

A Newsletter of the Michigan Basin Geological Society



2021-2022 Edition 7

www.mbgs.org

April 2022



MBGS APRIL MEETING

MBGS Membership Meeting, April 13th, 2022, 7:00PM: Terry R. Carter, MSc, P.Geo. will present "A 3-D Bedrock Geologic and Hydrostratigraphic Model of Southern Ontario".

Join Zoom Meeting

https://us06web.zoom.us/j/82682557674?pwd=VGIYaXVRRHpqSG4xdzIWL2dIQkVmdz09 Meeting ID: 826 8255 7674 Passcode: YQ4ZtD Call In: +13017158592, 82682557674# *528414# US (Washington DC) +13126266799, 82682557674# *528414# US (Chicago)

MBGS SEEKS EXECUTIVE COMMITTEE CANDIDATES FOR 2022-2023

Are you interested in becoming more involved with the Michigan Basin Geological Society? This summer we will hold elections for the position of Vice President, Treasurer, and Secretary for the 2022-2023 business year. Please contact any of our current executive committee members or visit our website to get information.

CORE DISPLAY EDUCATIONAL TOOL AVAILABLE TO MEMBERS

MBGS has a core display available for use that visually demonstrates permeability/porosity. There are educational posters available for use with the core display. Contact any of the officers to reserve this great educational tool.



LED FIELD LENS AND MBGS LANYARD AVAILABLE

The Michigan Basin Geological Society is offering to its members and non- members this geological field hand lens and lanyard (photo attached). The field hand lens is a large 21mm lens with a 20X magnification. A pair of white LEDs provides illumination for all those darkened close-up viewing of rocks, minerals and fossils. A case is provided for the field lens with a key to remove the batteries. Batteries are included. The green lanyard has MICHIGAN BASIN GEOLOGICAL SOCIETY printed on one side of the unfussy 1" wide webbing. This lanyard is designed with a breakaway buckle clip and detachable keychain for versatile use and comfortable wearing. MBGS is offering



the Lanyard/LED Hand Lens and Case combo for \$15 each and the Lanyard alone for \$5 each if picked up at a meeting or field trip. If you request to have your purchase mailed, standard costs for mailing container and postage will apply. Please contact Mark Wollensak at wollensak@att.net to order.



APRIL 2022 MBGS Virtual Membership Meeting

Presentation: A 3-D Bedrock Geologic and Hydrostratigraphic Model of Southern Ontario
Presenter: Terry R. Carter, MSc, P.Geo.
When: April 13th, 7:00 PM, 2022
Join Zoom Meeting: <u>https://us06web.zoom.us/j/82682557674?pwd=VGIYaXVRRHpqSG4xdzIWL2dIQkVmdz09</u>
Meeting ID: 826 8255 7674
Passcode: YQ4ZtD

Abstract: Large volumes of groundwater occur in the Paleozoic bedrock of southern Ontario. At shallow depths this groundwater is fresh and is an important source of potable water for domestic, agricultural and industrial supply, a ground-source heat pump storage-exchange resource, as well as supporting aquatic habitats by groundwater discharge to streams and wetlands. At greater depths groundwater is increasingly saline yet still has a variety of practical uses. Deep saline aquifers are utilized for disposal of saline oilfield water produced as a by-product of petroleum production operations and, in the past, for disposal of liquid industrial wastes. In some parts of southern Ontario saline aquifers are being considered for CO2 sequestration. Hydrochemical and isotopic zonation of groundwater also provides supporting scientific knowledge to develop a safety case for long-term isolation of nuclear wastes in low-permeability geological repositories. At intermediate depths groundwater aquifers in southern Ontario contain dissolved H2S generated by a diverse but poorly understood microbial ecosystem dominated by sulphur proteobacteria. This "sulphur water" is a known corrosion hazard for unprotected steel and concrete in subsurface infrastructure such as tunnels, mine shafts, petroleum wells and foundations, especially in the Lucas-Dundee Aquifer. In parts of southern Ontario this aquifer is artesian and is a drilling hazard where it contains H2S.

