

APPENDIX B.1 – ITHACA HEARING NOTICE



ASSEMBLY STANDING COMMITTEE ON ENVIRONMENTAL CONSERVATION

NOTICE OF PUBLIC HEARING **Oral Testimony by Invitation Only**

SUBJECT: Vaporization of contamination from soil and groundwater into indoor air

PURPOSE: To examine the human health impact of vapor intrusion stemming from soil and groundwater contamination

ITHACA
Thursday, April 21, 2005
10:30 a.m.
Shirley A. Raffensperger Meeting Room
Town Hall
215 North Tioga Street
Ithaca, NY

Contamination of indoor air by volatile chemicals from contaminated soil and groundwater is an emerging area of public health concern. Vapor intrusion is known to have occurred at Superfund sites in New York State and has occurred at brownfield sites as well. While the New York State Department of Environmental Conservation and the Department of Health, as well as the United States Environmental Protection Agency, have issued draft guidance pertaining to various aspects of vapor intrusion, none of these agencies have issued final guidance.

Chapter 1 of the Laws of 2003 established the Brownfield Cleanup Program (BCP) as well as refinancing the State Superfund program and providing for a comprehensive program for the long-term restoration of groundwater. The BCP requires, at all brownfield sites, the "elimination of volatilization into buildings: provided however if such elimination is not feasible such exposure shall be eliminated to the greatest extent feasible." Vapor intrusion should be considered in remediation of all contaminated sites.

The purpose of this hearing, the second in a series, is to examine issues concerning the vaporization of contamination and to determine what can be learned to address vapor intrusion in the future. The Committee will take testimony from various witnesses including panels of government officials, public health and environmental experts and citizens representing affected communities.

Oral testimony will be accepted by invitation only and limited to 5 minutes duration. 10 copies of any prepared testimony should be submitted at the hearing registration desk. The Committee would appreciate advance receipt of prepared statements. Written testimony will also be accepted and may be sent to the contact person listed on the reply form. In order to further publicize the hearing, please inform interested parties of the Committee's interest in receiving written testimony from all sources.

In order to meet the needs of those who may have a disability, the Assembly, in accordance with its policy of non-discrimination on the basis of disability, as well as the 1990 Americans with Disabilities Act (ADA), has made its facilities and services available to all individuals with disabilities. For individuals with disabilities, accommodations will be provided, upon reasonable request, to afford such individuals access and admission to Assembly facilities and activities.

APPENDIX B.2 – ITHACA WITNESS LIST



ASSEMBLY STANDING COMMITTEE ON ENVIRONMENTAL CONSERVATION

Public Hearing on Vaporization of Contamination from Soil and Groundwater into Indoor Air

Thursday, April 21, 2005, 10:30 a.m.
Shirley A. Raffensperger Meeting Room
Town Hall, 215 North Tioga Street
Ithaca, NY

WITNESS LIST

Honorable Carolyn Peterson, Mayor
City of Ithaca

PANEL

Carl Johnson, Deputy Commissioner
Office of Air and Waste Management
New York State Department of Environmental Conservation

G. Anders Carlson, Director
Division of Environmental Health Investigation
New York State Department of Health

PANEL

Tammo S. Steenhuis, Ph.D
Professor of Hydrology
Cornell University

James W. Gillett, Ph.D
Professor of Ecotoxicology
Cornell University

James A. Dix, Ph.D
Associate Professor, Department of Chemistry
State University of New York at Binghamton

PANEL

Jutta Dotterweich
Ithaca Coal Tar Advisory Committee

Ken Deschere, Local Citizen

Timothy Weber, Local Citizen

Janet Snoyer, Local Citizen

Rick Grossman, Local Citizen

PANEL

Kenneth S. Kamlet, Director of Legal Affairs
Newman Development Group, L.L.C.

Walter Hang, President
Toxics Targeting, Inc.

APPENDIX B.3 - SUMMARY OF TESTIMONY, ITHACA HEARING

*Copies of written testimony may be obtained by contacting the Committee.

Honorable Carolyn Peterson, Mayor, City of Ithaca

As a result of concern over contamination from the Emerson Power Transmission site, the city of Ithaca became involved in the issue about a year ago. In addition to written communication to DEC, EPA, and DOH, we also conducted our own sampling of soil and groundwater on Spencer Street where new road construction was occurring and on South Cayuga Street where road reconstruction was occurring. The city was, at this early stage, concerned about exposing neighboring residents and city workers to dangerous vapors through soil disruption. The city, at its own expense, undertook this testing in an effort to protect the residents and our employees.

Although I do not have expertise in the science of vaporization of contamination, I do have expertise on how contamination and its proposed remediation can and does affect a community. I can address the strength of the feeling regarding the elimination of contamination and the frustration that many residents share regarding waiting for the science before cleanup occurs. I cannot over emphasize the worry and fear that some of our residents have been living with for months and months. Because two of the tenets of good health include clean water and clean air, especially in one's private home, it is understandable that the highest level of cleanup is desired.

