

Geologically Speaking

A Michigan Section AIPG Publication

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Regulatory Roundup

Field Trip Guide: The Rockport Quarry

Environmental Risk Management Workshop Call for Abstracts!

Section Officers

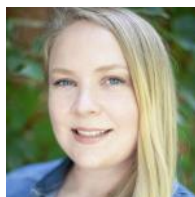
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Front Cover: Lake Superior Shoreline with beach pebbles about 15 miles east of Grand Marais. Photo taken by Sara Pearson in October 2022.

The logo for WSP GOLDER, with 'WSP' in a stylized white font and 'GOLDER' in a clean, sans-serif white font, set against a red background.

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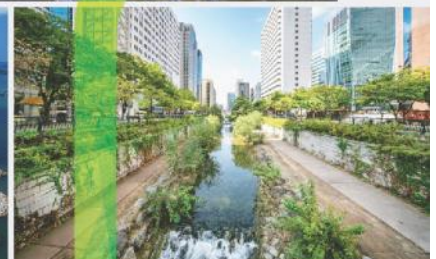
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Geology Crossword #10 Solution

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Across

1. No crocodiles here
4. Very dry climate
5. Prehistoric cockroach
7. Black, gassy shale
8. Common evaporite
12. Mid-Devonian Epoch
13. Not a submarine
15. Equivalent to Berea & Bedford
17. ___ and them
19. Paternal predecessor
20. Third state of matter
22. The Mackinac Br. caissons were built here
24. Nail polish color
25. Formed when halite beds dissolved

Down

- 1 Together in Motown
2. Magnesium rich evaporite
3. A former consulting company
4. Has an atomic mass of 95
6. "Winged" fossil
9. Not a salad dressing
10. Of caves and sinkholes
11. A cherty limestone
14. Early Devonian Epoch
16. Quarry off M-32 near Alpena
18. The Sylvania
21. The only Devonian waterfall in MI
23. e.g. crude

From the President's Desk

Happy Fall AIPG Members. As another year comes to an end, there are still opportunities for you to be involved with the Michigan Section. Every year at the Michigan Section Annual Meeting at Weber's in Ann Arbor, the Section awards hardworking members and nonmembers for the dedication to the Section and Geology. I strongly encourage you to nominate one of your colleagues for one of our awards. The award nomination form can be found here: <http://mi.aipg.org/awards.htm>. Please submit your nominations for awards to me at MellisaLPowers@gmail.com by November 25, 2022. The awards categories include:

- Significant Contribution to the Michigan Section
- Outstanding Geologist
- Legislative
- Outstanding Regulatory
- Outstanding Educator

I would like to thank you all for the opportunity to serve the chapter over the past four years. It has been an amazing experience. I am grateful to all of the other officers I have had the opportunity to serve with. Their dedication and hard work reminds me of why this organization is so important to me. I hope you all have a great holiday season and I hope to see you at the Annual Meeting in December!

Mellisa Powers-Taylor

Check Out the AIPG Mentoring Program

Mentoring is an experience that promotes personal growth, creates meaningful connections, and sparks creative innovations. AIPG offers an opportunity to connect mentees with mentors. To sign up for the program is easy and can be done when paying your annual dues or updating your online profile. You may check the box on your paper dues renewal form that you send in via mail or log into your account at www.aipg.org and update your member profile. Be sure to check whether you would like to be a mentor or mentee and the fields of expertise. The system allows individuals to search for people with similar interests and connect via email. Check it out today!

I Want To Publish Your Articles!



Hey everyone, I would like to encourage you to submit your articles for publication! As the Michigan Section Editor, and also the 2021-24 National Editor, I am working to put together two top-quality publications for our members. This is not a one person job. This is where you come in. I welcome your technical articles, case

studies, opinion pieces, mini field guides, and letters to the Editor.

The guidelines are pretty simple for articles for *Geologically Speaking*. All submissions must be professional and may not violate the AIPG code of ethics. They also may not have been submitted for publication elsewhere.

While most submissions will be accepted, we do not accept articles that are a sales pitch for a product or company.

The deadline for submitting articles for *TPG* is two months before the start of the quarter for which the *TPG* edition is published. Thus, February 1 is the deadline for the Apr/May/June edition.

Please submit your articles of no more than 3,200 words in MS Word format directly to me or to Dorothy Combs at National Headquarters at aipg@aipg.org. All graphics (photos, figures, or tables) should be submitted in .jpg, .tiff or other standard format at 300 dpi. Please ensure your graphics are clean and easy to read to make things easier for the editorial staff. Complete information on submitting an article may be found on National's website at: <https://aipg.org/page/TPGInformation>.

IDENTIFYING AND RESOLVING PFAS ISSUES FOR 20 YEARS



Per- and polyfluoroalkyl substances (PFAS) are extremely mobile in water, leading to widespread contamination. Long-term use of PFAS chemicals have resulted in contamination of land, groundwater and surface water resources which can threaten water supplies.

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- Worldwide experience in PFAS investigation, risk assessment and treatment
- Conducted largest PFAS investigation ever performed with 15,000 samples, investigating 80 mile segment of river

Secretary's Report

The Michigan section AIPG Executive Committee meets about every month on the first Friday with a few deviations due to schedules. During the monthly one-hour meetings, Executive Committee board members have discussed and planned various topics, highlighted by month below:

January- Website Updates /Committee Chairs

Based on membership feedback, the current MI AIPG website is generally not helpful and is outdated with broken links. The executive committee discussed adding the bylaws, updating the past president list, fixing broken links, and working to move to another host server to provide a more helpful, updated, website to better server members. This move will allow more flexibility in updating content directly, rather than going through National as the last website hosted on the old National server location. The executive committee discussed current subcommittee chairs and modifications. No objections were made the chair modifications for 2022.

February- Student Liaison Committee and National Meeting Planning

ECP Joe Swarz reported he has been coordinating with student chapters to send out information such as job posting, scholarships, and discussed planning for an updated version of the meet-a-professional meeting. It was reported by Newsletter editor Adam Heft that the National planning committee continued to meet to discuss the upcoming National meeting to be held in Marquette, Michigan, and specifically provided details on the many field trips that were planned.

March- Approved Budget/Website Funding and Management Plan

The Executive Committee voted to approve the 2022 budget as discussed in a separate budget discussion meeting. Discussion continued concerning the cost saving and enhanced services that would come with a new website platform. The cost of a new website platform was approved within the new budget, and Vice President Kalan Briggs and Secretary Ashley Miller planned to meet to discuss the framework for development and management.

April- Money Moves

Treasurer Poonam Rameshbabu reported that the Section's 2021 taxes were completed and spearheaded a consultation with National to discuss investment options for money currently in the money market account.

May- More Website and National Updates

Following investigation and research on cost, services, and relative ease for set up and maintenance, Vice President Kalan Briggs and Secretary Ashley Miller suggested using the platform Wild Apricot for the development of a new MI AIPG section website. It is reported that the current payment service Eventbrite is cutting services; however, with the time of year and list of current scheduled events, cost savings from a new website platform that includes a payment service will not be seen until next year. Newsletter Editor Adam Heft reported that the National planning committee continued to meet and have received abstracts, sponsorships, and exhibitor interest.

June- Investment Options

Treasurer Poonam Rameshbabu and Newsletter Editor Adam Heft met with Dave Rhode of RBC to discuss investment options under the same AIPG roof as National instead of allowing the money to sit in the current money market account. A scholarship application for the Andrew Mozzola scholarship was awaiting consensus prior to recipient notification.

