

The Mirador Mine – An Overview May 2023

The Mirador project, operated by the Chinese mining company ECSA, is being developed over an operating area of 6,998 ha and with a mining infrastructure area of 1,836 ha.

Looking at our human behaviours through the eyes of Nature, irresponsibility rises up to the level of insanity when we consider the implications inherent in the Mirador Mine exploitation.

I have filed a complaint with the International Board of the EITI.
(Extractive Industries Transparency Initiative)

The EITI welcomed Ecuador as an EITI-implementing country on 15 October 2020.¹ In accordance with the EITI Standard, Ecuador is required to publish the required information (typically through an EITI Report) within 18 months of being admitted as an EITI implementing country (i.e., by 15 April 2022). Validation will commence within two and a half years of becoming a candidate (i.e., 5 April 2023).

I gather that Ecuador has not published the required information and is therefore failing to comply with the EITI Standard. We also see failure in compliance under protocols 6.4, (Environmental impact of extractive activities), and 1.3, (civil society engagement).

I think it will be worthwhile to bring another complaint to the international board of the EITI

The article <https://www.labarraespaciadora.com/medio-ambiente/mina-mirador-bomba-de-tiempo/> is very informative.

In it, William Sacher Freslon, professor at the Universidad Andina Simón Bolívar, states that the costs, expenses and losses of transforming Ecuador into a mega-mining country, "would exceed the benefits by

¹ <https://eiti.org/board-decision/2020-74>

\$24.5 billion," meaning that the costs would end up being 1.5 times greater than the revenues collected. According to Sacher's study the cost of breaking a tailings dam at the Mirador mine with the most likely and most pessimistic scenario, would reach 141 billion,408 million US dollars. This is equivalent to about four times the approved general state budget in 2022. ²

This is clearly a short-term gain followed by massive insupportable losses.

In an interview published in July 2019 by El Comercio newspaper, Augusto Flores, Ecuacorriente S.A. spokesman, acknowledged that the environmental damages caused by the Mirador mine will be irreversible:

"It is going to be significant, enormous, because obviously, we are altering the relief of the area. And I, as a spokesperson for the company, will not lend myself to deceit, ever. The processes are irreversible, it is irremediable".³

"The Tundayme River is a large basin's base and deepest part. From the riverbank upwards the basin itself is formed, and that is where we are going to deposit the tailings. We will start filling little by little, from the base of the basin (of the river) and we will lose it. "⁴

Steve Emerman, a world-renowned expert on tailings dams, states, "An immediate moratorium on further construction of the Mirador mine is recommended," His study concluded that "a failure of the tailings dams at the Mirador mine is inevitable and the consequences will be extreme."⁵

² Freslon, William Sacher (2022), "Un análisis costo-beneficio extendido de la megaminería en el Ecuador (2020-2120)"; published in: "Ecuador Debate 117", pp. 109-142; Quito, Ecuador; December 2022

³ <https://www.elcomercio.com/actualidad/negocios/augusto-flores-impacto-mirador-negocios.html>

⁴ <https://www.elcomercio.com/actualidad/negocios/augusto-flores-impacto-mirador-negocios.html>

The worst-case scenario is of a Mirador Mine dam collapse releasing 400 million cubic meters of toxic waste will be a catastrophe 10 times greater than the previously largest ever recorded catastrophe which was caused by the collapse of the Fundão tailings dam in Brazil in 2015.

The Fundão tailings dam collapse was responsible for the rupture of a tailings dam that released 43 million cubic meters of poisonous waste, killed 19 people and wiped out the town of Bento Rodrigues and polluted the entire length of 668 km of watercourses from the Doce River Basin to the Atlantic Ocean.⁶ The collapse of the Fundão tailings dam was the largest environmental disaster in the world's mining industry history, both in terms of the volume of tailings dumped and the magnitude of the damage.

The volume of pollutants and the extent of ecosystems affected have assumed unprecedented proportions, including the damage of the ecosystem of the Brazilian Atlantic Forest – one of the world's biodiversity hotspots.

The immediate cause was static liquefaction that was triggered by a minor earthquake.⁷ Important similarities between the Fundão and Mirador dams are: (1), upstream construction and (2), inadequate characterization of the foundation (underlying geologic materials).

The fact that the Mirador Mine is located at the headwaters of the River Amazon indicates that a tailings dam collapse, considered inevitable, would, in the worst-case scenario, pollute the whole of the Amazon Basin, travelling from the headwaters for 7,000 km to the Atlantic Ocean.