I believe that while you are examining the human health impacts, the psychological stress and duress experienced by residents should weigh equally with physical symptoms. Consideration should be given regarding the balance of waiting for the exact science and the very real stresses on the residents who are waiting out the process. In other words, mental health is also a human health impact and takes its toll as well. Performing a more general and faster cleanup than such a precisely targeted one could be a solution. At the same time, the highest level of cleanup should be expected.

The elected city representatives are often the first people that resident's turn to when there is concern about an issue. We are asked to advocate for the residents, to assist residents who are trying to get information from the state, and to assist in expediting contact with offices such as the DEC and DOH. I want to stress that the local government is very much a part of the remediation process. The local government is more easily accessible to the citizens and takes a direct role in helping citizens sort out the issues or contact other officials.

This contamination has required inordinate hours of work and expense from our citizens, as well as from local government officials and employees. We look to the state for clear accessible lines of communication, a speedy remediation, and the highest level of cleanup of the air that people breathe in their own homes. The residents should not have to bear the physical price of breathing contaminated air.

Carl Johnson, Deputy Commissioner, Office of Air and Waste Management, NYS Department of Environmental Conservation

Historically, we thought that vapor intrusion was only an issue where the source of the contaminants was very shallow and the magnitude of the contamination was very great. We now know that our previous assumptions about the mechanisms that could lead to exposure to vapor intrusion were not complete. The result is that additional work may be required to investigate or remediate sites that are in the operational or monitoring phase, or that have already been closed.

The department has developed a document, "Evaluating the Potential for Vapor Intrusion at Past, Present, and Future Sites," which describes the conditions under which the state will conduct vapor intrusion evaluations, and the order in which sites will be addressed. At remedial sites where there are ongoing environmental investigations, we will evaluate the vapor intrusion pathway as part of the remedial investigation. At legacy sites where remedial decisions have already been made which do not address vapor intrusion, we will use various criteria to re-evaluate and rank the sites for the likelihood of current or potential exposures. Because the number of sites at which evaluations for vapor intrusion are expected to be made is quite large, sites where the perceived likelihood of exposure is great will be scheduled for vapor intrusion evaluations sooner than sites where the perceived likelihood of exposure is small.

We should complete our initial site characterization work to prioritize all the legacy sites by December 2006. We expect to commence field work before the beginning of the next heating season. Although some field work, such as soil gas sampling, will begin in the summer, indoor sampling cannot begin until October, when the heating season starts.

The department's evaluation of a vapor intrusion pathway at a specific site will initially involve a review of existing environmental data to see if sufficient information is already available to assess possible vapor impacts. If a vapor intrusion problem is suspected, we may recommend additional sampling, monitoring or mitigation actions. Additional sampling would be used to determine the extent of soil vapor contamination and to verify our initial findings. Monitoring, or sampling on a recurring basis, is typically conducted if there is a significant potential for vapor intrusion to occur if building conditions change. Mitigation steps are intended to prevent exposures associated with soil vapor intrusion. Mitigation may include sealing cracks in the building's foundation; adjusting the building's heating, ventilation, or air-conditioning system to maintain a positive pressure to prevent infiltration of subsurface vapors; or installing a sub-slab depressurization system beneath the building.

Because the state's decisions on mitigation measures will vary from site to site, it may appear that we are applying our vapor intrusion policy and guidance inconsistently. In reality, however, decisions on how to address exposure to vapor intrusion will be made on a site-by-site basis, after a comprehensive review of individual subsurface vapor, indoor air and outdoor air sampling results, and after consideration of additional site-specific parameters, such as sources of volatile chemicals, background levels, and applicable guidelines for volatile chemicals in the air. This is the most appropriate approach to ensure the protection of public health.

Andy Carlson, Director, Division of Environmental Health Investigation, NYS Department of Health

The department's draft "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" is intended to provide a scientifically sound and consistent basis for investigating and remediating vapor intrusion. The general approach is consistent with the process and methods used for investigating any environmental contamination.

DOH has developed air guidelines/criteria for several contaminants, including trichloroethene (TCE). The TCE guideline (5 mcg/m³) was established after an extensive evaluation of scientific information about its health effects, using methods consistent with those used by other agencies and scientific bodies. We are committed to an expert peer review process for the TCE guideline. We anticipate having a twelve-member panel with a balanced selection from each of the four interest areas: business/industry organizations, public health organizations, other governmental agencies, and citizen groups. We are close to completing the TCE technical document that the scientists will be reviewing, which will be available to the public. Based on the comments from the peer review, we will revise our assessment, including re-evaluating our guideline.

