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Filtered Tailings in Indonesia

The Catastrophic Failure of a Disruptive Technology

Summary, Analysis, and Recommendations

Technical Report: Steven H. Emerman, PhD, Malach Consulting
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On behalf of Earthworks

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Endorsed by: WALHI Southeast Sulawesi, WALHI South Sulawesi, WALHI North Maluku, Yayasan Tanah Merdeka (YTM), PUSPAHAM, Satya Bumi, Aksi Ekologi & Emansipasi Rakyat (AEER)

Report available at: earthworks.org/tailings-indonesia

Responses from mining companies and automakers available at: earthworks.org/tailings-indonesia

Cover photo: Filtered tailings facility, courtesy of a worker at Indonesia Morowali Industrial Park

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Summary, Analysis, and Recommendations Based on the Report *Filtered Tailings in Indonesia: The Catastrophic Failure of a Disruptive Technology*

Increasing demand for nickel and the rise of high pressure acid leach refining

Indonesia sits at the crossroads of mining, climate, and human rights. Nickel is one of the key minerals in electric vehicle batteries, and Indonesia is scaling up production to meet skyrocketing demand. Between 2023 and 2050, global demand for nickel is expected to double,ⁱ and in the last nine years, Indonesia has gone from 5.7% to 62.26% of world mine nickel production.ⁱⁱ

Increased nickel mining and processing in Indonesia means more mine waste. Driving the increase in mine waste is High-Pressure Acid Leaching (HPAL), a technology that takes low grade nickel ore and refines it to produce mixed hydroxide precipitate, a precursor for a key component of electric vehicle batteries. HPAL processing facilities generate massive amounts of toxic waste. Each metric ton of nickel metal processed using HPAL produces 133 metric tons of waste.ⁱⁱⁱ

HPAL is a rapidly expanding technology in Indonesia. The amount of waste produced by these facilities is growing at a remarkable rate as well. As of June 2025, there were seven HPAL facilities operating in Indonesia, two at Harita Nickel at Obi Island, North Maluku, one at the Indonesia Weda Bay Industrial Park (IWIP) at Halmahera Island, North Maluku and four at the Indonesia Morowali Industrial Park (IMIP) in Central Sulawesi. These facilities alone are expected to produce at least 57 million metric tons of tailings per year.^{iv} Two additional HPAL facilities at IMIP have come online since, potentially increasing the total tailings volume to approximately 62.6 million tons per year.^v There are 12 additional HPAL projects that are permitted and/or are under construction and another 12 HPAL projects that are in the proposal stage, forecasting the potential for an exponential increase in the volume of toxic tailings generated in the name of meeting the demand for electric vehicle batteries. This would create 275 million metric tons of tailings per year if all operating, permitted and proposed HPAL projects were to be built.^{vi}

The sheer volume of the toxic waste generated by HPAL processing facilities today and into the future presents an enormous risk to the environment and communities. HPAL tailings are highly acidic, toxic and contain heavy metals. Adding to this challenge are the particular conditions in Indonesia, notably the lack of standards for tailings storage facilities in national regulations, as well as a wet climate and geography that is prone to earthquakes and landslides.

HPAL technology and tailings safety

Initially, companies developing HPAL projects at IMIP and Obi Island planned to use the outdated practice of disposing the tailings into the ocean, which is allowed under Indonesian regulations.^{vii} However, the Government of Indonesia announced that it would not issue permits for the practice, forcing the companies to instead store the waste on land.^{viii} All of the HPAL processing facilities changed plans to use filtered tailings storage, commonly referred to as “dry stack tailings” by operators in Indonesia.

The amount of water in a tailings facility can directly impact its physical stability. Filtered tailings, which require reducing the water content of the tailings before depositing them in the tailings facility, are considered industry best practice for a number of reasons, including the reduced likelihood of failure and the reduced consequences of a potential failure. Also, filtered tailings facilities make closing a site easier when mining and processing ends.

In Indonesia and beyond, the use of the term “dry stack tailings” is a marketing and public relations term that provides an illusion of safety and serves to greenwash mining and processing operations. The use of the term “dry” evokes a tailings dam with little to no water present, while in reality filtered tailings are similar to a moist soil.

