

Consulting engineers in Ontario have helped develop new – and improved – soil background data for site remediations.

Brownfield Remediations

Co-operation between consulting engineers and regulators is crucial in the development of practical, science-based policy. The Ontario Ministry of the Environment (MOE) has recently shown greater willingness to work with scientists and consultants in private practice to address issues where policy, science and law intersect. A good example of this is the recent update to Ontario's database of background soil concentrations of chemicals that are typically present in brownfield sites.

Problem with background levels

A primary purpose of site remediation regulation in Ontario is to ensure that lands that have been adversely affected by human activity are remediated to a point where appropriate use can be made of those lands. In some cases, such as where the site is environmentally sensitive, the lands must be remediated to "background" chemical levels. The concept of "background level" assumes that some quantity of the chemical may well be present in the soils but is not the result of any human activity that should be the subject of regulation.

In the early 1990s, the MOE created a database of background soil levels based on samples obtained from a number of parkland sites (termed "old rural parkland" and "rural parkland") from six regions in the province. Unfortunately, the data was subject to criticism that the sampling and handling methodologies were not as rigorous as they should have been, resulting in losses prior to analysis that in turn resulted in artificially low background levels: "Since the collection of VOC samples in 1991, scientific evidence has shown that the failure to use proper methods to preserve soil samples during sample collection and storage can result in substantial under-reporting of VOC concentrations (in some cases by over 99%) and consequently, substantial under-estimating of background concentrations. This seems to be the case with current Table 1 VOC values especially Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) ..." — *Ontario Typical Range Soil Background Study*, Ontario Centres of Excellence, 2010, page 5.

In other words, the original sampling and handling methods could have resulted in significant losses of volatile material. This in turn would result in artificially low analytical results that would not reflect the real background levels. Policy decisions and regulations would be based on numbers that were more stringent than was necessary.

The financial implications, if the criticisms were correct, would be that site remediations were being needlessly extended to levels beyond what the true background levels were. Greenfield sites that were found to have "above background" numbers were cited as examples of needless remediation activity driven by faulty data rather than by a genuine policy or scientific imperative.

Finding a better database

Responding to these criticisms, the MOE and the Canadian Petroleum Producers Institute hired the Ontario Centres of Excellence to manage an up-to-date background study that would use the latest sampling, handling and analytical methods to arrive at a better database that could be used by industry and regulators in determining background petroleum hydrocarbon and VOC soil levels.

To create the new data, expert consulting engineers and laboratory scientists were engaged to develop rigorous sample collection, handling and preservation protocols. The process, including participant selection, methodology development and how unforeseen field circumstances were handled, has now been published, along with the results, in a web-based publication: www.oce-ontario.org/documents/Ontario_Soil_Background_Study_Report20100929.pdf.

Whether the results unequivocally validate the criticism of the original data is perhaps open to question and will no doubt be the subject of future discussion.

The exercise, however, is a good example of how closely consulting engineers and regulators need to work together to develop defensible regulatory parameters in fields where science, policy and law intersect. The new database will be far less open to criticism than its predecessor. While the results were not published in time to be incorporated in Ontario's Regulation 511 amendments to the generic standards of the Brownfield Regulation, there is no reason the numbers will not be acceptable to the MOE in any risk assessment submission.

The methodologies and techniques used to develop the new database as well as the co-operative approach of industry, consulting engineers and the regulator throughout the process, could serve as a useful model for other Canadian jurisdictions contemplating a similar exercise. CCE

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