By 2035, experts project a staggering 50 million acres of new land will be developed for energy production in the United States. The overwhelming majority of that development will be for so-called “clean energy” and “clean technology” projects such as wind and solar projects, mining associated with these technologies and EV lithium batteries, and transmission line and electric grid expansion and upgrades.

As the United States continues to invest in “clean technologies,” industrial development for these projects will grow. Congress, with the support of both the Trump and Biden Administrations, has passed legislation to incentivize this development, and heavily invested in domestic supply chains for critical minerals, positioning this supply as a national security issue.

Total mineral demand for clean energy technologies to 2040

Nevada is ground zero for the massive increase in minerals extraction required to meet “clean energy” and “clean technology” goals. According to the Bureau of Land Management (BLM), Nevada leads the nation with the largest mining program in the BLM, with more than 180,000 active mining claims (49% of the BLM total), 198 authorized mining plans of operations, and 282 active exploration notices.

Nevada also leads the nation in toxic pollution, in large part due to the mining industry. As of the EPA’s 2017 Toxic Release Inventory, Nevada had a total of 148 facilities managing toxic material in 2017, generating 397.7 million pounds of releases annually.

The rush to build “clean technology” and “clean energy” projects in the United States and around the world will dramatically increase the demand for materials, and thus mining. This report examines the implications of this expected increase in mining by investigating how mining hurts communities.

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**Extraction for “clean technologies” at a glance**

Building solar and wind systems requires roughly a tenfold increase in total tons of materials such as concrete, steel, and glass to deliver the same quantity of energy compared to power plants powered by fossil fuels. These technologies also require significant increases in specialty minerals and metals like copper, nickel, chromium, zinc, cobalt, and rare earths, often far more than a tenfold increase.

The current preferred BLM plan for solar energy would make 22 million acres of public land open to proposals for solar development in 11 states, and Nevada’s impact would be the largest.

At least 384 new mines for minerals such as graphite, lithium, nickel, and cobalt will need to be built in the next decade to meet projected 2035 demand for electric vehicle (EV) and energy storage batteries.

The U.S. has over half a million abandoned mine sites, with tens of millions of gallons of water contaminated with arsenic, lead and other toxic metals flowing from these sites into surrounding streams and ponds without being treated.

Mining requires large amounts of water, particularly lithium mining: 500,000 gallons of water are required to produce one ton of lithium. With more than 50% of lithium extraction coming from high desert environments like Nevada, this puts a strain on already stressed water supplies.

Due to minerals demand for EV and grid storage batteries, lithium demand in 2040 may be 51 times higher than today’s levels. Cobalt and graphite may grow by 30 times, nickel by 20 times, and rare earths by 7 times. With commitments by Congress to prioritize domestic supply chains, this means an enormous increase in impacts from mining, refining, and manufacturing.

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**Total mineral demand for clean energy technologies by scenario, 2010-2040**, IEA. Licence: CC BY 4.0

"Technologies assumed to populate the clean energy shift... are in fact significantly MORE material intensive in their composition than current traditional fossil-fuel-based energy supply systems." 

**The Growing Role of Minerals and Metals for a Low Carbon Future**, The World Bank, June 2017

Extraction projects often bring man camps, and man camps bring violence.

A 2019 study conducted by the U.S. Bureau of Justice Statistics on violent crime in the Bakken oil fields in Montana and N. Dakota showed that from 2006-2012 the rate of violent crime increased 70%. There was no increase in violent crime outside this region.

A rate of serious crime (homicide, rape, etc.) increased 30%. Violent victimization by strangers increased 53% and women experienced a 54% increase in sexual assault.

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Growth in demand means more mining

Building “clean energy” is creating demand for billions of tons of materials for solar and wind electricity generation, and grid storage and car batteries.

These materials must all be mined. Mining processes vary by material, but almost all modern extraction uses open pit mining, vast amounts of energy (diesel and electricity) and water, toxic chemicals for refining, and destroys the land being mined along with surrounding land that is covered with waste rock, and poisoned with toxic tailings.

We list below a few statistics from the International Energy Agency (IEA) report The Role of Critical Minerals in Clean Energy Transitions to give you a sense of the scale of demand, and thus the mining, required for the materials for so-called “clean energy” and “clean technologies.”

To extract 1 ton of copper requires digging up, moving, crushing, and refining 200 tons of ore.

Meeting 20% of U.S. electricity demand from wind by 2030 would require 1.5 million metric tons of steel, 310,000 metric tons of cast iron, and 40,000 metric tons of copper.

Lithium
Lithium demand grows by 40 times.

Nickel
Nickel demand grows by 89 times for concentrated solar, by 41 times for EV batteries and by 141 times for grid storage batteries.

Graphite
Graphite demand grows by 25-30 times for EV and grid storage batteries.

Silicon
Silicon demand grows by 460 times for EVs and batteries.

