

Gasoline Station Stage II Ecological Risk Assessment

ECOLOGICAL RISK ASSESSMENT PROJECT

Site Location: Central Massachusetts
Client: Confidential Client
Date: 2010-ongoing

The site was operated as a gasoline service station from 1963 until 1986, during which time gasoline was stored in five, 4,000-gallon underground storage tanks (USTs). Oily liquids originating onsite were directed to an oil-water separator (OWS) located behind the former gasoline service station before being discharged directly into a Bordering Vegetated Wetland (BVW) (Massachusetts Wetlands Protection Act 310 CMR 10.55) located to the south of the site. Oil and/or hazardous material (OHM) associated with previous site activities have been detected in wetland soils including extractable petroleum hydrocarbons (EPH), volatile petroleum hydrocarbons (VPH), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).



Risk analyses included: additional wetland soil sampling; acute soil toxicity testing using the lumbricid earthworm *Eisenia foetida*; use of terrestrial biota-soil accumulation factors (BSAFs) and regression-based uptake models to estimate earthworm tissue burdens; and biostatistical analyses. Food-web modeling was conducted for the omnivorous American robin, the insectivorous American woodcock, and the insectivorous northern short-tailed shrew whereby estimated daily doses were compared with published NOAEL and LOAEL Toxicity Reference Values (TRVs). The comparison with the TRV was expressed as a Hazard Quotient (HQ) as part of the risk characterization. An uncertainty analysis was also conducted.

No statistically significant reductions in either the survival or growth of earthworms exposed to Site sediments were observed. Furthermore, the HQs for PAHs and PCBs reported for the three ecological receptors were below the NOAEL for both PAHs and PCBs, indicating that the risk of adverse ecological harm is unlikely.

The assessment of environmental harm conducted as part of this Stage II ERC, which was based upon a Weight of Evidence (WOE) approach indicated that a condition of “No Significant Risk of Harm to the Environment” exists at the Site.