At brownfields, or inactive hazardous waste sites, the air guidelines developed by DOH will be one part of the decision making process used in determining what actions may be required. However, these guidelines are not "bright lines" that define a decision point to mitigate or not mitigate. There have been, and will be in the future, many instances where mitigation systems are installed at levels well below the guideline for the chemical of concern.

DOH has developed two matrices to use as tools in making decisions. The first was originally developed for TCE and the second matrix was originally developed for PCE. Because the matrices are risk management tools and consider a number of factors, DOH intends to assign other chemicals to one of these two matrices, as appropriate. Additional matrices will be developed when a chemical's toxicological properties, background concentrations, or analytical capabilities suggest that major revisions are needed.

The matrices explicitly consider the relationship between indoor air concentrations and sub-slab vapor concentrations, but decisions based on the guidance they provide must consider specific and general aspects of a site or area under investigation. Such considerations may include the nature of the source, the local geology, foundation and building characteristics, indoor and ambient sources and the status of adjacent buildings. We feel that sub-slab concentration is important, because it represents the source where the contamination is coming from. If the concentration in the source is high, but there are low levels in the home, we still feel the need to respond to that, because we can't always be there and know whether or not that source is changing and is getting into the home. That's why the matrix is constructed the way it is—to give us the ability to make decisions site by site, and within the context of the total environment of the source. Based on the relationship between sub-slab vapor concentrations and corresponding indoor air concentrations, the following actions may be recommended: no further action, take reasonable and practical actions to identify source(s) and reduce exposures, monitor or mitigate.

Region 2 of the U.S. EPA uses a very similar matrix. There have, however, been many reports that Region 2 uses a cleanup number for TCE of .38 mcg/m³. Region 2 found at a particular site that it was more efficient to install vapor mitigation systems than to carry out long-term monitoring, and that when the systems were installed they could expect to achieve levels in the indoor air below the analytical detection limit of .38 mcg/m³. This number was then stated by the Region 2 program staff as the cleanup goal for the site. The number has come to be commonly reported as the Region 2 response level, leading people to believe that the EPA sets out and responds to anything over their detection limit. This is not the case. Like the state, Region 2 makes its decisions on a case-by-case basis, taking sub-slab concentrations into account.

In a few of the places around the state where we have been working with responsible parties, they are choosing, based on their interpretation of whatever elements they might consider (i.e. costs, liability, community outreach), to install a system wherever they find contamination. An obvious up side of this is that where you have the potential and you mitigate it, you've eliminated the potential.

In addition to environmental investigations and remedial actions, DOH also considers the need to review health outcome data for past or ongoing exposures. The studies that are easiest to conduct use readily available health data to compare health outcome rates in a community with a possible exposure to those of the general population using statewide or national rates. While these types of studies cannot prove whether or not the disease was caused by a particular exposure, they can be useful in identifying communities where a more complex study might be necessary.

The use of a registry is another option. In 1999, DOH established the New York State Volatile Organic Compounds (VOC) Exposure Registry as a tool for health status assessment and long-term follow-up for communities and individuals with documented exposures to VOCs. Individuals and communities are selected for inclusion in the registry if potential exposures from contaminated private wells, public water supplies, or indoor air have been verified by sampling results.

Tammo Steenhuis, Professor, Department of Biological and Environmental Engineering, Cornell University

Lawrence Cathles, Professor, Department of Earth and Atmospheric Sciences, Cornell University

The South Hill area in Ithaca is a unique and complex environment. The hillside consists of some topsoil, soft shale, and hard shale with many cracks (joints). Science tells us that pollutants from the Emerson plant will travel down the hill through the cracks in the shale. However, science cannot predict the exact paths that will be traveled. Ground penetrating radar might be the best way to find dense, non-aqueous phase liquids (DNAPLs) such as TCE and PCE, but will not be effective in finding all the accumulations that can be in almost any crack or pocket in the bedrock. In addition, the radar penetrates only a few meters.

The current testing of both groundwater and indoor air quality is a good start, but it is limited in extent and may not define the location of all the DNAPLs. Indoor air quality can be highly variable and a 24-hour sample is not necessarily a good indication of the long-term exposure.

Even if and when the extent and severity of the pollution is defined, complete cleanup would be an unrealistic and probably undesirable goal. Digging all the soft shale below the Emerson plant would take years to accomplish, destroy the neighborhood, and would likely be ineffective.

We recommend that steps be taken to decrease the anxiety level of the home owners. For instance, each home that could be potentially affected should be mitigated with a basement ventilation system. Money is better spent on mitigation than on extensive air sampling and analysis (at approximately \$1,000 per sample). A few of these houses should be monitored to assure that the mitigation is functioning. There should also be a guarantee that houses can be sold at fair market value. The differences between the actual selling price and the fair market value should be made up.

We also recommend that steps be taken to prevent further contamination. All future spills should be prevented by cleaning up all potential sources at the Emerson plant. This will require cooperation and openness.