To meet climate goals, the world must add or replace 50 million miles of transmission lines by 2040, according to an October, 2023 report by the International Energy Agency.
How to mine in the United States on public land:

1. Set up a mining company in any country you like.

2. Walk onto U.S. public land and stick a flag in the ground on a 20-acre lot.

3. File a $175 registration fee.

4. Discover valuable minerals that can be extracted profitably, and get your claim.

5. Mine as much as you can, paying zero royalty fees to the U.S. government. That's right; it's free.
How mining creates violence within communities

Canadian Mining Companies are Complicit in Human Rights Abuses

According to MiningWatch Canada, 75% of the world’s mining companies are headquartered in Canada. They operate at over 8,000 sites in over 100 countries. A 2016 report to the UN found that “many of these mines are also sites of serious human rights violations, including direct violence against local women and environmental degradation that destroys women’s ability to support their families. One recent study found that Canada’s mining companies are involved in such abuses and conflict more than any other country.”

Under the UN Committee on the Elimination of Discrimination against Women (CEDAW), “Canada is obligated to take appropriate measures to eliminate discrimination of any women by national corporations operating in other countries, and is required to do so by taking measures to prevent, prohibit and punish violations by those corporations. It also requires them to provide effective remedies to victims of such violations.”

Catherine Counsell of MiningWatch Canada says “Canada has failed to do so.”

In September, 2023, MiningWatch Canada briefed the Standing Committee on International Trade at the 1st session of the 44th Parliament in Canada. According to the report, “national security forces and private security firms guarding Canadian-owned mines in Africa, the Asia-Pacific region and Latin America have abused Indigenous peoples, defenders of human rights and the natural environment, and mine employees” and that “these human rights abuses are ‘persistent’ and ‘widespread globally.’”

The Thacker Pass mine in Humboldt County, Nevada is owned by Canadian company Lithium Americas.

Case Study: U.S. Bureau of Justice Statistics 2019 Report on Violence from Man Camps in the Bakken Oil Fields Region

A Bureau of Justice Statistics (BJS) project studied “trends in violent crime from 2006 to 2012, a period during which regions of Montana and North Dakota that contain parts of the Bakken shale formation experienced relatively rapid growth in oil and gas production, an influx of new residents to work in oil sector-related jobs, and ... a corresponding increase in calls for service to local law enforcement.”

The report found that “from 2006 to 2012, the rate of violent victimization known to law enforcement in the Bakken oil-producing region increased, particularly the rate of aggravated assault, which increased 70%. There was no similar increase in rates of violent crime in the counties surrounding the Bakken oil region. Rates of male and female violent victimization in the Bakken region increased during this period, with the increase being higher for males (up 31%) than females (up 38%).”

Case Study: Enbridge Line 3

Increasing violence against women and girls when extraction projects come to a community is predictable. The Enbridge Line 3 crude oil pipeline project brought thousands of workers to Minnesota, many of whom ended up in man camps along the pipeline route. An October 2023 report on the risks and harms of oil and gas projects notes that the Minnesota Public Utilities Commission acknowledged in its environmental impact statement that sex trafficking and sexual abuse would likely increase and that “the affected regions do not have the resources to track and prevent this violence.” This prediction came true, with a large increase in reports of sexual violence; two workers employed by Enbridge subcontractor Precision Pipeline were charged in a sex trafficking sting operation.

People were singing and dancing – the protest was peaceful. Then, the police started attacking ... It was terrible to watch.” — Angelica Choc who are pressing legal claims against Canadian mining company in my house.”

“I was paralysed. I felt someone choking me. They called me a socialist, a whore. I was in my underwear; they touched me. One put his fingers inside of me. The officers told me not to protest any more. When they left, they took the gag out and, one by one, kissed me on the lips. I stayed immobilised on the floor for 13 hours.” — Sheila Jeffreys, The Industrial Vagina: The Political Economy of the Global Sex Trade, 2009.

Every 68 seconds, an American is sexually assaulted. — Rape, Abuse & Incest National Network (RAINN), February 18, 2024.

As foreign mining and logging companies open up new areas for new forms of colonial exploitation, they set up prostitution industries to support and financing mining companies involved in discrimination, rape, and violence against women in their operations abroad, when it should be holding those companies accountable for the abuse.”
How mining poisons communities

Mining Injuries and Fatalities
As mining has become more automated, fatalities from U.S. mining have been dramatically reduced in recent decades. Since the U.S. Mining Health and Safety Administration began tracking mining injuries and fatalities in the mining industry in 1984, the injury rate has dropped from 5.72 injuries per 200,000 hours worked, to 1.86 in 2022, and the fatal injury rate has dropped from 0.0422 per 200,000 hours worked, to 0.0120 in 2022. There were 42 mine worker deaths in the U.S. in 2023.

However, the mining industry is still one of the most dangerous industries in the United States. According to the U.S. Bureau of Labor Statistics, “Workers in transportation and material moving occupations experienced 1,640 fatal work injuries in 2022 and represented the occupational group with the most fatalities. The next highest was construction and extraction workers with 1,056 fatalities, an 11.0-percent increase from 2021.”

Case Study: Heap Leaching and Cyanide
Heap leaching is a common process in Nevada for extracting gold and silver from ore. Ores are blasted from the ground, piled into heaps, and cyanide is applied to the heaps. Cyanide reacts with the metals as it flows through the heap, and the cyanide-metal solution is collected below the heap and processed to further refine the metals. From an Earthworks report, Cyanide Use in Gold Mining:

“Cyanide is highly toxic, and can result in substantial environmental impacts and public health risks if released into the environment. Cyanide spills have resulted in major fish kills, contaminated drinking water supplies and harmed agricultural lands.”