In Indonesia, HPAL companies are promising the use of filtered or “dry” tailings as a way to reduce potential stability risks, but in practice they are not actually meeting the technical requirements to make good on those promises.^{ix} Even if the companies achieve tailings with the appropriate water content, precipitation can impact the small margin that exists between optimal or safe tailings, and saturation.^x

In some cases, the facilities are not even consistently lowering the water content to the target levels the companies claim they will reach. For example, the target water content of the tailings from the PT Halmahera Persada Lygend HPAL refinery at Harita’s Obi Island operation is 35%, but the actual reported water content has ranged from 8-36%. This wild fluctuation indicates a lack of quality control, makes adequate compaction of the tailings impossible and greatly increases the likelihood of catastrophic failure.^{xi}

An untested technology meets wet and seismic conditions

While filtered tailings are considered industry best practice, there are still risks, especially in a wet climate that is prone to earthquakes and landslides. The limited studies on the practice point to the difficulty of dewatering HPAL tailings and maintaining the necessary water content under rainy conditions.^{xii}

There are five environmental factors that make the effective implementation of filtered tailings in Indonesia challenging. These include high seismicity; high precipitation; soft, volcanic soils that are weak foundations and susceptible to liquefaction; steep topography with risk of landslides; and volcanic activity. Compounding factors include weak national-level regulations regarding tailings storage facilities and a disturbing lack of enforcement of the regulations that do exist regarding tailings storage facilities.^{xiii}

Analysis of operating HPAL facilities including Huafei Nickel Cobalt (HFNC) at IWIP, and PT Halmahera Persada Lygend (PT HPL) at the Harita Nickel facility on Obi Island, show that the projects are taller, and expected to process and store more waste than tailings facilities with comparable rainfall elsewhere in the world.^{xiv} This means mining and processing companies are using this technology in a way that has not been tested appropriately under these particularly challenging conditions, putting the environment and the lives of workers and residents at risk. The proposed Sonic Bay HPAL processing facility at IWIP was also found to go well beyond the current technological limits for proven, safe tailings management.^{xv} Due to the lack of data, this analysis was not able to definitively draw similar conclusions for other existing HPAL tailings facilities at IMIP and Harita Nickel's other operation at Obi Island, but it is likely that other HPAL tailings facilities are also operating beyond what is known to be safe.

Risks and impacts of HPAL tailings

Tailing facilities in Indonesia pose extreme risks to communities, workers, and the environment, including tailings failures, chronic water pollution, occupational health and safety concerns, deforestation, and the potential for deep sea tailings disposal.

While some of these risks may be exacerbated by the combination of HPAL processing and filtering technologies, they are not unique to this technology. Conventional slurry tailings facilities also present threats. HPAL filtered tailings facilities are already having significant impacts on surrounding communities and environments, and increased tailings production will likely increase the frequency and severity of harms.

Tailings failures

Filtered tailings facilities for HPAL waste have already failed at IMIP, and independent consultant reports made available through a data leak indicate that tailings pose an imminent risk of failure at Harita Nickel's operation on Obi Island. Proposed and existing HPAL tailings facilities at IWIP and the Harita Nickel operation on Obi Island fall well outside the current technological limitations for proven, safe tailings management.^{xvi}

A 2022 technical review by consulting firm SRK of the PT Halmahera Persada Lygend (PT HPL) facility known as 'Dry-Stack Tailing Facility' or DSTF, also warned of catastrophic tailings failure. SRK described the failure of the tailings facility as an "uncontrolled risk" given the facility had been built without any quality control or standard monitoring tools and systems in place.^{xvii}

Another consulting firm, PT Lapi ITB, warned that portions of the PT HPL DSTF would be unstable against seismic activity if regular operations were to continue as planned. Analysis of company correspondence and consultant reports made available through the data leak found that the PT HPL DSTF at Harita's operation is beyond repair and that even if perfect quality control were to be implemented, the tailings are still at risk of liquefaction and catastrophic failure with the potential to impact workers, the village of Kawasi, nearby waterways, and the Molucca Sea. Despite these warnings PT HPL has continued to add more tailings to these facilities.^{xviii}

A 2023 internal PT HPL company report indicated that one of four smaller HPAL filtered tailings facilities on Obi Island is on the brink of catastrophic failure and is located just uphill from mining infrastructure and workers. These facilities were not analyzed in the previous report from external consultants.

