

PROFILES WOMEN IN GEOTHERMAL



Promoting the education, professional development, and advancement of women in the geothermal community.



Spotlight on Women in Geothermal USA- March 2024

Kirsten Marcia, CEO and President of DEEP Earth Energy Production



Transitioning from the depths of a mine to the glamour of the diamond trade, and now leading the geothermal startup DEEP in Saskatchewan, Canada, Kirsten Marcia emerges as a fearless leader. Renowned for her profound understanding of complex geology, she readily exchanges her

high heels for field boots to engage in subsurface projects.

From Diamonds to Geothermal

Kirsten's journey is truly extraordinary. Initially inclined towards a business administration degree like her peers, she found herself at a crossroads. However, during a pivotal year-long hiatus from academia, she returned to her oil and coal-rich hometown of Estevan, where she was surrounded by professionals leading those industries. Guided by her patrons of the local pub, she discovered her passion for geology, ultimately earning a four-year degree from the University of Saskatchewan.

During her college years, Kirsten worked with Claude Resources, a Canadian gold mining company. Post-graduation in 1999, amidst the aftermath of the Bre-X gold mining scandal and armed with a stack of resumes, she traversed Calgary's oil and gas corridors, facing the challenges of a turbulent job market. Luckily, it wouldn't be long after that Kirsten embarked on her first job as a well site geologist at Belloy Petroleum Consulting, an oil and gas well site contracting company. Her role involved well site geological supervision to ensuring precise well positioning through chip sample evaluations, monitoring drilling rate response and geophysical wireline interpretation, which she carried out diligently for 18 months.

In 2000, she joined Star Diamonds, at the forefront of the new Canadian diamond boom, where she led the drilling of the original exploration drill cores into newly discovered diamondiferous

Kirsten's Upbringing

Fearlessly venturing into male-dominated spheres, Kirsten attributes her boldness to her upbringing by her mother, who instilled in her a sense of equality despite being surrounded by brothers. Throughout her journey, supportive male mentors encouraged her to speak up and excel, liberating her from gender constraints and allowing her to thrive in hands-on fieldwork.



Work Life Balance

Kirsten divides her time between her home office desk and her downtown office at the University. Her hobbies include tending to her acreage, being a mother to an 18-year-old, enjoying fishing and camping during the summer, and regularly hosting dinner parties.



kimberlite deposits. Handling on-site analysis of diamond assays, she was also involved in the deployment of a dense media separation facility to create diamond mineral concentrates. Progressing within the company, she assumed responsibility for the diamond parcels, orchestrating their overseas journey to Antwerp for evaluation by leading diamond companies. Leveraging her geological expertise, she also excelled in investor relations, adeptly articulating the intricacies of diamond exploration projects.