James Gillett, Professor of Ecotoxicology, Cornell University

The study of the phenomenon of vapor intrusion has revealed effective means of controlling residential exposures to diverse materials. While this approach does not do very much about the source of such intrusion, understanding the physicochemical processes enables decisive intervention. Such an understanding has been fully established, in spite of the so-called cryptic nature of the flow of intrusive materials via the cracks and crannies of soil and rock layers, various basement materials, diverse ways of using the space in households which create temperature and pressure gradients favoring intrusion, and many other activities introducing these same agents into residences. Thus, as a practical matter, we know how to respond to reduce any suspected risk even though we can't always permanently eliminate all sources.

Gases of volatile chemicals tend to absorb to soil organic matter and even clay particles. If capillaries in the soil are dry and are not warmed, then the chemicals will stay right there. If the capillaries are wetted, however, as by rising water levels, then that vapor can be forced off the capillary walls by the thousands of water molecules binding to the same sites. The displaced vapor moves up the soil capillary and sorbs to the next dry zone. But if rain is falling and the soil is saturated, some will stay on the organic matter and a small amount may dissolve. As soon as the soil dries sufficiently, those molecules will find their way back. Over time, however, materials can move quite a distance, moving up and down with the water table, saturated pore flow, and vapor distribution. This whole process is called the "wick effect," because it works like the wick of a candle to bring fuel to the flame.

When vapors in the soil approach the floor or walls of a basement—whether they are poured concrete, cinder block, or rocks—the tiny cracks and pores in these materials create similar pathways for these vapors to slowly seep into the house.

The vapor intrusion process takes time. Therefore, the measurement of it must be time-averaged on a basis which takes into account all the variations in the pathways into the residence and the intermittent use of closed or semi-closed areas in which the intrusion might build up. If you've done a radon survey, then you know that it takes weeks to accumulate a representative sample. It is not much different with TCE, chlordane or petroleum solvents. Moreover, our concern is with the duration and strength of a chronic exposure, typically as some major fraction of a lifetime, at the low doses typically encountered in intrusive episodes.

Many of the intrusions are of chemicals which don't alert us by smell and may not make us perceptibly ill. Still, they can create risks of cancer and other ill effects. So when intrusion is suspected, we often try to set up extensive (and expensive) monitoring programs. I would argue that, given what we already know about the variability of such exposures and the difficulty in locating the actual pathways by which these pollutants are traveling, we are far better off simply working on establishing fast and simple protection programs against the intrusion. These usually take the form of sub-slab vapor removal by venting, sealing of slab and wall surfaces with quality epoxy paint, and otherwise blocking vapor entry at French drains, slab cracks, etc.

For the most part, retrofitting housing to prevent the wick effect is easier than changing building codes or mobilizing the community to remove all the sources, which isn't very easy. Many of the

subject chemicals of concern still have uses which may bring them into some households by other routes on an irregular basis. These are being reduced, but not eliminated.

James Dix, Chemistry Professor, Binghamton University

Bruce Oldfield, Professor of Engineering Science, Broome Community College

I have a somewhat unique perspective on the environmental issues surrounding our legacy of unbridled industrial expansion of the last century. Living on top of a toxic plume in Endicott, NY, I have a vested interest in vapor intrusion, and given my scientific background, I'm able to delve into the technical minutiae associated with vapor intrusion.

Today I'd like to give my comments on the ambient air monitoring and modeling plan recently accepted by DEC to measure the concentrations of eleven VOCs in Endicott's air. We are generally impressed with the technical aspects of the monitoring and modeling plan. However, we do have some questions. For example, why is the downtown Endicott area designated rural for the purposes of the study? Why is the meteorological data used in the study from the airport, eight miles away, rather than from a more central location? Despite these questions, we believe the plan is a good template for Endicott and for other areas in New York State, such as the Ithaca area, that are plagued by VOCs in the air.

If one looks at the data from ambient air sampling collected two years ago as posted on the DEC web site, one can do a "back-of-the-envelope" calculation to conclude that the VOC concentration in ambient air from soil gas emission plus that from sub-slab ventilation will be low. But a low concentration is not synonymous with a safe concentration. We are pleased that DOH is reviewing its guideline of 5 mcg/m³ for TCE, one of the VOCs. We believe that this level is too high, and that the level should be much lower. We are not alone in this belief. Nearly four years ago, EPA's own scientists, based on a thorough review of recent scientific literature and an acknowledgement of susceptible populations, recommended a level more than an order of magnitude below 5 mcg/m³.

Why is there still no TCE guideline concentration from EPA and probably won't be one for years to come? In my view, one major factor is that Federal government entities have improperly interfered with the scientific review process. New York State can do better than that. There is a time for politics, but that time is not the time when, for example, one designs scientific studies and collects data on VOCs in ambient air, or when one reviews studies published in peer-reviewed scientific journals.

