Figures 1(a)-(c) graphically illustrate the iron grade of the blends obtained in plant 1 in particle size ranges 1, 2, and 3, respectively, according to the number of available excavators and the value of the tolerance ϵ adopted in Table 7 of the manuscript. The grey dotted lines represent the iron grade target established for the scenarios with the value of ϵ equal to zero. In turn, the red and blue dotted lines represent the lower and upper bounds, respectively, for the iron grade targets. The black dots represent the iron grades obtained in each scenario. The graphs show that the iron grade obtained in plant 1 satisfied the bounds established for the iron grade targets in almost all scenarios. The exceptions occurred for the iron grade in the particle size range 1 in scenarios with two excavators and tolerances ϵ less than or equal to 4% (Figure 1(a)), and for the iron grade in the particle size range 2 in the scenario with three excavators and ϵ equal to zero (Figure 1(b)).
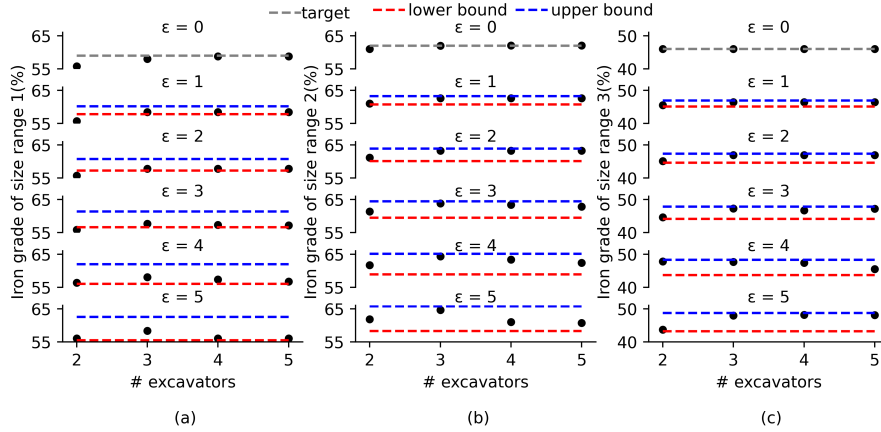

Figure 1.: Iron grade of the blends obtained in plant 1 according to the number of excavators and tolerance ϵ.

Figures 2(a)-(c) show the ore proportion results in particle size ranges 1, 2, and 3, respectively, for plant 1 according to the number of excavators and tolerances. In these figures, each value of tolerance ϵ is represented by a different symbol.
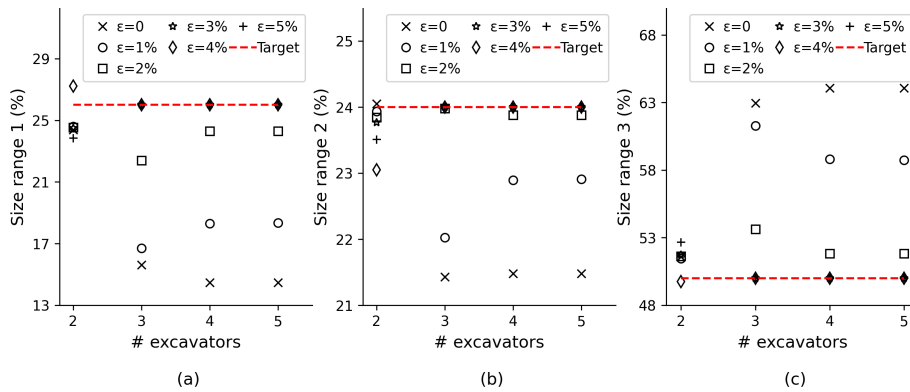

Figure 2.: Ore proportion in the particle size ranges for plant 1 according to the number of excavators and tolerance ϵ.

As shown in Figures 2(a)-(c), only the scenarios with three, four, and five excavators and tolerance ϵ equal to or greater than 3% have the closest results from the targets of

the ore proportions in the particle size ranges. It also can be noted that, except for the scenarios with two excavators, the results become too close to the targets as the plant's iron grade tolerance increases. The differences between the scenarios' results with four and five excavators are minimal, indicating that the ideal number of excavators is four.
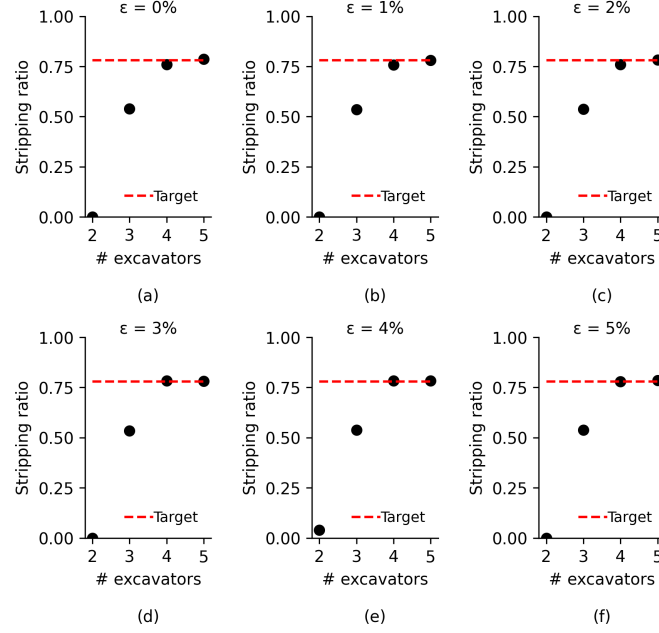

Figure 3.: Stripping ratio results according to the number of excavators and the tolerance ϵ from plants' iron grade targets.

Figure 3 shows the stripping ratio results according to the number of excavators and the tolerance ϵ from the plants' iron grade targets. The stripping ratio deviation is zero in all scenarios with five excavators and those with four excavators and tolerance greater than 2%. However, the deviations of the stripping ratio target were high for all results with two and three excavators.