Mine Disasters Seen Showing Cost of Cheap Waste Solutions

Danielle Bochove, Bloomberg News, 11-19-15

As miners globally review the way they store waste in the wake of another horrific dam spill, the solution may be as simple as it is dramatic: spend a lot more.

Images of sludge spewing into towns and rivers could be a thing of the past if mines used different types of storage such as removing water or building on more stable ground. While that can be as much as 10 times costlier for companies already squeezed by slumping prices, the cost is much higher when things go wrong.

The cleanup bill for the Nov. 5 spill at the Samarco iron-ore venture in Brazil, owned by BHP Billiton Ltd. and Vale SA, probably will exceed $1 billion, Deutsche Bank AG said. Then there's lost output and potential lawsuits.

"A failure is a lot more expensive than doing it right," said Dirk van Zyl, professor of mining engineering at the University of British Columbia and one of three experts on a panel into a dam spill in Canada last year.

Samarco says its dams were deemed safe in a July inspection and that it's too early to determine reasons for the spill. On Monday, BHP Chief Executive Officer Andrew Mackenzie said the company is "carrying out a thorough review of all of our dam facilities of scale." On the same day, Vale said it's open to improvements, even after concluding that its other installations, which use state-of-the-art safety practices, were fully compliant.

The Samarco breach, which propelled about 13 billion gallons of mud into communities below, comes a year after Imperial Metals Corp.'s Mount Polley mine in Canada also dumped billions of gallons into lakes and rivers. A common trait in the two cases was the fluidity of the waste.

Dryer Better

Tailings are the ground rock and effluents left over after milling. And when it comes to storage, the dryer the better, van Zyl said in a telephone interview.

Dry-stack tailings facilities, used in Chile where earthquakes are common, can cost 10 times more than so-called upstream ponds, in which discharged tailings become the foundation for future embankment raises, van Zyl said. The next best option, building storage on virgin ground and limiting the amount of water, could cost twice as much, he said.

Still, those higher investment and operating costs pale next to the expenses associated with a catastrophic accident.

"When you allow economics to be the primary driver we're going to see more safety-related incidents, and that's what's happening," said David Chambers, president of the Center for Science in Public Participation, a non-profit group based in Bozeman, Montana.

When asked if any of the dams used upstream construction, Samarco's owners referred questions to Samarco, which didn't provide a response. Alberto Sayao, a civil engineering professor at the Catholic University in Rio de Janeiro and a board member of non-governmental organization Brazilian Dam Committee, said the dam that burst, Fundao, was an "upstream heightening" design.

At Mount Polley, the upper portion of the dam was upstream, although the spill was attributed mainly to a layer of clay under one section, Chambers said. Vancouver-based Imperial didn't respond to requests for comment.

Ban Urged

Whatever the cause, there's no doubt the damage from both breaches would have been much less if the tailings had been less fluid, Chambers said. He co-authored a study, still to be peer-reviewed, which predicts the number of catastrophic failures will increase as miners are tempted to build larger upstream ponds in order to cut costs.

Regulators need to ban upstream construction and "wet closures" of old tailings ponds, in which the water is allowed to remain, Chambers said. Asked whether the incident in Brazil shows miners need a new way to store tailings, the emergency response coordinator of environment agency Ibama said "it needs to be evaluated," without elaborating.

The mandate of a panel into the Mount Polley case was to ensure that tailings disasters would be impossible in Canada, rather than just to lower the probability, according to Norbert Morgenstern, the panel's chairman.

By starting there, the focus quickly shifted to changing the nature of tailings themselves, and making them less fluid, Morgenstern said in an interview. That way, "if you have a failure, it's not going to go very far."

Not Feasible

How tailings should be stored will vary from location to location, Ben Chalmers, the Mining Association of Canada's vice president of sustainable development, said in an interview. Certain sulfide-heavy tailings may be safer under some amount of water, while dry storage may not be feasible in wet climates or at very high-output mines, he said.

While dry-stack storage is expensive during operations, it's much cheaper when it comes time to close, said Chuck Jeannes, CEO of Goldcorp Inc., which uses dry storage at mines in Canada, Mexico and Guatemala and has a dedicated manager in charge of tailings.

"The short answer is, yeah it's more expensive," he said in an interview. "But the long answer is, I don't think it's as much as people believe it is."