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REVIEWER'S REPORT

Manuscript No.: IJAR- 57593

Title: ASSESSMENT OF NATURAL RADIOACTIVITY AND HAZARD FROM CONSUMPTION OF COMMUNITY WATER SUPPLIED BY BOREHOLES AROUND GOLDMINE AREA IN KUILSE REGION, BURKINA FASO.

Recommendation:
Accept as it is .....
Accept after minor revision.....
Accept after major revision
Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity			✓	
Significance			✓	

Reviewer Name: **ANAPANA GOPAL**

Reviewer's Comment for Publication.

General Comments

The manuscript addresses an important environmental and public health issue by evaluating natural radionuclide concentrations and radiological hazards associated with borehole water consumption around a gold mining area in Burkina Faso. The study is relevant, particularly for regions where mining activities may influence groundwater quality. The use of HPGe gamma spectrometry is appropriate, and the findings contribute useful baseline radiological data for the Taparko mining region. However, the manuscript requires substantial revision in language, formatting, methodological clarity, data presentation, and interpretation before it can be considered for publication.

Content and Originality

- The topic is scientifically relevant and regionally important, especially due to increasing concerns regarding Naturally Occurring Radioactive Materials (NORMs) in mining environments.
- The manuscript provides original data from the Kuilsé region of Burkina Faso, where limited radiological groundwater studies have been reported.
- The study objectives are clearly stated; however, the discussion lacks depth and critical interpretation of the results.
- The comparison with previous studies is limited and should include more recent international literature.
- The manuscript would benefit from explaining the geological reasons behind the observed radionuclide concentrations.

Specific Concerns

- The conclusion that mining activities do not pose significant hazards may be premature without comparison to control/non-mining areas.
- Seasonal variations and hydrogeological influences were not considered.
- The novelty of the study should be emphasized more clearly in the introduction.

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Technical Quality

- The use of High Purity Germanium (HPGe) detector and gamma spectrometry methodology is technically appropriate.
- Equations for activity concentration, annual committed effective dose, and risk assessment are relevant.

Technical Issues

1. The manuscript does not clearly describe:
    - Sample storage duration before counting.
    - Secular equilibrium assumptions for uranium and thorium decay series.
    - Background subtraction procedure.
    - Minimum detectable activity (MDA).
    - Detector efficiency calibration details.
2. Units and notation are inconsistent throughout the manuscript:
    - "Bq. L-1", "Bq/L", and "Bq.L−1" are used interchangeably.
    - "mSv.year-1" and "mSv/y" should be standardized.
3. There are inconsistencies in Table 4:
    - Sample IDs are repeated (WSTA-001 to WSTA-004 appear twice).
    - The number of entries does not match the 17 samples reported earlier.
    - Decimal notation alternates between commas and periods.
4. Statistical treatment is inadequate:
    - No standard deviation or confidence interval analysis is presented beyond measurement uncertainty.
    - No correlation analysis among radionuclides was performed.
5. Figures require improvement:
    - Figure captions are insufficiently descriptive.
    - Figure quality and axis formatting should be enhanced.
    - Figure 3 lacks proper explanation and statistical comparison.

Language and Presentation

The manuscript contains numerous grammatical, typographical, and stylistic errors that significantly affect readability. Extensive English language editing is necessary.

Examples

- "naturel radioactivity" → "natural radioactivity"
- "these is no significant different" → "there is no significant difference"
- "far to the limit" → "far below the limit"
- "proctection" → "protection"
- "fouth ed." → "fourth edition"

Additional Issues

- Many sentences are overly long and poorly structured.
- Several paragraphs lack proper punctuation and scientific writing style.
- Scientific names, units, and symbols should follow journal formatting standards.
- Spaces between numerical values and units should be standardized.

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Structure and Organization

- The manuscript follows a conventional scientific structure (Abstract, Introduction, Materials and Methods, Results, Conclusion).
- Overall organization is acceptable, but several sections require restructuring for clarity.

Suggestions

- The Abstract should be shortened and revised to improve clarity and grammar.
- The Introduction should better highlight:
  - Existing knowledge gaps.
  - Importance of radiological monitoring in mining areas.
  - Study novelty.
- The Results and Discussion sections should be separated more clearly.
- The Discussion should provide:
  - More interpretation of radionuclide behavior.
  - Geological explanations.
  - Public health implications.
- The Conclusion currently repeats numerical results excessively and should instead focus on the scientific significance of the findings.

References and Citations

- The manuscript cites relevant foundational references such as WHO, IAEA, UNSCEAR, and ICRP documents.
- However, the reference list contains formatting inconsistencies and typographical errors.

Issues

- Citation style is inconsistent.
- Several references are outdated.
- Some references are incomplete or improperly formatted.
- Reference numbering and punctuation require correction.

Recommendations

- Include more recent studies (within the last 5–10 years) related to groundwater radioactivity and mining impacts.
- Ensure all references follow the journal's citation style consistently.

Overall Recommendation

The manuscript presents useful baseline radiological data and addresses an important environmental health topic. However, substantial revisions are required to improve methodological transparency, statistical analysis, language quality, data presentation, and scientific interpretation.
The study has publication potential after minor revision.

Final Decision:
Minor Revision