

SPILL RESPONSE – BAKKEN OIL FIELD

In September 2009, Matrix responded to an oil pipeline spill in southeast Saskatchewan's Bakken oil field. The spill occurred in native prairie grasslands that were underlain with till material comprising clay, sand and gravel. The groundwater was tested and was considered to be naturally unusable and ranged in depth from 5.0 to 8.5 m below ground.



The Challenge

Standard techniques (e.g., scraping the surface with a hoe, collection of free product with a hydrovac) were used to recover the spilled product from the ground surface. An exploration test hole was completed to test for belowground contamination. Free product (hydrocarbons) was recorded entering the hole at a rate of several cubic metres per day. Matrix stopped applying standard techniques to characterize the product and found that it consisted of volatile hydrocarbons and a large proportion of non-biodegradable, heavier-end material. The site represented both environmental and human health risks due to the nature of the soils and the presence of highly volatile hydrocarbons.

The Matrix Solution

Matrix assessed the immediate effects of the spill using our automated helicopter device to obtain aerial photographs and through the identification of short term receptor risks using the Matrix Comparative Risk Evaluation Calculator. Product was recovered at the surface and the hydrocarbons were characterized to determine the appropriate remediation technique.

Due to the volume of product present and its hazardous nature, standard excavation options were ruled out. Instead, Matrix drilled boreholes to delineate the spill which provided the option to install either monitoring wells or product recovery wells. A temporary multi-phase extraction system was field tested and successfully recovered product. The system remained on-site following the field test, to continue product recovery.

The Result

Matrix was able to avoid soil excavation while providing technical assurance of receptor protection. This approach recovered significant volumes of free product and reduced the shut in time of pipeline activities.

Subsequent groundwater monitoring has shown that receptors continue to be protected while continuous product recovery moves the site towards a condition that would allow ex situ remediation if necessary.



Matrix Spill Response Team

Matrix provides emergency spill response teams based out of each of our strategic office locations across Western Canada: Fort St. John, Grande Prairie, Edmonton, Calgary, Medicine Hat, Lloydminster, Weyburn, Swift Current, and Oxbow. Our spill response team develops pragmatic spill response strategies that account for the type of contaminant and site specific conditions. The result is a cost effective response tailored to client and regulator objectives.

Based on the nature of the spill, our response services can include:

- GIS-supported data gathering to quickly determine risk to receptors such as waterbodies;
- On-site testing to separate impacted and clean soil and water, to minimize trucking and disposal costs;
- Integration of operational pipeline repair efforts with environmental emergency spill response activities;
- Assistance with the transition from emergency spill response to environmental assessment and remediation;
- Regulatory, stakeholder and landowner liaison;
- Regulatory reporting; and
- Development of regional spill response strategies that account for conditions such as soil type, natural soil salinity and receptor risk to guide future emergency spill responses.