A surface mine optimizes its profits by maximizing the net present value (NPV) of its operation. One important operational component is production scheduling, i.e., defining when each section, or block, of ore should be removed. A production schedule requires adherence to geospatial and operational constraints. A common exact method for determining this block extraction sequence is formulating the problem as an integer program where binary variables represent when (and if) a given block is removed from the orebody. We suggest methodologies to expedite solution times for instances of this block sequencing problem: (i) we apply deterministic variable reduction techniques to eliminate blocks from consideration; (ii) we add cuts that strengthen the model's formulation; and (iii) we implement Lagrangian relaxation techniques that allow us to determine an optimal (or near-optimal) solution more quickly than solving the monolith (original) problem. Our techniques on data sets ranging from 100 to 10000 blocks reduce solution times by up to 80%.

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