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STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
PROPOSED AMENDMENTS TO)
TIERED APPROACH TO CORRECTIVE)
ACTION OBJECTIVES)
(35 Ill. Adm. Code 742))
)

R11- 9
(Rulemaking-Land)

NOTICE

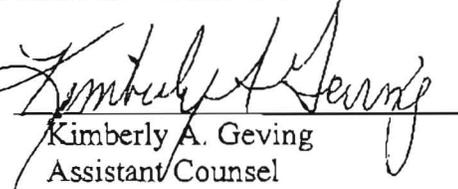
Dorothy Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph, Suite 11-500
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(Via First Class Mail)

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Environmental Enforcement/Asbestos
Litigation Division
Illinois Attorney General's Office
James R. Thompson Center
69 W. Washington Street, 18th Floor
Chicago, Illinois 60602
(Via First Class Mail)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board the Illinois Environmental Protection Agency's ("Illinois EPA") Motion for Acceptance, Appearance of Attorney, Certification of Origination, List of Studies and Reports Used in Regulatory Development, Statement of Reasons, and the Proposed Amendments a copy of each of which is herewith served upon you.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: 
Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

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APPEARANCE

The undersigned, as one of its attorneys, hereby enters her entry of Appearance on behalf of the Illinois Environmental Protection Agency.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: Kimberly A. Geving
Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

DATE: November 5, 2010

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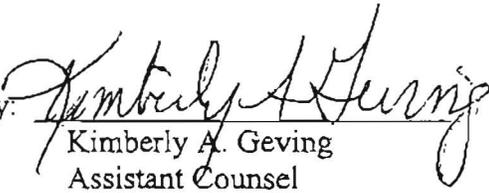
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)	

CERTIFICATION OF ORIGINATION

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA") and, pursuant to 35 Ill. Adm. Code 102.202(i), certifies that this proposal for amendments to 35 Ill. Adm. Code 742 amends the most recent version of that rule as published on the Illinois Pollution Control Board's website.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: 
Kimberly A. Geving
Assistant Counsel

DATE: November 5, 2010

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MOTION FOR ACCEPTANCE

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA") and, pursuant to 35 Ill. Adm. Code 102.106, 102.200, and 102.202, moves the Illinois Pollution Control Board ("Board") to accept the Illinois EPA's proposal for hearing. This regulatory proposal includes: 1) the Appearance for the attorney representing the Illinois EPA; 2) Certification of Origination; 3) the Statement of Reasons; and 4) the Proposed Amendments.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: Douglas P. Scott
Douglas P. Scott
Director

DATE: November 5, 2010

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STATEMENT OF REASONS

The Illinois Environmental Protection Agency ("Illinois EPA") hereby submits its Statement of Reasons for the above-captioned matter to the Illinois Pollution Control Board ("Board") pursuant to Section 27 of the Illinois Environmental Protection Act ("Act")(415 ILCS 5/27) and 35 Ill. Adm. Code 102.200 and 102.202.

I. FACTS IN SUPPORT, PURPOSE, AND EFFECT

A. Background

On December 15, 1995, P.A. 89-431 (which added a new Title XVII to the Act) was signed into law by Governor Edgar. Pursuant to Section 58.11(c) of the Act, Illinois EPA proposed regulations prescribing procedures and standards for the Illinois EPA's administration of its duties under Title XVII. That proposal became known as the Tiered Approach to Corrective Action Objectives ("TACO") under 35 Ill. Adm. Code 742, which established a system whereby sites undergoing remediation in the Site Remediation Program ("SRP"), the Leaking Underground Storage Tank ("LUST") Program, and RCRA Part B Permits and Closures could use the methodology set forth in the TACO rules to determine remediation objectives. Since the inception of the initial rulemaking, TACO's applicability has been expanded outside the three programs listed above.