The history of New York government agencies' involvement in the Southern Tier's bout with VOCs is checkered. The Endicott plume was misclassified by DEC as a Class 4 site for years. EPA Region II, driven by health concerns, mitigated in East Fishkill when there was any detectable indoor TCE level, while DOH mitigated in the Southern Tier at the much higher level of 5 mcg/m³, claiming EPA's East Fishkill mitigation at any detectable level was driven by economics.

It's time to get this right. We are going in the right direction with the ambient air monitoring and modeling study in Endicott. Let's stay the course.

Jutta Dotterweich, Ithaca Coal Tar Advisory Committee

I am speaking as an Ithaca resident and a member of the Coal Tar Advisory Committee. I would like to focus my remarks on concerns related to the public notification and participation process.

In 1994, NYSEG was named as the responsible party for the cleanup of the contamination at the former gas manufacturing plant operated by the Ithaca Gas and Light Company. A consent decree signed between NYSEG and the DEC outlines a public participation which basically assures that the public is informed at certain times during the cleanup or remediation process and is given time to respond to completed reports and proposed actions. Despite this participation plan, the public, and the neighborhood in particular, was largely unaware of the extent of contamination at the site until 2000. In that year, NYSEG began vacuuming several subsurface containment structures on the original plant site, at which point residents were able to smell the obnoxious odor of coal tar throughout the neighborhood. The lack of notification about the cleanup process and subsequent complaints resulted in a meeting in 2001 between residents, NYSEG, DEC, and DOH. The agencies agreed to a better notification process.

After this initial meeting, residents became very concerned about the extent of the contamination and whether or not it was getting into homes, and what health risks were connected with such exposure. Residents formed the Coal Tar Advisory Committee in 2002 with the goal to get involved and ensure that the cleanup was done properly and comprehensively. Residents asked questions about such issues as cleanup standards, health risks, testing instruments and cleanup methods. In public meetings, answers to those questions remained vague at best. It appeared that NYSEG, DEC, and DOH had already decided upon and mapped out what the plan of action was going to be. The questions we raised did not fit in.

In 2002 and 2003, as part of the remedial investigation, houses and other buildings along the original site were tested for indoor vapors. Complaints came in right away: the notification was insufficient; agents did not have the protocol available; homeowners were not prepared for the inspection; the screening device was not sensitive enough. Improvements were made in a second round of indoor testing: advanced notification including written step-by-step protocol; CTAC endorsed testing encouraging homeowners to participate and how to prepare for it; the use of more sensitive equipment; and the testing of more houses.

The role of DEC and DOH as public monitoring agents has been problematic. Although it has improved over time, we have relied on outside experts, lawyers, and political representatives to make sure that our interests are represented. Based on our experience, I recommend that DEC and DOH rethink and restructure the public participation process—it might be helpful to set up meetings for neighborhood groups and DEC/DOH without the corporation that is responsible for the cleanup, in addition to regular public meetings. I also recommend that DEC and DOH provide more public information and education on contamination sources, pathways, cleanup methods, cleanup standards and health risks. This requires that they translate technical concepts. Furthermore, the public should have real input on the scope of the investigation and remedial action—connecting with an established neighborhood group or association might be an effective strategy to engage the neighborhood from the beginning. Finally, New York State should invest in studies that establish clearer connections between industrial contamination and health risks.

Ken Deschere, Ithaca Resident

I am a resident of the City of Ithaca and have lived about two blocks downhill from the Emerson site for the last 24 years. For about 20 of those years, I worked on computers in an office in the basement of our home. My wife and I brought two sons, now 22 and 20, into this house as newborns. They had a large playroom in the basement.

In October 2003 I was diagnosed with a Stage IV squamous cell cancer. After three surgeries within 15 days, followed by two months of lengthy sessions of radiation, I have recovered enough to resume part-time work and begin exercising to restore my strength and energy. The doctors could not identify a likely cause for my cancer—it was listed simply as “of unknown origin.”

In the spring of 2004, our neighborhood became aware of the high levels of TCE and other toxins present at the Emerson plant site. Through research, and with the cooperation of local officials, we found that Emerson had failed to abide by the terms of the 1994 Record of Decision regarding the toxic pollution found on their site. We also found that DEC had failed to properly monitor Emerson’s activities in this regard.

At the public information session conducted by DEC, DOH, and Emerson last August, we asked the Emerson representatives present to include our home among those to be tested for toxins and indoor air quality. We signed Emerson’s Access Agreement at that time, authorizing them to perform the tests, but our home was not among those selected for the first round of tests, which were performed late in 2004.

Our home was among the very few added for the second phase of tests, and we were tested on February 10 and 11. Nine weeks later, the results of those tests still have not been made available to us. The reason for the delay is unclear. What is clear is that we still don’t know what toxins may be present in our home—eight months after the initial meeting and a year after the issue returned to public view. The many people who live in the shadow of the 90-acre Emerson site whose homes have not yet been tested also don’t know about the safety of their homes.

