



# WATER RESOURCES AUTHORITY

ESTABLISHED BY THE WATER RESOURCES ACT, 1995

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REF: DR 8-26

December 15, 2020

Chief Executive Officer  
National Environment and Planning Agency  
10 Caledonia Avenue  
Kingston

**Attention: Mr. Peter Knight**

Dear Sir,

**Re: Mining Operations, Special Mining Lease 173 Area in St. Ann & Trelawny**  
**Universal Application Number: 2018-07017-EIA00196**

We are in receipt of your letter dated 19 November, 2020 (received November 24, 2020) regarding the captioned Environmental Impact Assessment.

The Water Resources Authority (WRA) previously made comments on the first submission of this EIA as stated in our letters to NEPA dated August 30, 2019 and March 19, 2020. These letters are attached to the current communication. The WRA comments on the submission received November 24, 2020 are as follows. Quotations from the EIA are in *italics*.

**Page 1-7:** *"...ground water resources are at significant depths (more than 100 m) below the surface of SML 173."*

The WRA believes that this should not be used as a metric to minimize the risk of contamination. The aquifer beneath SML 173 is karstified and significantly faulted, and these conditions increase the permeability of the aquifer which increases the risks of contamination to groundwater.

**Page 1-7:** *"Nationally, the baseline associated with ground water quality and quantity in proximity to bauxite mining operations for over 60 years have shown that there has been no pollution of ground water caused by bauxite mining. It is highly improbable that the water resources will be impacted by the mining of bauxite in areas of similar karstic geomorphology. This is supported by evidence gathered from monitoring wells in St. Elizabeth, Manchester, St. Ann and Clarendon."*

The WRA re-affirms its comments from the August 30, 2019 letter in that this assertion is not yet definitively proven, and the purported evidence was not presented to support the assertion. The Retreat well is a stated example of pollution impacting groundwater in the region, although it has not been determined what the source of that pollution was/is. The EIA should mention and address this particular matter of the Retreat well.

**Jamaica's Hydrologic Agency**

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**Board: Dr. Parris Lyew-Ayee Jr. (Chairman), Prof. Michael Taylor, Mr. Michael Brown,  
Miss Nadine Spence, Mr. George Grant, Ms. Stephanie Abrahams,  
Ms. Georgia Hamilton, Ms. Novelette Howell, Ms. Allison Rangolan.**

**Page 1-7:** *“Most of the caves identified are elevated above the deposits and areas containing sinkholes will not be mined.”*

The EIA should definitively state that there are no caves in or near the areas proposed for mining, if this is the actual situation. The quoted sentence gives the impression that there are some caves that are not elevated above the deposits. There should be a definitive investigation/ground truthing of the specific areas potentially slated for mining to confirm whether any unknown caves/sinkholes are within those areas. At least two sinkholes/caves were stated in the EIA as discovered by CD&A, so this illustrates the possibility that other unidentified sinkholes/caves may be in the region.

Additionally, the EIA should state how the applicant proposes to treat with caves/sinkholes that are located in/near the potential mining areas/orebodies. It may be that the proximity to caves/sinkholes will sterilize the potential for mining at a given location.

**Page 1-7:** *“Our investigations of the environmental baseline have identified degraded water quality of high nitrate and sulfate concentrations in the Ulster Spring Area...”*

This data and investigations details did not appear to be present in the EIA itself. The data and investigation details should be included in the EIA as evidence for the statement.

**Page 5-14:** *“Map of Potential Sinkholes within SML 173”*

The WRA posits that a superimposition of mapped orebodies onto mapped depressions may prove informative.

**Page 5-17:** *“...there is a general misconception that bauxite occurs under forested areas and hence the belief that bauxite mining impacts watershed quality.”*

A watershed is an area of land that drains water into a specific waterbody (USGS). Bauxite mining removes vegetation and soil cover, creates fugitive dust and alters flow regime by changing the landscape, all of which **absolutely do impact the watershed** by changing the air quality and destroying the flora which forces the fauna to adapt or depart. Rainfall will combine with fugitive dust to create runoff which can possibly lead to contamination (turbidity through increased solids) of the aquifer via infiltration through the now denuded strata. Increased anthropogenic activity in the watershed (such as bauxite mining) will further degrade the watershed. The EIA seems to overlook the fact that much of SML 173 encompasses forest reserves, and the statement about bauxite occurring under grassland cover appears at odds with the statements about bauxite reserves in the heavily forested Cockpit Country Protected Area. At any rate, the watershed’s current degradation status of Least Degraded should lead to concerted efforts to maintain this status.

**Page 5-17, Page 5-19, 5-23:** Various maps of the study area designating a boundary for the ‘*Rio Bueno sub-basin*’

The WRA did **not** provide the *Rio Bueno sub-basin* boundary indicated on these maps. The boundary appears to be a generated watershed based on the topography of the region around the Dornoch Spring; however, it ignores the contributing flows of the Cave, Lowe and Quashie Rivers and their watersheds. The EIA should state clearly the origin of the “*Rio Bueno sub-basin*” boundary, and not attribute it to the WRA.

**Page 5-25:** The historical Cave River dye trace connection should be included. The WRA has repeated the Cave River trace and re-confirmed the results. The WRA has also confirmed that flows from the Cave River appear to go only to the Rio Bueno, and do not flow to either the Pear Tree Bottom River or the Laughland Great River.