Part 742 established procedures for developing remediation objectives based on various risks to human health posed by environmental conditions at a site. Because human health may be impacted by any type of environmental contamination, whether it originates from petroleum, metals, or some other type of waste, it was logical to create a single set of procedures that any of the land remediation programs could use to address contamination at any given site. What resulted was the TACO methodology, whereby risks posed to human health are evaluated, site conditions are assessed, and individuals propose remediation objectives to mitigate conditions at the site so that they no longer pose a threat to human health.

The Board adopted TACO on June 5, 1997 (with three sub-dockets being adopted shortly thereafter). In May of 2000, Illinois EPA proposed amendments to TACO that were necessitated by new technology, science, and programmatic changes. The Board adopted those amendments in December of 2000, with two sub-dockets being adopted shortly thereafter. In 2002 and again in 2005, the Board adopted additional amendments to TACO for the purpose of keeping the TACO procedures and requirements current and to improve standards and procedures so that end users of the rules can achieve accurate data results that are protective of human health.

The new amendments propose to add the indoor inhalation exposure route to the existing risk-based methodology. The indoor inhalation exposure route will be managed similarly to the current exposure routes under TACO. It follows the basic framework of TACO's three tiers, calculates both residential and industrial/commercial remediation objectives, and allows for exclusion of exposure routes.

Individuals will assess the indoor inhalation exposure route using collected soil gas and groundwater data and then apply a modified Johnson and Ettinger (J&E) model to develop remediation objectives. The modified J&E model simulates the migration of contaminants from a

subsurface source to the air inside a building. Additional equations are presented that calculate acceptable soil gas and groundwater remediation objectives. This modified J&E model used in TACO contains 18 equations and 54 parameters. Like the SSL and RBCA models used for other exposure routes, modified J&E model parameters have conservative default values under Tier 1 that can be substituted for site-specific conditions under Tier 2. Tier 3 allows the use of subslab soil gas data to establish remediation objectives. A new Subpart L provides requirements for building control technologies to mitigate the potential for contaminated soil gas to enter the indoor air, an approach similar to engineered barriers under Subpart K.

The effect of the proposed amendments is to protect building occupants from volatile chemicals that have the potential to migrate from the soil and groundwater to indoor air. This migration process has been colloquially referred to as “vapor intrusion.”

There is no specific legislative or regulatory requirement to propose these amendments. Illinois EPA wants to broaden the exposure routes evaluated so as to fully protect public health from contaminated sites and to add more certainty to the release of liability provided by the No Further Remediation determination.

Until now, Illinois EPA has evaluated vapor intrusion on a limited scale, when major indoor inhalation risks are suspected. U.S. EPA recommends screening all sites that have the potential to cause indoor inhalation health risks. Other states have experienced public health crises and ensuing legal and financial challenges caused by vapor intrusion exposures at sites where the indoor inhalation exposure route was not evaluated as part of the regulatory cleanup prior to issuance of the No Further Remediation letter or its equivalent. ASTM’s *Standard Guide for Vapor Encroachment Screening in Property Involved in Real Estate Transactions* (E2600-10) instructs users to refer to existing federal or state vapor intrusion assessment regulations, policy

or guidance. Since Illinois EPA filed its original indoor inhalation amendments in 2008, several more states have established methodologies for evaluating and mitigating risks from vapor intrusion. Most recently, Ohio EPA issued its *Guidance Document for Sample Collection and Evaluation of Indoor Air for Remedial Response and Voluntary Action Programs* (2010).

Regulatory Development

In November 2005, Illinois EPA convened an internal workgroup to create a methodology for evaluating the indoor inhalation exposure route that would be compatible with and integrated into the existing TACO regulations.

In September 2008, Illinois EPA filed a proposal with the Board to amend TACO by adding the indoor inhalation exposure route (Docket R09-9). As part of that filing, Illinois EPA also proposed to update remediation objectives for all of the exposure routes to keep current with the scientific literature and protection of human health. In developing the amendments under Docket R09-9, Illinois EPA sought comments from the Site Remediation Advisory Committee (“SRAC”) and met with SRAC on four occasions to listen to member concerns, answer questions, and reach agreement on key provisions.