July- Summer Hiatus

The Executive Committee did not meet.

August- More Money Moves, Student Chapter Award, and Committee Bylaws

A motion to transfer money from the money market account to the checking account, and close the money market account for investment purposes was approved. The Student Chapter from Michigan Tech won the student chapter award, so a student will be sent to the National Conference in Marquette, Michigan. Michigan Tech requested to send Elana Barth. The executive Committee discussed at length the roles and limitations of committee members, particularly concerning financial contracts. If a committee is not included in the bylaws, the committee is renewed annually, and chair is appointed by president, although Powers-Taylor would request that it is determined by a vote from the Executive Committee. The Scholarship, Screening, and Awards Committees are standing committee in the section bylaws. The Workshop and Golf outing committees are ad hoc committees and need renewal and appointment each year.

September- Golf Outing, National, and Delegation of Authority

Vice President Kalan Briggs reported that 72 golfers attended the Golf Outing. He was awaiting the overall cost balance. It was reported that signage that can be reused next year for the golf outing was acquired from a different

vendor. Feedback from the National Conference was received and that financials for the meeting were forthcoming. The Executive Committee continued discussing dele-

gation of authority for committee chairs, but tabled the conversation.

Did You Know?

This article is intended to remind members of various aspects of AIPG and benefits of membership. If there is something you would like to see featured in this column, please contact the Editor...

AIPG believes mentoring is integral to encouraging geoscientists throughout their careers. This can include discussions on many different topics, including but not limited to:

- specific geoscience topics or questions
- education and experience required for specific career tracks
- any geoscience topic of interest
- geoscience employment search
- selecting the best suited geoscience career track
- work abroad experiences in geosciences

AIPG is setting up this mentor site to encourage one-on-one AIPG-member discussions. We encourage the mentor and mentee to include others in their discussions and research as needed. A mentor may or may not have applicable experience or knowledge related to a mentee's area of interest, but the mentor will help find information and/or an alternate mentor.

LOOKING FOR A MENTOR?

AIPG has members across all geoscience specialties who are willing to share their geoscience experiences, expertise and career choices and paths.

Any member looking for a Mentor is encouraged to contact a listed mentor by email to arrange a call, meeting, or virtual meeting. Talking with a professional that has "been there, done that" can be immensely beneficial. Furthermore, the networking will undoubtedly benefit both the mentee and mentor.

Search the list to find the geoscientist that works in your field of interest. Click on their name to see information about their geoscience expertise, experience, and interests. You will also find a link to their email. Go Explore! Find a mentor!

AIPG hopes that this new mentoring program will be beneficial. If you have questions or comments please contact the AIPG National Office at aipg@aipg.org or call 303-412-6205. All members are expected to adhere to the AIPG's Code of Ethics while using the Mentoring Program. AIPG Members (CPGs and Professional Members) interested in becoming a Mentor can submit the online Mentor form.

Students - Reminder

Don't Forget: Each Student Chapter must submit two articles for publication in *Geologically Speaking* each year to qualify for Section funding.

Send the articles to Adam Heft at adam.heft@wsp.com.

WANTED!

Your Articles for *The Professional Geologist*

- Technical
- Opinion
- Peer-Reviewed
- Letters to the Editor

Please submit your draft article to the Editor, Adam Heft at: adam.heft@wsp.com. Technical requirements may be found on the AIPG website.



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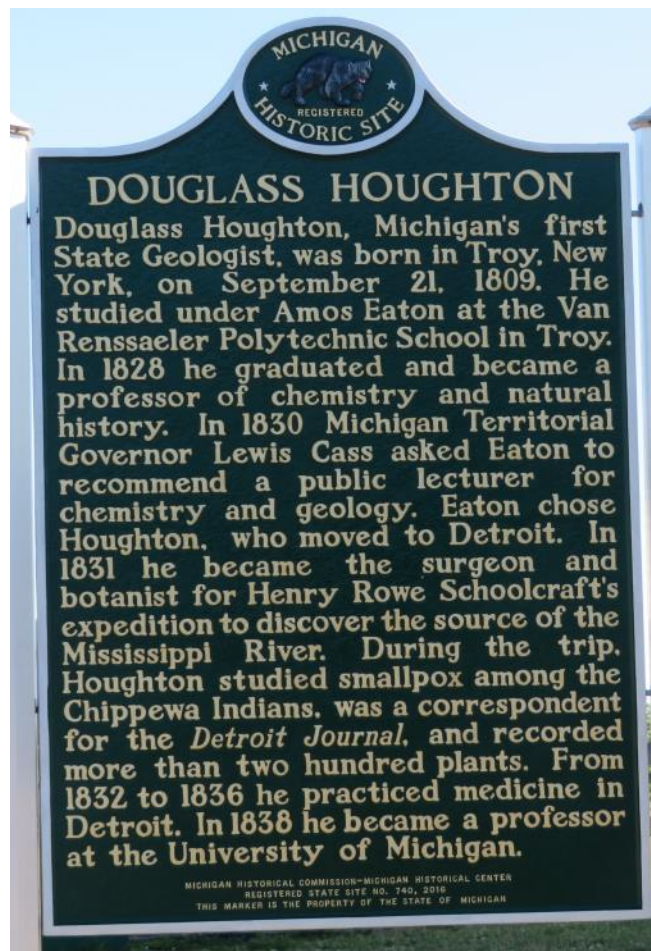
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Member's Corner

The Member's Corner includes information about the Section's membership. This is your chance to provide information on where you are and what you are doing. Simply send the information to the Editor for inclusion in this section.

No submittals for this edition of the Member's Corner were received by the Editor in time for publication.

Minerals for Sale!

Long-time Michigan mineral collector and dealer, Bill Micols, is selling his lifetime collection of material. Bill is in Milford. For additional details, please see the full-page flyer on the following page.

Interesting Geology Links

The Editor has received links to various interesting geology-related sites. Some of the more interesting links are included here. If you have any links to geology-related sites that you would like to share, please forward them (with a citation, if applicable) to the Editor.

Thanks to Mark Francek of Central Michigan University for sharing via the "Earth Science Site of the Week" emails. This edition features a few "fun" links.

This is a glacial lake outburst flood: <https://atlas.eia.gov/apps/5039a1a01ec34b6bbf0ab4fd57da5eb4/explore>.

Tornado at the base of La Palma Volcano: <https://www.youtube.com/watch?v=7OJi7HE7TSI>.

Japan's Okinawa Coastlines Struggling With Pumice Stones From Volcanic Eruption: <https://www.usgs.gov/media/images/overview-water-quality-principal-aquifers-0>.

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Coming Events

November 17, 2022: AIPG OH Section Annual Meeting. Dr. Greg Wiles will be speaking on Assembling Records of Environmental Change from Tree Rings. Meeting to be held at The Boat House, Columbus, Ohio. Registration at <https://www.aipg-ohio.org/eventdetails.php>.

November 22, 2022: AIPG Town Hall webinar. 2022 President Matt Rhoades and Executive Director Aaron Johnson will provide an update on recent activities and the status of AIPG. See the eNews for further details and registration link.

November 29, 2022: AIPG Lunch & Earn webinar: Mineral Resource and Mineral Reserve Estimation and Reporting: The Canadian System. See the AIPG eNews for further details.

