



The Colorado Professional Geologist



American Institute of Professional Geologists—Colorado Section

Colorado Section email: Colorado-aipg@outlook.com



Central City and Idaho Springs Field Trip

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of the
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2019 SECTION OFFICERS

The Board usually meets the first Tuesday of each month at 7:00 AM; all members are invited to attend. Please contact a Board Member to confirm time and location.

President Ronald W. Pritchett

Independent Geologist
9522 Brook Hill Drive, Lone Tree, CO 80124
303.919.6848
pritchett61@msn.com

President-elect Thomas A. Harp

Remediation Risk Reduction, LLC
138 Rudi Lane
Golden, Colorado 80403
303.903.4858
taharp55@gmail.com

Vice President Louis Bull

Waste Management Inc.
2400 W. Union Ave. Englewood, CO 80111
303.914.1400
lbull1@wm.com

Secretary Rick Allison

303.246.2117
geobrewer@yahoo.com

Treasurer Jessica Davey

4585 Zuni, Street
Denver, CO
720.394.4270
jdavey@mhausa.com

Editor James Russell

Summit Data Services, LLC
1909 Sage Circle
Golden, Co 80401
303.815.3901
summitdatasvcs@msn.com

Leg. & Reg. Ann Vasko

720.810.1942
avgivan@gmail.com

Advisors

Tom Van Arsdale

901.268.3323
tomgvansdale@gmail.com

Mark B. Mathisen

Roscoe Postle Associates
143 Union Blvd., Ste. 505, Lakewood, CO 80228
303.204.2464
mbmathisen@msn.com

Doug Peters

Peters Geosciences Golden, CO 80403
303.278.1540
dcpeters@tuveraexploration.com

Call for Articles

The Colorado Section of AIPG newsletter welcomes submission of technical or informational articles for publication. Articles may be submitted via e-mail to the editor at:

*summitdatasvcs@msn.com
(Microsoft Word format is preferred.)*

*James Russell
1909 Sage Circle, Golden, CO 80401*

Contact James at 303-278-4456
for additional information.

Change of email:

Change of email notices and other contact information changes for the CPG should be sent directly to:

AIPG National Headquarters
1333 West 120th Ave, Suite 211
Westminster, CO 80234
303-412-6205
Email: aipg@aipg.org

(The National Office maintains the address list for all.)

Letters, articles, announcements, ads, etc. must be received by the Editor by the **end of the fourth full week of the month preceding publication**. Letters, articles, ads, announcements, etc. accepted on a space available basis. Submission of articles, etc. via e-mail is the preferred method. Copy can be accepted in most PC formats, but DOC or DOCX are preferred. Call or e-mail James Russell for details on submission of copy or advertising at 303-815-3901, summitdatasvcs@msn.com.

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The opinions expressed are those of the authors and not the Colorado Section officers unless clearly stated otherwise.

Editor's Remarks

James Russell

As summer comes to a close, I hope all have had a successful field season. Field work inconveniences such as wild fires and bad weather have not been as bad as past years.

This issue includes clarifying information on AIPG's policy on advocacy, bylaw changes, pictures from our summer field trip and picnic, upcoming events, detailed information on two bills that were signed into law finally the second part of my discussion on Geological Data Sharing and Outreach Using Geospatial Technology.



Call for Articles

If you have any articles that you would like to share, please let me know (your editor).

National Youth Leadership Forum

On July 18th, in connection with the Society of Petroleum Engineers (SPE) – Denver Chapter, The National Youth Leadership Forum “Envision” Program organized an hour-long panel discussion with technology professionals.



(left-right adjacent picture: Ellen Scott, a petroleum engineer with Fracture ID; Kristi Steinhilber, a meteorologist with Applied Weather Associates; and Ron Pritchett representing Colorado AIPG and his background in the petroleum business.)

The meeting was held at the University of Denver – Sturm Hall, and 200 STEM students – middle-school aged 7th and 8th graders from all over the nation attended, as part of the National Youth Leadership Forum (NYLF) study program for these exceptional students. Students were “selected based on scholastic merit, scientific interest, community involvement, and leadership experience.” Students were provided brief background materials on the panelists. The meeting was an opportunity for panelists and students to engage in conversation; questions were impromptu after brief panelist introductions. Questions for panelists included: “What influenced you to go into the profession you are in now?” and “What are we going to do about climate change?” and “What were some of your biggest challenges in your career?”

Ellen and Kristi emphasized the usefulness of their basic STEM training, especially physics, math, and chemistry, for it prepared them for a wide variety of employment. Ron emphasized the need to learn a variety of disciplines, for both “hard” and “soft” skills interact to give students a better ability to adapt in swiftly changing environments. All of us admitted surprising turns in our careers, including setbacks. We agree that STEM training, and continuing education for a blend of skills will allow students to find useful careers in decades ahead.

