

Tractor Trailer Fire and Hazardous Material Release (Concentrated Herbicide), Exploration of Remediation Options and Innovative Solutions – A Case Study

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A large volume release of concentrated herbicide from a tractor-trailer unit fire in Southern Saskatchewan resulted in a significant soil and groundwater plume containing bromoxynil, MCPA and naphthalene as the contaminants of concern (COC). Soil remediation options available tended to be cost prohibitive and timely (soil disposal as hazardous waste, on and off-site thermal desorption), while groundwater remediation options (ex situ pump and treat, carbon filtration and monitored natural attenuation – MNA) presented the same limitations. Furthering the problem, the release occurred during the winter and a large volume of impacted snow needed to be collected and managed. Nichols Environmental recognized the need for an innovative approach to reach a compliance end point for the site.

Removal of the source of the impacts (contaminated snow and soil) commenced immediately so as to prevent additional migration of the COC, with soil being excavated and stockpiled within a lined containment cell on site and the snow was contained at a nearby industrial yard within open top slop tanks. The source removal allowed us to control the risk of additional migration of the COC while allowing for time to evaluate all possible remediation alternatives and formulate a final strategy that was acceptable to the regulators and cost effective for the client.

Disposal of the impacted soils across the international border was selected due to the soil being classified as non-hazardous waste in the USA, whereas in Canada the soil would be treated as hazardous waste requiring significant transport distance for disposal, and at a significant expense. As well, the same facility was able to accept the melt water from the impacted snow that was collected from the site as non-hazardous waste, whereas in Canada the resulting melt water would be treated as hazardous waste. By immediately controlling the risk of additional migration following the release, we had time to communicate with federal regulatory agencies involved in permitting the movement of contaminated soil and water across the international border.

Following the remediation of the soil and melt water, a near surface groundwater plume was identified which needed to be addressed as part of the overall remediation plan. Nichols Environmental explored the potential use of an oxidant to treat the organic based COC. A bench scale study was completed and indicated that the COC were reduced by over 90%. A field trial was subsequently completed involving the injection of the oxidant under pressure into the subsoils at the site, with initial results indicating that the COC were reduced by over 50%. Nichols Environmental also worked closely with the provincial regulatory agency at this stage of the site remediation in developing site specific compliance guidelines. A full-scale remediation program was initiated thereafter, which resulted in the groundwater plume being

reduced in size by over 90%. Our presentation will be a case study documenting the release of the COC, initial response, subsequent remediation and a 75% cost savings realized by the client as compared to other conventional remediation strategies.

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