At the Indonesia Morowali Industrial Park, harmful and even deadly tailings failures are already happening. According to media and worker testimony, on March 16, 2025 the PT Huayue Nickel Cobalt (PT HYNC) tailings storage facility inside IMIP was breached, and liquified tailings flowed into the Bahadopi River and eventually the ocean.^{xix}

Five days later, on March 21, another tailings facility inside IMIP, owned by PT Qing Mei Bang (PT QMB) New Energy Materials, collapsed, killing three workers.^{xx} According to testimony from workers represented by SPIM-KPBI, the second largest union at IMIP, the tailings facility was constructed on top of an infilled pond. Photos taken at the site of rescue efforts show a pond where the body of one of the workers was found. The PT QMB tailings facility that collapsed is located right next to the PT Huayue Nickel Cobalt (PT HYNC) tailings facility, at a location locally known as KM8. It is unclear if these two facilities actually operate as one.

On February 18, 2026, another failure reportedly killed one person and halted operations at the IMIP.^{xxi} According to a report by CNBC Indonesia, the man who died was a worker from Palopo, South Sulawesi.^{xxii} He did not have time to evacuate and was buried by the landslide inside an excavator. IMIP spokesperson Dedy Kurniawan said that the most recent landslide is suspected to have been triggered by the fragile soil conditions at the lower area of the tailings disposal, which were unable to support the weight of the tailings.^{xxiii}

Satellite imagery shows that the March 2025 failures at IMIP were likely not the first. Images from January 3, 2025, show a clearly-defined landslide from the PT HYNC filtered tailings storage facility with channels for tailings to travel to the Bahodopi River. A video taken by a mineworker in September 2023 shows a bulldozer being engulfed by a landslide at an unidentified filtered tailings storage facility at IMIP.^{xxiv}

Water contamination

Toxins in tailings can leak, polluting ground water, surface water, or the ocean. Tailings from nickel mining and HPAL processing of nickel ore can release a toxic carcinogen called hexavalent chromium, also known as chromium-6. This chromium may cause respiratory illnesses and an increased risk of cancer.^{xxv}

In May of 2025, The Organized Crime and Corruption Reporting Project (OCCRP), the Gecko Project, and partners exposed that the Harita Group — one of the world's major nickel suppliers — knew for more than a decade that its operations on Obi Island were polluting water with the toxic chemical chromium-6.^{xxvi} A 2022 report from SRK Consulting documented groundwater contamination from the PT Halmahera Persada Lygend (PT HPL) tailings facility on Obi Island. A 2020 report from consultant group, PT Lapi ITB, estimated that 29,326 cubic meters of potentially contaminated water will leak into the aquifer below the tailings facility with the potential to spread throughout the groundwater system.^{xxvii} As recently as 2023, leaked documents reveal dangerous levels of the chemical while Harita publicly denied any danger to residents' drinking water. Chromium-6 levels in 2023 were more than three times the Indonesian legal limit for drinking water.^{xxviii}

The presence of toxic heavy metals, including hexavalent chromium, have been documented at other nickel mining and refining operations throughout Indonesia. The NGO WALHI South Sulawesi has documented hexavalent chromium in the Lawewu River, in the Nuha District and in community water sources in Asuli Village, Towuti District, South Sulawesi dating back to July 2022. They have tied this pollution to the company PT Vale Indonesia's nickel mining activities.^{xxix} In February 2024, WALHI Central Sulawesi and Friends of the Earth Japan found concerning levels of hexavalent

chromium in the Bahodopi river,^{xxx} which is heavily polluted by nickel mining and processing operations in Morowali.

These examples point to a chronic water contamination problem linked to nickel mining. While the latter examples cannot yet be directly tied to HPAL tailings facilities, the example of ongoing chromium-6 pollution at Harita's mining and tailings storage operations point to a grave problem and indicate the potential for similar pollution to take place at nickel mining and HPAL processing operations throughout the country.