There will be future opportunities to engage with STEM students. Our various professional societies, including SPE and AIPG, should actively pursue meetings where geoprofessionals get to talk in a personal way about the important role of professional societies and issues of importance to students.

Changes to Colorado Section Bylaws

The Executive Committee of the Colorado Section of AIPG made several changes to the Section bylaws concerning membership at its January 8, 2019 meeting. After feedback from the AIPG National Executive Committee, the Colorado Section made additional changes to the Section Bylaws. The following changes have been approved by both the Colorado and National Executive Committees and went into effect June 29, 2019:

Delete the Vice President's position. This proposal required several changes to remove the Vice President office from the bylaws and reassign its duties to the President-Elect. The duties of the Vice President in the current Bylaws are to (1) assume the duties of the President in the President's absence or incapacity and (2) to serve as the program chair arranging for speakers at monthly meetings. In practice in recent years, the President-elect rather than the Vice President has assumed the President's duties in the President's absence or incapacity.

The Section has been unable to hold regular meetings for some years primarily due to the fact that a large percentage of the membership no longer works in downtown Denver and so such meetings are no longer scheduled.

Increase the number of Advisors from 3 to 4. Increasing the number of Advisors from 3 to 4 maintains the number of voting members on the Executive Committee, while eliminating the Vice President.

Encourage at least one voting member of the ExCom be a Young Professional Member. Encouraging at least one voting member be a Young Professional aligns with the Colorado Section and National goals to engage with Young Professionals and develop their membership and participation. Encouraging a Young Professional be a voting member states our desire to have Young Professional representation on the Committee, but does not obligate the Executive Committee to seat a Young Professional Member if no candidates can be found.

Require that all members of the Screening Committee be CPGs. The National AIPG Bylaws, Section 7.2.5, require that all members of a Section screening committees be CPGs because only applicants for Certification are screened. This change adds this requirement to the Colorado Section's Bylaws for purposes of clarity.

Require that the offices of President and President-Elect be held by a Professional Member or a Certified Professional Geologist. This change does not disallow a Young Professional to hold these offices, but the Young Professional would need to register as a Professional Member.

All Colorado Section Members may access the current and past Section Bylaws in the Section Dropbox at: <https://www.dropbox.com/s/agfh7gah7w28sz8/2019COSectionBylaws2-5-19.pdf?dl=0>

Contact Rick Allison, Colorado Section Secretary, or any Colorado Executive Committee Officer with questions regarding the bylaws.

AIPG Policy on Advocacy
(Adopted July 12, 1986)
(<http://aipg.org/policies#Advocacy>, 8/4/19)

AIPG is an association of professional geologists organized in part to strengthen the geological sciences as a profession. Individual Members of the Institute share a collective sense of responsibility to assure that geological research and expertise are made available to benefit all mankind. AIPG encourages its Members to exercise their personal sense of responsibility and values in individually addressing current political and social issues.

Accordingly, the following policies will guide AIPG when it speaks on public issues.

- The Institute has a responsibility to its Members to adopt positions of advocacy on public issues involving the geological sciences or their application to public issues. Such advocacy will be based solely on the merit of each issue and the needs of the public.
- To the extent that the understanding and application of geology is relevant, AIPG will offer to make information available to all parties interested in the issue.
- The Institute will not take or advocate public positions in its name on judgmental issues that extend beyond the professional practice of geology.

Public positions adopted by AIPG, and statements issued on its behalf, must be based on sound evidence and must reflect the opinions of its Members, consistent with an appropriate poll of Section or Institute Members.

Methods and Choices for the Institute to Provide Information

AIPG may provide input into the legislative process in a variety of ways that are described below. The President and/or the Executive Committee will consider the appropriateness of each option in each individual case.

Option 1: AIPG-endorsed testimony

This is an official opinion based on a review, endorsement, and poll of Members or Sections. It may be presented:

- a. In person by an officer or official representative of the Institute, or
- b. In written form.

Option 2: AIPG may arrange for testimony, written or oral, to be given by a knowledgeable Member in his or her own name.

This can be accomplished through the President, Section presidents, or the Governmental Affairs Committee. One or more qualified Members may be selected to present a statement or testimony. Expert testimony is useful in providing a government body with factual data from a reputable source and does not commit the Institute to endorsement of the testimony.

Because this option can be quickly arranged, it may be used by the Institute in response to requests for expert testimony. The Member presenting testimony may be asked to state that his or her appearance: "Has been arranged by the American Institute of Professional Geologists, but that AIPG does not necessarily endorse or sponsor these remarks."

Option 3: AIPG may join with other interested groups in development and presentation of testimony about matters of mutual concern.

AIPG may take joint action with or endorse a position of other scientific or professional societies. An officially-designated representative of AIPG, working with similarly appointed persons from other societies, may agree to a jointly-developed statement on some issue.