We understand that testing and monitoring take time. However, this slow pace is adding to the anxieties in our neighborhood and to the frustrations of those of us who want to know to what level of toxins we, our children, neighbors, and friends, have been exposed.

The slow pace extends to DEC’s response to information requests as well. On March 17, we faxed a FOIL request for a copy of a letter DEC had made public at the March 3 information meeting held here in Ithaca. Over a month later, we have yet to receive a copy of the letter we requested.

Both Emerson and DEC have failed to provide the timely answers our neighborhood’s residents deserve. I respectfully ask this committee to pressure all parties involved to speed up their efforts, perform meaningful tests, and to provide proper and timely remediation.

Timothy Weber, Ithaca Resident

At present, indoor air testing is the standard way to test for vapor intrusion. For residents, the first concern is getting one's own home tested and obtaining the results. If the tests are positive (contaminants are found), mitigation is offered. If the test results are negative (contaminants are not found, or are found at levels below the remediation thresholds), mitigation is not offered. However, due to the unpredictable nature of subsurface contaminant movement – especially given the particular geology of the Emerson site – a negative result does not necessarily indicate that a property is under no risk of vapor intrusion, or that it could not be at risk in a different season, under different weather conditions, or even on a different day.

Residents need to come to the best understanding they can of the risks, options and costs, to make their own decisions as to the proper course of action. So, in the context of the process as it stands, it is essential that residents know where their homes sit geographically in relation to the pattern of contamination. The state agencies recognize residents' need to understand the spatial distribution of test results. However, the DEC/DOH's privacy policy requires that data points be anonymized – that is, full test results are provided to property owners, but publicly presented test results must not be identifiable to an individual property. So, the DEC presents to the public a map with the following features to help anonymize the values: instead of a city map, a satellite photo is used, with the test region painted over in a flat color; properties are assigned arbitrary numbers instead of addresses; and test values are presented as numbers in boxes, so it's visually difficult to relate them to their origins. DEC also randomizes the location of the result points by moving them or exchanging them with neighboring points. So, if the viewer does pick out a property, it might really be located down the block from the point indicated.

This does effectively anonymize the data. But the question is whether it still allows us to understand the spatial relationships and patterns. In our case, a representative from the DEC presented this map at a public meeting and said "As you can see, there's no discernible pattern." It's certainly true that it's difficult to discern a pattern from this map. But does that mean there is no spatial pattern in the data?

In order to find out, my neighbors and I asked property owners in the test area to voluntarily contribute their results to a public database. By the time of this writing, we've collected more than half the total results in this way. I have constructed a map of those results, without the anonymization the DEC is required to do. To many residents, this map does present a discernible pattern. The pattern appears to point to an area of the site that, to our knowledge, hasn't received attention so far. The mitigation efforts performed so far at the Emerson site itself have centered around the fire reservoir. While the non-anonymized map does suggest some involvement from that part of the site, the R&D lab appears to be much more significantly related to the pattern of contamination.

I conclude that the agencies' privacy policy is, at least in our case, preventing residents from adequately assessing the test results to meet our needs. This is a significant cost. The benefits of the privacy policy, if any, must be measured against that cost, and I believe it's imperative that a better solution is found.

Janet Snoyer, Ithaca Resident

Since June of 2004, my residential community has relied on information provided by DEC and Emerson. Since the first round of testing, I have experienced a progressive shutdown in communication. People who live in communities where there is any chance of vapor intrusion in their homes need information. We are getting information filtered through a lot of self-protective lenses at this point, making the information itself seriously distorted, and we cannot use it to protect our own self-interest. One example of poorly communicated information is the DEC site map, where privacy rationale prevented us from detecting a pattern to indoor test results.

After the indoor air in my home was tested, and high levels of contamination were found, I was offered a mitigation system, which was installed in January 2005. Since the installation of the remediation system, much has gone wrong. For five weeks I have had standing water in my basement for the first time in 21 years. In addition, the fan that provides the vacuum to pull the vapors out from the house has failed after only three months and needs to be replaced. I cannot help but wonder: why did it fail so soon?

Economists have studied the effect of chemical contamination on property values. Housing prices go down and, until the contamination is cleaned up, they stay down. Will any potential economic impact be reflected in an overall NYS assessment of the problem of vapor intrusion?

People don't want to raise families in these houses. They are most likely to sell to people who want to rent them out to others. We have disclosure laws that require me to inform a potential buyer of what I know about contamination problems with the house, but is a landlord required to inform tenants?