Their report describes a few specific examples of how cyanide heap leaching has poisoned communities:

- Mexico, 2014: 500,000 gallons of cyanide solution spilled from a retaining pond at the Proyecto Magistral mine, after heavy rains.
- Kyrgyzstan, Kumtor Gold Mine, 1998: A truck carrying 2 tons of sodium cyanide crashed into the Barskoon river, resulting in more than 2,000 people seeking medical care.
- United States, Zortman-Landusky Mine, Montana, 1982: 52,000 gallons of cyanide solution poisoned the aquifer that supplies fresh drinking water for the town of Zortman.
- Romania, Aural Gold, 2000: A tailings dam ruptured, spilling 3.5 million cubic feet of cyanide-contaminated water into the Tisza and Danube Rivers, killing fish and poisoning water supplies as far as 250 miles downstream in Hungary and Yugoslavia.
- Turkey, Copler Gold Mine, February 13, 2024: The mine collapsed, sending ten million cubic meters of cyanide-laced tailings down a 200-meter slope, trapping nine workers underneath, and potentially contaminating the Euphrates River, western Asia’s longest river.

Metal Mining Toxic Releases
According to the EPA, the metal mining sector accounted for 44% of toxic inventory releases (1.44 billion pounds) in 2021, which were primarily in the form of on-site land disposal.

Costly Cleanup and Remediation
The EPA estimates the backlog of cleanup costs for abandoned mines will cost taxpayers $50 million or more, and that mining has polluted 40% or more of western watersheds.
Case Study: The Kennecott Copper Mine in Utah

The Kennecott Copper Mine is a large surface mine in Utah. Years of mining, mineral processing, and leaching operations to extract copper, lead, and other precious metals from ore has created a groundwater pollution plume that extends for 70 square miles. Along with the groundwater, production wastes have contaminated soil, surface water, and wetlands between the site and the shore of Great Salt Lake.

Kennecott's cleanup actions include removing and disposing of contaminated soils, sediments and solid mine waste as required by the EPA. One wonders where these contaminated soils have been removed to.

In a report to the U.S. Congress published in 2019, researchers “reviewed government and industry documents for fifteen operating open-pit copper mines, representing 99% of U.S. copper production in 2015 – the most recent data on copper production available from the U.S. Geological Survey.” They found that “14 out of 15 (93%) failed to capture and control wastewater, resulting in significant water quality impacts. These unauthorized wastewater releases occurred from a number of different sources including uncontrolled seepage from tailings impoundments, waste rock piles, open pits, or other mine facilities, or failure of water treatment facilities, pipeline failures or other accidental releases.”

About Kennecott’s Bingham Canyon Mine, they write: “Wastewater from the mine has escaped the site’s collection system, contaminating groundwater with acid, metals and sulfates. The groundwater plume extends towards the Jordan River and covers an extensive area – contaminating the drinking water aquifer used by Salt Lake City residents. Water treatment will be required in perpetuity.”

Kennecott’s Utah mines are also the largest air polluter in Salt Lake County. They contribute 30% of the overall pollution, ten times more than the next largest source (the Chevron oil refinery). Salt Lake City has been given grade “F” by the American Lung Association, as it consistently ranks in the top ten worst cities in the country for air pollution, and violates many of the EPA’s national air quality standards. Per employee, the mines emit 14,500 lbs of air pollutants, far more than any other industry.
Case Study: The Gold King Mine waste water spill

Pollution from mine sites, historic and current, seeps, trickles, and flows into the soil and water every hour of every day in the United States. Historic populations of trout and other fish were long gone from the Animas and San Juan rivers in Colorado due to decades of acid mine drainage from mines in the region before a massive spill of tailings and waste water from the abandoned gold and silver Gold King Mine.

"Areas near mines often experience chronic exposure to heavy metals, but examining the history of mining pollution reveals that this exposure is occasionally punctuated by acute spills and accidental releases of mine waste," write the authors of a 2018 report titled Persistent Effects of the Gold King Mine Spill on Biota: Animas and San Juan Rivers, Northern New Mexico. They continue, "A recent example of a significant, single-event contaminant release was on August 5, 2015, when more than eleven million liters [3 million gallons] of heavy metal-contaminated water was discharged from Gold King Mine (GKM), eroded a tailings pile, and flowed into Cement Creek, a tributary to the Animas River near Silverton, Colorado. The contamination plume flowed into the Animas River and San Juan River, crossing into New Mexico and Utah. Most of the heavy metal contamination released by the GKM spill existed as suspended solids which were likely deposited within the streambed sediment of the Animas and San Juan Rivers, and transported into Lake Powell, Utah."

Contaminants, including arsenic (As), cadmium (Cd), copper (Cu), manganese (Mn), zinc (Zn), lead (Pb) and aluminum (Al), were found in the Animas and San Juan Rivers following the spill at levels above limits allowed by the Colorado Department of Public Health and Environment. From the Wikipedia page about the spill: "River visitors were advised to stay out of the water, and people were told to avoid contact with the river, including contact by their pets, and to prevent farmed animals from drinking the water. They were advised not to catch fish in the river. The Navajo Nation Commission on Emergency Management issued a state of emergency declaration in response to the spill; it has suffered devastating effects."