Quality vs. Quantity of Responses

Because of the volume of proposals for legislation and agency regulations each year, it is impractical and counter-productive for AIPG to attempt to address every bill that has implications for geologists. The Institute finds it more productive to review the merits of pending issues, prioritize in order of significance to the geoscience community, and concentrate its efforts on those policies of greatest impact. The opinions of Sections must help guide these efforts.

CO-AIPG 2019 Annual Field Trip Central City and Idaho Springs Mining Districts

Douglas C. Peters, CPG-8274

CO-AIPG held its annual field trip on June 29, this time to the Central City and Idaho Springs mining districts west of Denver. The trip leaders were Jim Russell and Larry James. Jim had worked for Gilpin County in Central City as their GIS Specialist. One of his projects was to pull together mine maps of the Central City District (at least within the county boundaries). He also created 3D models of the mines using those maps, and so had an intimate knowledge of where the mine openings existed and interconnections between the mines. Larry has worked for many years on the geology and mining of the two interconnected districts, including time as the manager of one of the old mills in Black Hawk (pre-gambling days).

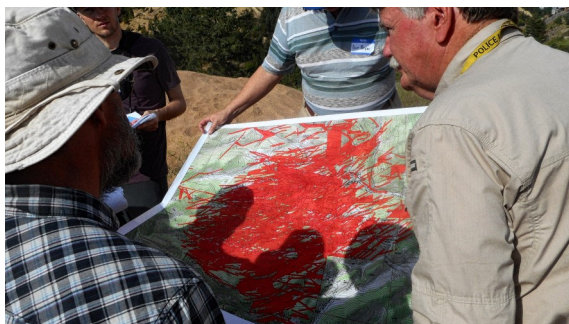
The first trip stop was at the southeast edge of the Central City District to do a geologic overview of the area and discuss things such as the old placer mines and a current tourist placer operation. The second stop was at an overlook in Central City that provided an excellent view of the trends of mines along the major veins on the east side of the district and views of both Central City and Black Hawk.

The third stop was at the Hidee Mine to the southwest of Central City along the Parkway. This is primarily a tour mine to show how veins were followed and intersected and the old mining equipment. This is perhaps the only place in either district where a significant vein is exposed and available for sampling by tour participants. However, the mine staff also are preparing to re-open the old workings below and adjacent to the tour mine over 2019 and 2020 and make it a small, producing gold mine.

The fourth stop was a two-part location in the western part of the district, with the first stop being at the Wood Mine on Alps Hill and the second stop being at the Old Town Mine on the south side of Russell Gulch. Both were gold mines, but also had some production of uranium which was used to produce radium. Fred Solheim, who arranged for permission to visit the Wood Mine, provided multiple scintillometers for trip participants to carry around the waste dumps to see variations in radioactivity. Fred even found a chunk of waste rock in the Old Town Mine dump just below the surface that had a coating of sooty pitchblende and significant response on the scintillometer.

The fifth stop was lunch and lively discussion at a city picnic shelter in Idaho Springs, across Clear Creek from the Argo Water Treatment Plant. After that break and a cooling rain storm, the trip continued with a stop at the Stanley Mine on the south edge of the Idaho Springs District along Clear Creek. This mine was relatively extensive on both sides of Clear Creek and was known for the high volumes of ground water that had to be pumped to keep the mine accessible below the creek level.

The last stop of the day was at the Argo Mill and Tunnel in Idaho Springs, thereby taking the sequence of stops through a series from general geology to specific mine and vein examples and to the processing of ores from the two districts. The guided tour of the tunnel and mill was most informative about both general mining and history of the area as well as the specific processes used in the mill to liberate and extract gold and silver from ores. Amazingly, as few as 5 people could fully run the large mill. Both the Hidee and Argo tours are recommended for anyone interested in the history and vein geology of the districts!



Central City Mining District Land Ownership Discussion



Hidee Mine Tour



Argo Gold Mill



Argo Gold Mill Interior

Mining-4-Beer Networking Event

Douglas C. Peters, CPG-8274

The Second Anniversary Mining-4-Beer networking event was held July 25 at the Zuni Street Brewing Co. in Denver. These events were started by Trevor Howard of Lakewood as a means of informally getting members of the mining and minerals community together to chat and make connections. This being the 2nd Anniversary meant it was a little more formalized, with tickets to cover basic costs and allow everyone one ticketed drink and food from a food truck at the brewery. They also had a speaker, Dave Cole (CEO EMX Royalties), who gave some views on the mining industry and financing for exploration projects. The attendees were about evenly split between young professionals and older members of the industry.

The Colorado Section of AIPG participated as an informal sponsor of the event, the first time we were officially involved in the Mining-4-Beer series of events. The new organizer of the events, Kelly Ward, is aiming to have them monthly going forward. Another was held at the Baere Brewing Co. in Denver on August 29. CO-AIPG looks forward to participating in more of these events in the coming months.



