

AAPG

Research LAUNCHER Program

About You

First Name: Theresa Last Name: Jehn-Dellaport

Company: Quantum Water Consulting

Check which apply to you: Student Non Student Independent Researcher Professor
 Corporate Research Other (Woman-Owned Small Business)

Primary phone: (720) 524-4294 Secondary phone: (720) 626-7873

Address: 3500 South Wadsworth Boulevard, Suite 408

City: Lakewood State: Colorado Zip Code: 80235

Country: United States of America

Email: Theresa@quantumwaterco.com Fax: N/A

Short Bio:

Quantum Water Consulting has over 55 years combined expertise in providing western water rights consulting, water supply analyses and surface water and groundwater hydrogeology. As a woman-owned small business, our goal is to provide unparalleled service with creative solutions to industry, municipalities, government, and private clients. Our team is made up of experienced professionals that are highly proficient in geology, geographic information science, hydrogeology, and hydrology while also understanding water law.

We evaluate and quantify groundwater resource potential and routinely provide consulting services to our clients. Identifying water resources and facilitating the extraction of these resources is a cornerstone of our company.

Quantum Water is dedicated to providing the most accurate and current project-specific geographic information through our innovative GIS capabilities. We use ESRI's ArcGIS 10.2, in addition to the Spatial Analyst and 3D Analyst extensions, and Aquaveo's Subsurface Analyst to visually support all facets of our services including geologic mapping, site locations, cross-sections, watershed delineations, thematic mapping, fly-through animations, data modeling and data management.

Quantum Water has developed modeling strategies to facilitate long-term water supply planning. We are dedicated to helping municipalities, industry, government and private clients leverage the latest technology in both software code and computer hardware to present the most hydrogeologically accurate and representative models possible.

Project Description

1. Name of Project: ***Identification of New Groundwater Resources within the Cheyenne Basin, Northeastern Colorado***

2. Brief synopsis/areas of geosciences or engineering (50-75 words)

Our project is focused on researching and identifying the extent and availability of groundwater resources within the previously named Upper Laramie, Laramie-Fox Hills, and Pawnee aquifers within the Cheyenne Basin, Northeastern Colorado. This project is based heavily on geology, hydrogeology, and geographic information science with an underlying understanding of Colorado Water Law.

3. Bullet list of 5-7 main outcomes/goals.

1. Identify the extent of the Upper Laramie, Laramie-Fox Hills, and Pawnee aquifers of the Cheyenne Basin in Northern Colorado
2. Calculate the aquifer properties and saturated thicknesses of the Upper Laramie, Laramie-Fox Hills, and Pawnee aquifers of the Cheyenne Basin
3. Establish the tributary/nontributary line of these aquifers with respect to Colorado Water Law (CRS § 37-90-103(10.5))
4. Identify the average production of water wells that will be drilled into the Upper Laramie, Laramie-Fox Hills, and Pawnee aquifers
5. Estimate volumes of the Upper Laramie, Laramie-Fox Hills, and Pawnee aquifers, as well as their long-term durability and longevity under varied pumping conditions
6. Create maps, figures, and a report to educate the oil and gas industry and public about the water resource potential of the Upper Laramie, Laramie-Fox Hills, and Pawnee aquifers in the Cheyenne Basin of northeastern Colorado

