

**REPORT ON 2003 RESEARCH PROJECTS**



**ENVIRONMENTAL  
RESEARCH  
ADVISORY  
COUNCIL**

## REMEDIATION OF SALT-AFFECTED SITES BY LEACHING

Investigate the effectiveness of leaching for remediating salt-affected sites.

### WHAT IS THE PURPOSE OF THIS PROJECT?

Sodium chloride brines are a common by-product of oil and gas production in western Canada. In some older fields, for example, more than 95 per cent of the fluids produced may consist of brine. With such large volumes of brine being handled and disposed of during production, spills are inevitable. At present, the only sure way to remediate sodium chloride impacted soils to regulatory requirements is to excavate the soil and dispose of it in landfills. Landfilling is not only very expensive but also creates environmental problems. Over the years, many produced water spills have been remediated by leaching with varying degrees of success. However, some issues remain:

- The timeframe required to leach salts to levels that will meet regulatory criteria is uncertain;
- Site and spill conditions under which leaching to regulatory levels is likely to be achieved are unclear;
- Site and spill conditions where adverse impacts to possible shallow groundwater receptors will not occur needs to be assessed
- The relative costs of various leaching methods are unclear.

This project is studying whether some soil-leaching methods work better or are more cost effective than others and under what conditions these methods are most effective for remediating salt-affected sites. To do this, researchers are gathering information from salt-release sites treated by leaching. These sites must have at least three years data from the following types of treatment:

- Installed leaching systems such as tile drainage, leaching cells and trench intercepts
- Chemical amendments
- No interventions – left to leach naturally.

### HOW IS THE PROJECT BEING CONDUCTED?

Matrix Solutions Inc. is gathering information from oil and gas companies with salt-affected sites that are being remediated using leaching techniques. This information is being used to assess:

- The reliability of leaching and the time needed to complete remediation under different site and climate conditions
- The effectiveness of commonly-applied amendments and of systems constructed to collect leachate
- The cost of remediation.

Researchers are also collecting soil and/or groundwater samples from selected sites to assess vegetation growth and overall remediation success. They are also comparing the costs and benefits of effective, reliable leaching enhancement techniques.

### WHAT ARE THE RESULTS?

The project, approved in the fall of 2003, is still gathering data.

### WHAT HAPPENS NEXT?

A final report should be completed by the summer of 2004.

### PROJECT SPONSORS AND IN-KIND SUPPORT

This project is supported by the Canadian Association of Petroleum Producers (CAPP), Petroleum Technology Alliance Canada and numerous cooperating oil and gas companies.