December 1, 2022: MAEP Holiday Party, Weber's Inn, Ann Arbor.

December 5-7, 2022: Great Lakes PFAS Virtual Conference.

December 8, 2022: Michigan Section AIPG Annual Meeting. Clara Brennan, CMU Ph.D. Student will be speaking on Using Trace Element Geochemistry to Better Understand Li Ore Formation and Alteration Processes. Meeting to be held at Weber's Inn, Ann Arbor.

January 15, 2023: Deadline for AIPG National and Section Leadership Awards Nominations.

January 16, 2023: Michigan Section AIPG Environmental Risk Management Workshop Call for Abstracts Deadline. See flyer in this edition of Geologically Speaking.

February 1, 2023: Deadline for AIPG Student Scholarship Applications.

February 4, 2023: National Executive Committee Meeting, Tucson AZ.

February 9-12, 2023: The 68th Annual Tucson Gem & Mineral Show: Silica, Agates, & Opals, Oh My! Tucson Convention Center.

June 13-14, 2023: Michigan Section AIPG Environmental Risk Management Workshop at the Ralph A. MacMillan Conference Center in Roscommon.

July 6-18, 2023: Adventure Iceland Tour #1 with Dr. Tamie Jovanelly. www.icelandgeologytours.com.

July 25 to August 6, 2023: Adventure Iceland Tour #2 with Dr. Tamie Jovanelly. www.icelandgeologytours.com.

September 16-19, 2023: AIPG 60th Anniversary Conference. Covington, KY. Details forthcoming in Apr/May/ Jun edition of TPG.

Welcome New Members!

The Michigan Section is continuing to grow. Please welcome the following new CPGs, Professional Members, Early Career Professionals, Associate Members, and Students:

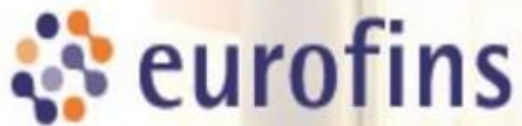
Matthew Bell, SA-11477; Dillon Breen, SA-11511; Heather Bricker, SA-11408; Maureen Casaus, SA-11493; Christopher Claes, CPG-12138; Trisha Cox, EXP-0949; Wiley Davenport, MEM-3416; Eric Dorais, SA-11496; Quin Doud, SA-11467; Maximillian Ehinger, SA-11410; Davis Eyth, ECP-0939; Hunter Golat, ECP-0914; Cole Keyworth, SA-11470; John Myaard, SA-11519; Zachary McFaul, ECP-0934; Andrea Munoz-Hernandez, MEM-3394; Daniel Nida, CPG-12131; Spencer Nuzum, SA-11471; Lars Olaussen, MEM-3399; Sananda Ray, SA-11516; Will Roosien, SA-11409; Lauren Schraeder, MEM-3377;

Madison Schrader, SA-11469; Trenton Singer, MEM-3413; Anton Smirnov, SA-11492; Madeleine Tan, SA-11475; Amy Towell, ECP-0935; Luke Vermeulen, MEM-3372.

To each of our new members, welcome to our Section! We encourage you to attend Section meetings and other events. You are also invited to provide information for the Member's Corner articles.

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Participants attending the Minerals & Falling Water Field Trip during the 2022 Annual Meeting at Jasper Knob, Ishpeming. Photograph provided by Sara Pearson.

Where in Michigan?

The August 2022 edition of *Geologically Speaking* featured a photograph of pillow basalts in the Mona Schist at the mouth of Whetstone Brook on the shore of Lake Superior in Marquette. The photograph was correctly identified by Mark Petrie.

This edition of *Geologically Speaking* features a new photograph **at right** - not the photo on the cover page. The first person to correctly identify what the photograph depicts (feature name, location, formation, and age) will win AIPG swag! Submit your entry via email to the editor; only one per person per issue please.

Don't forget to check out the feature article "Geology in Michigan" in this issue (as well as the last several editions) that presents a geologic feature of interest as a mini field guide. One of the best parts about being a geologist is field trips, and we are hoping that in your travels around the state or country you include these featured spots as a stop. Why not incorporate them into a family vacation or bring friends who may not be geologists and share these locations that make Michigan unique? We hope you enjoy reading about it, and more importantly, go see it in person! We invite you to share unique geologic features that you know about and submit a "mini field guide" to share with our members in future editions.



Invitation to Our Members!

Do you have a case study to share?

The Michigan Section AIPG promotes knowledge sharing and would like to feature case studies from projects where others may benefit from successes as well as lessons learned. We feel as professionals that learning from each other is a great opportunity that AIPG offers our members. AIPG offers connection with other professionals and their experiences in the work we do every day. This case study represents what we would like to offer more to our members, not only as a way to solve problems, but unify us as professional geologists. Additionally, do you have a suggestion for other types of information to share that would be of interest to our membership?

Please send your case studies and suggestions for future publication in upcoming editions of *Geologically Speaking* to the Editor.

Update Your Information!

Please be sure that you continue to receive the Section's *Geologically Speaking* publication and other announcements. Submit an updated e-mail address to Adam Heft at adam.heft@wsp.com. If you move or change places of employment, don't forget to send your new contact information to both the Section and to National. If you are not receiving announcements directly from the Editor, it is because your email address is not up to date with the Michigan Section.

Please help the Editor by making sure that your email address doesn't bounce when the next announcement is sent. And be sure to cc Dorothy Combs, National AIPG Membership Director at aipg@aipg.org when you update your contact information. Thank you!

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Student Chapter News



By Elana Barth...

When exploring the Keweenaw, it is not uncommon to stumble upon walls. The area is littered with old mining foundations built out of sandstone and basalt. Some are built so well that they still stand nearly two hundred years later. When one stumbles across a vertical wall within a ravine cut in half by a river, it is easy to assume that it was built by man. This wall stands some thirty feet tall with systematically jointed Jacobsville Sandstone making it appear to be intentionally constructed.

flowing down the mountains from the rift. The red color is attributed to the oxidation of iron from water flowing through the rock after deposition. Jacobsville Sandstone also contains spots or lines of reduction spots that were not oxidized red and appear white.

The Natural Wall of Calumet resides east of the Keweenaw Fault. It is a resistant bed of Jacobsville Sandstone that has been turned so it is nearly vertical. Between the wall and the fault, the sandstone beds are overturned. This is why you can see casts of ripple marks on the west side of the wall.

Michigan Tech's Depositional Systems class takes a



The Natural Wall, circa 1905. Note figures on the wall for scale. Photograph source: Michigan Technological University archives Nara Photograph Collection - ACC#09-038A.

Jacobsville Sandstone is a rift-flanking rock formed to the east of the Midcontinent Rift that divided Michigan's Keweenaw Peninsula. Zircon age dates indicate that the sandstone formed less than 960 Ma during the Neoproterozoic era. The Jacobsville Sandstone is a type of red bed sandstone, where sediment was deposited by rivers

field trip to this location every fall. During this outdoor lab, students have to interpret if the wall is overturned or not by the structures within the sandstone. This outcrop is on private land. If you would like to visit, please ask the landowner for permission. Directions are included here: [Natural Wall](#)



The Natural Wall, 2019. Photograph by Elana Barth.

