

Vapour Intrusion – Regulatory Framework and Case Law Review

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**Remediation Technologies Symposium 2013
October 16-18, 2013**

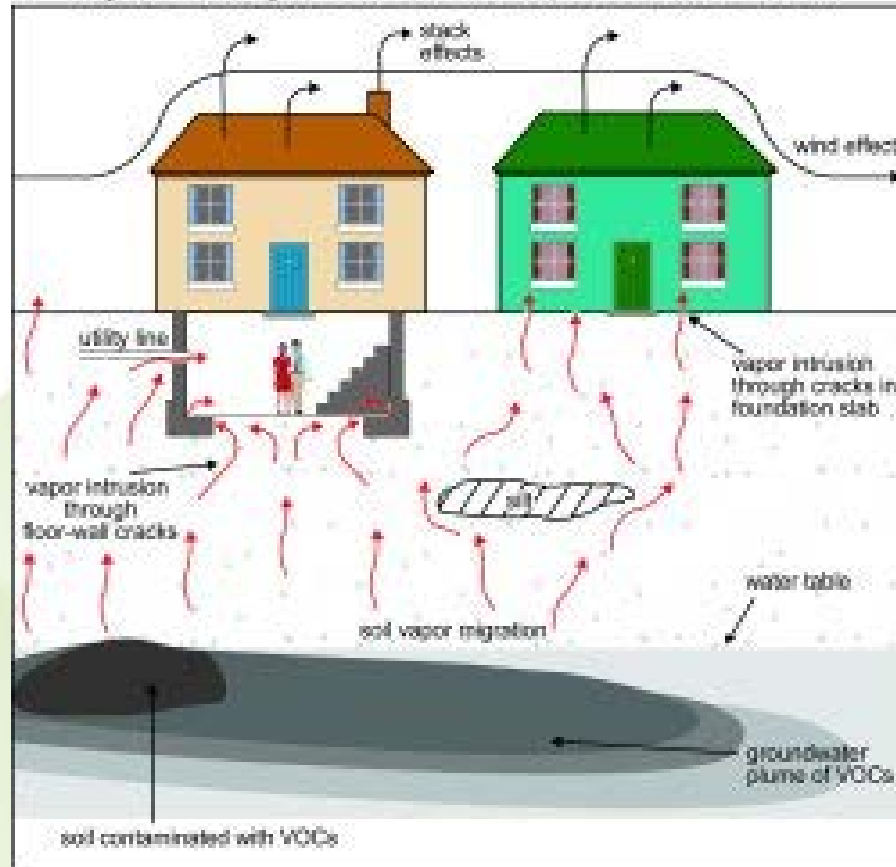
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Roadmap

- Vapour Intrusion (VI)
- Federal and Provincial Regulation
- U.S. Regulation
- Case Law (Canadian & U.S.)

What is VI?

Figure 1. Migration of Soil Vapors to Indoor Air



FEDERAL (CANADA) VAPOUR INTRUSION GUIDANCE

Federal Contaminated Sites Regime

- As of March 2011, federal government identified 22,000 actual, suspected, or closed federal contaminated sites
- According to the Government of Canada, a contaminated site is
 - “one at which substances occur at concentrations (1) above background (normally occurring) levels and **pose or are likely to pose an immediate or long term hazard to human health** or the environment, or (2) exceeding levels specified in policies and regulations.”

Federal Contaminated Sites Regime

- Legislation
 - There are no federal contaminated sites statutes or regulations
 - Canadian Environmental Protection Act, 1999
 - protection of the environment and human health from exposure to toxic substances
 - but, CEPA 1999 does not prescribe a contaminated sites legislative framework
- Guidelines
 - Contaminated sites and VI guidance published at the federal level

Federal Contaminated Sites Action Plan (2005)

- FCSAP
 - \$3.5B, 15 year program started in 2005
 - Program in 2nd phase and will continue to 2020
 - October 2012, Feds commit \$1B through to 2014 to remediate 1,100 highest priority sites
 - Purpose - reduce environmental and human health risks
 - Federal Contaminated Sites Inventory
 - Site Assessment done on priority basis based on risk of current or potential adverse impact on human health or environment

CCME National Classification System for Contaminated Sites (2008)

- NCSCS is a management tool for screening, prioritizing, investigating and remediating contaminated sites
- Contaminated sites assessed by considering
 - contaminant characteristics
 - migration potential
 - exposure (human and ecological)
- VI is to be considered as part of any “migration potential” assessment

