DANISH MINISTRY OF DEFENCE
ESTATE AGENCY

PROGRAM

08:30 - 09:00 **Registration**

09:00 - 09:10 **Welcome**

09:10 - 09:30 **Key-Note Speech**
Hans Jørgen Høyer, Director of the Danish Ministry of Defence Estate Agency

09:30 - 10:45 **Landfarming - Theory and Practice. An Example from Northeast Greenland**
Professor Jan H. Christensen, Copenhagen University; PhD Anders R. Johnsen, GEUS; and Geologist Peter Henriksen, NIRAS
Land Farming is a bioremediation technology. In 2012 a full-scale pilot project for landfarming was initiated in Northeast Greenland with a five year time limit. The project was funded by the Danish Defence.
NIRAS: Design, operation, monitoring program, and results.
GEUS: Microbial oil degradation in Arctic soil.
CU: Results from oil and "fingerprinting" analysis.

10:45 - 11:00 **Break**

11:00 - 11:50 **Bioremediation of Petroleum Hydrocarbons in the Canadian Arctic**
Dr. David Juck, Government of Canada
The bioremediation of petroleum hydrocarbon contaminated soils under Arctic conditions poses a broad set of challenges. Despite these, the biodegradation of petroleum hydrocarbons has been successfully employed to remediate contaminated soils in the Canadian Arctic. The goal of this presentation is to high-light some of the research and approaches employed by the NRC in successfully remediating petroleum hydrocarbon contaminated soils in the Canadian Arctic.

11:50 - 12:45 **Lunch**

12:45 - 13:35 **An Overview of Hydrocarbon Remediation Techniques and Activities Conducted at Australian Antarctic Stations**
Tim Spedding, Australia Antarctic Division
This talk will provide an overview of Australian Antarctic Division's human impacts and applied remediation research as it relates to hydrocarbon impacts and the optimisation of remediation technologies, such as permeable reactive barriers and biopiles, for cost-effective use in cold regions.

13:35 - 13:45 **Break**

13:45 - 14:35 **Building and Operating Biopiles to Remediate Fuel Contaminated Soil in the Antarctic**
Rebecca Mc Watters, Australia Antarctic Division
Since 2011, the Australian Antarctic Division has been using biopiles in the full scale remediation of fuel contaminated soil at its Antarctic stations. This is the first instance of using biopiles for the bulk remediation of contaminated soil in the Antarctic. This talk will detail the full life cycle of the biopiles – from design and construction, to operation and monitoring, and finally to decommissioning and the reuse of remediated soil.

14:35 - 14:50 **Break**

15:20 - 15:50 **Case Studies of Successful In-Situ Treatment of Oil Contamination Under Arctic Conditions**

Jonny Bergman, RGS Nordic

There are specific challenges to perform in-situ treatment of contaminated sites with cold arctic conditions. The ground will be frozen for a large part of the year, and all equipment and installations have to be kept warm to be operational. Biological methods often require a bit of warming of the contaminated soil and groundwater, and even chemical and physical methods are more inefficient in cold climate.

14:50 - 15:20 **Potential of Electrokinetic Remediation of Oil Contaminated Soils**

Professor Lisbeth M. Ottosen, DTU

An overview of research lab and pilot scale results on electrokinetic remediation of oil contaminated soils will be given. What do the results tell us? When and where can the method be used? What are the dominant processes, and when should which process be optimized for (thermal treatment/biological stimulation etc.)? In situ or on-site treatment? Does Grønnedal apply to the preconditions? What knowledge do we miss?

15:50 - 16:15 **Break**

16:15 - 16:45 **Effective Remediation of Petroleum Hydrocarbons in Water- Borne Deposits at Grønnedal Using Chemical Oxidation**

Chief Specialist Jarl Dall-Jepsen, COWI

The primary objective of the tests was to evaluate if ISCO can treat the dissolved and sorbed phase of petroleum hydrocarbons in the saturated interval, and collect design data for full scale remediation of the site. The test approach consisted of injecting hydrogen peroxide activated persulfate into the overburden to oxidize the petroleum hydrocarbons. Performance monitoring was conducted before and after the injection of amendments.

16:45 - 17:15 **In-Situ Thermal Treatment in Arctic?**

Kim Jensen, Arkil

ISTD/ESTD for clean-up of oil contaminated sites: An appropriate technology for remote areas.

17:15 - 17:30 **Break**

17:30 - 18:00 **Remediation of Fuel Leaks from Remote Lighthouses in Northern Norway**

Liv Marit, Rambøll Norway

Remote lighthouses in Norway has an emergency power supply, fueled by diesel. Because of harsh environment and lack of maintenance fuel containers has over time leaked diesel fuel to surrounding areas. Rambøll conducted plans for remediation, contracting and follow up in construction period. We will present our experience from survey to concluded projects and show examples of methods for remediation in small scale.

18:00 - 18:30 **Project Management of the Closure of Coal Mining in Svalbard**

Frank Holmgaard, Rambøll Norway

Science the WW2 a coalmining industry has emerged on Spitsbergen, Svalbard, at its highest excaviting more than 2 million tonnes of bituminous coal annually. As part of the operations there a small community relating to the mine has been established, some partly over a glacier. All infrastructure is planned to be decommissioned during the next years and Rambøll has on assignment of the mining operator estimated cost for closure and restoration of the surrounding areas

19:00 - 21:00 **Hosted dinner at Frederiksberg Castle**