The spill reached Lake Powell on August 14, 2015. Long-term contamination from the spill may be most evident in the trees, insects, and fish who live in the riparian areas along the affected rivers, and in wildlife and humans who eat the fish and any plants and crops contaminated with water from floodplain soils.

Sediments along the river beds will, of course, be contaminated for eons to come. No amount of money can unpollute a river.
How mining tears communities apart

Jobs, jobs, jobs
Most mining and extraction happens near or in poor and rural communities, because those are the communities that most need the jobs on offer from mining companies, and they are also the communities with the fewest alternatives, and the fewest resources to put up a fight to protect their land, air, and water. Mining companies know this. And so these companies have become expert at exploiting these communities.

Pro vs. Con
Large extraction and development projects frequently divide communities because these projects have enormous impacts on the landscape, the environment, and peoples physical and psychological health. Usually, the split in the community is around jobs vs. environmental impacts. Economic growth is welcomed by city and county councils, business leaders, and the unemployed, even at a cost to the environment. Those who depend on healthy and flourishing natural communities for subsistence lifestyles, farming, gardening, health, and clean air, water, and soil fight against these projects. The divisions in these communities can be devastating.

Case Study: Haines, Alaska
The Palmer Project is a copper, zinc, silver, gold, and barite mine project in the advanced exploration stage near the town of Haines, Alaska. The project claims cover an area of approximately 16,000 acres. Haines is heavily reliant on commercial salmon fishing, and the local Tlingit tribe is dependent on the salmon for their main food source. The mine project threatens the Chilkat glacial river, which flows from the Saksaia glacier, and could destroy the river’s salmon runs.

“The proposed mine has divided the community and sundered friendships, with each side accusing the other of surveillance and intimidation.”

Gershon Cohen is a long-time Haines resident and worries about the mine’s tailings—the toxic waste materials and millions of tons of contaminated water that will have to be managed forever, in an earthquake-prone region of the country. Jones Hotch is a Tlingit tribal leader and Klukwan elder who is concerned about the environmental impacts this mine will bring, and about the impacts to his subsistence lifestyle. Others, like Jan Hill, support the mine for the jobs and development it will bring to Haines. She believes the mining company will be “good stewards of the environment.”

The division in the community is “nerve-wracking” Chilkoot Indian Association member James Hart says; a woman was yelled at in the street “just for having an opinion.” This incident made him more nervous for himself and his family.

Case Study: Halmahera island, Indonesia
The Weda Bay Nickel mining company is clearing the homeland of the O Hongana Manyawa people, one of the world’s last remaining uncontacted nomadic tribes living in voluntary isolation from the industrialized world.

Indonesia is rich in nickel, and its government is rushing to build new mines and refineries to supply the steel and electric vehicle (EV) markets. EV maker Tesla has reportedly invested $5 billion in the Weda Bay Nickel mining company, as have other EV battery production companies.

Sophie Grig, senior researcher for the indigenous rights nonprofit Survival International, says the O Hongana Manyawa “rely on the forest for everything that enables them to live and survive and thrive.” Without the forest, they will not survive.

A Fort McDermitt tribal leader attacked a minor and choked him during a public community meeting with Lithium Americas. The youth was northern Nevada.

Brenda

FORT McDERMITT TRIBAL LEADER ATTACKED A MINOR AND CHOKED HIM DURING A PUBLIC COMMUNITY MEETING WITH LITHIUM AMERICAS.
How mining companies stifle community dissent

World-wide, systems are in place to protect and enable corporations to extract from the land in order to supply materials for development, industry, and economic growth. These systems are set up intentionally to deter individuals and communities from expressing their dissent. Some of those systems include the use of violent repression and coercion, as we’ve already discussed in How mining creates violence within communities.

In this section, we focus on tactics other than direct violence and other tools that states use to enable extraction. We describe these tactics primarily from the U.S.-centered perspective.

The Law

American law makes protecting the environment illegal.

The most important way the law does this is to define nature as property. Property comes with the right to consume and destroy that property. For example, if you own water rights to a river, you have the right to use that water as you see fit. Deep ecologist John Livingston called this “resource-ism”: whenever humans define something as a “resource”, that thing’s destruction is only a matter of time. The American legal system institutionalizes the idea that nature is a resource by defining nature as property.

Another way environmental protection is made illegal is corporate personhood—law that grants corporations the same rights as citizens. When a corporation acquires rights to mine private or public land, and citizens try to stop that mining project, the corporation can call on its own civil rights to land, and citizens try to stop that mining project, the corporation acquires rights to mine private or public land. When a corporation commits illegal acts, corporate personhood allows the corporation to bring suit against the citizens, and along with that court order was environmental groups filed lawsuits to try to stop Lithium Americas Corporation from mining. As Earthworks writes, “Federal law enshrines in the 1872 U.S. Mining Law, that government enforces the law, including the right to mine enshrined in the 1872 U.S. Mining Law, that permits mining of the public land. At the Dakota Access Pipeline site, eighteen states put forward laws criminalizing protests, including laws that ratchet up penalties for protesters labeling even non-violent protesters as “terrorists”.