Speaker Dave Cole of EMX Royalties

Mining-4-Beer Networking Event (continued)



Lively discussions among participants at the Mining-4-Beer



**2019 Annual Picnic Photos
August 24, 2019
Beer and Burgers!
Thank You Jessica!**



Geoscience Careers in the Petroleum Industry
Wednesday, 18 September 2019, 11 a.m. MDT

Registration:

<https://register.gotowebinar.com/register/3422063214384043523>

About the Webinar

This two-part presentation will provide a high-level review of what geoscientists do and information about starting a career in the petroleum industry. In part one, the presenter will give a short bio describing his experience and then he will talk about the petroleum industry, a major employer of geoscientists. He will introduce you to the life cycle on an asset (field) and then focus on petroleum exploration. Fred will use a series of questions to illustrate the types of challenges a geoscientist faces each day. In part two, Maryevalyn will cover what to expect when starting a career in the oil & gas industry, as well as how to transition from being a full-time student to an early career professional. She will discuss the geoscience technician hiring process at ExxonMobil and key skills, experiences, and characteristics recruiters search for in geology majors. Maryevalyn will also describe her personal experience with the company and what she loves most about her career.

Upcoming Events

Principles of Hydraulic Fracturing

by PTTC Rockies

Mon, Oct 14, 2019, 8:30 AM –

Tue, Oct 15, 2019, 5:00 PM MDT

Fort Lewis College, Student Union 103

1000 Rim Drive

Durango, CO 81301

Course Objectives

This two-day short course is directed at engineering and geoscience professionals involved in hydraulic fracture stimulation of oil and gas wells. The primary focus is stimulation design for tight gas and unconventional reservoirs, but the topics covered apply generally to hydraulic fracture stimulation of all reservoirs. Specific topics include rock mechanics, stresses, modeling, perforating for stimulation, fracture fluid rheology, predicting conductivity, pre-treatment injection tests, proppant transport, and horizontal well stimulation. The main course objective is to review and discuss topics critical for optimizing hydraulic fracturing treatments.

<https://www.eventbrite.com/e/principles-of-hydraulic-fracturing-tickets-69361639531>

Upcoming Events (Continued)

Oil and Gas Property Valuation

PTTC Rockies

Tuesday, November 12, 2019 from 8:30 AM to 5:00 PM (MST)
Colorado School of Mines
1600 Maple Street
Ben Parker Student Center - Ballroom C
Golden, CO 80401

The valuation of oil and gas properties has rapidly developed into one of the most important skills within the energy sector. This course aims to introduce individuals to a basic workflow that will allow them to take raw data and develop an opinion of value for oil and gas acreage. The focus will be on-shore U.S. unconventional resources. Valuations will be considered from both the standpoint of operators and royalty owners. Topics to be discussed are: the role of geology in valuations, forecasting production, commodity prices, development plans, defining risk, quantifying uncertainty, and the construction of discounted cash flows. All of these topics could be a course in their own right and this workshop does not aim to make participants experts in any one of the above topics. Rather, it aims to bring all these concepts together in a practical workflow, providing the participant guidance for future investigation. It should also help give technical experts context of how their day-to-day work affects business decisions. This is an introductory class and is not meant for individuals that are already familiar with oil and gas property valuation. The class encourages participants to bring their own computer, as some of the exercises will involve building simple cash flows in Excel.

RMAG/DWLS Fall Symposium

Multiscale Imaging for Reservoir Optimization

October 22, 2019 | Sheraton Denver West

Registration:

<http://www.rmag.org/index.php?cid=57613&&forward=25&&curlid=28>

The Rocky Mountain Association of Geologists and the Denver Well Logging Society are teaming up again to present the 2019 Fall Symposium on October 22, 2019 at the Sheraton Denver West! The technical program will be organized topically and will provide cross-disciplinary collaboration between our two societies.

Details:

Date/Time: October 22, 2019 / 8am-4pm, with an evening reception afterwards

Location: Sheraton Denver West (360 Union Blvd., Lakewood 80228)

Food: A breakfast/coffee bar and lunch will be served

Pricing:

RMAG & DWLS members, early bird (through Oct. 1): \$225; after Oct. 1: \$250

Non-members: \$275

Wednesday Luncheons

Time: 11:15 check-in; 12pm lunch; 12:20 talk

Location: Maggiano's Little Italy

Price: Members: \$35; Non-members: \$40; Talk only: \$15

October 2, 2019 | Matthew Belobraydic: "Geology at the Crossroads of the Future"

[Register for October Luncheon](#) | [Download abstract and bio](#)

Geology at the Crossroads of the Future

Speaker: Matthew Belobraydic

“With their four-dimensional minds, and in their interdisciplinary ultra-verbal way, geologists can wiggle out of almost anything.” – John McPhee

As the oil and gas industry moves to more data driven solutions through big data, cloud solutions, and artificial intelligence, geoscientists are poised to step deeper into the lead integrator role. Combining different scales, vintages, and sources of data is a requirement to maximize ROI in oil and gas fields and plays. Gone are the days of siloed teams. With cheap data storage and faster model realizations, multiple working hypotheses can be tested utilizing multidomain interpretations that can be integrated back into analyses, creating a positive feedback loop to identify true play and basin drivers, quantify uncertainties, and minimize risk.