Risks to workers

Mine workers risk their lives to carry out their jobs when tailings facilities are unsafe. The catastrophic tailings dam failure in Brumadinho, Brazil in 2019 killed 272 people, over 90% of whom were mine workers at the site.^{xxx} The March 21, 2025 tailings failure at IMIP killed three workers. Unsafe working conditions have led to other deaths at these nickel facilities. In January 2025, two workers were buried alive by a landslide caused by mining activities.^{xxxii} Internal communication in 2023 revealed that a PT Halmahera Persada Lygend (PT HPL) tailings facility is on the brink of failure, putting the lives of mine workers at risk.^{xxxiii}

Poor working conditions in Indonesian nickel mining and smelting facilities is a critical issue, and there are frequent cases of work-related accidents, including fatalities at sites throughout the country. One report documented 300 occupational accidents with 31 deaths at IMIP between 2023 and 2024.^{xxxiv} From January to May 2025, eight work-related accidents killed seven workers at IMIP.^{xxxv} In 2024, China Labor Watch released a video detailing the particularly harsh reality for Chinese workers at IMIP, including unsafe working conditions, grueling schedules, and restrictions of basic freedoms, like the freedom of movement.^{xxxvi} The video highlights how Chinese subcontractors often suffer additional abuses because their immigration and work status does not allow them to join mineworkers' unions.

Adoption of other risky tailings storage methods

Poor construction, management, and oversight of filtered tailings, unavoidable environmental challenges, and the potential for imminent catastrophic failure and water contamination at sites across Indonesia, means that companies may turn to other tailings management practices. Unfortunately, the alternatives to filtered tailings are also dangerous.

Deep sea tailings disposal is an outdated and harmful practice that has been phased out in many parts of the world, with limited new mining projects proposing to use it in Norway and Papua New Guinea. Deep sea tailings disposal risks smothering seabed

floors and coral reefs, and decimating fishing grounds, livelihoods, and the health of coastal ecosystems.^{xxxvii} Disposal of tailings into oceans, rivers, and lakes is not prohibited by Indonesian regulation.

Another dangerous possibility is the construction of conventional slurry or ‘wet’ tailings dams. As of 2022, PT HPL at Obi Island was already pursuing the construction of three conventional tailings facilities,^{xxxviii} an option the company itself had previously argued was too risky.^{xxxix} In June 2025, Lygend Resources announced that it had completed construction on a first of its kind ‘wet-discharge tailing pond’ at Obi Island^{xl}, despite the existence of multiple wet tailings storage facilities in Indonesia dating back to 1992, according to the Global Tailings Portal.^{xli} Lygend claims that the facility would be an improvement on the existing ‘dry piling process’ given dust and seismicity concerns.^{xlii} However, conventional or ‘wet’ tailings dams are failing with increasing frequency and severity around the globe.^{xliii} The rainy and seismic conditions in Indonesia, coupled with weak oversight and a spotty track record with regard to closure, present even greater risks to communities, workers and the environment.

Deforestation

Filtered and conventional tailings facilities occupy huge swaths of land, in addition to that which is swallowed up by the nickel mining and processing operations themselves.^{xliv} The existing, permitted, and planned expansion of HPAL processing facilities, and the waste that goes with them, has the potential to drive increased deforestation. The dangers posed by filtered tailings in the Indonesian context could mean that instead of building upward, companies will spread the waste out, expanding the footprint of their facilities and destroying more forest in an effort to address stability risks. Deforestation exacerbates flood events posing a compounding risk for communities living near mining operations. On Obi Island, heavy rains and the partial failure of the sediment pond designed to contain runoff from Harita Nickel’s mining operations, resulted in the flooding of homes and water sources in Kawasi Village.^{xlv}

Another risk is the potential for new conventional tailings facilities to drive deforestation. The footprint of the three proposed conventional tailings dams on Obi Island is eight times greater than the maximum projected footprint of the PT HPL filtered tailings facility.^{xlvi}

Insufficient standards and oversight

The oversight and regulatory structures that should safeguard clean air and water, workers’ rights, and community safety are failing to reign in the risks from HPAL tailings

facilities in Indonesia. The tailings regulations that do exist are generally non-quantitative, are spread across multiple documents, and are more focused on the necessary steps to receive permits and not on ensuring safety. There are also discrepancies between standards for dam safety that are sometimes adopted in practice and the actual regulations codified in Indonesian law. Indonesia does not have regulation or standards specific to filtered tailings.

Leaked documents from the Harita Group show how three international consulting firms brought in as independent reviewers for projects at Obi Island identified risks, discrepancies, and engineering flaws. Specifically, SRK Consulting highlighted the lack of any monitoring or regular inspections for the PT HPL tailings facility.