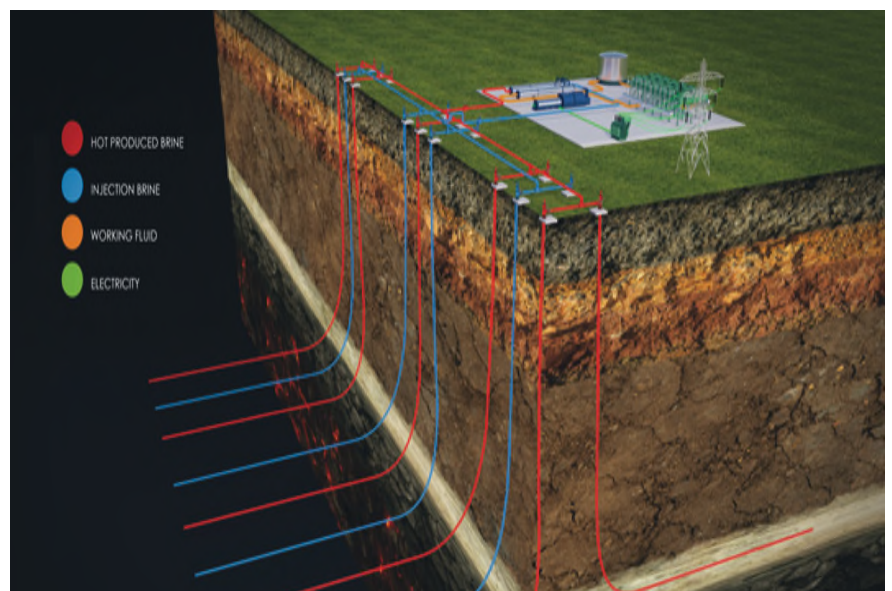


Next, she transitioned to a Peruvian gold and uranium company, serving as the Saskatoon-based Director of Investor Relations. She also held the position of Vice President of Exploration for Wescan Goldfields, with gold projects located in Northern Saskatchewan, a province known as the largest producer of Uranium and Potash. Working alongside Steve Hallabura, a prominent geologist in potash mining in Saskatchewan, she was inspired by his visionary idea. He proposed the concept of exploring a new resource, unlike anything previously mined, an inexhaustible source of heat. This idea resonated with Kirsten, who possessed the necessary tools and expertise to pursue it. Leveraging her local community's support, she successfully raised a million dollars of seed capital to explore geothermal resources in Saskatchewan and founded the geothermal startup DEEP in 2010. Their efforts led to the discovery of a promising geothermal site situated at the base of the Williston Sedimentary Basin.

DEEP Drills the First Horizontal Geothermal Well

In 2018, DEEP embarked on its first drilling endeavor following extensive modeling and research aimed at mitigating project risks. With a primary focus on low enthalpy geothermal resources in Saskatchewan, DEEP's mission revolves around comprehending the production capabilities of its wells in terms of flow rates and heat output. However, in 2020, the company encountered challenges regarding fluid deliverability in vertical wells. Undeterred, DEEP innovated by pioneering the drilling of the world's first horizontal geothermal well. This groundbreaking approach enhances reservoir heat sweep and flow rates by maximizing contact with the heat zone's surface area.

DEEP specializes in low enthalpy ($\sim 120^{\circ}\text{C}$) conventional geothermal resources within sedimentary formations, utilizing a distinctive horizontal well design with 500-meter spacing, devoid of hydraulic fracturing practices. This design incorporates alternating injector and producer wells, akin to a SAGD (Steam Assisted Gravity Drainage) configuration, aimed at efficiently extracting heat from the reservoir. SLB's analysis confirmed the viability of DEEP's geothermal resource, endorsing their 30 MW project comprising 12 producer and 10 injector wells. Projections indicate this project can sustain power generation for 40 years cost-effectively. With a focus on developing a low-risk, proven deliverability strategy, DEEP is now in the process of securing construction capital for the 30 MW power plant. Additionally, DEEP's well design holds promise for deployment worldwide in low enthalpy sedimentary resources.



Contemplations and Insights on Her Professional Journey

Kirsten conveyed profound gratitude for the women who have mentored her throughout her journey at DEEP. She specifically recognized and thanked Ann Robertson-Tate from SLB GeothermEX, acknowledging her as a sincere and direct supporter who has consistently cheered her on. Kirsten praised Ann for her steadfast encouragement and for celebrating Kirsten's commitment to empowering women in the geothermal sector. Additionally, Kirsten emphasized the significance of having supportive male mentors.

Reflecting on the challenges of the geothermal and geological fields, Kirsten highlighted the perseverance required by women in geothermal. She emphasized her desire to surround herself with women who embody determination and resilience, recognizing the invaluable contributions they bring to the field.

The advice she would offer to fellow entrepreneurs or leaders is to prioritize relationship-building. It's not only about fostering connections within your team, but it is essential to cultivate relationships with the broader community, government entities, and other businesses. Taking the initiative to engage with people authentically about the challenges you're encountering can pave the way for valuable support and collaboration. You can't expect to do it yourself.

When asked for advice she'd give her younger self when starting with DEEP, Kirsten's response was straightforward: "Wait five years." She feels she initiated her geothermal endeavors too early. From 2010 to 2015, DEEP faced challenges in raising capital, as global attention was absorbed by the Shale Revolution. However, from 2015 onwards, the world's acknowledgment of climate change has facilitated greater acceptance and adoption of geothermal energy.

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