Cloud computing, artificial intelligence, and new correlation methods are making it easier to find well locations, targets, and design completion strategies that provide the most economic advantageous way to extract hydrocarbons. Data scientists are creating new ways to make tedious parts of interpretations more automated, leading to a larger amount of data available to incorporate into interpretations. Correlations and results, however, may not make sense without being "groundtruthed" with real world geologic knowledge.

Through integrated teams and the increase in available data and interpretations, geologists are in a unique position to "wiggle" into the role of leading the data science revolution currently underway in the petroleum industry. Using the Bakken and Three Forks plays in the Williston Basin as an example, the geologic domain as the integration platform for petrophysics, geomechanics, production and stimulation engineering, reservoir engineering, management, and (of course) geology will be demonstrated.

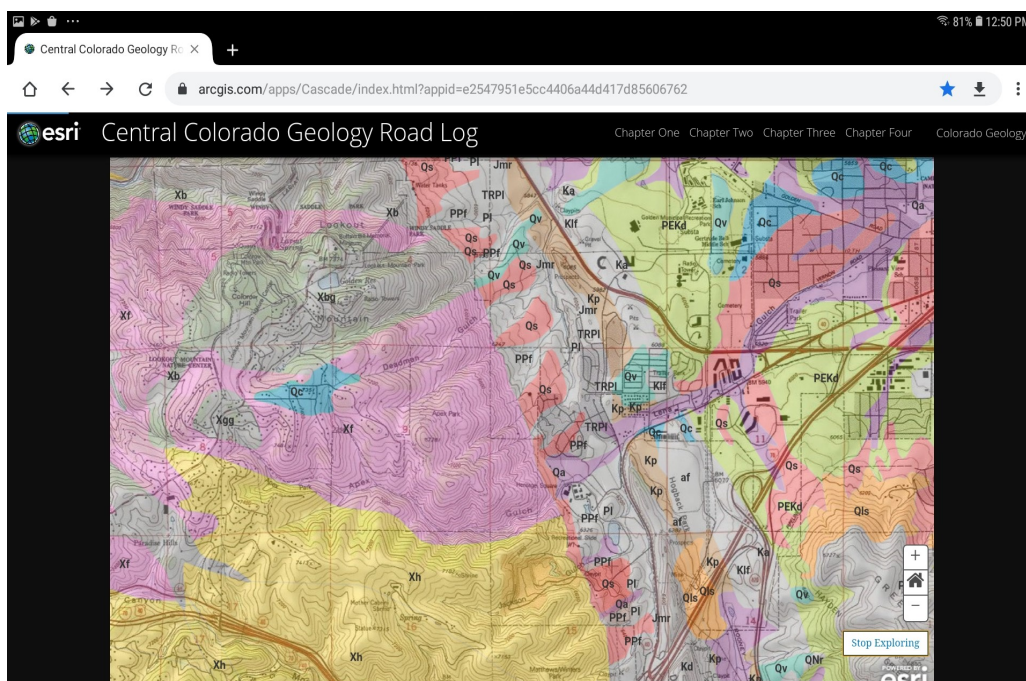
Geological Data Sharing and Outreach Using Geospatial Technology (Part 2)

James Russell, CPG

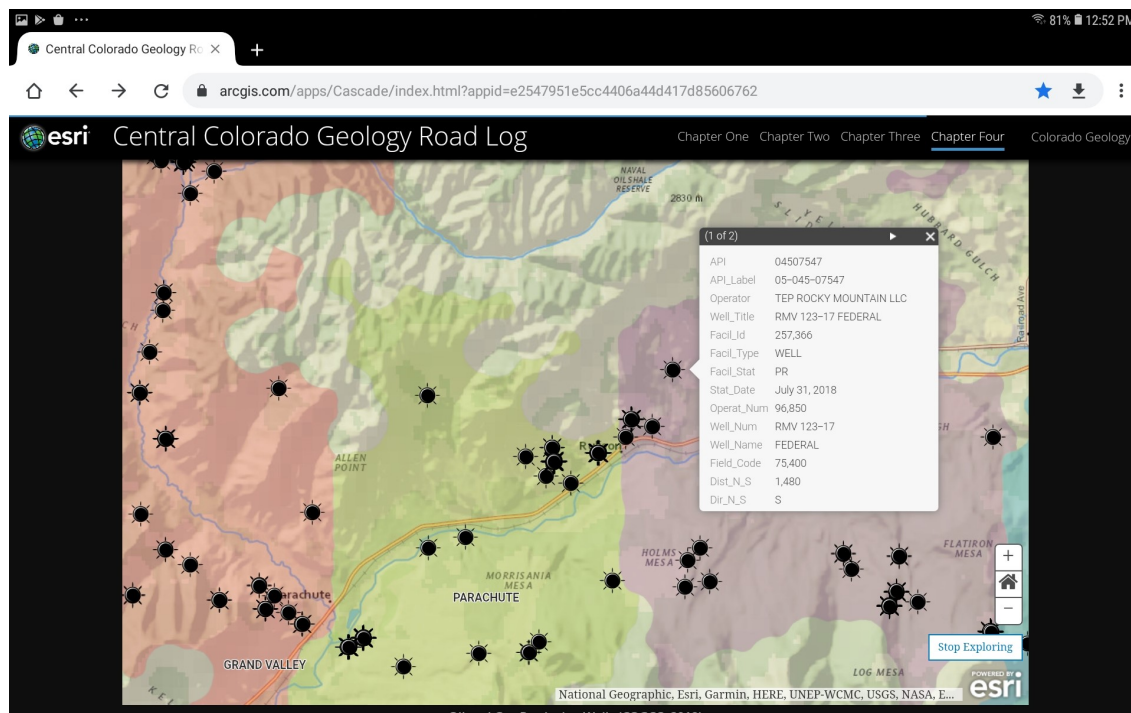
In the last newsletter I showed a cascade story map that incorporated a geological road log in a new digital format. The incorporation of color geological maps, photographs, and GIS enabled dynamic maps are major enhancements to the old style paper road log. It also allows for updates and additions when they are available.