I Contaminant Characteristics	II Migration Potential	III Exposure
1. Residency Media	1. Groundwater Movement	1. Human Receptors A. Known Impact B. Potential a. Land Use b. Accessibility c. Exposure Route
2. Chemical Hazard	2. Surface Water Movement	2. Human Modifying Factors
3. Contaminant Exceedance Factor	3. Soil	3. Ecological Receptors A. Known Impact B. Potential a. Terrestrial b. Aquatic
4. Contaminant Quantity	4. Vapour	4. Ecological Modifying Factors A. Species at Risk B. Aesthetics
5. Modifying Factors	5. Sediment Movement	5. Other Receptors A. Permafrost
	6. Modifying Factors	

NCSCS Contaminated Site Assessment Factors

CCME Study: Soil Vapour Monitoring Protocols (2008)

- CCME - Final Scoping Assessment of Soil Vapour Monitoring Protocols for Evaluating Subsurface Vapour Intrusion into Indoor Air
 - Purpose: develop a summary of published guidance documents to understand what information is available about soil gas sampling and the flexibility required to assess VI where different site conditions exist
 - Finding: there is no one guidance document that includes all necessary information, level of detail or flexibility required to assess VI at different site conditions that site professionals face in Canada

CCME Study: Soil Vapour Monitoring Protocols (2008)

- CCME made recommendations
 - Endorse several documents to provide required flexibility for assessing various site conditions
 - Write new and more comprehensive document to identify those discrepancies resulting in low quality data, or
 - Compile recommendations from this study into single procedure
- CCME now reviewing its draft “Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment”

CCME: Draft Guidance Manual (May 2012)

- Replaces the National Contaminated Sites Remediation Program 1993 Sampling and Analytical Guidance Document
- Methodologies for completing site characterization programs
 - Installation of soil gas probes
 - Collection of soil gas and subslab gas samples for chemical analysis
 - Suggested procedure for conducting leak testing of a soil gas probe and sampling train

Guidance for Assessing Vapour Intrusion at Federal Contaminated Sites, Part VII (2010)

- Health Canada (Guideline), Part VII
 - is an adjunct to Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (2010, rev. 2012)
 - provides guidance to federal departments about
 - potential for VI into federal buildings
 - when VI poses potential unacceptable risk to human health
 - relied on when there is
 - current occupation of a building at an existing contaminated site
 - potential for occupied buildings in a future land use scenario

Guidance for Assessing Vapour Intrusion at Federal Contaminated Sites, Part VII (2010)

- Two Tier Analysis
 - First tier: qualitative screening to categorize sites
 - Second tier: quantitative risk assessment
- Focus on chronic health risk associated with long-term exposure to vapours at low concentrations
- Identifies limitations of soil data for chlorinated hydrocarbons, recommends groundwater and indoor air data

PROVINCIAL REGULATION OF VAPOUR INTRUSION

Alberta: Environmental Protection and Enhancement Act

- Part 5, Division 2: Contaminated Sites
 - Site owner can prepare remedial action plan
 - Director can issue Environmental Protection Order to clean up
 - Remediation certificates can be issued once site has been remediated to protect against future Environmental Protection Orders

Alberta: Environmental Protection and Enhancement Act

- Tier 1 & 2 Guidelines for Soil and Groundwater Remediation
 - Tier 1: Generic Guidelines
 - Tier 2: Site-specific Guidelines
 - Risk based assessments to determine acceptable contamination levels
 - Vapour inhalation guidelines for soil and groundwater
 - Exposure Control site management measures

Ontario: *Environmental Protection Act*

- O.Reg. 153/04 Records of Site Condition
 - Purposes: (1) public access to information about site, (2) precludes MOE from issuing certain orders
 - Requires ESA
 - MOE Generic Standards or Site Specific Risk-based Standards from Risk Assessment
 - O. Reg. 153/04, Schedule E – Standards for Phase II ESA for soil vapour investigations
 - MOE can issue Certificate of Property Use

Ontario: Draft Technical Guidance on Soil Vapour Intrusion Assessment (September 2013)

- Released for comment on EBR Registry
- Used to identify, review and evaluate sites for VI
- Provides guidance on conducting site screening, sampling, and modelling
- Three-tier approach:
 - Preliminary Screening (comparison to generic site condition standards)
 - Screening Level VI Assessment
 - Detailed VI Assessment

Ontario: *Occupational Health and Safety Act, 1990*

- O. Reg. 833/90 Control of Exposure to Biological or Chemical Agents
- O. Reg. 490/09 Designated Substances
 - Over 11 designated substances (including benzene and VC)
 - Occupational Exposure Limits based on stakeholder consultation and recommendations from the American Conference of Governmental Industrial Hygienists
 - Worker exposure to designated substances imposes regulatory obligations on employers