References:

<http://www.geo.mtu.edu/KeweenawGeoheritage/Sandstone/Age.html#:~:text=Our%20best%20estimate%20of%20the,and%20during%20the%20Snowball%20Earth.>

<http://www.geo.mtu.edu/KeweenawGeoheritage/Sandstone/Sandstone/Welcome.html>

<http://www.copperrange.org/natural.htm>

http://www.geo.mtu.edu/KeweenawGeoheritage/The_Fault/Nat_Wall.html

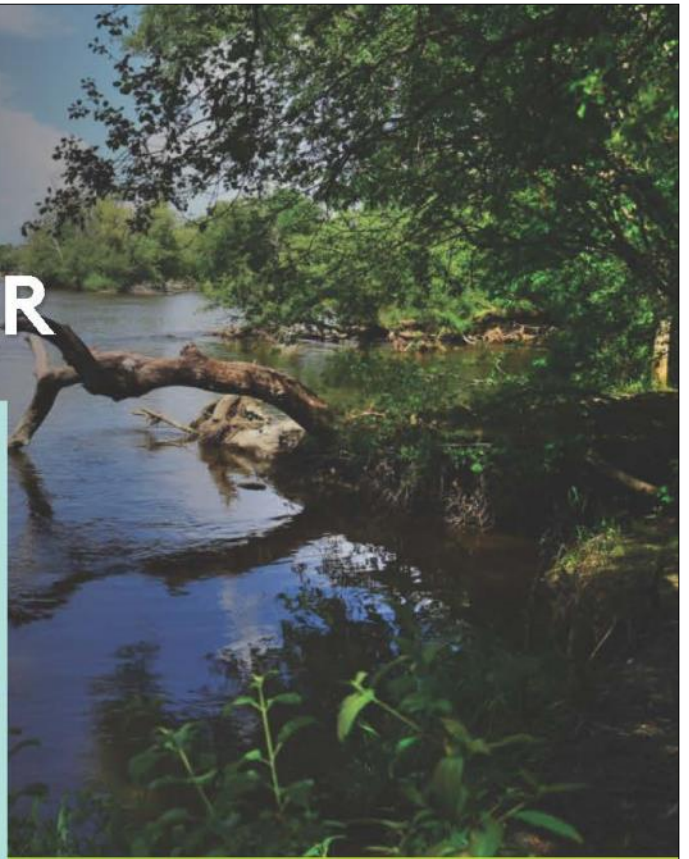
<http://www.geo.mtu.edu/KeweenawGeoheritage/Sandstone/Geology.html>

Section Website Reminders

The Michigan Section has created a database of geologic photographs on our website. Please submit photographs that you are willing to share to Adam Heft at adam.heft@wsp.com. Don't forget to include your name and a short explanation of what the photograph depicts. The photographs will be uploaded to the website periodically.

If you have suggestions on other items that should be included on the History page, please let a member of the Section Executive Committee know.

THE CHOICE OF ENVIRONMENTAL PROFESSIONALS JUST GOT BIGGER



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METIRI

Alaska Mantle Tomography



My passion for geology literally started small in Mineralogy, my first course at Wayne State. Mineralogy is focused more on the up-close and personal scale – the hand sample and thin section. As I progressed on through upper-level courses, particularly Structural Geology, I began to acquire a taste for larger-scale questions about the earth and its constituents. I was intrigued by big problems, like the processes that bring continents together, and there's nothing bigger than Alaska, as far as states go. I found an opportunity to do my master's thesis on mantle tomography deep underneath the surface of Alaska with Professor Scott Burdick.

Alaska has a quite complicated and intriguing geological setting. In the southwestern part of the state, along the Aleutian Islands, we have the subduction of the Pacific plate underneath the North American plate. These islands have up to 40 active volcanoes and comprise a portion of the ring of fire that encircles the Pacific Ocean. Over on the mainland in the southern region of the state, there is an accretionary terrain present in the Yakutat block, pushing up and creating most of the present land-mass on the Alaskan portion of the North American continent. A little bit farther northwest along the Yakutat slab, you can find the Denali fault and the Denali volcanic gap, which just adds to the complexity of the tectonic setting in this area.

My research is focused more on what goes on underneath this terrain. With the new recent expansion of the



Photograph of Ben Gaskevicius in Alaska.

permanent seismic monitoring network in Alaska, there has been an increase in both the quality and the quantity of seismic data available on Alaska. I am relatively in the early stages of this research and am focused now on gathering a better understanding of what we know today about Alaska's mantle tomography. With time, we hope to use new visualization methods to go through an in-depth analysis of our new model out there and see how it compares to earlier research on the far-reaching depths of the

subducting slab beneath the state. Alaska is home to the most seismically active region in our country, and it is capable of producing some of the most powerful earthquakes in the world; this would make any seismologist excited to be there and gives this budding researcher good vibrations on what can be discovered about the assembly of the 49th state.

Jackson Rock & Mineral Show

EThis year our AIPG EMU student chapter was lucky enough to get a chance to experience running a booth at the Jackson Rock and Mineral Show. This show was organized by the Michigan Gem and Mineralogical Society. We set up a booth with rocks students have collected from their field trips and geology camps, and then donated to our chapter. The booth had a wide variety of samples from brachiopod fossils, limestone chalk, petrified wood, to granites. There were no prices on our samples, everything was based on donations. The customers made a donation and picked a sample they enjoyed. It was great to get the opportunity to be able to share our passion for geology with the general public and learn from those who have had years of experience in the world of geology.

Rock enthusiasts of all ages were in attendance. It was fun to talk to a wide variety of people, from kids who are just now getting interested in geology to retired geologists who had decades of experience in the field. Many of the professional geologists who approached us gave us advice about their experiences in geology. They told us what they wished they knew when they started out and tips that helped them throughout their careers. We also had many people bring rocks to us for help with identifying them. Being able to share what we have learned helped us to realize how far we have come since starting our pathways in geology. Many of us have recently taken mineralogy and igneous and metamorphic petrology so we were able to give people more information than simply identifying the sample.

We also got to meet some of the other vendors that attended the show. They were all very welcoming and supportive. The members of the Michigan Gem and Mineralogical Society were very happy that they were able to include a college geology program in their event and they gave us some ideas for what to do for future shows. The biggest suggestion was that the average person likes attractive rocks and minerals and is not necessarily fo-

cused on rarity.

Overall, the show was a big success. The money made will be used to help fund the scholarship that we give out every year for the Geology Summer Field Scholarships. The rest of this money will be put into the bank account to help fund activities next year. Following this experience, we have decided to try and attend more rock shows in the future. With more funding we hope that we can go on more field trips and add to the scholarships.



EMU Student Chapter booth at the Jackson Rock & Mineral Show. Article and photograph provided by Morgan Bergren, 2022 Student Chapter President.