However, the same leaked documents show that external consultants hired by the mining companies may not be a reliable source of independent information on the risks posed by these operations. While SRK Consulting documented failings, it also omitted or minimized key information on water ponding and poor drainage observed on the PT HPL tailings facility, a cause for serious concern related to stability.^{xlvii}

Need for due diligence from nickel purchasers

The adverse impacts to human rights and the environment associated with the generation and storage of toxic waste from HPAL processing facilities at IWIP and IMIP implicate automakers such as BMW, Mercedes-Benz, Tesla, and VW who, through their supply chain relationships with Huayou Cobalt or CATL, source nickel from these industrial parks.^{xlviii}

By sourcing nickel through contractual relationships with GEM, Huayou Cobalt and CATL, companies such as BMW, Ford, General Motors, Honda, Mercedes-Benz, Tesla, Toyota, Volkswagen, Volvo Cars and Volvo Group AB could have nickel from Harita Nickel entering their supply chains.^{xlix} These existing operations, together with the potential to nearly triple the number of HPAL processing facilities and associated rate of generation of tailings based on permitted and proposed facilities, dramatically increases downstream companies' exposure to environmental and human rights risks.

Directly invested in this projected growth is the Ford Motor Company, which in March 2023 announced it had entered into an agreement with PT Vale and Huayou Cobalt to construct the Pomalaa Block High-Pressure Acid Leaching (HPAL) Project and associated filtered tailings facility with operations expected to begin in 2026.ⁱ

These, and other documented impacts of mineral supply chains has resulted in a widespread call amongst Indigenous leaders, communities, and civil society for

mandatory environmental and human rights due diligence laws to require that downstream companies identify and address the impacts of their businesses regardless of where they occur.^{li}

Earthworks' recommendations

The Indonesian government, operating companies, downstream buyers, and financial institutions must act swiftly to protect the environment, communities, and workers from risks posed by tailings facilities for HPAL waste and remedy the harms that have already occurred.

- The **Indonesian government** must hold existing operators to account for dangerous practices. It should enact a moratorium on the development and permitting of new facilities until it closes regulatory gaps and there are improvements to transparency, safety standards, community engagement, and oversight. It must carry out independent audits to confirm the facilities are safe.
- **Operating companies** must halt HPAL operations at sites where tailings failures have occurred or are imminent. They must take action to stop or mitigate harms, meaningfully engage impacted communities, and ensure transparency, independent monitoring and oversight.
- **Automakers** should initiate internal investigations into the tailings risks in their nickel supply chains and, where the outcomes of these investigations highlight safety concerns with tailings facilities, automakers should engage with nickel mining and processing companies about their plans to improve safety. Where suppliers fail to mitigate and remediate harmful impacts, automakers should responsibly disengage from sourcing at those sites.
- **Investors** should initiate internal investigations into the tailings risks in their nickel supply chains and, where the outcomes of these investigations highlight safety concerns with tailings facilities in the financial institution's portfolio, engage with nickel mining and processing companies about their plans to improve safety. Where there are unresolved safety concerns, investors should halt financing for these projects.

If safe tailings management cannot be consistently and transparently guaranteed, the Indonesian government should not permit new HPAL processing facilities or the expansion of existing facilities.

Appendixes

Appendix A: Recommendations for the Indonesian Government

To the Indonesian Regulatory Bodies, including the Ministry of Environment and Forestry, the Indonesian Ministry of Industry, the Indonesia Ministry of Public Works and the Governors of North Maluku and Central Sulawesi

The **Indonesian government** must hold existing operators to account for dangerous practices. It should enact a moratorium on the development and permitting of new facilities until it closes regulatory gaps and there are improvements to transparency, safety standards, community engagement, and oversight. It must carry out independent audits to confirm the facilities are safe.

Given the immediate risks posed by existing filtered tailings operations, we recommend the following immediate actions:

