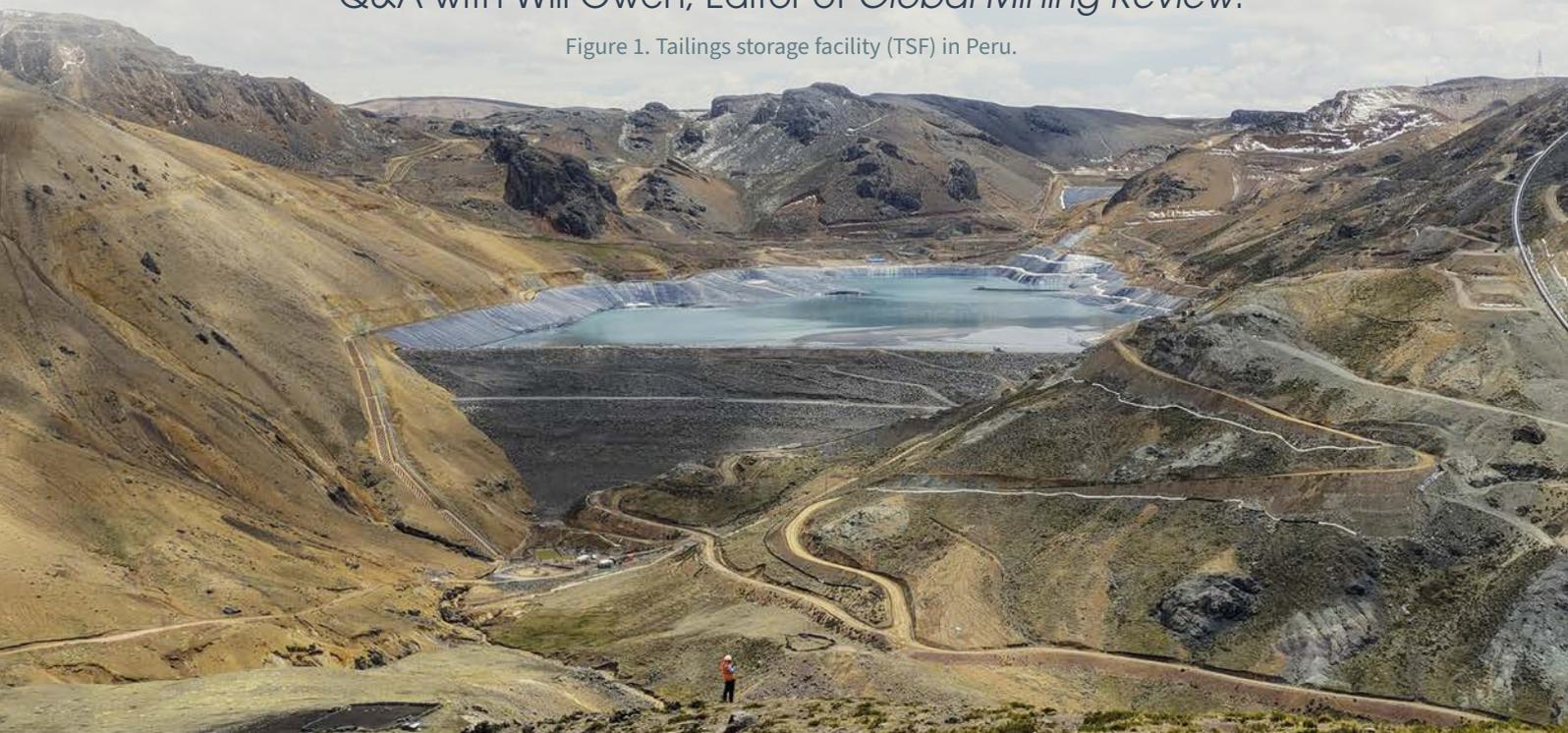


THE NEXT GENERATION OF ENGINEERS OF RECORD

Sam Abbaszadeh and Amanda Adams, Stantec, USA, assess the opportunities to attract the next generation of tailings engineers in a Q&A with Will Owen, Editor of *Global Mining Review*.