⁶ <https://www.sciencedirect.com/science/article/pii/S1679007316301566>

⁷ Morgenstern et al., 2016: “

The following combination of high-risk factors explain why dam failure is inevitable and why the dams constitute a worst-case scenario:

- 1) high seismicity
- 2) weak foundation (weak soils under the impoundment)
- 3) high precipitation
- 4) high topographic relief
- 5) close proximity to surface water
- 6) large dam height
- 7) large volumes of tailings

The probability of failure is also related to the human factors of design, construction and operation of the tailings dams.

Knight-Piésold (2007) predicted that the liquefaction of both the tailings and the foundation, with the subsequent failure of the tailings dam, was expected to occur during the 30-year lifetime of the Mirador project. To emphasize the above point, we note that three large earthquakes have occurred since the mine was opened in 2019.

An earthquake with a magnitude of 7.5 occurred on February 22nd, 2019, 218 kilometres northeast of the mine. An Earthquake of magnitude 8.0 occurred 434 kilometres southeast of the mine on May 26th, 2019 and an earthquake of 7.5 magnitude occurred 208 kilometres southeast of the mine on November 28th, 2021..

There is no available documentation that discusses the MDE, (Maximum Design Earthquake) the MCE, (Maximum Credible Earthquake) the OBE, (Operating Base Earthquake). There is no documentation discussing the foundation characteristics or the seismic stability of the Tundayme dam.

Details of the structural design of both tailings dams and of the treatment of wastewater are being withheld by the administration and ECSA under the pretext of “intellectual property”. We have a case pending in the Constitutional Court challenging this pretext. We are calling for Amici Curiae to support our case.

Acid mine drainage is one of the most long-lasting and environmentally harmful results of the mining of sulfide ore bodies like the ore body of the Mirador Mine.

The ore of the Mirador Mine contains high percentages of pyrite, which is the primary mineral responsible for the formation of acid mine drainage. Acid mine drainage contains elevated concentrations of metals and other mine-related contaminants and

After the ore is taken out of the ground in vast quantities, it is milled and 98% of the ore will become tailings, and only 2% will become the concentrate that is shipped to China for processing.

The pit will produce a large amount of mine drainage water (18,600 m³/day under “normal” conditions that are not defined, and 30,000 m³/day for a 20-year precipitation event); the pit drainage was estimated to have a pH of 4 (Cardno, 2014b, p. 4-65). Any pH value below 6 is considered acidic, and each lower pH unit is 10 times more acidic (Price, 2009).

Geochemical testing was conducted, but none of the numeric test results are presented in any publicly available mine document, including the feasibility studies for the original 30,000 tons/day or the EIAs (Environmental Impact Assessments) for the expanded 60,000 tons/day project.

Making matters even worse, we have a complementary EIA assessment for the expansion of the mine. You will read in the following extract that

this is hardly an assessment of environmental impact, and reads more like a request for a license to commence work on infrastructure which will more than double the present capacity of the mine, releasing 140,000 tons of tailings per day without knowing what to do with the toxic waste tailings.

“The tailings generated will be disposed of in the Tundayme tailings deposit, which is currently in operation. As an increase in the tailings deposit capacity is required, **ECSA is in the process of studying and analysing alternatives.** As soon as the best option for tailings management is defined, we will proceed with the regularisation of the beneficiation for a production of 140 ktpd considering: tailings deposit, auxiliary and complementary works”.⁸

Underlying all of this is the political situation in Ecuador. President Lasso is facing impeachment for embezzlement. From the Financial Times report:

“Lasso could dissolve congress before it votes on impeachment, taking advantage of a “mutual death” clause in the 2008 constitution that has never been used. This would trigger fresh elections for the presidency and for a new legislature but the president’s low popularity makes it a highly risky option. Indigenous leaders have threatened nationwide protests if he shuts Congress”.⁹

We need a moratorium on the mine pending a full safety survey of the dams pending the release of the documentation specifying the construction methods used in building the dams and the treatment of the waste-water.

⁸ “COMPLEMENTARY ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MIRADOR PROJECT, EXPLOITATION PHASE WITH A PRODUCTION OF 46.2 MTPA MIRADOR 1 CUMULATIVE CONCESSION (CODE 500807), CURIGEM 18 (CODE 4768) AND CURIGEM 19 (CODE 4769); 2022; p. 60/100

Download the full assessment here:

<http://protectecuador.org/wp-content/uploads/2023/04/Capitulo-5.-Descripcion-del-Proyecto-Mirador-en-GB.pdf>

⁹ <https://www.ft.com/content/4f8cbb9d-d561-4218-9df5-300b422dd4db>

I feel that the way forwards will be to exert external pressure on the administration, at present focusing on the EITI, and the Inter-American Commission on Human Rights, and internal pressure from the National Assembly and the Constitutional Court.

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David F. Dene

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