Appendix H

Progressive and Final Reclamation Work Undertaken
Year: 2016
Reference: 3BC-ALT1015, Part B, Item 1e.

Progressive Reclamation Work Undertaken in 2016:

A. Contaminated Sites In-Situ Bioremediation Work:

The National Research Council of Canada, on behalf of DND, collected soil samples for chemical and microbiological analyses. This work included laboratory studies involving microcosm mineralization assays for the in-situ bioremediation study on petroleum hydrocarbon biodegradation at the following sites:
1) Oxidator Building;
2) Baker's Dozen.

B. Rotation of Soils in the ALT-11 Landfarm (Biopile) Treatment Facility:

The majority of the soil from the large biopiles were successfully remediated using biodegradation processes. The remediated soil (from both the 2006 Diesel Pipeline Spill and 2007 Auxiliary Power Plant Spill) was moved back to the 2006 Diesel Pipeline Spill Excavation area.

C. Main Station Day Tank (ALT-10) Area

DND submitted a Licence Amendment & Renewal Application in 2015 that identified the newly constructed landfarm at ALT-10 as "ALT-10 Landfarm". The purpose of the "ALT-10 Landfarm" is to conduct remediation work of fuel-contaminated soils at the area excavated to the footprint of the Day Tank Facility. No physical work was conducted in 2016.

D. Environmental Sampling for Per/Polyfluorocarbon (PFC) Delineation

The purpose of this work was to identify potentially PFC contaminated sites. Environmental sampling and screening to determine the potential for biodegradation of PFCs as a remediation approach.

Future works proposed for 2017:

A. Contaminated Sites In-Situ Bioremediation Work:

Continuation of the pilot scale in-situ bioremediation study for petroleum hydrocarbon biodegradation at the following sites:
1) Oxidator Building;
2) Baker's Dozen.
Soil samples will be collected for chemical and microbiological analyses including laboratory studies involving microcosm mineralization assays.

B. Reclaim of Soils in the Landfarm (ALT-11) Treatment Facility:

A layer of soil in the large biopile treatment area possessing PHC contamination will be scraped into windrows to improve aeration of the soils. The remainder of the small biopile soils will move to the large biopile area after careful examination of the depth of the compacted soils. Regular monitoring of the downgrade area adjacent to the large biopile area will be performed to ensure no PHC contamination is moving from biopile area or from contaminated areas upgradient and to the west of the large biopile area.

C. Rotation of Soils in the Landfarm (ALT-10-11) Treatment Facilities:
Continuation of the microbial nutrient augmentation and aeration process in summer 2016 to increase oxygen content in the contaminated soil to promote microbial and bacterial activity within the landfarm facilities. This will be conducted at the ALT-10 and ALT-11 Landfarms.

D. In-Situ Bio-Containment Pilot Research Study:
As indicated with the INAC Inspectors during the 2015 Inspection, DND had taken a proactive approach, developing novel bio-containment barriers, to treat runoff and subsurface waters generated and passing through the boundaries of Federal Contaminated Sites. This activity will be conducted, and the effectiveness assessed, through a pilot research project with the National Research Council of Canada. The general purpose of these bio-containment barriers is to develop a microbial technology solution for bioremediation of runoff and subsurface waters that pass through and/or are generated from contaminated sites prior to reaching the Arctic Ocean. This work has applicability for the entire Canadian Arctic environment.

E. Environmental Sampling for Per/Polyfluorocarbon (PFC) Delineation
Further conduct environmental sampling and screening for PFCs as well as to evaluate the potential of biodegradation of PFC as a remediation approach.