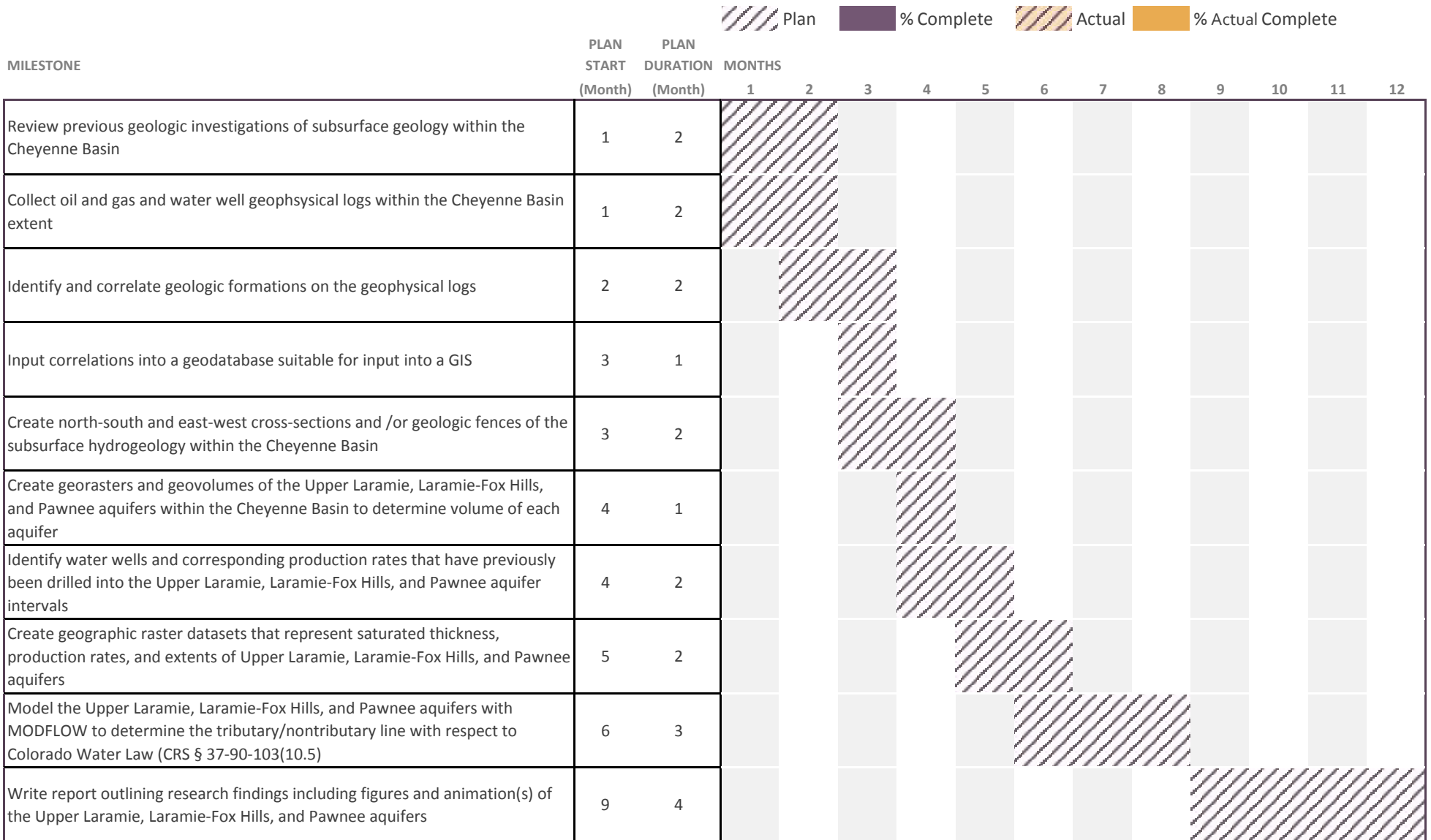
4. In two or three sentences, describe why your research is important. Please mention who will benefit from your work.

Identifying new and undeveloped water resources in northeastern Colorado has never been more important. The Colorado Oil and Gas Conservation Commission has predicted a five percent increase from 2014 to 2015 in the volumetric demand for water for hydraulic fracturing use in the state. The oil and gas industry, in addition to the citizens of northeastern Colorado and possibly beyond, will not only benefit from this research, but the educational materials on such resources that we will design and provide will lead to a better understanding of how these resources are connected, disconnected, and used.