I have a 24-year-old daughter. I bought the house when she was three, and she began preschool. Throughout elementary and middle school, her academic reports and evaluations repeated the same theme: smart girl, poor student—although she wants to, it seems she cannot focus, cannot concentrate, does not listen, does not complete assignments, is very slow at her work. In the summer between ninth and tenth grade, she told me that she couldn't continue to participate in school this way, that she loved her artistic pursuits. She begged me to let her apply to a performing arts boarding high school. She was accepted and I used a second mortgage on my house to pay for the school. On her first report card she received a B+ in creative writing and A's in the other subjects. There was no mention of an inability to concentrate. That was the last grade below an A that she would receive in her schooling. She took the most advanced and rigorous academic subjects offered by the school, went on to college at Brandeis University, completed two majors and two minors, and graduated summa cum laude with highest honors.

I never understood the seemingly instant transformation. Then last summer at the DEC's first meeting, which coincided with a visit home by my daughter, where the cognitive impairment effects of TCE exposure were listed, she leaned over and whispered to me, "that was me in elementary and middle school." If I had known that TCE vapors were present in our home, that information certainly would have entered my problem solving process in trying to help my daughter succeed in school.

Richard Grossman, Ithaca Resident

When you look up from our front yard on Park Street, you see a steep hillside with a huge factory atop it—the Emerson Power Transmission site. So, I am still amazed that, until a year ago, I had no idea we were living in the shadow of a massive toxic site that had been declared by the DEC “a significant threat to the public health or environment!” None of our neighbors were aware of this classification either. The fact that many people living near contaminated sites are either uninformed or generally unclear about the situation is a major concern.

Another issue of concern is that there are many people living near contaminated sites who wish to have their homes and the surrounding areas tested, but have no idea when or if the testing will be done. Additionally, people who do have their homes tested and receive testing results from their own home or the surrounding area often interpret those results differently and come to different conclusions.

The following are some suggestions on what needs to be done:

- Additional investigations need to be done promptly to identify all toxic substances used at the site and the locations on the site where they were used.
- Additional investigations need to be done promptly to determine the locations and extent of the contamination.
- The DEC and DOH need to make information widely available to the public and update the information regularly.
- The DEC and DOH need to make experts available to individuals who wish to have questions answered, information explained, etc.
- The owners of all homes in the area need to be offered testing as soon as possible.
- The owners of all homes tested and shown to be contaminated should be offered immediate mitigation. This mitigation should be at no initial cost and have no maintenance cost to the homeowner.
- The owners of all homes tested, regardless of results, should be offered periodic home monitoring at no cost to the homeowner.
- The owners of all homes tested, regardless of results, should be offered periodic health monitoring at no cost to the homeowner.
- Homeowners whose property values are diminished should be offered compensation.

I would be remiss if I did not bring up the issue of the former residents of the areas around these contaminated sites—both homeowners and renters. Many people who were longtime residents in these areas are no longer living nearby. It is very likely that they are completely unaware of their possible long-term exposure to toxic substances. What about the health of those individuals? Once again, there are more questions than answers. Will an effort be made to identify these former residents?

Ken Kamlet, Environmental Attorney

My interest lies in the interface between the Brownfield Cleanup Program (BCP) and the state's emerging Vapor Intrusion Program. While vapor intrusion is an important issue that can only benefit from clearer policies and guidance, I am very concerned that unduly complex evaluation requirements and unduly stringent cleanup endpoints, that are not directly tied to harmful exposures, could have a devastating impact on the new BCP.

While protection of public health and the environment must be a foremost concern, other significant interests and implications must also be considered, especially in the context of brownfields redevelopment where the burden of environmental investigation and cleanup falls primarily on "volunteers" who neither caused nor contributed to contamination of the sites they are seeking to redevelop. To the extent that the costs of environmental investigation and cleanup go beyond what is necessary to limit human exposures to toxic vapors in indoor air, they have the potential to negatively and unfairly impact innocent cleanup volunteers at new and old brownfield sites out of all proportion to resulting public health and environmental benefits. It follows that, especially in the brownfields context, the "rules" governing the control of vapor intrusion need to be both clear and flexible, with an emphasis on minimizing exposure potential, rather than on rigid concentration-based limits or complex evaluation procedures.

The following are some recommendations on how to strike the correct public policy balance between protecting public health from vapor intrusion and preserving the momentum and efficacy of the State's brownfields revitalization efforts:

- Brownfield cleanup volunteers should not be required to investigate or remediate vapor intrusion precursors beyond what is reasonably necessary to protect public health.
- Where "source" removal or treatment of potential vapor intrusion precursors is not feasible, the focus of remediation efforts should be on elimination of exposure.
- Where brownfield cleanups completed prior to the advent of the BCP law are revisited to investigate the presence of vapor intrusion, the costs of follow-up investigations and/or remediation should be borne by Responsible Parties or the State.
- Even where a potential vapor intrusion pathway is being addressed prospectively at a new BCP site, the state should take care not to "punish the innocent" by imposing Superfund-caliber investigation and remediation requirements (and costs) on brownfield volunteers.
- Brownfield certificates of completion should not lightly be reopened at brownfield sites to address belatedly recognized vapor intrusion precursors.
- The State should not impose on private parties more expansive and stringent mitigation or cleanup requirements at Vapor Intrusion sites than it is prepared to assume itself at sites for which it has responsibility.
- The incremental cancer risk threshold of one-in-a-million set forth in the BCP law is tantamount to a zero-risk standard. DOH and DEC should not succumb to "reverse auction" public pressure to enforce everywhere the lowest (most stringent) indoor air standards applied anywhere.
- DOH's emphasis on monitoring and mitigation should be emulated by DEC and given preference over dramatically more costly source removal and treatment approaches—except where significant incremental public health and environmental benefits can be shown to result.