Lawsuits

While the law clearly does not help communities and activists to protect the land we love, the law certainly helps corporations to make protesting destructive projects dangerous and expensive. Corporations file lawsuits against non-violent protesters using a variety of tactics. A tactic common in recent years is a SLAPP suit, or a Strategic Lawsuit Against Public Participation. These lawsuits are used as a weapon to create or silence critics by burdening them with legal costs and proceedings. The aim is not necessarily to win the case but to deter individuals or groups from expressing dissent or protest.

According to the Business and Human Rights Resource Centre:

SLAPPs seek to manipulate the judicial system by masquerading as legitimate legal claims, abusing laws (e.g. on libel / defamation) to target valid and protected speech or protest. SLAPPs can be effective in intimidating critics: they take advantage of the prohibitive costs and time that it takes to litigate a case, and can result in prison sentences and other harmful physical, financial and psychological impacts on defenders.

Protesters as Terrorists

Multiple U.S. states have passed laws criminalizing “impairing or interrupting” construction and/or operation of “critical infrastructure”. Within just two years of the Standing Rock protests at the Dakota Access Pipeline (DAPL) river-crossing site, eighteen states put forward laws criminalizing protests, including laws that ratchet up penalties for activists protesting or planning protests of critical infrastructure. Increasingly, government agencies are targeting environmental activists, labeling even non-violent protesters as eco-terrorists and domestic terrorists. Domestic terrorism enhancements can double prison time as DAPL protesters Jessica Reznicek discovered.

In an article titled Targeting Environmental Activists With Counterterrorism Measures Is an Abuse of the Law, Human Rights Watch writes that “typically, environmental defenders peacefully exercise their rights to freedom of speech, association, and assembly. Only in exceptional cases would their acts meet a generally-accepted definition of terrorism. And when environmentalists engage in civil disobedience, they do not usually aim to undermine the rule of law.”

In recent years, law enforcement agencies have used tactics similar to those used with known terrorist groups to try to control protests. In an article titled Targeting Environmental Activists With Counterterrorism Measures Is an Abuse of the Law, Human Rights Watch writes that “typically, environmental defenders peacefully exercise their rights to freedom of speech, association, and assembly. Only in exceptional cases would their acts meet a generally-accepted definition of terrorism. And when environmentalists engage in civil disobedience, they do not usually aim to undermine the rule of law.”

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agrees to provide as part of a development project. A CBA is the result of a negotiation process between the developer and organized representatives of affected communities, in which the developer agrees to shape the development in a certain way or to provide specific community benefits. In exchange, the community groups promise to support the proposed project before government bodies that provide the necessary permits and subsidies.

The October, 2022 CBA between Lithium Nevada Corporation (a subsidiary of Lithium Americas Corporation) and the Fort McDermitt Paiute and Shoshone Tribe is a good example of the kinds of agreements mining companies make with communities to ensure support for a project that will heavily impact the community in a wide variety of ways.

In exchange for the Tribes support, the company promises jobs and skills training, and will build an 8,000 square foot community center that includes a daycare, preschool, playground, cultural facility and communal greenhouse, costing the company approximately $5 million. The agreement and letter of support was signed by the Tribal Council, despite that the Tribe itself is split on the issue, and some of the Tribe members do not support the project. The agreement did so at the beginning of the Covid lockdowns, and during the holidays when Tribal of cases were closed. Unsurprisingly, the agency received no comments or concerns from the tribes within the 30 day mandated response period, and therefore assumed that their consultation obligations had been met. The BLM went on to approve the Thacker Pass Lithium Mine Project in record time - 1 year from initiating the promise of a three-month consultation process to just four of the ten regional tribes with cultural and historical connections to Thacker Pass. The agency did not find out about the mine until after it was approved. The BLM did so at the beginning of the Covid lockdowns, and during the holidays when Tribal of cases were closed.

The Myth of “Consultation”

U.S. law requires federal agencies to consult with recognized tribes when a major project will affect them, because a project might impact subsistence lifestyles reliant on land or fishing areas, or impact areas of cultural and historical significance to tribes. However, federal agencies have no legal requirement to incorporate tribal input into final decisions about a project, or to modify the project based on that consultation, so one might ask, is the consultation meaningful in any way?

At times, what counts as “consultation” borders on the ridiculous. To fulfill II their consultation obligations before approving the Thacker Pass Lithium Mine Project, the Bureau of Land Management (BLM) sent letters of notification to initiate consultation sessions to just four of the ten regional tribes with cultural and historical connections to Thacker Pass. The agency did so at the beginning of the Covid lockdowns, and during the holidays when Tribal of cases were closed. Unsurprisingly, the agency received no comments or concerns from the tribes within the 30 day mandated response period, and therefore assumed that their consultation obligations had been met. The BLM went on to approve the Thacker Pass Lithium Mine Project in record time - 1 year from initiating the promise of a three-month consultation process to just four of the ten regional tribes with cultural and historical connections to Thacker Pass. The agency did not find out about the mine until after it was approved.

Unfortunately, this indifferent and neglectful approach to consultation is not unusual. When these organizations do make substantive comments on a project during public input phases - on scoping, assessment, and draft environmental impact statements, those comments are typically used by the agencies and the corporation to shape the project to where they need to make adjustments in order to fully comply with the law. The public input, in other words, helps the corporations to get the permits they require to proceed with a project.