Figure 1. Tailings storage facility (TSF) in Peru.



Engineers of Record (EORs) oversee all aspects of a tailings storage facility (TSF) and need a varied and specialised skillset. Adoption of the role has increased in recent years, thanks in part to the Global Industry Standard on Tailings Management (GISTM), which requires EORs on certain tailings projects. Will Owen (WO), Editor of *Global Mining Review*, recently sat down with Stantec's Sam Abbaszadeh (SA), Tailings and Waste Technical Practice Lead, and Amanda Adams (AA), Principal, Mining, Minerals, and Metals, to discuss how they are guiding the next generation of tailings practitioners into EOR roles for TSFs.

WO

Sam, you are an Engineer of Record (EOR). Why did you choose EOR as a career path?

SA

To be more accurate, I'd say EOR chose me. An opportunity arose where I was asked to be the deputy EOR for an

inactive site in Arizona and I said yes. At the time, I didn't really think that far ahead, and I was just curious about the opportunity to learn. The challenge sounded exciting, so I said yes to the opportunity and started getting into the EOR role.

WO

What did the learning process look like?

SA

It was a long journey (about 8 years now) and involved many site visits, inspections, preparing, and presenting to Independent Technical Review Boards (ITRBs) and Tailings Stewardship Teams (TSTs). The highlight of it is how much more beyond your specific discipline (in my case, geotechnical) you have to absorb to be ready for the EOR role. You can't just stay in your comfort zone or area of expertise and ignore the other areas. You must develop at least a basic understanding of other disciplines, such as

hydrology, hydraulics, water management, water balance, material balance, geochemistry, geology, and mine operation and closure. There are a lot of other things, and you must stay curious, ask questions, and grow. I was very lucky to have the opportunity to learn from some of the best in the industry.

WO

How will you modify that learning process to train your Deputy EOR?

SA

With the global gap in that type of skillset and knowledge, we know we need to accelerate the process to train more EORs. Ideally, a TSF has a lead EOR and a Deputy EOR. This helps with institutional knowledge and general transfer of skills. On my first site visit it took me a while to understand the importance of the multidisciplinary knowledge. If I went back to do it again, I'd be more intentional in transitioning from a geotechnical engineer to someone with a basic understanding of all the aspects of the TSF. That would be my main focus when it comes to training a Deputy: to emphasise the importance of multidisciplinary knowledge that is required for this role.

WO

How do you think the industry at large is addressing the EOR workforce issue?

SA

TSFs are getting more attention today compared to any other time in the history of mining. We are seeing a lot of collaboration globally to share knowledge and accelerate tailings education. As an example, this year I went to the International Commission on Large Dams (ICOLD) conference in Sweden, and I think for the first time one of the two keynotes focused on tailings and three of the four short courses focused on tailings. Historically, this is not a conference devoted to tailings. So, globally the industry is sharing knowledge and contributing to the growth of these initiatives. And as far as the EOR workforce issue is concerned, this is a great step forward to help accelerate gaining the multidisciplinary knowledge required. Another, and perhaps more challenging, component is the practical knowledge which only comes when you are willing to put your boots on the ground and spend time at various TSFs.

WO

What does the next generation of tailings engineers need to do differently?

SA

I have thought about this a lot because I am in the 'middle' generation. I think one of the things the next generation needs to focus on more is proactive succession planning and training. This is particularly important because it was probably not a major issue for the previous generation of tailings engineers and EORs. The current legends in the industry, who are nearing their retirement now, may have trained a few disciples throughout their careers who are

becoming the new leaders of our era. This was probably sufficient, given the industry needs at the time. However, for us to meet the needs of today and the future, each of these new legends must train another dozen disciples in the industry. So, if you consider yourself a next generation tailings engineer, make sure that you identify the tailings legends in your organisation and express your interest to be trained. And if you are one of those legends, make it your mission to train a dozen of the next generation engineers before you retire. That will be your legacy that will live long after you leave the industry, and that is how we continue to grow and improve.