A hydrostratigraphic model has been developed based on grouping lithostratigraphic model layers from a previously developed 3-D geologic model into 14 hydrostratigraphic layers. Layers are expressed as either aquifer or aquitard based principally on hydrogeologic characteristics in the intermediate to deep groundwater regimes below the influence of modern meteoric water. Hydrostratigraphic aquifer units are sub-divided into up to three distinct hydrochemical regimes: brines (deep), brackish-saline sulphur water (intermediate), and fresh (shallow). The hydrostratigraphic unit assignment provides a standard nomenclature and definition for regional flow modelling of potable water and deeper fluids. Included in the model are: 3-D representations of oil and natural gas reservoirs which form an integral part of the intermediate to deep groundwater regimes, 3-D water level surfaces for deep Cambrian brines and the fresh to sulphurous groundwater of the Lucas-Dundee regional aquifer, inferred shallow karst, base of fresh water, Lockport Group TDS, and the 3D lithostratigraphy. Like the lithostratigraphic model, the hydrostratigraphic model is constructed using Leapfrog Works at 400 m grid scale and will be distributed in a proprietary format with free viewer software as well as industry standard formats.

Biography: Terry R. Carter, MSc, P.Geo., Consulting Geologist, <u>Terry.carter@cartergeologic.com</u>

Terry is formerly the Chief Geologist, Petroleum Operations, of the Ontario Ministry of Natural Resources and is now a Consulting Geologist in London, Ontario. Terry specializes in mapping, modelling and interpretation of the Paleozoic bedrock geology of southern Ontario, its oil, gas and salt resources, and regional bedrock aquifers.

Terry is co-author of the book Subsurface Paleozoic Stratigraphy of Southern Ontario, published by the Ontario Geological Survey in 2010 and is project coordinator on an ongoing project to produce 3D geological and hydrostratigraphic models of the Paleozoic bedrock of southern Ontario.

EVENTS

Many organizations have switched to virtual platforms or have cancelled events. We are providing links for your reference. Please visit these sites to learn more about specific events and happenings. If you have an event to share, let us know!



American Institute of Professional Geologist – Michigan Section – <u>http://mi.aipg.org/newsletters.htm</u> Central Michigan Lapidary and Mineral Society - <u>http://www.michrocks.org/</u> Eastern Section AAPG - <u>https://www.esaapg.org/</u> EGLE Calendar of Events - <u>https://www.michigan.gov/egle/0,9429,7-135-3308_3333---,00.html</u> Flint Rock and Gem - <u>https://flintrockandgem.org/events</u> Michigan Association of Environmental Professionals - <u>https://www.maep.org/</u> Michigan Basin Geological Society – <u>www.mbgs.org</u> Michigan Clean Water Corps - <u>https://micorps.net/about/</u> Michigan Mineralogical Society - <u>https://www.michmin.org/</u> Mid-Michigan Rock Club - <u>http://www.midmichrockclub.com/?Page=1</u> Midwest Mineralogical and Lapidary Society - <u>http://www.mmls.us/</u> Society of Petroleum Engineers - <u>https://www.spe.org/events/calendar/</u>

On the Calendar

April 7-8th, 2022: 2022 GSA Joint North-Central & Southeastern Section Meeting, Cincinnati, OH, Home - Joint

North-Central & Southeastern Section Meeting - 2022 (geosociety.org)

April 13th, 2022: MBGS Monthly Meeting

April 28th, 2022: WM-AWMA Spring Conference, Grand Rapids, MI, Air & Waste Management Association +

West Michigan Chapter (wmawma.org)

May 5th, 2022: AIPG and MBGS Joint Meeting,

May 10-11th, 2022: 68th Annual Institute on Lake Superior Geology Annual Meeting, Sudbury, ON, <u>ILSG -</u>

Terrace Bay 2019 (lakesuperiorgeology.org)

June 14-15th, 2022: Environmental Risk Management Workshop at the Ralph A. MacMullan Conference

Center, Roscommon, Michigan

August 6-9th, 2022: 58th Annual AIPG Meeting to be held in Marquette, Michigan

ONLINE RESOURCES

- Central Michigan University, Clarke Historical Library, Michigan Geology: https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Material_Statewide/Michigan_Oi <a href="https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Material_Statewide/Michigan_Oi <a href="https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Material_Statewide/Michigan_Oi <a href="https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Material_Statewide/Michigan_Oi <a href="https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Material_Statewide/Michigan_Oi <a href="https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Material_Statewide/Michigan_Oi <a href="https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Material_Statewide/Michigan_Oi https://www.cmich.edu/library/clarke/ResearchResources/Michigan_Geology.aspx
- Digital Geology Library Overview: <u>https://www.michigan.gov/documents/deq/GIMDL-Catalog-2010-</u>
 <u>01-20_307979_7.pdf</u>
- Digital Geology Library Mining Overview: <u>https://www.michigan.gov/documents/deq/GIMDL-Catalog-</u> 2013 06 22 mining 425595 7.pdf
- GeoWebFace: <u>https://www.michigan.gov/deq/0,4561,7-135-3311_60700---,00.html</u>
- Michigan Department of Natural Resource Calendar: <u>Michigan.gov/DNRCalendar</u>
- Michigan Geological Survey: <u>https://wmich.edu/geologysurvey</u>
- Michigan Geology Maps Available: https://www.michigan.gov/deq/0,4561,7-135-3304-116670---