Walter Hang, President, Toxics Targeting

When a citizen contacted me about the chain factory about a year ago, I documented its contamination problems using publicly available data, determined that long-standing hazards had never been remedied, and brought my findings to the public's attention.

In 1987, the metal degreasing solvent TCE was reportedly identified at a concentration of 2,400 ppm in oil partially skimmed from an underground fire reservoir at the old Morse Chain factory. First, the reservoir was cleaned out and sealed. Then efforts were undertaken to identify, investigate, and cleanup the site as a whole.

In 1994, DEC adopted a Record of Decision requiring a two-phase vapor/groundwater treatment system that "should operate for three years, but may reach goals in a shorter time frame." DEC changed the site's classification code from two ("significant threat to the public health or environment—action required) to four ("site properly closed—continued management required").

Monitoring results generated in November 2003 reported up to 28,000 ppb of TCE in groundwater. The cleanup standard for TCE in groundwater is 5 ppb. Despite the long-term inadequacy of the remedial system, no effort was made to determine whether indoor air pollution persisted in nearby homes. A study to assess soil gas vapor migration was ten years overdue.

During the last year, monitoring of indoor air quality in dozens of homes near the site has identified multiple contaminants, notably PCE and TCE, at concentrations exceeding background levels. Even though DEC recently determined that the site poses a significant threat to public health and the environment and action is required, vapor suppression systems have been installed in only a handful of homes, the full range of the site's hazards have yet to be determined, and there is no overall mitigation or remediation agreement in place.

The factory has operated for nearly 100 years and it is imperative to identify the full range of its hazards. In terms of what should be done, first, all of the toxic solvents ever used at the factory must be inventoried. Second, a study must be undertaken to determine the full extent of those solvents in soil and groundwater surrounding the site. Third, all homes located in the impacted area must be monitored for toxic vapor intrusion. Fourth, homes found to be threatened or impacted by toxics must be equipped with vapor suppression systems or otherwise mitigated. The effectiveness of those systems must be verified on an ongoing basis. Finally, property values near the site must be protected. Responsible parties often offer financial settlements or insurance policies to safeguard the interests of local residents. Comprehensive protection should be afforded residents at no cost if they request it.

Cleaning up the plant site, however technically difficult and costly, could be warranted because vapor suppression or other mitigation systems might not protect residents from long-term health risks. In addition, extensive hazards could lie beneath the factory and might threaten plant workers.

James Little, Process Specialist, IBM Manufacturing Plant, Endicott

As a worker and insider, I bring a unique perspective to uncover some of the factors that led to contamination. Such factors include a lack of knowledge early on about the toxicity of these chemicals, lax government standards, complacency, and the fact that chemical companies failed to maintain good accounting practices when underground holding tanks or pipes leaked. In addition, I believe that practices at work are often what lead to spills. Work accountability is lacking, as evidenced by lost training records, machines that are allowed to leak chemicals in favor of production, and employees who are allowed to let chemical safety courses expire.

There is a concern at work about the possibility of the plant having some older plumbing and leaking tanks, and that our drainage system (where the chemicals exit the machines) might lead directly into the ground. This concern is backed up by the fact that if you look at some of the DEC plants, all the contamination from TCE and other chemicals seems to emanate directly from the buildings. I propose that DEC look into some type of process where they put a dye into the drainage systems to make sure that we're not continuing to contaminate.

I think emphasis should be on extensive testing of the contaminated sites, thorough cleanups, corporate accountability by establishing stringent standards, and the on-site presence of safety inspectors.

Finally, I am very concerned about chemical standards at the workplace. I know this isn't about work—this is about what the workplace has done to the community—but it's really all tied together. We have called in OSHA and they did a study and told us that we were within OSHA standards. Despite what they said, we knew the reality—we'd go in, come out of there feeling drunk, and wake up in the middle of the nights with cold sweats, and we knew something wasn't right. About a year ago I found out that the standards were outdated, going back to the 1950s and 1960s. What's going on at workplaces as far as outdated chemical standards is a travesty and should be a crime. We have the technology to prevent chemical exposure at work. Reducing workplace exposure is a win/win for companies because it will save money on health care costs, reduce time lost from work, lower workman's compensation costs, and increase productivity.