British Columbia: *Environmental Management Act*

- Part 4 – Contaminated Site Remediation
 - Five step review process: screening, investigation/determination, planning, remediation, and evaluation/monitoring
 - Contaminated Site Protocols (20 to date)
 - *Technical Guidance on Contaminated Site – Vapour Investigation and Remediation*

Saskatchewan: *Environmental Management and Protection Act*

- Part 3, Division 2 – Contaminated Sites
 - RAP required for designated contaminated sites
- Saskatchewan Petroleum Industry / Government Environmental Committee guidelines for oil and gas industry
- Saskatchewan adopted the CCME's NCSCS

Nova Scotia, PEI, Newfoundland, and New Brunswick

- *Guidance for Soil Vapour and Indoor Air Monitoring Assessment under Atlantic RBCA*
 - Only for petroleum impacted sites
 - Assessment of subsurface vapours from petroleum to indoor air exposure pathways
 - Focus on protection of chronic health risks due to long term exposure

NWT, Nunavut, Yukon

- NWT - *Environmental Guideline for Contaminated Site Remediation*
 - Considers VI during site assessment process
 - Vapour inhalation clean-up criteria for chlorinated HC
- Yukon – Contaminated Site Regulation
 - Protocols – standards and measurement techniques
 - Generic and site-specific standards
 - Plan of Restoration must be approved which outlines remedial or containment steps

Manitoba & Quebec

- Limited vapour intrusion guidance
- Manitoba – Guide to the Contaminated Sites Remediation Act
 - Mentions vapour as common pathway to be investigated and identified at contaminated sites
 - Adopts CCME guidelines and standards, which do not address vapour intrusion
- Quebec – no specific soil gas sampling protocols

UNITED STATES REGULATION OF VAPOUR INTRUSION

US EPA: 2013 Draft VI Guidelines

- *Final Guidance Assessing and Mitigating the VI Pathway from Subsurface Sources to Indoor Air*
- *Guidance for Addressing Petroleum VI at Leaking Underground Storage Tanks Sites*
 - Key factors for assessing VI, making risk management decisions, implementing mitigation
 - Standards for VI - concentration levels for contaminants
 - Made significant changes to the 2002 Draft VI Guidance
- AAI Regulation to adopt the new ASTM Standard E1527-13

New Jersey & California

- NJ Department of Environmental Protection – *VI Technical Guidance*
 - Updated VI screening levels based on published risk-based information from US EPA
 - Priority levels and implementation strategies
- California Department of Toxic Substances Control - *Final Guidance for the Evaluation & Mitigation of Subsurface Vapor Intrusion to Indoor Air*
 - Soil gas investigations, evaluating and mitigating subsurface vapour intrusion, remediating vapour source areas, long-term monitoring, public participation

CASE LAW CANADA & US

Windsor v Canadian Pacific Railway Ltd (Alta CA, 2007)

- VI from contamination via use of a degreaser (TCE)
- Certification of class action upheld by Court of Appeal
- Plaintiff class consisted of residents with properties adjacent to Defendant's maintenance and repair shop
- Alleged TCE from shop contaminated groundwater and seeped into indoor air in plaintiffs' homes
- Damages Claimed: reduction in property and rental value, and physical damage to property from remediation measures

Wamboldt v Northstar Aerospace (Ont Sup Ct J, 2009)

- VI from contamination via use of TCE
- Superior Court of Justice approves certification of class for settlement approval
- Plaintiff class consisted of residents with properties adjacent to defendant's facility
- Defendant entered into negotiations after class applied for certification
- Settlement: \$4 million to damage fund, \$500,000 to extraordinary damages fund, \$550,000 for legal costs

Burley v Burlington N & Santa Fe Ry Co (Mont Sup Ct, 2012)

- Montana Supreme Court held that the continuing tort doctrine can apply to VI claims
- Contamination continues to migrate despite being stabilized in terms of quantity or concentration
- Limitation period begins when abatement is not reasonable or complete abatement cannot be achieved, and a permanent injury exists

Leese et al v Lockheed Martin Corp (NJ Dist Ct, 2012)

- Claim under NJ spill and pollution laws and under common law torts
- Court dismissed Defendant's motion to dismiss claim and argument that no connection between TCE in groundwater and exposure inside residence
- Plaintiff was neighbour to Defendant's facility
- Defendant ordered to remediate TCE contamination on its site and conduct sampling at neighbouring properties by the state regulator
- Air quality sampling found PCE in home of Plaintiff

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