 <u>,00.html</u>
- USGS Michigan Geological Map Data: <u>https://mrdata.usgs.gov/geology/state/state.php?state=MI</u>
- USGS Publications: U.S. Geological Survey Publications Warehouse (usgs.gov)



MICHIGAN BASIN GEOLOGICAL SOCIETY OFFICERS 2021-2022

PRESIDENT: CHRIS CHRISTENSEN, Geologist

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ELECTRONIC PUBLICATIONS: Please contact an officer for information

WEBMASTER: JOHN ESCH, eschj@michigan.gov

MBGS PUBLICATIONS

http://www.mbgs.org/publications.html

Historical publications now available on USB Flash Drives". Each USB Flash Drive is 8GB

Prices include postage, handling and any applicable sales tax. Orders for publications should be prepaid in U.S. Funds and addressed to: MBGS — Publications P.O. Box 14044 Lansing, MI 48901-4044

Historical CD #1: Nine out-of-print publications from 1949 through 1965 and 1998, 2000, \$15

- The Stratigraphy of Manitoulin Island, Ontario, Canada, June 19-20, 1954
- The Devonian and Silurian Rocks of Parts of Ontario, Canada and Western New York, June 22-23, 1951
- The Traverse Group of the Northern Part of the Southern Peninsula of Michigan, June 16-17, 1949
- The Devonian Strata of the London-Sarnia Area, Southwestern Ontario, Compiled by Erwin C. Stumm, Lewis B. Kellum and Jean Davies Wright, June 9-10, 1956
- The Ordovician Rocks of the Escanaba-Stonington Area, Led by R. C. Hussey, June 2-3, 1950
- The Niagara Escarpment of Peninsular Ontario, Canada, June 18-19, 1955
- Lower Paleozoic and Pleistocene Stratigraphy Across Central Wisconsin, Compiled by C. E. Prouty, Led by L. M. Cline, J. L. Hough and R. F. Black, 1960
- Classic Silurian Reefs of the Chicago Area, by Donald G. Mikulic and Joanne Kluessendorf, June 27, 1998
- Geology of Central Ontario, Canada, 1965

Historical CD #2: Four out-of-print publications from 1947, 1959, 1983 and 1991, 2001, \$15

- Copper Country Field Trip, Michigan, June 20-22, 1947
- Geology of Mackinac Island and Lower and Middle Devonian, South of the Straits of Mackinac, June 12-14, 1959
- Tectonics, Structure and Karst in Northern Lower Michigan, August 1983
- Geology of the Pictured Rocks, Upper Peninsula, Michigan, July 11-13, 1991

Historical CD #3: Six out-of-print publications from 1948, 1952, 1990 - 1995, 2001, \$15

- Pleistocene and Early Paleozoic of the Eastern Part of the Northern Peninsula of Michigan, June 18-21, 1948
- Stratigraphy and Structure of the Devonian Rocks in Southeastern MI and Northwestern OH, June 20-21, 1952
- Lower Ordovician and Upper Cambrian of Wisconsin, May 10-12, 1990
- Guidebook to the Precambrian Geology and Metallogeny of the Central Upper Peninsula of Michigan September 12-13, 1991

Historical CD #4: Six out-of-print publications from 1957, 1958, 1961, 1967, 1968 and 1970, 2004, \$15

- Silurian Rocks of the Northern Peninsula of Michigan, 1957
- Cambrian Geology of Parts of Dickinson and Iron Counties, Michigan, June 1958
- Geologic Features of Parts of Houghton, Keweenaw, Baraga and Ontonagon Counties, Michigan, May 19-21, 1961
- Correlation Problems of the Cambrian and Ordovician Outcrops Areas, Northern Peninsula of Michigan 1967
- The Geology of Manitoulin Island, June 1968
- Devonian Strata of Alpena and Presque Isle Counties, Michigan 1970

Historical CD #5: Five out-of-print publications from 1971, 1989, 2001, and Oil & Gas Fields Vol. 1 & 2, 1969 & 1992, 2006, \$50

- Oil & Gas Fields Symposium, Volume 1, April 1969, 200 pp., maps, illus., second printing with updates
- Oil & Gas Fields Manual of the Michigan Basin, Volume 2, 1992, 520 pp., maps, illus.
- Glacial Geology of Southwestern Michigan, 1989, 53 pp. by A. Kehew, L. J. Schmaltz, and W. T. Straw
- Geology of the Lake Erie Islands and Adjacent Shores, 1971, 65pp., maps, illus. by Jane L. Forsyth
- Glacial Geology of Southwestern Michigan, Landforms of the Lake Michigan Lobe, Southwestern Michigan, 2001, AAPG Eastern Section Meeting Field Trip, 32 pp., maps, illus. by A Kehew and A. Kozlowski

Historical CD #6: Six out-of-print publications from 1946, 1953, 1963, 1966, 1978 & 1987 plus the Richfield Challenge, 1952 & Tom Knapp's MS Thesis, 2007 \$15.

