Chapter 1

Preferential Pathways And Vapor Intrusion

1.1 Introduction

Early on in the history of VI investigations, it was discovered that many VI sites had significant temporal variation of indoor air contaminant concentration. This variability presented a problem for all concerned, as it made it more difficult to assess the relevant human exposure at a site. Of particular concern was the discovery that some sites were characterized by active and inactive periods. This meant that it was possible for a VI investigation to give a false-positive result, further complicating things.

To address the growing concerns of temporal variability in VI, the EPA, together with Arizona State University (ASU), purchased a VI impacted building near Hill Air Force Base (AFB) in Utah. The purpose of this was to conduct a long-term high-resolution scientific inquiry, with which the rich dataset would reveal the nature of these temporal variabilities, and offer unprecedented insights into the VI phenomenon.

The house in question, henceforth referred to as the ASU house, was outfitted a wide array of instrumentation to monitored a slew of factors deemed pertinent for VI, e.g. building pressurization, weather factors, air exchange rate, and much more. Of most significance was the measuring of contaminant concentrations inside the building, but also in the soil-gas, and contaminated groundwater below. Many soil-gas and groundwater probes were placed at different locations and depths - detailing how the contaminant was distributed throughout the soil and groundwater around the house. Indoor air sampling also took place in different parts of the building.

The measurements, in particular indoor air contaminant concentration measurements, revealed what was perhaps one of the most significant temporal variabilities recorded at a VI site. In Figure 1.1

1.2 References

Figure 1.1