

APPENDIX E.-HEAPREC EQUATIONS

Pertinent equipment productivity and cost equations used to develop the HEAPREC are included in this appendix. The equations are organized by section as presented in the HEAPREC User's Manual as follows:

SUBSOIL EARTHWORK, OTHER DOZER APPLICATIONS, TOPSOIL APPLICATION, TOPSOIL GRADING, REVEGETATION, STRUCTURE DEMOLITION, LINER DISPOSAL, CAPPING HEAP, and DETOXIFICATION METHODS.

SUBSOIL EARTHWORK

**** Scraper- Subsoil Earthwork (A121..F140) ****

Description: Estimate costs to haul and reapply subsoil using a scraper.

Input data: Haul distance, amount of material to move.

Data range: Scraper capacity, hourly equipment operation, hourly labor cost.

Given data: None.

Production equation:

$$P = (600 \times C) / (H/100 + 30)$$

where P = production (yd³/h),

C = scraper capacity (yd³),

and H = haul distance one way (ft).

The equation gives a rough estimate of production by assuming a scraper speed of 22.7 mi/h requiring 15 hp/yd³ scraper capacity and a fixed time for loading, accelerating, turning, and dumping of 3 min per cycle.

Total scraper time equation:

$$T = (M/P) \times (1/80\%)$$

where T = Total scraper time (h),

M = amount of material to moved (yd³),