Remember, this is a system designed to permit extraction projects that are considered “the highest and best use” of the land, not a system designed to protect natural or human communities.

The Myth of “Free, Prior, and Informed Consent”

Free, prior, and informed consent (FPIC), is essentially an international version of U.S. consultation. The aim of FPIC is to establish consultation with “informed indigenous communities that will be impacted by large development projects,” and allow communities to provide input and, potentially, withdraw their consent prior to a project’s development, free of coercion from corporations and governments with interests in these projects.

However, research into the reality on the ground of the FPIC process concludes that “the FPIC consultation undermines Indigenous autonomy, reinforces a context of substantial political and economic asymmetry between state, corporate and elite interest and Indigenous shamen and farmers. Thus, the FPIC consultation reinforces state–corporate power while simultaneously acting as a marketing platform for development projects and constructing the illusion of real dialogue, negotiation and, by extension, democratic decision making.”

Recent events in Jujuy, Argentina are just one example of this inadequate process. Argentina requires consultation to be held before any project that affects indigenous people proceeds. Despite this, in Jujuy, a province which sits at the middle of the “lithium triangle”, constitutional reforms limiting the right of protest and facilitating lithium mining in the region were pushed through in just one week. In 2023, despite the promise of a three-month consultation process with the region’s indigenous communities. Protests erupted in the weeks following the reforms, during which provincial police used “indiscriminate force” and “a campaign of intimidation and surveillance” against protesters.

As in the U.S., it is typical- world wide for consultation to be neglected and the interests of indigenous communities to be ignored or repressed. Bureaucracy Engaging with the public participation processes established by the U.S. federal government to understand and comment on proposed mining projects is almost insurmountable for most ordinary citizens. To participate requires understanding federal and state law related to the projects, understanding the regulations of the government agencies involved, reading hundreds or even thousands of pages of scoping documents, environmental assessments, and environmental impact statements, and educating oneself fully about the ecology and history of the area, including the flora, fauna, and human communities who will be directly impacted by a project.

It is no wonder so few people participate in this process. To write substantive comments, as agencies like the BLM require in order for those comments to be considered, demands expertise, time, and money most people simply don’t have.

As a result, most projects receive comments primarily from organizations established with the purpose of submitting comments about certain kinds of projects, and, sometimes, filing lawsuits if they find agencies or mining companies are not fully complying with the law.

These organizations tend to be small, with limited resources and funding, so they are unable to comment on all of the many extraction projects underway in the U.S.

When these organizations do make substantive comments on a project during public input phases, the comments are typically used by the agencies and the corporation to shape the project to where they need to make adjustments in order to fully comply with the law. The public input, in other words, helps the corporations to get the permits they require to proceed with a project.

Remember, this is a system designed to permit extraction projects that are considered “the highest and best use” of the land, not a system designed to protect natural or human communities.

Do mining companies have all the power? You might conclude, after reading this section of the report, that mining companies and the governments that enable them have all the power and there’s nothing you can do. You might feel despair.

Action is the best antidote for despair. As Joan Kuyek writes in her book Unclearing Justice: How to Protect Your Community from the Mining Industry: Sometimes... direct action—the assertion of our responsibility to protect the earth and one another— is necessary. It is necessary to protect endangered species and resist destruction of land, water, and community.

"Learning how mining projects can be a 'nose-bleed' learning curve."

—Joan Kuyek, Unclearing Justice
Exploration has a tiny footprint.

This is possibly the biggest deposit (in the area, the province/state, the world)!

The mine will create hundreds of jobs and enrich governments.

The mine can make community members rich and solve all of their social and economic problems.

Modern engineering will ensure that the mine doesn't damage the water, air, or the wildlife.

To stop a mine:

You need to organize. Rally your friends. Do your research about the company and the permits they need to go ahead. Do anything you can to slow the company down.

At some point, you and your community will probably have to physically block the company from accessing the land.

— From Unearthing Justice, by Joan Kuyek.
Mining is an inherently destructive process, no matter how it’s done. Open-pit mining, underground mining, and brine pit mining all have catastrophic consequences on the environments where mining occurs. The damage is compounded by refining processes that use toxic and dangerous chemicals such as cyanide and sulfuric acid to leach metals from the ore.

The harms to a landscape are much larger than from the mining pit alone. Waste rock and tailings are usually piled on the land or stored behind large dams, and infrastructure built to support the mines, such as roads, ports, wells, pipelines, power stations, power lines, parking lots, housing for mine workers, and more, increases the scope of destruction.

In this section, we describe just a few of the many negative impacts mine construction and operation has on ecosystems. These impacts include deforestation, erosion, pollution, contamination of streams, rivers, and wetlands, dust pollution, noise and light pollution, biodiversity loss, greenhouse gas emissions, habitat fragmentation, and disrupted wildlife migration routes and breeding habits.

Overburden

First, we need to talk about “overburden,” the callous and cruel descriptor mining companies use for the natural communities living over the metals and minerals they wish to extract. Overburden is stripped using excavators, draglines (massive chains dragged across the land), graders, and other earth-moving equipment and removed from the mine site in large dump trucks. This process kills every living being on the land from the trees and wildlife to the bacteria who lived in the soil.

