

Soil Remediation of 26,200 m³ of Hydrocarbon-impacted Soil at a Former Well Site Using the Ex situ Biopile Process

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Biogenie was awarded a contract in 2006, to complete remediation of five well sites located in northern Alberta. Each site represented specific challenges as they involved different constituents of concern, as well as issues with local stakeholders (land owners, county, etc.). Specific strategies were therefore developed for each site in order to attain all objectives. Three of the sites were impacted with produced water constituents and were excavated and the impacted soil transported to a Class II landfill for disposal. On-site biotreatment was proposed for the two remaining sites where only hydrocarbon impacts were present.

This presentation will focus on the largest impacted site, where 26,200 m³ of hydrocarbon-impacted soil was treated using the ex situ Biopile process. This process was selected based on the depth of impact (more than 9 m below ground surface) and the large volume of soil to remediate. The remedial objectives were to obtain compliance with the generic Tier 1 guidelines as presented in the Alberta Environment Soil and Water Quality Guidelines for Hydrocarbons at Upstream Oil and Gas Facilities (Alberta Environment, 2001).

Several challenges were identified on this site that influenced the remediation plan and design of the system to be engineered and implemented. A few of these challenges were the limited space on site, the proximity of residential and agricultural neighbours, and the depth of impact.

In order to maximize the space available, a 5 m high biopile was constructed to allow for stockpiling and treatment of 26,200 m³ of impacted soil. Typically, soil is placed in biopiles approximately 2 m to 2.5 m high. As well, air quality was of great concern to the adjacent

landowners and the client. In addition to the monitoring of air quality during excavation and treatment according to the Alberta Ambient Air Quality Guidelines (Alberta Environment, 2000), an engineered biofiltration system installed downstream of the blower unit treated the air prior to its release to the atmosphere. To control run off of precipitation and leachate from the biopile, a water collection system was included in the design that allowed for capture, analysis, and treatment of 100% of the water prior to discharge to the environment.

This presentation outlines the site-specific challenges and the combination of solutions that were incorporated to meet them. Additionally, the presentation will summarize analytical data obtained over the course of the project highlighting soil remediation guidelines being met at the conclusion of the work, and that all work was completed in a safe environment for workers and neighbours.

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Mr. Wade Simpson holds a diploma in Petroleum Technology from the Southern Alberta Institute of Technology and a Bachelor of Science in Physical Geography from the University of Calgary. Mr. Simpson has over 20 years of experience in environmental assessment and remediation and has worked on hundreds of remediation projects throughout Western Canada and the Northwest Territories for industry, government, and commercial clients. He specializes in soil and groundwater assessment, remedial, and reclamation projects for upstream oil and gas clients. In 2008, he joined Biogenie as a director in the Sherwood Park office where he currently supervises a team of project managers and field technicians.