This new approach uses a server in the cloud that stores an application and data relating to a geological road log in a format that detects and adjusts to either a cell phone, tablet or laptop form factor depending upon the user's hardware. As I described in the last newsletter, this type of application is available free to users and a free public account from ESRI is available to develop new road log and map applications. The only constraint is that a free public account has a capacity limitation (2Gb). This constraint for most developers is not a major issue. Either a commercial license or a current ArcMap/ArcGIS Pro license under maintenance is required for significantly larger applications.

The only other requirement is access to the Internet. I currently use a cell phone as a hotspot for my tablet. This works well for the vast majority of areas where the road log follows an Interstate or State highway. Other GIS-enabled software used to collect data without an Internet link such as ESRI's Data Collector are a different type of application and are not a part of this discussion. Creating a Cascade Story map of this type is not terribly difficult but it does require some basic knowledge of Geographic Information Systems (GIS). A cascade story map is not a Power Point or Pdf type of file but is an application running remotely by the user through a hyperlink on a Chrome browser. There is no software to install. All a person needs to do is copy/paste the URL into a Chrome browser and select 'Enter'



Dynamic Golden Geology Map (Tablet View)



Dynamic Oil/Gas Wells of the Piceance Basin (Tablet View)

There is little in the way of instructions because it is not needed. Just scroll down to access the log. There is a 'table of contents' at the top of the application which allows the user to jump to the chapters. Just click on one and it will take you there.

The geologic road log for central Colorado is a work in progress and will have new material and new functionality added over time.

The geological road log can now be accessed at the following URL:

<https://www.arcgis.com/apps/Cascade/index.html?appid=e2547951e5cc4406a44d417d85606762>

Give it a try with a Chrome browser. Constructive feedback is always welcome. It is possible to create your own logs. ESRI has tutorials online at their ArcGIS Online website at:

<https://learn.arcgis.com/en/projects/get-started-with-arcgis-online>

Recent Bills from the Colorado House and Senate

Two bills that could have an impact on the extractive industries in Colorado are Senate bill **SB-19-181**, 'Concerning Additional Public Welfare Protections Regarding the Conduct of Oil and Gas Operations, and in Connection Therewith, Making and Appropriation.' and House bill **HB-19-1113**, 'Concerning the Protection of Water Quality From Adverse Impacts Caused by Mineral' and Senate Bill , The following are summaries from these bills from the Colorado Assembly web page. *Sorry in advance about the length of these 'summaries'. They are a bit long.*

SB-19-181

Oil and gas operations - air quality regulation - local government authority - oil and gas conservation commission - composition - authority - financial assurance requirements - pooling - appropriation. The act prioritizes the protection of public safety, health, welfare, and the environment in the regulation of the oil and gas industry by modifying the oil and gas statutes and by clarifying, reinforcing, or establishing various aspects of local governments' regulatory authority over the surface impacts of oil and gas development.

Current law specifies that local governments have so-called "House Bill 1041" powers, which are a type of land use authority over oil and gas mineral extraction areas, only if the Colorado oil and gas conservation commission (commission) has identified a specific area for designation. Sections 1 and 2 of the act repeal that limitation.

Section 3 directs the air quality control commission to review its rules to consider whether to adopt more stringent rules and to adopt rules to minimize emissions of methane and other hydrocarbons, volatile organic compounds, and oxides of nitrogen.