Despite mining company profits to spin their projects as “environmentally sensitive” there is no such thing. The simple truth is that mining annihilates ecosystems.

Mine footprints

Kennecott’s Bingham Canyon open-pit copper mine in Utah is one of the largest mines in the U.S. The pit is three-quarters of a mile (3960 feet) deep and nearly three miles wide. All open pit mines have a large footprint, some wider and some deeper than others. Every living being who lived on the land prior to mine construction was killed or driven away; the land at a mine site supports no life.

Billions of tons of rock are removed from the Earth over the course of a mine’s operation. Most of this rock is waste rock and tailings which is piled on top of the land next to the mine, or processed into tailings “ponds” (massive sludge lakes). This land, too, is rendered lifeless and barren, and, because of acid mine drainage and leaching chemicals, poisonous to living beings.

The footprint extends beyond the mine pit, waste rock and tailings; the processing stations and road networks, roads, buildings, parking lots, fences, and more all have an impact, fragmenting and obliterating the ecosystems where they are situated. When water, soil, air, noise, light, and dust pollution are accounted for, the devastation expands even further.

Water

Removing vegetation, operating heavy equipment, constructing buildings and roads and power stations and parking lots and housing, and, eventually, blasting a massive pit into the Earth all causes erosion. Erosion contributes to sedimentation in waterways, which can smother vegetation and aquatic species.

Along with erosion, mining damages waterways far beyond the mine site itself with acid mine drainage. As Joan Kuyek describes in Unearthing Justice:

“Mining is a rapid, ferocious, and continuous assault on the earth.”
—Joan Kuyek, Unearthing Justice

The metals that we mine can be found in rocks all over the Earth. Undisturbed, these metals and the chemicals that are bound to them dissolve gradually and have established a long-term symbiotic relationship with the life around them. Mining destroys that relationship. It rips the desired metal from the rock thatbirthed it by smashing the rock to powder, and then uses chemicals and heat to break the chemical bonds.

Unwanted metals and chemicals are left behind in the extraction process and end up smashed to bits, with many surfaces exposed to air and water in waste rock dumps, tailings impoundments, mine dams and roads, and mine pits. This smashed up waste rock is exposed to the elements. Rain falls on these rocks and trickles into streams taking sulfuric acid with it. The water carries acid away from mine sites and into streams, rivers, lakes, and groundwater, killing aquatic life and making these waterways inhospitable to all natural communities.

When leaching liquids containing chemicals such as cyanide and metal residues are added to this mix, the result is even more devastating. This toxic stew of acid and leaching chemicals is a poison to the plants and animals who live in waterways polluted by mines.

A 2021 study of the Appalachian eco-region where mountain-top mining is common found that streams from heavily mined watersheds had 40% fewer species than streams with cleaner water. The mining caused biodiversity loss in fish, insects, clams, crustaceans, algae, fungi, bacteria, and more.

Noise

While it is fairly obvious to most people that mining destroys the soil, obliterates and fragments habitat, and creates water, soil, and air pollution, many don’t think about the threats to wildlife and ecosystems from noise pollution.

Any noise over 85 dB can be harmful to human health, especially if repeated exposures. Minesites regularly operate at noise levels between 114-120 dB, with blasting noise reaching up to 160 dB. Of course, humans can protect their ears. Wildlife can’t.

A 2023 paper studying neurobehavioral alterations from noise exposure in animals identified five main ways in which animals are adversely affected by noise pollution:

(i) hearing loss, with noise levels of 85 Decibel or higher;
(ii) masking, such as the inability to hear important environmental and animal signals;
(iii) increased heart rate and breathing;
(iv) behavioral effects, and found “anomalous responses from wildlife begin at noise intensities of around 40 dBA.”

A separate study on how road noise affects birds found that “bird abundance declined by 31% on average” near road noise and changed their behavior significantly when exposed to road noise in the 55-61 dB range, far below the level of noise at a typical mine site.

The Thacker Pass Lithium mine in northern Nevada is situated near Greater sage-grouse leks, areas where sage-grouse display and mate. A BLM noise survey prior to mine construction measured ambient noise levels at all of the levels in the range of 13 to 26 dB, with an average level of 13 dB during lekking hours. This is the environment in which sage-grouse are used to living, foraging, mating, and breeding.

Sage-grouse are exquisitely sensitive to noise, and do not habituate to the impacts of noise over time. We anticipate the noise from the mine will have an enormous impact on these endangered birds.
Case Study: The Fundão Dam Collapse in Mariana, Brazil

The iron ore mines at Samarco Mariana Mining Complex near Mariana, Minas Gerais, Brazil are just three of the over 900 iron ore mines around the world supplying the global steel industry. Steel (along with concrete) is what we use to build the modern world, and so iron accounts for about 93% of the metals mined globally and 98% of that iron is used to make steel.

On November 5, 2015, the Fundão mine tailings dam at Samarco collapsed. 50 million tons of mud and toxic waste poured into Brazil's Rio Doce. The mining waste flowed 400 miles (650 km) from the collapsed dam to the South Atlantic Ocean, destroying 39 municipalities in two districts, polluting drinking water for humans and wildlife, crashing through villages, and tearing trees out of the ground. Nineteen people lost their lives, as well as countless trees, animals, fish, and microorganisms. When the toxic slurry of mud, iron oxides, manganese, silica, and other heavy metals reached the Atlantic, it delivered a massive plume of sediments to the estuarine and coastal environments.

