of Appendix B specifically identifies the Hazard Index calculation for two mixtures of similar acting substances for which both members of the mixture have had groundwater standards for Class I: Potable Resource Groundwater proposed in Section 620.301. For any other mixtures in which one or more of the members do not have groundwater standards proposed in Section 620.301, the procedures outlined in subsections (d) through (g) of

Appendix B identify the Hazard Index calculations for such mixtures for similar acting substances in the mixtures.

Subsection (d) of Appendix B sets forth the method of calculating the Hazard Index, using a dose addition model[5]. The Hazard Index is calculated by summing two or more fractions, which are calculated by dividing the measured concentration of each similar acting substance in the mixture by its respective acceptable level.

Subsection (e) of Appendix B identifies the acceptable levels to be used in subsection (d) for substances which have a mechanism of toxicity for which there is a threshold for the toxic effect.

Subsection (f) of Appendix B identifies the acceptable levels to be used in subsection (d) for carcinogens.

Subsection (g) of Appendix B requires that a separate Hazard Index be calculated for each toxicity endpoint of concern for the chemical substances in a mixture. This follows from the use of a dose addition model, which is most properly applied to cases in which two or more substances induce the same toxic effect by the same or similar mode of action.

Subsection (h) of Appendix B lists the health-based goals for the individual substances in a mixture and the

[5]This model does not take into account possible synergistic or antagonistic effects of chemicals in a mixture.

goal for those chemicals in a mixture which are similar acting substances.

Appendix C sets forth guidance for determining when two or more chemical substances in a mixture shall be considered to be similar acting. This guidance is provided since the use of the dose addition model in Appendix B to address the combined toxicities of two or more chemicals in a mixture is most appropriate when the chemicals cause the same toxic effect by the same or similar mode of action.

Subsection (a) of Appendix C describes instances in which substances will be considered to be similar acting. This will occur when it can be shown that the substances have the same target in an organism or when the substances have the same mechanism of toxicity.

Subsection (b) of Appendix C cautions against including substances in a mixture which are fundamentally different in their mechanism of toxicity. Specifically, substances which cause toxic effects for which there is a threshold for the toxic effect shall not be included in mixtures of chemicals which exert their effects through a nonthreshold mechanism (i.e., carcinogens), and vice-versa. This subsection, however, does provide for the inclusion of a carcinogen in a mixture with "threshold" substances if it can be shown that the carcinogen also causes the same threshold effect as the other substances in the mixture. In this case, the

acceptable level for the threshold effect of the carcinogen is calculated the same as the Human Threshold Toxicant Advisory Concentration in Appendix A.

Subsection (c) of Appendix C directs that certain complex mixtures, which are composed of closely related compounds and which are produced commercially as specific products, be treated as if they are a single chemical substance. In such cases, the Health Advisory for these complex mixtures shall be derived using the procedures of Appendix A for mixtures which cause threshold effects, and shall be equal to the lowest PQL for those mixtures which are carcinogens.

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