Section 4 clarifies that local governments have land use authority to regulate the siting of oil and gas locations to minimize adverse impacts to public safety, health, welfare, and the environment and to regulate land use and surface impacts, including the ability to inspect oil and gas facilities; impose fines for leaks, spills, and emissions; and impose fees on operators or owners to cover the reasonably foreseeable direct and indirect costs of permitting and regulation and the costs of any monitoring and inspection program necessary to address the impacts of development and enforce local governmental requirements. Section 4 also allows a local government or oil and gas operator to request the director of the commission to convene a technical review board to evaluate the effect of the local government's preliminary or final determination on the operator's application.

Section 5 repeals an exemption for oil and gas production from counties' authority to regulate noise.

The remaining substantive sections of the act amend the "Oil and Gas Conservation Act" (Act). The legislative declaration for the Act states that it is in the public interest to "foster" the development of oil and gas resources in a manner "consistent" with the protection of public health, safety, and welfare, including protection of the environment and wildlife resources; this has been construed to impose a balancing test between fostering oil and gas development and protecting public health, safety, and welfare. Section 6 states that the public interest is to "regulate" oil and gas development to "protect" those values.

Currently, the Act defines "waste" to include a diminution in the quantity of oil or gas that ultimately may be produced. Section 7 excludes from that definition the nonproduction of oil or gas as necessary to protect public health, safety, welfare, the environment, or wildlife resources. Section 7 also repeals the requirement that the commission take into consideration cost-effectiveness and technical feasibility with regard to actions and decisions taken to minimize adverse impacts and repeals the limitation of the term "minimize adverse impacts" to wildlife resources.

The 9-member commission currently includes the executive directors of the departments of natural resources and public health and environment as ex officio members, 3 members who must have substantial experience in the oil and gas industry, and one member who must have training or experience in environmental or wildlife protection. Section 8 reduces the number of industry members to one and requires one member with training or substantial experience in wildlife protection; one member with training or substantial experience in environmental protection; one member with training or substantial experience in soil conservation or reclamation or technical expertise relevant to the issues considered by the commission; one member who is an active agricultural producer or a royalty owner; and one member with training or substantial experience in public health. This version of the commission is repealed on the earlier of July 1, 2020, or the date on which 3 specific rules promulgated by the commission have become effective. On that date, section 9, which creates a professional 5-member commission (along with the 2 ex officio executive directors), becomes effective.

Section 10 requires the director of the commission to hire up to 2 deputy directors. Upon receipt of a request for a technical review, the director is required to appoint technical review board members.

The Act currently specifies that the commission has exclusive authority relating to the conservation of oil or gas. Section 11 clarifies that nothing in the Act alters, impairs, or negates the authority of:

- The air quality control commission to regulate the air pollution associated with oil and gas operations;
- The water quality control commission to regulate the discharge of water pollutants from oil and gas operations;
- The state board of health to regulate the disposal of naturally occurring radioactive materials and technologically enhanced naturally occurring radioactive materials from oil and gas operations;
- The solid and hazardous waste commission to regulate the disposal of hazardous waste and exploration and production waste from oil and gas operations; or
- A local government to regulate land use related to oil and gas operations, including specifically the siting of an oil and gas location.

Currently, an operator first gets a permit from the commission to drill one or more wells within a drilling unit, which is located within a defined area, and then notifies the applicable local government of the proposed development and seeks any necessary local government approval. Section 12 requires operators to file, with the application for a permit to drill, either: Proof that the operator has already filed an application with the affected local government to approve the siting of the proposed oil and gas location and of the local government's disposition of the application; or proof that the affected local

government does not regulate the siting of oil and gas locations. Section 12 also specifies that, until the commission has promulgated rules regarding 3 specific topics and the rules have become effective, the director may delay the final determination regarding a permit if the director, following a public comment period, determines that the permit requires additional analysis

to ensure the protection of public health, safety, and welfare or the environment or requires additional local government or other state agency consultation. Pursuant to commission rule, an operator may submit a statewide blanket financial assurance of \$60,000 for fewer than 100 wells or \$100,000 for 100 or more wells. Section 12 directs the commission to adopt rules that require financial assurance sufficient to

provide adequate coverage for all applicable requirements of the Act. Current law allows the commission to set numerous fees used to administer the Act and sets a \$200 or \$100 cap on the fees. Section 12 eliminates the caps and requires the commission to set a permit application fee in an amount sufficient to recover the commission's reasonably foreseeable direct and indirect costs in conducting the analysis necessary to assure that permitted operations will be conducted in compliance with all applicable requirements of the Act. Current law allows the commission to set numerous fees used to administer the Act and sets a \$200 or \$100 cap on the fees. Section 12 eliminates the caps and requires the commission to set a permit application fee in an amount sufficient to recover the commission's reasonably foreseeable direct and indirect costs in conducting the analysis necessary to assure that permitted operations will be conducted in compliance with all applicable requirements of the Act.

