

# Dams & Levees

Bulletin of the United States Society on Dams



**Women  
In  
Industry**

**CHIMNEY HOLLOW RESERVOIR  
CONSTRUCTION RISK MANAGEMENT**

**BOOK REVIEW: CREDIBILITY CRISIS—  
BRUMADINHO AND THE POLITICS OF  
MINING INDUSTRY REFORM**

**USSD VIRTUAL CONFERENCE RECAP**

# RACHAEL BISNETT

Stantec



## Please tell us about your background and current position.

I have a BSCE and MSCE from Purdue University in Structural and Geotechnical Engineering, respectively. I've spent the last 11 years working on dam, hydropower, and hydraulic structure projects both domestically and internationally. Currently I lead dam safety risk assessments and projects, incorporating risk informed decision making for Stantec.

## What path led you to the dam and levee industry?

I knew that I wanted to be an engineer from a young age because of my mom. As an engineer, she provided me a lot of exposure to dams as a child and there were many opportunities to accompany her on her job. In high school, I participated in the Project Lead the Way engineering program which was a window for the different fields of engineering. I spent a couple of summers interning and realized that structural engineering wasn't for me and continued my education at Purdue earning a master's in geotechnical engineering.

As a graduate student, I applied for a USSD scholarship which provided me the opportunity to attend the USSD annual conference and meet with dam professionals. There I met David Kleiner, who was one of the senior geotechnical engineers at Stantec (formerly MWH). I was offered an internship which led to a full-time position upon graduation.

## What do you find most rewarding about your job?

I have been blessed to work with a lot of great people who have been invested in helping me learn. It's important to me to pay it forward through mentoring and teaching younger engineers.

Meeting and developing friendships with coworkers all over the world. Travel can get

tiring, but I am privileged to work with great people who look out for me and take the time to show me around their city or share parts of their culture. Getting to know coworkers on a personal level creates trust and loyalty that is so important for being able to push through tough spots on projects together.

It's also very rewarding to work on projects that improve our communities by generating clean, renewable energy and making dams safer.

## What have been some of the most interesting projects that you've worked on?

From the onset of my career, I've had the opportunity to work on some really great projects. The Panama Canal Third Set of Locks Project was one of my first projects with Stantec (then MWH). Aside from being a once-in-a-generation project, there were a lot of complex technical issues to deal with in the design and construction of the new lock complexes on each side of the canal. I also enjoyed the opportunity to work in Panama for a few months. The Red Rock Hydroelectric Project is on the other end of the spectrum in terms of project size, but that was part of what made it so interesting to work on. We had to be very creative with the design elements to make it all work within the project boundaries. I had the chance to work with all types of geotechnical solutions.

## Did you have a mentor early in your career that helped you or provided guidance? If so, how?

Yes, I am fortunate to have many mentors who have all helped in different ways. Some are technical and others have helped me navigate the industry. None of my mentoring relationships have happened through formal programs but have developed organically through project work or professional organizations.



I knew that I wanted to be an engineer from a young age because of my mom. As an engineer, she provided me a lot of exposure to dams as a child and there were many opportunities to accompany her on her job.

## Outside of your job, how are you involved in a volunteer capacity with your community or profession?

It's important to me to introduce students to dams and I present to student groups (university, high school programs, and even elementary school career days). I have also been very active in USSD since I joined the organization as a student member while in college. Since 2014, I've been the Embankment Dams Committee Chair, which I recently stepped down from. I also served as the Conference Technical Program Planning Chair in 2019 when the conference was held in Chicago and led the effort to revamp the USSD website 6 years ago.

This year, I'll be leading USSD's new speaker's bureau program. It will provide an avenue to reach out to universities and give our members the opportunity to go into schools to share cool projects they're working on and to help students think about a career in dams. It will also be an opportunity to share information about USSD and create stronger ties with academia. 🐦

# AMANDA ADAMS

Stantec



**Please tell us about your background and current position.**

I am a Geological Engineer and earned my bachelor's degree at Colorado School of Mines. I am a Principal in the Mining Group at Stantec with 15 years of industry experience and have been involved in a variety of projects, primarily focusing on design of tailing storage dams. My design experience has spanned all phases of project development from siting studies to pre-feasibility, feasibility, basic engineering, detailed design, construction, operation, and closure.

For a large part of my career, I have served as a project manager. I work to integrate large, diverse project teams, spanning multiple locations both in the US and internationally. I like the challenge of bringing together the various technical disciplines required for dam design and coordinating the technical interactions, as well as scope, schedule, and budget.

In addition to managing projects, I am a member of Stantec's Mining leadership team in the role of Business Center Practice Lead. I am responsible for leading the delivery of excellent work to Stantec's clients.

**What path led you to the dam and levee industry?**

My dad is a structural engineer and as a kid, I never thought I would do something like this. I was always interested in geology and earth science so at Mines I studied Geological Engineering with an emphasis on exploration geology. I thought I would have a career finding new mines or oil and gas prospects. After I graduated, I worked for 3 years in a geotechnical engineering company which gave me a background in soil mechanics and foundation design. After I joined MWH (now Stantec) I started working on mining projects,

and one day was asked to work on a tailings dam project. I have been working on tailings dams for the past decade and absolutely love the work that I do.