- For the PT HPL project on Obi Island, PT QMB New Energy Materials, and PT Huayue Nickel Cobalt in the Indonesia Morowali Industrial Park: order project owners to halt the deposition of tailings given the documented risk of catastrophic tailings failure and, in the case of operations on Obi Island, water pollution.
- For the PT Huafei Nickel Cobalt Project at Indonesia Weda Bay Industrial Park: order project owners to halt the deposition of tailings given it far exceeds proven technological limits for tailing storage volume, height, and throughput for the annual mean precipitation rates and therefore presents unmitigated risks to the environment, communities, and workers.
- Carry out safety audits at all existing filtered tailings storage facilities in Indonesia using independent consulting companies chosen by the Indonesian government but paid for by the owners of the tailings storage facilities. Mining and processing companies or other stakeholders should not be allowed to alter the results of audit reports.
 - Only reopen existing filtered tailings storage facilities that receive satisfactory safety audit and that comply with improved oversight and regulation.
- Order a pause on further development of the 12 HPAL projects that are permitted and/or are under construction, and enact a moratorium on permits for the 12 HPAL projects in the proposal stage until immediate safety concerns related to tailings storage are addressed, robust government oversight is established and regulatory gaps related to mine

waste are closed. Deny future permits for facilities in instances where safe tailings storage is not possible.

- Develop specific, stand-alone tailings regulations and close the regulatory gaps in the laws related to mine waste such as Law 32/2009 on Environmental Protection and Management, Law 32/2014 on Industry, Law 24/2007 on Disaster Management, Mineral and Coal Mining Law 3/2020 that Amended 4/2009, Law 6/2023 on Stipulating Government Regulation in Lieu of Law 2/2022 on Job Creating into Law, Government Regulation (GR) 37/2010 on Dams, GR 27/2020 on Specific Waste Management, GR 22/2021 on the Implementation of Environmental Protection and Management, GR 28/2021 on the Implementation of the Industrial Sector, and Ministerial Regulation of Environment and Forestry 6/2021 on Procedures and Requirements for Managing Hazardous and Toxic Materials. Some remaining gaps can be addressed by implementing the guidance set out in *Safety First: Guidelines for Responsible Mine Tailings Management*, including
 - Require the proponents of potential projects provide overwhelming evidence that the project will not have unacceptable adverse consequences on the environment, neighboring communities, or workers.
 - Increase the capacity of environmental officials to conduct regular inspections to ensure the safe management of existing tailing facilities and to assess social and environmental impacts and operational governance of the facilities.
 - a. Regularly publish the outcome of these inspections and assessments of facilities' social and environmental impacts.
 - b. Increase the capacity of relevant agencies to enforce fines and other penalties for non-compliance with regulations, in accordance with sanctions established in the Indonesia Constitution.
- Require the project owners for all tailings facilities to actively engage all potentially impacted downstream communities and workers in a process to co-design emergency management and response plans that prioritize safety, while respecting community rights and preferences regarding relocation.
 - The design process should include communities, workers, local unions, and local organizations.
 - The design process should be developed based on worst case failure scenarios.

- Improve transparency and access to information on tailings facilities by:
 - Making all documents related to tailings facilities and their impacts publicly available, including Environmental Impact Assessments.
 - Require mining and processing companies to publicly disclose the location of all tailing facilities and all information related to their safety and stability. In the case of tailings failures, require companies immediately make the location, date, amount of tailings released, and environmental/social impacts publicly available.
 - Create a nationwide registry of tailings dams that includes the name, location, size, volume, age, construction type, and hazard classification of all active, inactive and closed tailings facilities.
- Develop and implement a standard for relocation/resettlement in line with international guidance that prioritizes the protection of communities from forced relocation or land grabbing. This standard should require companies to prove relocation is the only viable option and ensures communities are only relocated if they are consulted and given the option to decline relocation.
 - In cases where communities agree to relocation, the standard should establish a participatory process to determine adequate compensation, where the community to be relocated has the final decision-making power to accept or decline the terms. The standard should ensure that relocation:
 - a. Improves livelihoods and standards of living for those who are resettled. Compensation should account not just for land value, but also lost crop and production value.
 - b. Accounts for time to rebuild agricultural land, local economies, etc.
 - c. Does not put communities in a location that is an at-risk area.
 - d. Is only carried out once communities' full compensation requirements have been met.
- Engage with labor unions to improve Health & Safety standards for mine workers including regulations to improve infrastructure and emergency evacuation routes.
- Codify a ban of aqueous tailings disposal.

Appendix B: Recommendations for Operating Companies

To the mining and processing companies operating at the Indonesia Morowali Industrial Park, the Indonesia Weda Bay Industrial Park, and within the Harita Nickel complex on Obi Island, and those companies with proposed or permitted HPAL facilities

Operating companies must halt HPAL operations at sites where tailings failures have occurred or are imminent. They must take action to stop or mitigate harms, meaningfully engage impacted communities, and ensure transparency, independent monitoring and oversight.