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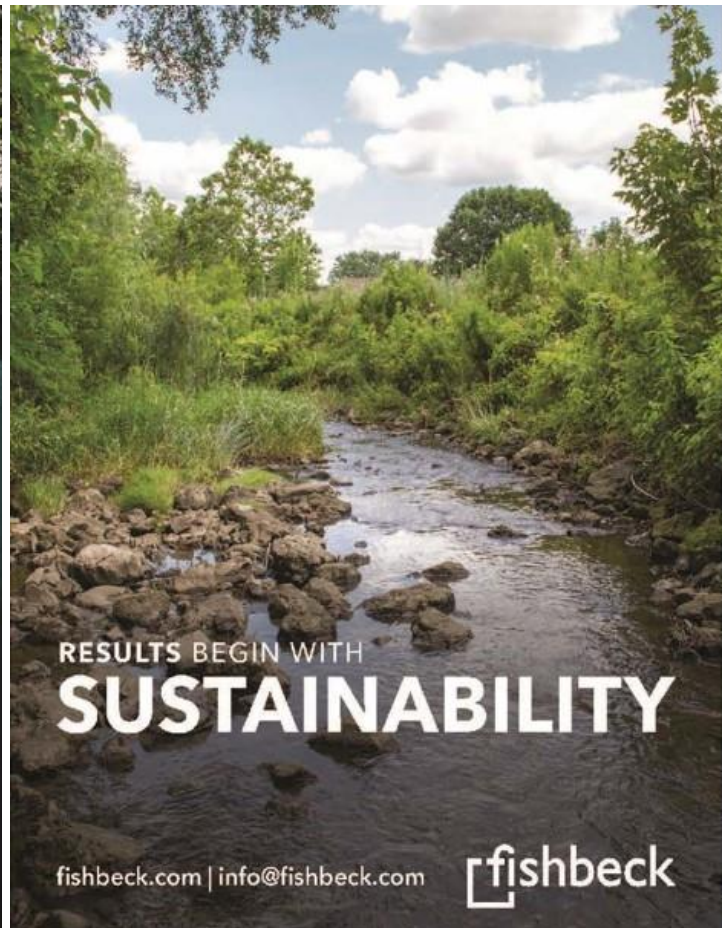
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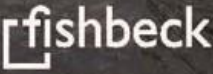
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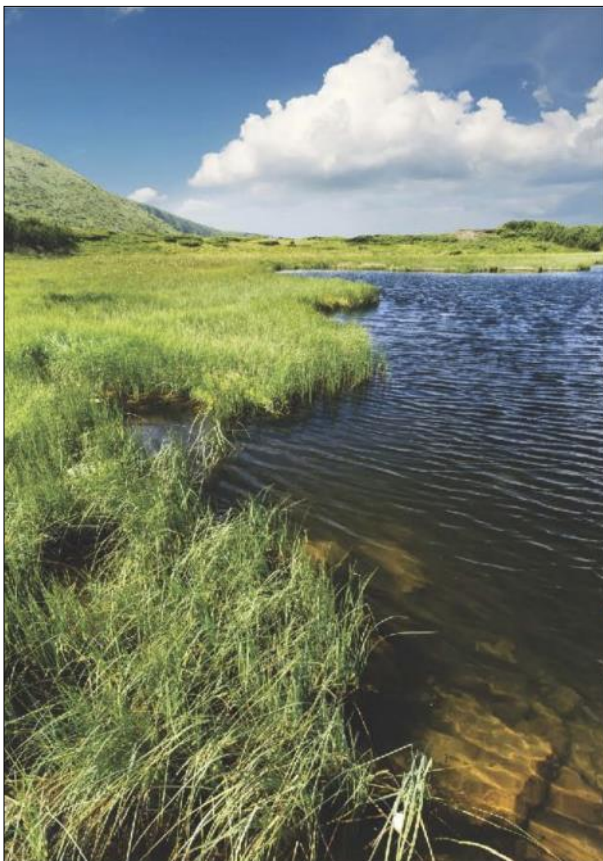
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Regulatory Roundup

It has been a busy year so far! The state budget was passed early this year and per- and polyfluoroalkyl substances (PFAS) and drinking water remain at the top of the headlines. Amendments to the Underground Storage Tanks (USTs) regulations under Part 211 of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended were signed into law in July 2022. Another bill amending Part 211 was introduced in September. Another set of bills has been introduced to promote mining and sustainability in the Upper Peninsula.

With the passage of the budget, the Michigan Geological Survey, for the first time in 30 years, has funding to hire staff for mapping and related projects. The budget also provides funding for the programs administered by the EGLE divisions. The [bill analysis](#) provides more details.

In June, the United States Environmental Protection Agency (US EPA) issued interim drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) as part of the PFAS Strategic Roadmap initiative. The new levels replace those set in 2016 by the EPA. According to the latest science and looking at exposure over a lifetime, the advisory levels are now near zero in drinking water. The advisories are 0.004 parts per trillion for PFOA and 0.02 ppt for PFOS. Additionally, EPA issued two final health advisories for hexafluoropropylene oxide (HFPO) dimer acid and its ammonium salt (together referred to as “GenX chemicals”) and perfluorobutane sulfonic acid and its related compound potassium perfluorobutane sulfonate (together referred to as “PFBS”). The final lifetime health advisory for GenX Chemicals is 10 ppt and the final value for PFBS is, 2,000 ppt. More information on the calculation of the health advisories and EPA’s PFAS roadmap can be found [here](#).

The Rule 57 Water Quality Values for Select PFAS (listed in nanograms per liter which is equivalent to parts per trillion) are as follows:

PFAS	HNV*(drinking)	HNV* (nondrinking)	FCV*	AMV*	FAV*
PFOS	11	12	140,000	780,000	1,600,000
PFOA ¹	66	170	880,000	7,700,000	15,000,000
PFBS ²	8,300	670,000	24,000,000	120,000,000	240,000,000

¹ Revised Values; ² New Values

*Human Noncancer Value (HNV), Final Chronic Value (FCV), Aquatic Maximum Value (AMV), Final Acute Value (FAV)

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has also established new Water Quality Values for for PFBS PFOA. The source of the article dated July 27, 2022 below is from EGLE’s [website](#). An excerpt is below. The website includes a frequently asked questions section on this topic.

EGLE establishes new surface water values for two PFAS chemicals

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has established a new Water Quality Value (WQV) for perfluorobutane sulfonic acid (PFBS) and has revised the existing WQV for perfluorooctanoic acid (PFOA). PFOA and PFBS are members of the larger group of per- and polyfluoroalkyl substances (PFAS). WQVs are designed to protect the designated uses of Michigan’s surface waters, including protections for aquatic life and public health.

The agency’s Water Resources Division (WRD) determined that sufficient data was available to generate human health and aquatic life values for PFBS. Following the risk assessment method provided in Rule 323.1057 (“Rule 57”), a PFBS concentration of 670,000 parts per trillion (ppt; or nanograms per liter) was set for surface water to be broadly protective of human health and 8,300 ppt for surface water specifically protected as a drinking water source. While aquatic life values were established, the human health values are lower and thereby provide a more conservative endpoint with the overall goal of protecting water quality.

For PFOA, an update to the existing WQV from 2011 was undertaken after a review of current science indicated that a revision was needed to ensure the public and environment are protected from adverse effects. The revised human health values for PFOA are 170 ppt for surface



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water (reduced from 12,000 ppt previously) and 66 ppt for surface water protected as a drinking water source (reduced from 420 ppt, previously).

EGLE's WQVs for PFOS are not being updated at this time. EGLE continues to collaborate with other state departments and review new literature to determine if changes to its PFOS WQVs are warranted.

In the last edition of the Regulatory Roundup, it was reported that Senate Bill [SB 991](#) had been introduced on March 24, 2022 to amend Part 211 of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended. The bill revised placement distances of underground storage tanks from drinking water wells. The bill was signed by Governor Whitmer and took immediate effect on July 19, 2022 as PA 160 of 2022. This legislation only applies to replacement of existing USTs being installed in the same location. Construction of UST systems at new gas stations are required to meet the minimum isolation distances for major sources of contamination from existing drinking water wells. If the minimum distances cannot be met, a request for a variance must be requested from the Underground Storage Tank Division in the Bureau of Fire Services under the Department of Licensing and Regulatory Affairs (LARA). Hydrogeological information is needed for the variance requests to determine whether there is adequate natural geological protection to prevent contaminants from affecting the water quality if a release were to occur.