**What do you find most rewarding about your job?**

As a consultant I have the opportunity to work on diverse projects all over the world. I had never been outside the US before, and now I have travelled to Peru, India and Canada, all for work. I love the fact that Stantec is a global company and I frequently interact with colleagues in other states and other countries.

I also love the satisfaction that comes from problem solving. All dam design projects are unique because the landscape, geology, hydrology, etc. of each project will be different. That means that every project is different, and you can always find a way to apply what you learned on your last project for improving your next project.

**What have been some of the most interesting projects that you've worked on?**

I have been fortunate to work on the Cerro Verde project, located in Arequipa, Peru. I began work on the Linga Tailings Storage Facility project when it was in the prefeasibility design stage and have continued my involvement ever since. The Linga TSF consists of a zoned rockfill Starter Dam that is raised by the centerline construction method, the tailings impoundment located upstream, and a Seepage Collection Sump located downstream of the TSF embankment, a two-stage cyclone station, reclaim water system and tailings transport and delivery systems. There were many unique challenges on the project, including complex foundation geology, the need to identify a low-permeability borrow source, and the incredibly

I am passionate about women in STEM and have been involved with Women in Mining since 2010. I currently serve as the Denver Chapter President. We focus on providing networking and leadership skills and training to our members, as well as education about the mining industry to our communities.

compressed construction schedule for the Starter Dam.

**Did you have a mentor early in your career that helped you or provided guidance? If so, how?**

I have an outstanding mentor who actually encouraged me to get involved with USSD. Tatyana Alexieva was my colleague at MWH and I owe much of my career success to her. She is also a mother of two daughters and showed me that women can be successful in this career field. She continually pushed me to stretch myself outside of my comfort zone. She encouraged me to apply for the Tailings committee VP Vice Chair, and I now have been the committee Chair for several years. I would never have been involved if not for her advice.

*continued on page 46*

# MELANIE DAVIS

Stantec



## Please tell us about your background and current position.

I am a Principal Geotechnical Engineer and Project Manager at Stantec. I have 25 years of experience in geotechnical engineering primarily for mine design, reclamation, and remediation projects. I am currently the engineer of record for three tailings dams and provide technical review for numerous other tailings dams. In addition to dam design, my technical areas of expertise include conventional and alternative (evapotranspiration) cover and liner systems designs for waste and fluid containment facilities, site investigations, site-wide water balance modeling, slope stability analyses, seepage analyses, settlement/consolidation analyses, hydrologic analyses, unsaturated flow modeling, and other general aspects of geotechnical and geo-environmental engineering. I have also created and instructed short courses on water and material balance modeling. I received my B.S. in Civil Engineering from Drexel University and my M.S. in Civil Engineering from Colorado State University.

## What path led you to the dam and levee industry?

My technical interests in graduate school were liner and cover systems designs, which fit well with tailings impoundment design and reclamation. I started on these types of projects with my first job after completing graduate school and stayed in mining due to the project variety and interesting technical challenges.

## What do you find most rewarding about your job?

I find helping clients manage challenging projects very rewarding. I enjoy managing large projects and building talented teams from various disciplines to work together with clients. I also

really enjoy helping staff find opportunities and grow in their careers. I love seeing people find what they are passionate about and incorporate that into their career.

## What have been some of the most interesting projects that you've worked on?

The most interesting projects I have worked on are independent dam safety risk reviews and tailings stewardship projects. I enjoy projects focused on improving dam safety and reducing risks. I have also enjoyed working on tailings dams all over the world in regard to seeing the various practices and ways clients are working to improve tailings management. Notably, I was project manager for risk assessments of eleven tailings and water storage dams for a client in Latin America and project manager/technical lead for Tailings Stewardship Program for North American mining sites in Canada from initiation (2015) through program closeout in 2019.

For both, I really enjoyed working with the mining company leads and site staff. They were all motivated to improve dam safety and tailings management and it was great to be part of projects with those key drivers in mind. It has been rewarding to work on projects focused on improving practices and reducing risks to owners and stakeholders.

## Did you have a mentor early in your career that helped you or provided guidance? If so, how?

Yes, I have had a mentor since the beginning of my career. His name is Clint Strachan and I currently work with him at Stantec. He provided me opportunities early in my career to learn and grow, while also encouraging me to follow my career interests. He has been a great sounding board and has provided good constructive feedback. He is also respected in this field and a



The most interesting projects I have worked on are independent dam safety risk reviews and tailings stewardship projects. I enjoy projects focused on improving dam safety and reducing risks.

great role model. I appreciate his integrity and willingness to help others. I am grateful to have worked with him for so many years and be able to continue to learn from him.

## Outside of your job, how are you involved in a volunteer capacity with your community or profession?

The majority of my volunteerism has been associated with my two daughters at their school or for their activities for the past 20 years. This includes volunteering for numerous school events (i.e., school dances, performances, holiday activities, presentations, etc.) and general volunteering for activities, as well as being an assistant leader for Girl Scouts and co-leading a Girls on the Run team. This allowed me to have more time with my daughters, which was always a priority for me. I was also able to volunteer through Stantec at the Girls & Science event at the Denver Museum of Nature & Science and bring my oldest daughter with me to volunteer. I also have been volunteering for local running races for over 30 years, including being a race director for a few years. 🐾