- Provide transparent access to information about tailings facility risks and impacts that ensure the implementation of internationally recognized frameworks and norms.
 - Publicly disclose accurate, detailed, high-quality data to demonstrate the safety and stability of all tailings facilities, based on best practices outlined in *Safety First: Guidelines for Responsible Mine Tailings Management* and any forthcoming guidance documents developed by the Indonesian government including but not limited to:
 - a. The name, location, size, volume, age, construction type, and hazard classification of all active, inactive and closed tailings facilities.
 - b. Facility-level Environmental Impact Assessments (EIAs) that include environmental risks, management plans, and mitigation activities.
 - c. Dam Breach Analyses and any relevant updates.
 - d. Emergency Management and Response Plans, and details on how the plans were developed.
 - e. Closure plans and amount of financial bonding committed, annual costs to restore land, and changes to financial plan.
 - f. The location, date, amount of tailings released, and environmental/social impacts of all tailings failures. This information should be updated over time.
 - Provide access to independent technical experts for community members to assess all relevant data and reports outlining risks posed by tailings facilities. Communities must be able to choose or approve the independent experts, but the cost must be covered by the responsible company.
- Meaningfully engage in local languages and in an accessible manner with communities impacted by tailings facilities to provide accurate, transparent and timely information on the risks, impacts, and safety and stability of tailing facilities.
 - Actively engage all potentially impacted downstream communities in a process to co-design emergency management and response plans that prioritize safety, while respecting community rights and preferences regarding relocation.
 - a. The design process should include communities, workers, local unions, and local organizations, and

- b. Be developed based on worst case failure scenarios.
- Recognize the cultural, territorial, and self-governance rights of Indigenous Peoples in terms of the UN Declaration on the Rights of Indigenous Peoples and ILO 169 by ensuring protocols are in place to obtain Free, Prior and Informed Consent (FPIC)^{lii} for all tailings facilities.
- Implement site-level, independent, grievance mechanisms based on the UNGP of Business and Human Rights and ensure remedy for complaints is adequate, effective, and prompt.^{liii}
- Voluntarily and transparently participate in all oversight, management and compliance activities required by the Indonesian government, including but not limited to:
 - Stopping operations at filtered tailing facilities, if ordered to do so.
 - Complying with all relevant legislation.
- Implement policies that only relocate communities with their full consent and via a participatory process where the community to be relocated has the final decision-making power design and accept or decline the terms. Companies must prove that there is no option to avoid relocation, never involuntarily relocate communities, and follow any relevant government standards for relocation.
- Develop and implement robust water quality monitoring programs downstream from all tailings facilities which:
 - Identify and test all water sources subject to potential water pollution.
 - Include community participation in the program design, and train and incorporate community as water monitors. Communities must be able to choose their own representatives in the programs.
 - Monitor water quality frequently enough to detect pollution in a timely manner.
 - Publicly disclose the results, including parameters and raw data, in all relevant local languages.
 - Where water quality has been impacted, improve and restore degraded water quality.
- Implement policies that prohibit the use of deep-sea tailings disposal.

Given the documented risk of catastrophic tailings failure and, in the case of operations on Obi Island, water pollution, we recommend that PT Halmahera Persada Lygend on Obi Island, as well as PT QMB New Energy Materials, and PT Huayue Nickel Cobalt operating in the Indonesia Morowali Industrial Park:

- Halt the deposition of tailings and immediately engage all potentially impacted downstream communities in a process to co-design emergency management and response plans that prioritize safety, while respecting community rights and preferences regarding relocation.
- Fully remediate areas where tailings spills and dam collapses have already occurred and provide compensation for communities and victims.

Given the PT Huafei Nickel Cobalt at Indonesia Weda Bay Industrial Park tailings facility far exceeds proven technological limits for tailing storage volume, height, and throughput for the annual mean precipitation rates and therefore presents unmitigated risks to the environment, communities, and workers, we recommend the company:

- Halt the deposition of tailings and immediately engage all potentially impacted downstream communities in a process to co-design Emergency Management and Response Plans that prioritizes safety, while respecting community rights and preferences regarding relocation.