A second bill [SB-1169](#) was introduced on September 20, 2022, to address the need for variances for new UST systems for new stations or for adding a new UST to increase the capacity of an existing system. This bill calls for the systems to meet the isolation distances prescribed in the Safe Drinking Water Act, PA 399 of 1976, as amended and the Well Construction Administrative Rules, Part 127 of the Public Health Code, PA 386 of 1978, as amended. If a UST system installation would not meet the required isolation distances, the bill requires documentation showing that the system construction and leak detection monitoring are adequate and that any wells within the minimum isolation distance would not be impacted by a release. This documentation is to be provided by a professional engineer or qualified underground storage tank consultant, as defined in Part 213 of the NREPA, PA 451 of 1994, as amended. The bill also states that no wells will be installed less than 50 feet from a residential well, 75 feet from Type IIb and III wells, and 200 feet from a Type I or Type IIa well.

A set of five bills related to mining and sustainability were introduced earlier this year. They were developed by Michigan's Mining Future committee. They include the following:

[House Bill 6254](#): Ferrous Mining Research and Development Grants

[House Bill 6218](#): Non-Ferrous Research and Development Grants

[House Bill 6219](#): Unemployment Extension for Ferrous Mine Idle or Closure

[House Bill 6220](#): Advisory Committee on Michigan Hard-Rock Mining

[House Bill 6255](#): Mining Reclamation Fund

EGLE's Air Quality Division has a pending rule set #2022-18 EQ on the Part 6. Emission Limitations and Prohibitions – Existing Sources of VIC Emissions. If you are interested in this rule set, be sure to subscribe to the [EGLE calendar](#) for dates on upcoming public hearing and comment opportunities.

As always, we encourage you as an expert on these topics to lend your professional knowledge and experience and contact your legislators on any bills and rules that have been introduced. For additional searches on topics, the links are provided in the buttons below.

Proposed
Rules

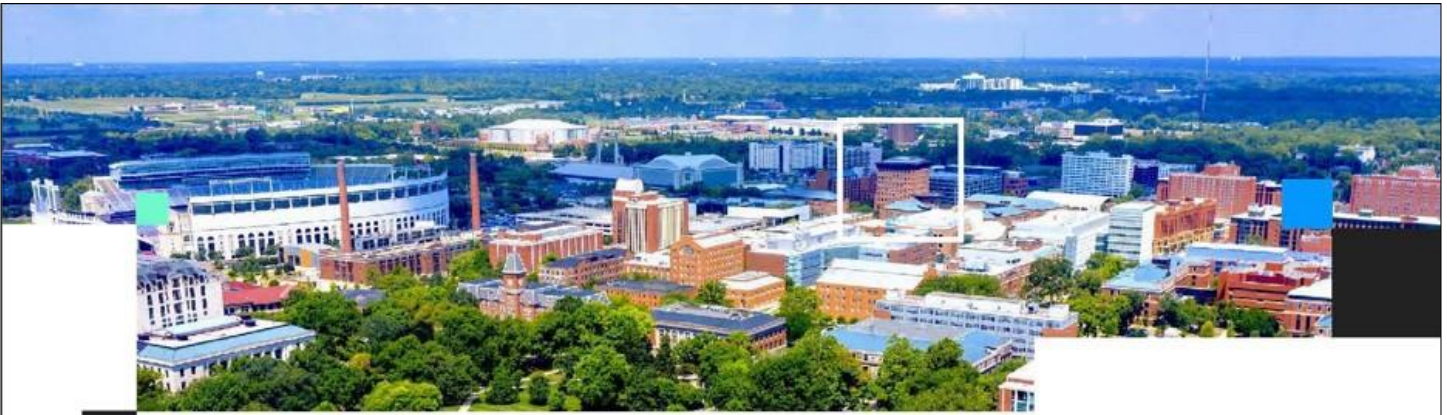
Natural Resources and Environmental Protection Act,
PA 451 of 1994, as amended, [bill search](#)

Safe Drinking Water Act,
PA 399 of 1976, as amended, [bill search](#)

Gas Safety Standards,
PA 165 of 1969, as amended, [bill search](#)

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Geology in Michigan – Rockport Quarry, Rockport, Michigan

By Adam W. Heft, CPG-10265



Figure 1: Aerial view of the quarry and harbor on Lake Huron. Note that the road does not extend through the quarry. Photograph from Google Earth.

Editor's Note: Information in this article was borrowed from the 2011 Michigan Section Field Trip, where we explored karst features of northeast Michigan and collected fossils in the quarry.

Kelly's Quarry is located in Section 1 of T33N, R8E and Section 6 of T33N, R9E, in Michigan's northern Lower Peninsula. (Figure 1).

Latitude 45°12'81" N; **Longitude** 83°23'89"W.

Directions

From Alpena, head north on US-23 for a distance of about 9.0 miles. Turn right onto Rockport Road and follow it east about 2.25 miles to a bend to the left/north. Continue around the bend about one mile to the parking

lot where the road ends.

Stratigraphic Position

The Rockport Quarry, formerly known as the Kelly Island Rock and Transport Company's Quarry at Rockport, is the location of the type locality of the Rockport Quarry Limestone (RQL) Formation. This is the only location in Michigan where the entire thickness of the RQL is entirely exposed for observation and study. The RQL is middle Devonian in age, lies immediately above the Bell Shale (the basal unit of the Traverse Group) and immediately below the Ferron Point Formation. Portions of both the Bell Shale and the Ferron Point Formation also are exposed at this location.



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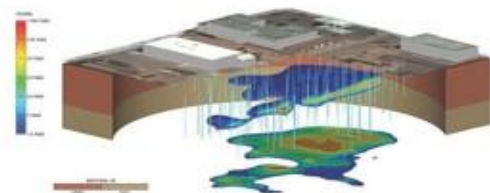
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Figure 2: Looking across the quarry floor in 2011. Piles of rock and small trees/bushes are abundant throughout the quarry. The southwest wall of the quarry is visible in the background. Photo by Sara Pearson, 2011.

Industrial Uses

The RQL was mined for aggregate used in the building industry and used as flux material in the steel industry out east. More recently, it was mined and used as ballast material in the caissons used in the construction of the Mackinac Bridge. Additionally, the caissons were assembled on this property, loaded on barges and transported to the straits to be put in position. The remains of a portion of the port, although in disrepair, are still in place at the waters edge.

Historical Geology

The contact between the RQL and the underlying Bell Shale Formation is not sharp and distinct, but is a gradational contact marked by the appearance of tabular stromatoporoids. This contact indicates a gradually shallowing sea where the conditions were conducive to the appearance and prolific growth of the stromatoporoids. The stromatoporoids represents a shallow subtidal bioherm forming a low relief shoal. Including the Bell Shale, the RQL is interpreted as a gradually shallowing-upward sequence of limestone facies representing a suite of paleoenvironments ranging from a shallow subtidal stromatoporoid bioherm, a slightly deeper shoreward lagoon, inter-

tidal zone and tidal flat.