WO

What challenges and opportunities is the industry facing?

SA

We're seeing a global shift in the workforce. Today, people seek more work-life balance and workplace flexibility. This can be difficult when much of our work happens at a project site. To me, this is one of the biggest challenges, and a learning process across generations as we all work together. I believe both employers and employees need to think creatively and flexibly to apply modern solutions when appropriate. And as with any challenge, we're also presented with new opportunities we didn't have even 10 years ago. We're seeing huge advances in technologies to allow for remote data sensing. As an example, we worked on a cool tailings project recently where we increased confidence in data integrity of dam inspection observations by implementing GIS-based remote data collection. Another great opportunity is elevating industry-wide collaboration. For example, it would be very beneficial to the industry if the mining companies and consulting firms would create a job-sharing framework where they could easily exchange employees for a certain period of time. This would benefit the employees, as well as their employers.

WO

What needs to be done to attract people to these roles?

SA

We should start with the multidisciplinary aspect of this role, the challenges it brings, and the nature of problem-solving. I think that is how we should advertise it – a multidisciplinary opportunity to grow almost endlessly, form teams, and solve problems for the benefit of our environment and communities. And, by the way, it is also paid very well, but the conversation needs to go in that order. You need to have the passion first, to be successful in this role.

For example, some tech companies are successful in attracting the next generation of talent not only because of their high pay, but also because they provide opportunities to learn new things and take on new challenges. We need to take this approach with the next generation of EORs.

WO

Now Amanda, let me ask you a question – I know you haven't been in an EOR role, but you have been involved extensively, what's your opinion on how to attract this next generation?

AA

In order to attract a new generation of EORs we have to promise – and deliver – mentorship. The people who take on these roles need to know they have the tools and support in place to be successful. I am really invested in the success of our EORs, and in the future of the EOR workforce. That’s why I am involved with the tailings committees for organisations like SME and USSD, and I work with USSD and CDA’s joint working group on EOR. It’s also why I spend time teaching short courses through the Tailings Center, and why Stantec is a committed industry partner of TALENG. Tailings engineering is a fascinating career that I love, and I want to introduce the next generation to it, because it has provided me with many unique and interesting opportunities.

WO

What do you think about the pressure we put on young professionals; how do we allow them to fail safely? A lot of people are almost scared of this role because they think, “if this facility fails tomorrow, I will go to prison”. Realistically, how can we keep people protected?

AA

We (Stantec) must do work for owners that we trust to safely manage their tailings facilities. We take on EOR roles when we are a partner with the owners, when we know our recommendations will be valued, and when we know the owner is committed to doing the right thing. We protect our EORs by taking on EOR assignments where we are confident we will be successful, where we have the data we need to make the right decisions, and where we are involved for the long-term.

WO

Thank you both for providing your opinions on this important topic, any closing thoughts?

AA

I am excited to see where the industry is going, because there is so much collaboration between tailings practitioners. Sam and I recently attended the Tailings & Mine Waste 2023 Conference in Vancouver, and it was astonishing and motivating to see how openly owners, consultants, academics, and vendors were sharing their successes (and struggles). The people in this industry want to do what is right, and they know that we do not have the luxury of spending the next 20 years figuring it out. In order to advance the industry, we need to share lessons learned and build on our collective experience – we don’t have time for everyone to experience the same mistakes on their own. I am so optimistic about the future because we aren’t doing things the same way we always have. We are adopting technology faster, in newer, better ways, solving problems with more diverse teams, and seeing more collaboration than ever before. We have a big challenge ahead of us, but we also have the right people to figure it out. [GMR](#)