The tailings contaminated the coral reefs in the Abrolhos Marine National Park, a 914-square-kilometer nature reserve in northeast Brazil. Home to coral reefs with the largest biodiversity in the South Atlantic, this area is also where humpback whales give birth and is a waypoint for sea turtles and migratory birds. A study completed several years after the tailings dam collapse discovered heavy metals contaminating coral exoskeletons.

Many years later, the waters of Rio Doce still run reddish-brown, and a thick layer of toxic mud still blankets the riverbed and coats the river shorelines with a mixture of mining waste and persistent heavy metals.

Two years after the disaster, the Minas Gerais State Board of Environmental Policies lowered the environmental licensing criteria for operations and activities that use environmental resources in Minas Gerais. And two years after that, another tailings dam collapsed, in the town of Brumadinho, Minas Gerais, taking 259 human lives, millions more non-human lives, and destroying another river.

Iron ore tailings have immediate negative impacts on ecosystems, and can contaminate the soil and water with toxic elements including arsenic, cadmium, and lead. These elements can poison microalgae, plants, invertebrates, microbial communities, and fish, and affect soil metabolic processes.
The scale of mining and its impacts at a glance

- **The number of active metal mines operating in the United States (as of 2022):** 280
- **The number of active sand, gravel, coal, and non-metal mines operating in the United States (as of 2022):** 12,563
- **The number of active iron ore mines in operation globally:** 917
- **The years it will take the BLM to complete an inventory of abandoned hard rock mines and features on its land, at current staffing levels and resources:** 500
- **The estimated number of abandoned mines sites in 13 Western states in the U.S.:** 620,000
- **The actual environmental hazard costs of the 25 most expensive mining and mineral processing sites in the U.S.:** $50m - $538m
- **The UN’s Global Resources Outlook 2019 report found that natural resource extraction and processing account for more than 90 per cent of global biodiversity loss and water stress:** 90%
- **The world’s top 10 largest mines are iron ore, copper, diamond, and coal mines:** Top 10
- **Tailings and waste rock from metals mining is approximately 20 times larger in volume than the total amount of metals extracted from ore:** 20x
- **The number of active, inactive, and closed tailings storage facilities bigger than 280 billion metric tons, worldwide:** 8,500
- **Mining activity causes nearly 10 percent of Amazon deforestation:** 10%
- **Metals extraction and refining accounts for 40% of all industrial greenhouse gas emissions and 10% of global energy consumption:** 40%
- **In 1920, global average copper grade was 1.6%. In 2019, the average copper grade was approximately 0.5%:** 0.5%
- **The number of new mines worldwide that will begin operation in 2024. The largest of these will extract iron, gold, and copper:** 100
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The scale of mining for “clean technologies” at a glance

Mining and processing the rare earth metals now common in most wind turbines produces significant toxic waste. Many rare earth metals are bound up in ore deposits that contain thorium and uranium, both of which are radioactive. One ton of radioactive waste is produced for every ton of mined rare earth metals. Rare earth metal processing for wind turbines already generates as much radioactive waste as the nuclear industry.


For every kilogram of battery, 50-100 kg of ore needs to be mined, transported, and processed. Constructing enough lithium batteries to store only 12 hours worth of daily power consumption would require 18 months worth of global primary energy production and the entire global supply of several minerals.


The International Energy Agency (IEA) estimates that reaching “net zero” globally by 2050 would require six times the amount of mineral resources used today. This would entail a quantity of metal production over the next 15 years roughly equal to that from the start of humanity until 2013.


To phase out fossil fuels, 4,575,523,674 tons of copper will be needed to produce one generation of technology units (wind, solar, batteries, electricity grid lines, etc.), requiring 189.1 years at 2019 rates of production.

— Simon Michaux, Assessment of the extra capacity requirements of alternative energy electrical power systems to completely replace fossil fuels.
Mining is inherently unsustainable.
- Tomas Benson, Vice President of Global Exploration at Lithium Americas and Adjunct Associate Research Professor at Columbia University. The key ingredient to millions of EVs is buried under a former volcano — but there's still a lot we don't know, August 30, 2023.

It’s not “green” to destroy the land, whether you’re mining coal or lithium. If we want to stop global warming, changing what’s under the hoods of our cars isn’t enough. Reducing emissions and saving our planet means challenging our culture of consumption and growth.

That’s the new inconvenient truth.
- Max Wilbert, Indigenous Women Are Leading Mass Protests Against Lithium Mining in Argentina, August 12, 2023

Mining companies lie. They just lie.
- Joan Kuyek, Unearthing Justice: How to Protect Your Community From The Mining Industry, 2019

When the last tree is cut, the last fish is caught, and the last river is polluted; when to breathe the air is sickening, you will realize, too late, that wealth is not in bank accounts and that you can’t eat money.
- Alanis Obomsawin, Canadian filmmaker of Abenaki descent. From “Conversations with North American Indians” by Ted Poole in Who is the Chairman of This Meeting? : A Collection of Essays (1972) edited by Ralph Osborne.
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