Subsequent to the conclusion of the Board’s hearings and pre-first notice comment period for Docket R09-9, Illinois EPA was informed by U.S. EPA Region 5 that Illinois’ proposal was inconsistent with national policy and inconsistent with the way the J&E model was supposed to operate.

On October 5, 2009, Illinois EPA filed a motion for partial stay of the proposed amendments pertaining to vapor intrusion so that we could fully evaluate U.S. EPA’s concerns, the impact of those concerns on our proposal, and the latest research findings on vapor intrusion.

On November 5, 2009, the Board granted a one-year partial stay of the R09-9 TACO rulemaking and required Illinois EPA to file quarterly status reports through November 5, 2010. Six months later, as reported in the May 5, 2010 status report, Illinois EPA made two significant changes to its indoor inhalation proposal.

First, Illinois EPA added the advection component to the modified J&E model it uses to calculate remediation objectives for the proposed indoor inhalation exposure route. The advection component accounts for the migration of contaminants in soil gas brought about by differences in pressure gradients between the interior of a building and the soil nearest the building foundation. Illinois EPA set the parameter value used to measure advective flow, called Q_{soil} , to the U.S. EPA default number. U.S. EPA's concerns with Illinois EPA's original proposal centered around the lack of an advection component.

Second, Illinois EPA added soil gas remediation objectives to the existing outdoor inhalation exposure route in 35 Ill. Adm. Code Part 742. As revised, this means that compliance with the outdoor inhalation exposure route may be met by using either soil or soil gas remediation objectives. This change increases the usefulness and applicability of soil gas data collected as part of an indoor inhalation exposure route evaluation.

On May 25, 2010, Illinois EPA met with representatives from U.S. EPA Region 5 to brief them on the revisions Illinois EPA had made to the vapor intrusion proposal in response to their original comments, to answer questions and provide further explanations as needed and to request additional review by U.S. EPA Region 5 to obtain their concurrence with the modifications. On August 12, 2010, Illinois EPA received a letter from U.S. EPA Region 5 commenting on and recommending changes to the revised proposal.

U.S. EPA Region 5 recommended that when the Diffusion Only Table (Appendix B, Table I) is used to demonstrate compliance, that compliance with both soil gas remediation objectives and groundwater remediation objectives be required. Illinois EPA agreed that multiple lines of evidence from soil gas and groundwater should be obtained prior to using Appendix B, Table I.

U.S. EPA Region 5 raised concerns about the use of a water filled soil porosity value of 30 percent as being non-representative of Illinois soil conditions. The 30 percent value is the subsurface default parameter value recommended by U. S. EPA's Soil Screening Guidance Document (1996); however, SRAC raised the same concern when meeting with Illinois EPA to discuss the changes. As a result, Illinois EPA adjusted the water filled soil porosity value to 15 percent, a value more consistent with typical Illinois soils. Changing this input parameter, however, meant recalculating the remediation objectives in Appendix B, Tables H and I, lowering them (making them more conservative) by as much as 25 percent in Table H (Diffusion and Advection) and by as much as 90 percent in Table I (Diffusion Only). By using the more conservative water filled soil porosity value of 15 percent typical of Illinois soils, Illinois EPA has developed a more conservative set of screening values and no longer needs to condition use of the Tier 1 Tables based on determining site specific water filled soil porosity (as proposed in the May 2010 draft provided to U.S. EPA and SRAC).

Throughout its re-examining of the proposal, Illinois EPA has provided SRAC with the opportunity to review and comment on the revisions. The most recent meeting between Illinois EPA and SRAC occurred on September 8, 2010.