Facies & Paleo-Environment

The stromatoporoid bioherm is dominated by pale grey tabular stromatoporoids interbedded with a dark chocolate colored, organic-rich limestone matrix, giving it a zebra appearance. The dark chocolate limestone matrix represents subtidal cyanobacterial mats that provided a stabilized substrate for tabular stromatoporoid growth. The bacterial mats and tabular stromatoporoids were in constant competition, neither species achieving dominance over the other as evidenced by the appearance of alternating tabulae and dark matrix material.

Proceeding vertically (shoreward), the next facies encountered is the lagoonal facies. The lagoonal facies consists mostly of cyanobacterial mat with crinoid hash and fenestrate bryozoan-rich zones. The lagoon was located shoreward of, and thus protected by the stromatoporoid bioherm. This quieter environment allowed the bacterial mats to thrive and was probably not conducive to stromatoporoid growth. This quieter environment also allowed patches of crinoids and delicate bryozoans to grow. These patches become more and more abundant up section or shoreward.

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The next facies encountered is the intertidal wave zone, typified by the reappearance of tabular stromatoporoids and some hemispherical stromatoporoids. Tabular stromatoporoids are less abundant and less robust than those found in the bioherm. Small hemispherical (helmet-shaped) stromatoporoids appear. Apparently the environmental conditions in this environment were favorable for their survival. Bacterial mats are still present but appear to be less concentrated than in the more seaward environments. Perhaps the water velocities and agitation were not as favorable for them. Numerous horn corals, stony (more robust) bryozoans and colonial corals are found here, none in growth position.

The next facies encountered represents a tidal flat and supratidal marsh. The tidal flat zone is represented by dense micrite. A few sparse lamellar and branching stromatoporoids can be found here. This tidal flat environment was generally not conducive to macro fauna. Micro fauna such as some foraminifera and many ostracods enjoyed this environment. Some calcareous algae can be found free or encrusting fragments of other fauna in thin section in this facies. Some crude, vertical fenestrae can be seen occasionally in this dense micrite. They are filled with either sparry calcite or dolomite and taper downward. The sediment laminations they penetrate curl slightly downward, indicating a possible plant origin (root or stem casts).

The salt marsh environment is represented by a predominantly fenestral micrite exhibiting mostly horizontal fenestral fabric with also some pustular and vertical fenestrae. This facies is devoid of any recognizable macro fauna. The dominant life forms found in this facies environment are ostracods. In thin section calcareous algal

forms are found as well faint layering of alternating grain sizes, indicating a possible algal origin.

The contact between the RQL and the overlying Ferron Point Formation is sharp and abrupt. This contact indicates an extremely sudden change in paleo-environmental conditions. This can be seen in the quarry by noting the very sparse fauna found in the dense micrite of the uppermost RQL and the relatively fossil rich Ferron Point Formation. Numerous brachiopods, trilobites, horn corals and small branching corals are found in the Ferron Point Formation.

Fossils

Fossils to collect in abundance include stromatoporoids (all three types), horn corals, colonial corals (hexagonaria), and bryozoans. Rare finds include fish plates (replaced by the blue mineral vivianite) of Placyderms, trilobites (Bell shale, more shaly zones of RQL and overlying Ferron Point fm.) and ammonoid cephalopods. Other fossils that can be seen and found include crinoid parts, brachiopods, fenestral bryozoans and pelecypods.

Caution

It is recommended that collectors limit their collecting to the quarry floor, for many of the quarry walls are unstable. The quarry floor provides plenty of material to collect, from boulders to whack your hammers on to hand-sized rocks and individual specimens. You might want to wear your hard hats and steel toe boots if you brought them along. **Collecting on or near the quarry walls is at your own risk.**



Figure 3: The northwest quarry wall in January 2018. Ice formations occur in areas with groundwater seeps and/or where surface water runs over the edge into the quarry. Photo by Sara Pearson.



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ASBOG Exam Update

Ten individuals registered to take the ASBOG Fundamentals of Geology (FG) examination at Central Michigan University on October 7, 2022. This was the last time that the ASBOG exam will be given using a paper and pencil format. Beginning in March, 2023, the ASBOG will utilize a computer based testing (CBT) system to administer the Fundamentals of Geology (FG) examination. The exam will continue to be given during the 3rd Friday in March and 1st Friday in October each year.

Central Michigan University will continue to approve Michigan applicants to take the FG Exam based on their

educational credentials. However, from March 2023 on, approved candidates will be able to take the exam on the scheduled test date and time at a large number of CBT sites administered by Prometric.

More information will be forthcoming on the official ASBOG website soon.

Member Input Sought

The Section Executive Committee is seeking input from members on a variety of topics. Do you have any suggestions regarding speakers/presentation topics that you would like to hear? What about field trips or other events? Some place you'd like to see us go, or something you think the membership would enjoy doing?

Then make your voice heard; please send your suggestions to one of the members of the Executive Committee; any of the seven members would be glad to hear from you. AIPG is your organization. Please help keep it relevant and interesting for all by participating.



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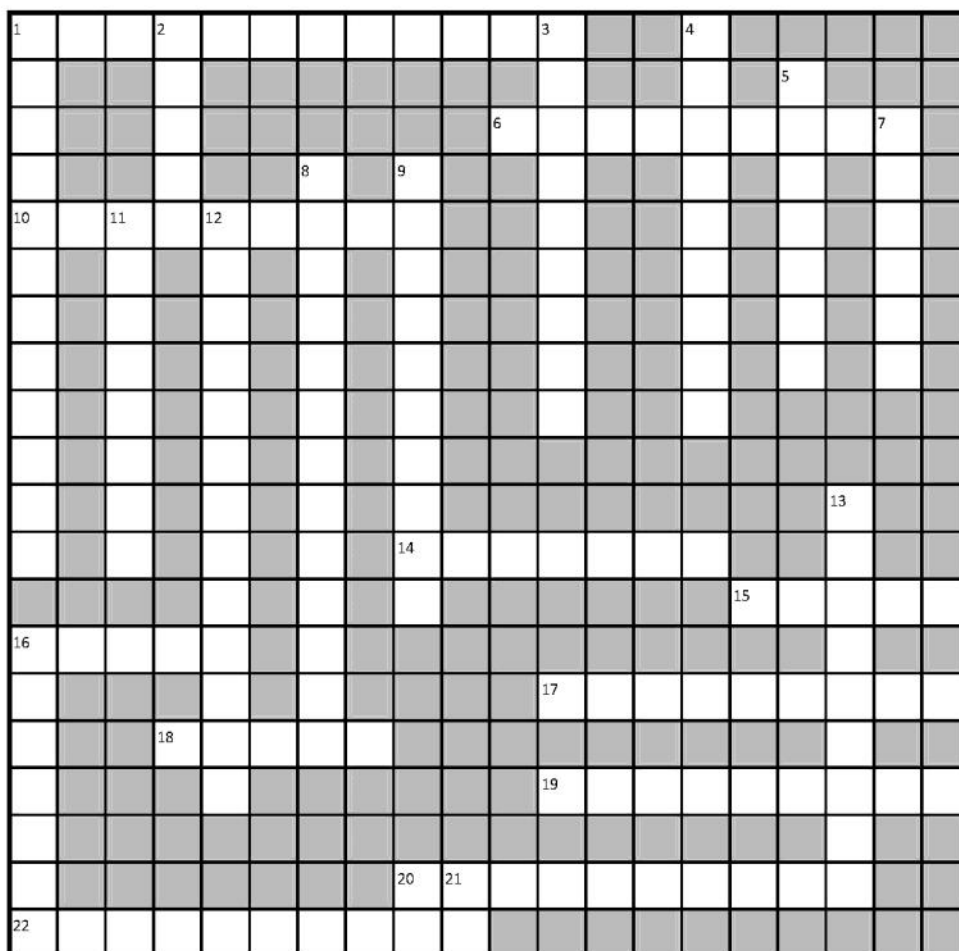
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Geology Crossword #11