Current law gives the commission the authority to regulate oil and gas operations so as to prevent and mitigate "significant" adverse environmental impacts to the extent necessary to protect public health, safety, and welfare, taking into consideration cost-effectiveness and technical feasibility. Section 12 requires the commission to protect and minimize adverse impacts to public health, safety, and welfare, the environment, and wildlife resources and protect against adverse environmental impacts on any air, water, soil, or biological resource resulting from oil and gas operations. Section 12 also requires the commission to adopt rules that require alternate location analyses for oil and gas facilities that are proposed to be located near populated areas and that evaluate and address the cumulative impacts of oil and gas development. Finally, Section 12 directs the commission to promulgate rules to:

- Ensure proper wellbore integrity of all oil and gas production wells, including the use of nondestructive testing of weld joints and requiring certification of several categories of oil and gas workers;
- Allow public disclosure of flowline information and to evaluate and determine when a deactivated flowline must be inspected before being reactivated; and
- Evaluate and determine when inactive, temporarily abandoned, and shut-in wells must be inspected before being put into production or used for injection.

Section 13 modifies the commission's administrative procedures, including by taking into account determinations made by administrative law judges.

Current law authorizes "forced" or "statutory" pooling, a process by which "any interested person", typically an operator who has at least one lease or royalty interest, may apply to the commission for an order to pool oil and gas resources located within a particularly identified drilling unit. After giving notice to interested parties and holding a hearing, the commission can adopt a pooling order to require an owner of oil and gas resources within the drilling unit who has not consented to the application (non-

nonconsenting owner) to allow the operator to produce the oil and gas within the drilling unit notwithstanding the owner's lack of consent. Section 14 requires that the owners of more than 45% of the mineral interests to be pooled must have joined in the application for a pooling order and that the application include either: Proof that the applicant has already filed an application with the affected local government to approve the siting of the proposed oil and gas facilities and of the local government's disposition of the application; or proof that the affected local government does not regulate the siting of oil and gas facilities. Section 14 also specifies that the operator cannot use the surface owned by a nonconsenting owner without permission from the nonconsenting owner.

Current law also sets the royalty that a nonconsenting owner is entitled to receive at 12.5% of the full royalty rate until the consenting owners have been fully reimbursed (out of the remaining 87.5% of the nonconsenting owner's royalty) for their costs. Section 14 raises a nonconsenting owner's royalty rate during this pay-back period from 12.5% to 13% for gas and 16% for oil and makes corresponding reductions of the portions of the nonconsenting owner's royalty from which the consenting owners' costs are paid.

Current law requires the commission to ensure that the 2-year average of the unobligated portion of the oil and gas conservation and environmental response fund does not exceed \$6 million and that there is an adequate balance in the environmental response fund does not exceed \$6 million and that there is an adequate balance in the environmental response account in the fund to address environmental response needs. Section 15 directs the commission to ensure that the unobligated portion of the fund does not exceed 50% of total appropriations from the fund for the upcoming fiscal year and that there is an adequate balance in the account to support the operations of the commission and to address environmental response needs.

Section 16 specifies that for permit-specific conditions for wildlife habitat protection, the commission is required to consult with and obtain consent from a surface owner only if the permit-specific conditions directly impact the affected surface owner's property or use of that property.

Section 17 amends preemption law by specifying that both state agencies and local governments have authority to regulate oil and gas operations and establishes that local government requirements may be more protective or stricter than state requirements.

Section 18 appropriates \$851,010 to the department of natural resources to implement the act.

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Current law does not address reliance on perpetual water treatment as the means to minimize impacts to water quality in a reclamation plan for a mining operation. **Section 1** of the bill requires most reclamation plans to demonstrate, by substantial evidence, a reasonably foreseeable end date for any water quality treatment necessary to ensure compliance with applicable water quality standards.

Current law allows a mining permittee to submit an audited financial statement as proof that the operator has sufficient funds to meet its reclamation liabilities in lieu of a bond or other financial assurance. **Section 2** eliminates this self-bonding option and also requires that all reclamation bonds include financial assurances in an amount sufficient to protect water quality, including costs for any necessary treatment and monitoring costs.



David M. Abbott, Jr.
Consulting Geologist LLC

AIPG CPG, FAusIMM, EurGeol, PG-TX, UT, WY

evaluating natural resources, disclosures about them,
5055 Tamarac Street Tel: 303-394-0321

dimageol@msn.com



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Douglas C. Peters

AIPG-CPG #8274
L.P.G. PA #2365, TX #5972
UT#2250, WA#396, WY#367

825 Raptor Point Road
Golden, CO 80403-8881

Voice: 303-278-1540

Fax: 303-463-0573

dcpeters@arnevutresources.com

Are you interested in learning more about
oil and gas development? Contact us to request
an informational presentation:

ambassador@anadarko.com



Colorado Section email:
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USA

2201 Kipling Street, Suite 150
Lakewood CO, 80215 303-423-8475

Canada

1030 West Georgia Street, Suite 1112
Vancouver BC, V6E 2Y3 604-830-8334