On October 19, 2010, Illinois EPA filed a motion to voluntarily withdraw the entire Docket R09-9, including the portion that was put on an order of stay in November 2009. The

purposes for doing so are Illinois EPA has a new proposal for vapor intrusion that effectively addresses all of U.S. EPA Region 5's concerns, and the amendments in the remainder of R09-9 are more than two years old and now in need of updating (e.g., the toxicity data used to calculate remediation objectives for the existing exposure routes). Illinois EPA will submit a new proposal for these other provisions at a later date.

Illinois EPA appreciates the comments, issues and concerns raised by U.S. EPA, SRAC, and the regulated community. Their careful review of the proposal under Docket R09-9 has greatly improved Illinois EPA's approach to evaluating vapor intrusion.

Affected Sources and Facilities and Economic Impact

Persons affected by this rule include any and all persons (as defined in Section 58.2 of the Act) undergoing remediation who are entitled to use a risk-based methodology for determining remediation objectives. Such persons would include, but not necessarily be limited to, those conducting remediation under the SRP, the LUST Program, RCRA Part B permits and closures, or other Illinois EPA remediation programs.

The use of TACO in conjunction with various program regulations has accomplished the goal of putting many sites back into safe, productive use while significantly decreasing remediation expenses statewide.

B. Environmental, Technical, and Economic Justification

The original SSL and RBCA models from which TACO evolved included the indoor inhalation exposure route. Back in 1997, when TACO was first adopted, Illinois EPA omitted the indoor inhalation exposure route intentionally, due to a lack of confidence in the existing scientific data. Twelve years later, research gaps have narrowed substantially and Illinois EPA

has been able to calculate soil gas and groundwater remediation objectives for indoor inhalation using generally accepted modeling equations.

The proposed indoor inhalation amendments will increase the cost of some site cleanups but will bring three important benefits. First, Illinois residents will be better protected from volatile chemicals migrating from contaminated sites. Second, site owners or other remediation applicants will receive expanded liability relief through issuance of a No Further Remediation letter that takes the indoor inhalation exposure route into account. Third, establishing remediation objectives for the indoor inhalation exposure route will facilitate property transactions. There is a strong public policy argument that the benefit to the public outweighs any additional remediation costs.

The extent of the anticipated cost increases is unknown and expected to vary widely depending on site and contaminant characteristics and the willingness of affected property owner(s) to accept building control technologies and institutional controls.

To further ease implementation of the new indoor inhalation exposure route, the Illinois EPA's internal workgroup is preparing a guidance document containing detailed information on how to manage the exposure route under TACO's three tiers.

II. THE PROPOSED AMENDMENTS

Inserting a new exposure route into TACO requires comprehensive changes to the existing regulations. As would be expected, these proposed amendments contain new definitions, equations, parameters, default remediation objectives, and mechanisms for managing the indoor inhalation exposure route. What follows is a general overview of the changes proposed.

A. Subpart A

Illinois EPA proposes language in Section 742.105 to clarify that an evaluation of the indoor inhalation exposure route addresses the potential of volatile chemicals in soil gas and groundwater to reach human receptors and that this evaluation makes no assurances about the safety or protectiveness of the buildings on or off-site.

Illinois EPA proposes language in Sections 742.110 and 742.115 to account for the inclusion of the modified J&E model and the indoor inhalation exposure route, respectively. Section 742.115 has also been amended to establish soil gas as a medium by which both the indoor and outdoor inhalation exposure routes may be evaluated.

B. Subpart B

Amendments to Subpart B include: adding definitions for “Building,” “Building Control Technology,” “Capillary Fringe,” “Qsoil,” “Saturated Zone,” “Soil Gas,” “Soil Vapor Saturation Limit,” “Unconfined Aquifer,” “Volatile Chemicals,” and “Water Table”; adding new incorporations by reference; and adding new Sections 742.222 and 742.227 to allow for the use of soil gas data when determining remediation objectives for the indoor and outdoor inhalation exposure routes.