Appendix C: Recommendations for Automakers and Downstream Purchasers

To automakers sourcing nickel from companies with operations at the Indonesia Morowali Industrial Park, the Indonesia Weda Bay Industrial Park, and Harita Nickel

Automakers should initiate internal investigations into the tailings risks in their nickel supply chains. Where these investigations highlight safety concerns with tailings facilities, automakers should engage with nickel mining and processing companies about their plans to improve safety. Where suppliers fail to mitigate and remediate harmful impacts, automakers should responsibly disengage from sourcing at those sites.

- Automakers should initiate an internal investigation into the tailings risks in their nickel supply chains, with careful attention to the specific risks associated with HPAL filtered tailings and publish the timebound commitments, developed with their suppliers, on how they will ensure their suppliers implement corrective action. This corrective action should conform to international best practices such as *Safety First: Guidelines for Responsible Mine Tailings Management* and this process should require nickel mining and processing companies to:
 - Publicly disclose detailed and high-quality data on their tailings facilities through their sustainability reports, through the Global Tailings Portal or on their websites, including for example: Accurate, detailed, high-quality data to demonstrate the safety and stability of all tailings facilities, based on best practices outlined in *Safety First: Guidelines for Responsible Mine Tailings Management* and any forthcoming guidance documents developed by the Indonesian government
 - Publicly disclose accurate, detailed, high-quality data to demonstrate the safety and stability of all tailings facilities, based on best practices outlined in *Safety First: Guidelines for Responsible Mine Tailings Management*.

- Take all necessary steps to increase transparency, stop and remedy harms caused to communities, workers and the environment by operating filtered tailings facilities, ensure that future operations avoid unacceptable harms, and comply with government regulations.
- Implement policies that prohibit sourcing from mines or processing facilities that use deep sea tailings disposal.
- If automakers find that the facilities in their supply chain persist in not mitigating and remediating their harmful impacts, then automakers should end the business relationship in line with the UN Guiding Principles of Business and Human Rights and the OECD Guidelines for Multinational Enterprises.
- Automakers should request from the Government of Indonesia the results of the safety audits on all existing filtered tailings storage facilities.

To Ford Motor Company

In addition to the points set out above, undertake due diligence to ensure the construction of the Pomalaa HPAL Project and associated tailings facilities aligns with the UNGP on Business and Human Rights and Ford's policy commitments to respect human rights and the environment. This includes implementing best practices as outlined in *Safety First: Guidelines for Responsible Mine Tailings Management*.

Appendix D: Recommendations for Investors

To investors and financiers in HPAL processing facilities at the Indonesia Morowali Industrial Park, the Indonesia Weda Bay Industrial Park, and Harita Nickel, as well as permitted or planned facilities, and the national banking and financial services regulatory authorities

Investors should initiate internal investigations into the tailings risks in their nickel supply chains and, where these investigations highlight safety concerns with tailings facilities in the financial institution's portfolio, engage with nickel mining and processing companies about their plans to improve safety. Where there are unresolved safety concerns, investors should halt financing for these projects.

- Where invested in mining and processing facilities in Indonesia, initiate an internal investigation into the tailings risks in their nickel supply chains, with careful attention to the specific risks associated with HPAL filtered tailings and require facilities to conform to international best practices such as *Safety First: Guidelines for Responsible Mine Tailings Management* as part of this, require nickel mining and processing companies to:

- Publicly disclose detailed and high-quality data on their tailings facilities through their sustainability reports, through the Global Tailings Portal or on their websites, including for example: Accurate, detailed, high-quality data to demonstrate the safety and stability of all tailings facilities, based on best practices outlined in *Safety First: Guidelines for Responsible Mine Tailings Management* and any forthcoming guidance documents developed by the Indonesian government;
 - Take all necessary steps to stop and remedy harms caused to communities, workers and the environment, ensure that future operations avoid unacceptable harms, and that companies comply with government regulations;
 - Commit to ensuring the independence of these audits and accepting their results;
 - Implement policies that commit to not source from mines that use deep sea tailings disposal.
- Where the outcome of these audits highlight safety concerns with tailings facilities in the financial institution's portfolio, engage with nickel mining and processing companies about their plans to improve safety and, where they persist in not mitigating and remediating their harmful impacts, halt financing.
 - Investors and financiers should request from the Government of Indonesia the results of safety audits using credible independent consulting companies chosen by the Indonesian government, for all existing filtered tailings storage facilities in a portfolio.

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