Across

1. Common in eolian deposits
6. Used for abandoning or sealing borings
10. Massive CaCO_3
14. Many spherical particles
15. Massive deposit in Dover
16. Not Flint, but close
17. c.f. Munising or Marshall
18. More or _____
19. Submarine debris flow
20. Five intervals of a turbidite
22. Applied to trash

Down

1. Similar to breccia, but smooth
2. e.g. Bell or Ellsworth
3. Twilight color craziness
4. Common clay mineral
5. Not a farmer's job
7. As with dune deposits
8. Rock with evidence of life
9. Court case activity
11. Non-fissile shale
12. Deposition of particles
13. Deposits from supersaturation
16. Not plastic or elastic
20. One's significant other
21. Sporadically

*The solution to this geology crossword will be included in the next edition of *Geologically Speaking*.

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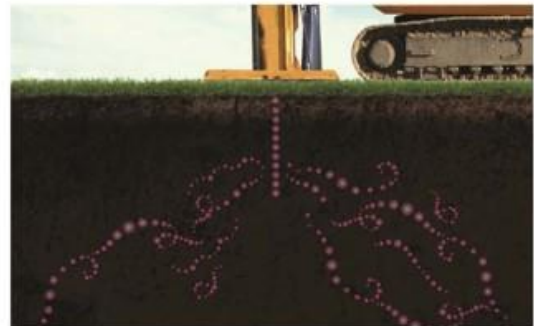
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AIPG Michigan Section Announces the

12th

Environmental Risk Management Workshop The Basics to the Latest in Contaminant Fate & Transport



CALL FOR ABSTRACTS

The American Institute of Professional Geologists (AIPG) Michigan Section is calling for abstracts for the 2023 Environmental Risk Management Workshop to be held **June 13-14, 2023**, at the **Ralph A. MacMullen Conference Center** in Roscommon, Michigan.

The Michigan Section is looking forward to hosting this event in person in 2023! We provide high quality technical training that focuses on practical application and case studies for environmental professionals. We bring together a broad base of topic expertise and perspectives from the consulting, regulatory, academic, and industry sectors. This unique workshop forum promotes collaboration and partnership to solve complex environmental problems in a peer-to-peer learning format.

This year our goal is to look at **The Basics to the Latest in Contaminant Fate and Transport** at the workshop. We have learned over time that the fate and transport of hazardous substances in the environment is variable and not always predictable. There are general rules of thumb that we expect for well-studied contaminants with similar characteristics particularly when one substance is released in homogeneous subsurface conditions. However, this is rarely the case due to the many variables that influence the migration, degradation, phase transformation, and persistence of compounds. Co-mingling of hazardous substances can be beneficial as the rate of degradation can be increased or decreased due to the influence of other contaminants. Emerging contaminants pose an entirely new set of challenges with too many unknowns to easily predict the fate and transport; yet, we must still work to protect receptors from exposure to them.

The public relies on the work we do to identify, investigate and determine where and how far contaminants will migrate, what pathways pose the greatest risk for exposure, and take actions to manage risks. The behaviors of contaminants in the subsurface must be understood to implement effective and efficient remedial approaches. Contaminants that degrade into daughter products that may have greater toxicity must also be considered or perhaps they volatilize and pose a threat via the inhalation pathway.

Typically, we set out to talk about innovations at this workshop. We are at a unique point in the history of our industry with the

turnover in staff across the nation in the public and private sectors, and for the 2023 workshop, we again want to look towards innovation, but also address the basics which are the foundation upon which our understanding of contaminant fate and transport is based. It is a blend of the basics with the latest innovations that we can use to find the key to strategic remedies moving forward with fresh perspectives and tried and true knowledge to solve problems today and into the future.

The following are some topical concepts for which we are seeking abstracts:

- **Contaminant Characteristics:** chemistry, hydrogeochemical evaluations, phase transformation, co-mingling contaminant behaviors
- **Emerging Contaminants:** Per and poly-fluoroalkyl substances (PFAS), microplastics, pharmaceuticals, viruses
- **Tools for Evaluating Contaminant Fate and Transport:** Monitoring approaches, models, chemical analyses, unknown v. known contaminants
- **Data Collection and Analysis:** data collection tools, groundwater modeling, calculation of the contaminant mass, documentation and CSM development, life cycle analysis and cost-to-closure solutions.
- **Geologic Conditions and Complex Environments:** geologic conditions influence movement, rate of contaminant migration based on soil type and lithology, retardation factors and influences, groundwater/surface water interface
- **Remediation:** Enhance remedial approaches, measuring natural attenuation or source zone depletion, chemical and/or biological in-situ remediation
- **Closure:** Documentation to demonstrate risks are managed based on contaminant fate and transport, models, life cycle analysis and cost-to-closure solutions.

Two part abstracts are welcome for more detailed presentations. Presentations are 30-40 minutes in length. In addition to abstracts for case studies, the Michigan Section is calling for demonstration abstracts that can include outdoor demonstrations.

Submittal Deadline: January 16, 2023

Complimentary registration and accommodations for up to two speakers for selected abstracts.

AIPG Michigan Section Guidelines for Abstract Submittal

Important: The following guidelines provide details on the style and format of abstracts. The AIPG Michigan Section appreciates your interest and submittal of quality abstracts. Thank you.

Abstracts shall be no more than one page in length, and all text shall be 12-pt Times New Roman font with single spacing one-inch margins.

The abstract title shall be centered at the top of the page and be in bold 14-pt Times New Roman font. Directly below the title, list the presenter's names and organization(s) followed by the author's names.

Writing style should NOT be in first person. Rather, please use third person and the correct verb tense (e.g. present, future, past). The abstract should include the nature of the work and its relationship to the workshop theme and Environmental Risk Management, justification for the work, key/data findings and conclusions. Leave one blank line between paragraphs and other headings and text. Use right and left justification of all margins and do not indent paragraphs.

Please do NOT indicate in the abstract that particular information will be discussed during the presentation. The abstract should stand on its own merit and not point to the presentation that will be made at the workshop.

Please add a notation in the header of the abstract indicating topic category selecting from those listed in the text description on the front page of this flyer.

Information on Authors

Please include the following:

Names of Presenter(s):

Last Name, First Name and Initial
Place of Employment, Job Title
Email address and Work/Mobile Phone Number(s)

If there are more than two presenters, please list the two key presenters first.

Names of Other Authors:

(Please include the information below for all key authors. If there are more than four authors, add the additional authors on a separate page.)

Name of Author(s):

Last Name, First Name and Initial
Place of Employment, Job Title
Email address and Work/Mobile Phone Number(s)

Presenter Biographies

Additionally, please include a brief author biography for each presenter with the abstract submission on separate pages.

Abstracts Due: January 16, 2023
Selection Notification: February 28, 2023
Submit to AIPG.MI.Section@gmail.com

Questions? Contact Chair: Sara Pearson (pearsons@michigan.gov) Thank you.

Note: We are planning for this to be an in-person event. We are looking forward to hosting this event and hope to see you there!