C. Subpart C

Illinois EPA inserted “Outdoor” before “Inhalation Exposure Route” in Section 742.310 and added Section 742.312 that states when the indoor inhalation exposure route may be excluded from consideration. As part of Section 742.312, the exposure route may be excluded by use of a building control technology that meets the requirements of Subpart L.

In both Sections 742.310 and 742.312, Illinois EPA added a new option for exposure route exclusion called demonstration of active biodegradation. This exclusion would be available to sites contaminated by benzene, toluene, ethylbenzene, and total xylenes.

D. Subpart E

Illinois EPA modified Sections 742.505 and 742.510 to explain how to use the Tier 1 outdoor inhalation remediation objectives for soil gas in Appendix B, Table G, as well as expanded Section 742.505 to explain how to use the Tier 1 indoor inhalation remediation objectives for soil gas and groundwater in Appendix B, Tables H and I. Illinois EPA also created Section 742.515 to define how compliance shall be determined when using Appendix B, Tables H and I.

E. Subpart F

Amendments to Section 742.600 include: adding a condition that the calculated Tier 2 indoor or outdoor inhalation remediation objective for soil gas cannot exceed the soil vapor saturation limit; stipulating that individuals who opt for diffusion only mode of contaminant transport must calculate remediation objectives for both soil gas and groundwater; and specifying that if a contaminant has both carcinogenic and noncarcinogenic effects for any applicable exposure route or receptor, that the remediation objectives shall be calculated for each effect and the lower remediation objective shall apply.

F. Subpart G

Amendments to Subpart G include: replacing IRIS with OSWER Directive 9285.7-53 as the alternate source for toxicological-specific information; changing Section 742.700(g) to exclude the construction worker population from the indoor inhalation exposure route; adding Section 742.712 to provide the SSL soil gas equation for the outdoor inhalation exposure route; adding Section 742.717 to require use of the modified J&E model and to explain how the J&E equations for soil gas data are to be applied for the indoor inhalation exposure route; and, under

Section 742.717(i), describing when the soil vapor saturation limit is to be used as the soil gas remediation objective for the indoor inhalation exposure route.

G. Subpart H

Amendments to Subpart H include adding Section 742.805(e) to require individuals to use Section 742.812 when developing Tier 2 groundwater remediation objectives for the indoor inhalation exposure route, and adding Section 742.812 to explain how the J&E equations are to be used for developing groundwater remediation objectives. Section 742.812 also sets the default thickness of the capillary fringe at 37.5 cm and describes when the solubility limit is to be used as the groundwater remediation objective.

H. Subpart I

Amendments to Subpart I include: adding Section 742.935(a) to allow exposure route exclusion (as an alternative to Section 742.312) for the indoor inhalation exposure route; adding Section 742.935(b) to allow the use of building control technologies (as an alternative to those described in Subpart L) as a means to prevent or mitigate human exposures under the indoor inhalation exposure route; adding Section 742.935(c) to allow the use of soil gas data (as an alternative to Section 742.227) to establish remediation objectives for the indoor inhalation exposure route; adding Section 742.935(d) to allow the use of soil data to establish remediation objectives for the indoor inhalation exposure route; and adjusting language elsewhere in this Subpart to account for this new Section.

I. Subpart J

Illinois EPA added Section 742.1000(a)(7) to require the use of institutional controls whenever indoor inhalation remediation objectives are based on a diffusion only mode of contaminant transport, and added Section 742.1000(a)(8) to require the use of institutional

controls whenever indoor inhalation remediation objectives are based on a building control technology. New Section 742.1015(j) states that a groundwater ordinance may not be used to exclude the indoor inhalation exposure route. This is because an ordinance restricting the source of drinking water would be incapable of protecting the enclosed air space of a building from the migration of contaminants in the groundwater.

J. Subpart L

Illinois EPA created this Subpart to provide requirements for four types of building control technologies: sub-slab depressurization systems, sub-membrane depressurization systems, membrane barrier systems, and vented raised floors.