Identification of New Groundwater Resources

Cheyenne Basin, Northeastern Colorado



6. Funding amount needed to achieve first basic goals within 12 months.

Identification of New Groundwater Resources

Cheyenne Basin, Northeastern Colorado



MILESTONE	PLAN DURATION (Months)	APPROXIMATE COST
Review previous geologic investigations	2	\$2,820.00
Collect oil and gas and water well geophysical logs	2	\$2,300.00
Identify and correlate geologic formations on geophysical logs	2	\$2,990.00
Input correlations in geodatabase	1	\$1,400.00
Create hydrogeologic cross-sections/fences	2	\$8,690.00
Create georaster and geovolumes	1	\$3,290.00
Identify water wells within aquifer intervals and input into geodatabase	2	\$3,315.00
Create raster datasets of saturated thickness, production rates, and extents of aquifers	2	\$3,200.00
Model the Upper Laramie and Pawnee aquifers to determine tributary/nontributary line	3	\$19,340.00
Write report including figures and animations of the Upper Laramie and Pawnee aquifers	4	\$7,490.00
	Subtotal	\$54,835.00

7. In the process of gaining background knowledge in the field of your proposed research, who did you find to be the top two or three researchers? What are the main concepts that are being explored? Please briefly describe.

In researching previously published reports and data pertinent to the subsurface geology of the Cheyenne Basin the two scientists that provide the most insight are R. M. Kirkham and L.W. Kiteley. R.M. Kirkham studied areas within the Cheyenne Basin to gain an understanding for both the shallow water resources for a smaller area within the Basin and for uranium exploration. L.W. Kiteley researched the subsurface geology of the Cheyenne Basin for the potential of hydrocarbon-rich resources. Both researchers touched upon the potential for the Upper Laramie, Laramie-Fox Hills, and Pawnee aquifers to be a water resource, however, this was not the main focus of their research.

8. Please provide a photo of yourself and a photo related to your proposed project. It will be very helpful in publicizing your project and potentially securing funding.

The Team at Quantum Water Consulting



White River Outcrop, Weld County, Northeastern Colorado



9. Who will benefit?

Researching and identifying a new groundwater resource within northeastern Colorado will benefit not only the oil and gas industry, but also the citizens (ranchers, farmers, well-owners, etc.). Water is an invaluable resource, especially in a geographic area where oil and gas production is increasing and water use for oil and gas production is predicted to rise. Extracting groundwater not hydraulically connected to a major river is of utmost importance in Colorado Water Law. Our research will show where this non-connected (nontributary) water exists and how much is available.

AAPG Research LAUNCHER supporters receive

The opportunity to work directly with you and receive reports, information, and findings, depending on the level of support.

The Deal

The researcher agrees to:

- Develop a brief public presentation on the research to be made available to AAPG
- Share an annotated bibliography and review of relevant published articles
- Present research findings on project at an AAPG Forum, GTW, or Research Symposium
- Write a detailed report on the results of your research to be made available to LAUNCHER supporters
- Write an extended abstract on the results of your research to be made available to AAPG

Thank you for submitting your research proposal to the AAPG Research LAUNCHER Program. Your proposal will be reviewed and upon acceptance you will be contacted by AAPG Education/Research. If your proposal is accepted, we will publicize your proposal and encourage funders to contact you directly. AAPG does not guarantee funds nor have any connection with the success or failure of the endeavor. The goal is to support scientific research in the petroleum geosciences and engineering and launch the next generation of geological advances.

Theresa Jehn-Dellaport

Research Candidate (Print)

Date

6/20/14

AAPG Education/Research (Print)

Date

Theresa Jehn-Dellaport

Research Candidate (Sign)

Date

6/20/14

AAPG Education/Research (Sign)

Date

AAPG Education/Research

P.O. Box 979 | Tulsa, Oklahoma 74101, USA

Phone: 918-560-2650 | Fax: 918-560-2678

Email: educate@aapg.org

www.aapg.org