4.5. OVERVIEW OF PERMAFROST FOR ARD CONTROL

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AN OVERVIEW OF PERMAFROST FOR ARD CONTROL

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OUTLINE

- BACKGROUND

- ISSUES

- CONTROL STRATEGIES

- RESEARCH REQUIREMENTS
Figure 1.1  Canada’s Northern Permafrost Regions
Figure 4.1: Seasonal Thawing Thickness for Mine Waste in Permafrost Regions
Figure 3.5  Distribution of Unfrozen water in frozen soils.
(a) Low salt concentration pore fluid in fine-grained soil.
(b) High salt concentration pore fluid in fine-grained soil.
(a and b) following Sheeran and Yong (1975).
(c) High salt concentration pore fluid in coarse-grained soil.
Figure 4.6: Typical Grain Size Distributions of Waste Rock Materials
Figure 4.7: Saturation Relationships for Sandy Gravel Mine Waste Rock Materials
A. CONSTRUCTION CONFIGURATION

B. RE-SLOPED CONFIGURATION

NOTE: RE-SLOPING OF FINE SANDY GRAVEL WASTE SERVES TO REDUCE AIR FLOW THRU BASE OF PILE. COARSE DRAINAGE LAYER BENEATH NON-ACIDIC UPPER LIFT LIMITS INFILTRATION INTO ACIDIC WASTE

Figure 4.10: Climate Controlled ARD Strategy for Terraced End-Dumped Construction
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RESEARCH AND
DEMONSTRATION
REQUIREMENTS

- FREEZING POINT DEPRESSION DUE TO PROCESS CHEMICALS
- ECONOMIC INSULATING COVER DESIGNS
- WATER AND HEAT TRANSFER IN WASTE ROCK DUMPS