K. Appendix A, Table A

Illinois EPA added a column to distinguish between the outdoor inhalation exposure route and the soil component of the groundwater ingestion exposure route. The difference in values is based on the fraction of organic carbon content (f_{oc}).

L. Appendix A, Table E

Illinois EPA added fifteen chemicals based on the proposed amendments to the Groundwater Quality Standards (35 Ill. Adm. Code Part 620, currently pending before the Board in Docket R08-18). The entire table has been alphabetized by target organ. For this table, the Illinois EPA opted to update all the similar-acting chemicals (not just volatile chemicals) to minimize confusion.

M. Appendix A, Table F

Illinois EPA added fifteen chemicals based on the proposed amendments to the Groundwater Quality Standards (35 Ill. Adm. Code Part 620). The entire table has been

alphabetized by target organ. For this table, the Illinois EPA opted to update all the similar-acting chemicals (not just volatile chemicals) to minimize confusion.

N. Appendix A, Table J

This is a new table identifying the 59 TACO volatile chemicals that are considered contaminants of concern for the indoor inhalation exposure route.

O. Appendix A, Table K

This is a new table identifying the soil vapor saturation limits for volatile chemicals.

P. Appendix B, Table G

This is a new table containing the Tier 1 soil gas remediation objectives for volatile chemicals under the outdoor inhalation exposure route. Residential, industrial/commercial, and construction worker values are given.

Q. Appendix B, Table H

This is a new table containing the Tier 1 soil gas and groundwater remediation objectives for volatile chemicals under the indoor inhalation exposure route for the diffusion and advection mode of contaminant transport. In this scenario, the remediation objectives are calculated using a Q_{soil} parameter value of $83.33 \text{ cm}^3/\text{sec}$. Residential and industrial/commercial values are given.

R. Appendix B, Table I

This is a new table containing the Tier 1 soil gas and groundwater remediation objectives for volatile chemicals under the indoor inhalation exposure route for the diffusion only mode of contaminant transport. In this scenario, the remediation objectives are calculated using a Q_{soil} parameter value of $0.0 \text{ cm}^3/\text{sec}$. Residential and industrial/commercial values are given.

Individuals using remediation objectives from this table must use institutional controls in accordance with Subpart J.

S. Appendix C, Table A

Illinois EPA added Equation S30 to calculate soil gas remediation objectives for the outdoor inhalation exposure route.

T. Appendix C, Table B

Illinois EPA added the SSL parameters corresponding to Equation S30.

U. Appendix C, Table E

Illinois EPA updated the default values to be consistent with current scientific literature. These changes have been made for all chemicals (not just volatile chemicals) so as to minimize confusion and avoid complicating the footnotes. We also inserted a new column of default values for Dimensionless Henry's Law Constant at 13° C that are used in the J&E equations and added three new footnotes. All values are now expressed in scientific notation.

V. Appendix C, Table F

Illinois EPA added new methods for determining the following physical soil parameters: total soil porosity, air-filled soil porosity, and water-filled soil porosity.

W. Appendix C, Table L

This is a new table containing the J&E equations used in calculating remediation objectives for the indoor inhalation exposure route.

X. Appendix C, Table M

This is a new table containing the J&E parameters used in calculating remediation objectives for the indoor inhalation exposure route.

III. AGENCY WITNESSES AND SYNOPSIS OF TESTIMONY

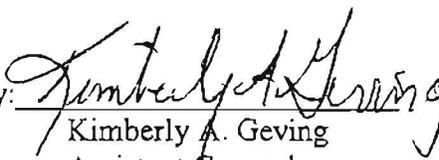
Illinois EPA will provide six witnesses who will be available to testify at hearing. The witnesses are Gary King, Thomas Homshaw, Tracey Hurley, Hernando Albarracin, Joyce Munie, and Heather Nifong from Illinois EPA.