**Page 5-28:** “*The trend line indicates a slight increase in flow despite the diversion of the Cave River and the mining of bauxite within the Rio Bueno sub-Basin...over the past 50 years*”

Mining activities over the past 60 years appear to have been focused in areas that may not contribute significant flow to the Rio Bueno. The EIA made the accurate observation that the flows from Cave, Lowe and Quashie Rivers all go to the Rio Bueno and nowhere else; however, past mining in SML 165 (centered on Alexandria) would most likely not have had much impact on the Rio Bueno based on its location. More research would be needed to validate the EIA’s assertion, and it would require comparisons of flows and water quality for the Pear Tree Bottom River and Laughland Great River, among others. See figure 1 at the end of this response.

**Page 5-29:** The document states that surface runoff will be increased due to construction of haul roads. The applicant needs to state the mitigation strategies proposed to deal with same.

**Page 5-29:** The increase in turbidity and discolouration that is expected, may affect users of the water resources in the basin. The applicant should discuss these expectations with the stakeholders and propose mitigation methods should this disruption occur.

**Page 5-30:** The WRA reiterates its previous comment regarding the depth to groundwater as a non-determinant of how susceptible the aquifer is to contamination.

**Page 5-30:** “*The ore bodies to be mined are shown on figure 5-11*”

Figure 5-11 shows **all** ore bodies within SML 173, with no regard for locations near sinkholes, locations in forest reserves, or other stated limitations of mining activities. The EIA should prepare a map that presents the actual proposed areas for mining as limited by the various sterilization factors, not a map that presents all orebodies as proposed mining sites.

**Page 5-35:** Though the 30 year mean annual rainfall has been cited, an emerging trend of a westward shift in rainfall has been noted by the Meteorological Service of Jamaica. This may have an impact on expected rainfall amounts and projected runoff.

**Page 5-59:** The drought statement as presented is misleading. Drought is defined by low water availability, either from a meteorological, hydrological, or agricultural perspective. The word “drainage” in the EIA would be more accurately substituted by “infiltration”, and that would not in and of itself be a precursor to drought.

**Page 7-7:** The design of the drainage works should be submitted to the National Works Agency for review.

**Page 7-8:** Item WQ1 *“The impacts on groundwater of this project, if any, will be negligible as there are no chemicals, waste streams or disposal activities associated with the development that stand to affect groundwater”.*

This statement remains unproven. Introduction of particles into an aquifer is considered a type of contamination, and there is precedent for polluted groundwater in this region as previously indicated by the Retreat well. The potential risks to groundwater should not be downplayed or minimized.

#### **Pages 7-23 – 7-25, Risk to Water Resources**

The WRA believes that this section of the EIA is not objectively presented, seeks to minimize and otherwise “spin” the interpretation of the data currently available, and makes significant conclusions based on the absence of data as opposed to the presence of data. The potential impacts of mining on water resources (along with all other potential impacts and concerns in other spheres) requires that decisions be made on the best data available, not on the absence of data or the projection of data. In the absence of data, then the most conservative approach should be taken, and data should be gathered to guide the best decision possible. Any decision made to mine bauxite in SML 173 should not be based on exaggerated optimism, subjective/biased analysis, or a dismissal of the concerns of stakeholders. For example, the section mentions the noted turbidity observed in Sherwood Content and Lluidas Vale NWC well, but then goes to say *“it is highly unlikely that this would occur in the Rio Bueno catchment”* IF certain ore bodies are not mined. This observation should not be dismissed or downplayed. At minimum, the EIA should present a fulsome analysis of the available data to buttress the assertions made in this section, and the EIA should also determine what, if any, observed historical impacts may or may not be attributable to bauxite activities.

**Page 11-4:** In addition to the bi-monthly monitoring proposed, the WRA recommends additional monitoring be conducted after significant rain events, with the threshold of significance to be determined.

**Page 11-6:** *“There are no wells close to the Cockpit Country of the SML 173 area that can be monitored for either groundwater level or groundwater quality.”*

The EIA continues after this statement to mention the Barnstaple NWC well, which is located less than 1 km north of the SML 173 boundary. The Brown’s Town-Minards wells (NWC) are both located 1.7 km north of the SML 173 ‘panhandle’, and the Retreat Well is located less than 500 metres from the ‘panhandle.’ The WRA reiterates that the Retreat well was abandoned due to pollution issues, and the EIA does not reference this fact even though it was pointed out in the August 30, 2019 letter. At minimum, these three wells should be monitored for water quality and water level. In addition, the Swanswick-Clarks Town well is now in operation by Organic Growth Holdings, and could also be utilized as a WQ sample point.

The Cave Valley well information does not include the actual rate for the stated yield test.

The dye tracing statement does not account for the previous recognition in the current EIA of the dye trace work conducted by the WRA in 2018-present.

Finally, the WRA refers to a comment we made in the August 30, 2019 letter that there appeared to be a bias in the EIA that may be inappropriate for a supposedly objective Environmental Impact Assessment. This revised EIA appears to maintain a significant lack of objectivity throughout the document, and this lack of objectivity does not provide the EIA with the credibility required to make an accurate assessment of the potential impacts of mining in SML 173. An objective assessment should present all of the facts available, state the gaps in the available data, and make a recommendation based on those facts and data. The assessment should not be based on economic exigencies or predetermined outcomes. The significance and public profile of this particular issue demands an objective analysis that can withstand scrutiny from all stakeholders, and the WRA strongly recommends that NEPA ensure the development and presentation of an **objective EIA analysis**, even if it means selecting an assessor that is not engaged by the applicant or by opposing stakeholders.

We trust that this review will prove informative and relevant to your deliberations, and we remain available for any future discussions on this matter.

Sincerely,

**Water Resources Authority**



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Geoffrey Marshall (Mr.)  
**Chief Hydrologist**  
For Managing Director



