This review manuscript assesses the potential to recover REEs from drill cuttings, an underutilized byproduct of subsurface exploration. The paper covers mineralogical modes of occurrence, lithology-specific behavior, drilling fluid interactions, extraction and characterization techniques, and decision-making frameworks for REE recovery. While it covers many mineralogical aspects of REE recovery from drill cuttings, the manuscript overall lacks in-depth analysis, particularly in section 4 through 8. In fact, sections 4 and 5 are poorly organized and unprofessionally numbered. Although the authors disclosed the use of AI, such easily noticeable errors should have been detected by it. These sections are also very short and should be expanded with more thorough discussion and critical analysis, rather than merely summarizing previously published studies. Thus, not recommended for publication.

Additional suggestions for improvement:

- Add line numbers for reviewers' convenience.
- Pg 2, typically treated as waste.[20-22] should be typically treated as waste[20-22].
- While the manuscript is comprehensive, it might benefit from a more focused comparison of REE behavior in drill cuttings vs. core samples, which could help justify why cuttings deserve more attention despite their heterogeneity.
- Pg 11, section 5.1. The fig 2 should be Fig 3. Also, more descriptive labels to the y axis, not just %. On the x-axis, why are extraction & characterization techniques comparable? Only two extraction techniques are included, although five are discussed in section 6. Why are the remaining four excluded from Fig. 3? In the caption, no space b/t in and recent. In the last sentence, elaborate on speed and reagent efficiency.
- In Table 6, Xenotim e should be Xenotime.
- In section 5.1, fluid should be solution to be more specific.
- In section 6, extraction should be leaching or, more specifically, solid-liquid extraction.
- In section 7.2, abbreviate phrases at their first appearance. Don't use an abbreviation here if the acronym was introduced earlier.
- Pg 17, correct Best p[171]ractices.
- In Fig 5, remove ? in the 1st box as no bifurcation at this step. Why is only ICP-MS included? What about ICP-AES/AAS?
- In Conflicts of Interest, don't better be do not.
- A more detailed cost-benefit analysis or commentary on the economic viability of REE recovery from drill cuttings (even qualitatively) would strengthen the paper's impact.
- The geographic focus is heavily skewed toward US case studies. A broader inclusion of examples from Asia or Africa (beyond Namibia) would help generalize the review.
- Consider adding "A Review" at the end to make it more discoverable.

Some references are missing critical information. For example, [2] is missing the year. The authors should carefully check all references for completeness and accuracy.