Illinois EPA will submit written testimony in advance of the hearings pursuant to any hearing officer order that follows this proposal. Illinois EPA respectfully requests that the Board allow oral testimony of Illinois EPA's witnesses in panel format rather than calling each individually. This has streamlined several regulatory hearings in the past and allows Illinois EPA to more fully respond to questions during the hearing, thereby promoting a more complete hearing record.

As a note to the Board, even though this is a new docket, the Illinois EPA has opted to use the existing Service List from Docket R09-9 for purposes of this proposal. Illinois EPA requests that if the Board establishes new Notice and Service lists for this rulemaking, that it send those to Illinois EPA so that we can properly serve parties with any future submittals.

WHEREFORE, Illinois EPA requests that the Board accept this proposal in its entirety for hearing.

Respectfully submitted,
ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: 
Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

DATED: November 5, 2010

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List of Studies and Reports Used in Regulatory Development

Abreu, L.D.V., Ettinger, R., McAlary, T. 2009. "Simulated Soil Vapor Intrusion Attenuation Factors Including Biodegradation for Petroleum Hydrocarbons." *Ground Water Monitoring and Remediation* 29(1):105-117.

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Geoprobe Systems. 2006. *Direct Push Installation of Devices for Active Soil Gas Sampling and Monitoring*. Technical Bulletin No. MK3098.

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- Hers, I., Zapf-Gilje, R. 1998. "Canadian Consortium Research Project- Field Validation of Soil Gas Transport to Indoor Air Pathway." In *Proceedings of 1998 Petrol. Hydro. and Chem. in Ground Water*; API/NGWA, Houston, TX, November 11-13; pp 251-266.
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- Hers, I., Evans, D., Zapf-Gilje, R., Li, L. 2002. "Comparison, Validation and Use of Models for Predicting Indoor Air Quality from Soil and Groundwater Contamination." *Soil & Sediment Contamination*. 11(4):491-527.
- Hers, I., Zapf-Gilje, R., Johnson, P.C., Li, L. 2003. "Evaluation of the Johnson and Ettinger Model for Prediction of Indoor Air Quality." *Ground Water Monitoring and Remediation* 23(1):62-76.
- Johnson, P.C. 2005. "Identification of Application-Specific Critical Inputs for the 1991 Johnson and Ettinger Vapor Intrusion Algorithm." *Ground Water Monitoring and Remediation* 25(1):63-78.
- Johnson, P.C., Ettinger, R.A. 1991. "Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Buildings." *Environmental Science and Technology* 25(8): 1445-1452.
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STATE OF ILLINOIS)
)
COUNTY OF SANGAMON)

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached Motion for Acceptance, Appearance of Attorney, Certification of Origination, List of Studies and Reports Used in Regulatory Development, Statement of Reasons, and the Proposed Amendments upon the persons to whom they are directed, by placing a copy of each in an envelope addressed to:

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

Mitchell Cohen
Chief Legal Counsel
Illinois Dept. of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271

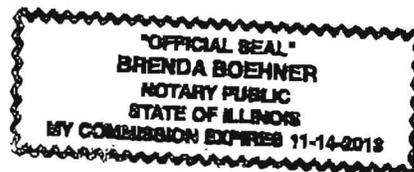
Matthew J. Dunn, Chief
Environmental Enforcement/Asbestos
Illinois Attorney General's Office
Litigation Division
69 W. Washington Street, 18th Floor
Chicago, Illinois 60602

and mailing them (First Class Mail) from Springfield, Illinois on November 5,
2010 with sufficient postage affixed as indicated above.

Brenda Taylor

SUBSCRIBED AND SWORN TO BEFORE ME
This 5th day of November, 2010.

Brenda Boehner
Notary Public



Service List

<u>Party Name</u>	<u>Address</u>	<u>City/State/Zip</u>	<u>Phone/Fax</u>
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