- Guidebook for Ordovician Stratigraphy of the Cincinnati, Ohio and Richmond, Indiana Areas, June 12, 13, 1953 by W. H. Shideler and B. T. Sandefur
- Guidebook for Ontario Geological Excursion to Kettle Point Owen Sound- Waubaushene, June 21, 22, 23 1946 by W. A. Roliff, C.S. Evans and J.F. Caley
- Guidebook for the Stratigraphy of the Silurian Rocks in Western Ohio, May 31- June 2, 1963 by C. H. Summerson, Jane L. Forsyth, Karl V. Hoover and J. R. Ulteig
- Guidebook for Cambrian Stratigraphy in Western Wisconsin, May 21, 22, 1966 by Merideth E. Ostrom
- Geology of the Manitoulin Area, Special Papers #3, September 29, 30 and October 1, 1978 by J. T. Sanford
- and R. E. Mosher
- Middle Devonian Cratonic Carbonates and Shales in Southwestern Ontario, November 14, 1987 by Bruce Wilkinson
- The Richfield Challenge, A Review of the Richfield Developments in Michigan, 1952 by Gordon H. Hautan
- A Theory of Rogers City and Dundee Relationships in Central Michigan, Masters Thesis, 1947 by Tom Knapp

Historical CD #7: Field Guidebooks from 1962, 1969, 1977, 1980, 1985 & 1988, \$15

- Silurian Rocks of the Southern Lake Michigan Area, 1962, James H. Fisher, Chairman, MBGS Annual Field Conference
- Studies of the Precambrian of the Michigan Basin, by Harold B. Stonehouse, 1969
- The Geology of the Marquette District: a Field Guide By F. W. Cambray, 1977
- Ordovician and Silurian Geology of the N. Peninsula of Michigan, 1980, R.B. Votaw, 40 pp., illus., maps
- Special Paper #4: Ordovician and Silurian Rocks of the Michigan Basin and its Margins, 1985 K.R. Cercone and J.M. Budai (eds.), 96 pp., illus.
- Upper Keweenawan Rift-Fill Sequence, Mid-Continent Rift System, Michigan, 1988, P.A. Daniels and R.D. Elmore, M.S. Wollensak, ed., 150 pp., illus., maps

OTHER SPECIAL OFFERS

- Historical CD Set #1 7 (detailed above) for a special purchase price of \$95
- NE Lower Peninsula Geological Field Conf., 2004, T. Black, M. Wollensak, On CD \$10
- Stratigraphic Lexicon for Michigan, 2001, prepared by MBGS and published by DEQ, \$4
- **Robert E. Mosher Geological Studies** A lifetime of geological research on Silurian Rocks with John T. Sanford. The disks are organized chronologically and include field work in North America and Europe. 2007, 2 CDs \$35.

AIPG 2022 National Annual Conference, Marquette, Michigan

Call for Abstracts and Student Poster Contest, Submit by May 9, 2022

AIPG is currently accepting abstracts for oral presentations and poster presentations for the 59th American Institute of Professional Geologists' National Conference that will be held in Marquette, Michigan, on the beautiful shores of the world's largest freshwater lake.



Geology: The Cornerstone of our Future August 6-9 | Marquette, MI

This year's meeting theme is "Geology: The Cornerstone of our Future". Geology plays a significant role in today's society and will become ever more important in the years to come. Our reliance on basic resources and building materials such as sand and gravel for roads, limestone for concrete, iron for structural purposes, and other base metals for electronics and other applications will not diminish; rather, it will become a greater concern as existing deposits are depleted or rendered inaccessible.

The ever-increasing number of applications of rare earth elements has created a greater demand on extraction and several of these elements will be needed in ever greater quantities to assist in the transition to a reduced carbon emission future. Geologists will be needed to identify, quantify, and yes, help with extraction of these mineral deposits.

A reliable source of clean freshwater is a basic necessity for life, and the onset of climate change is impacting these resources. Changing climate patterns mean that widespread areas may become stricken with drought. This will mean that significant depletion of groundwater aquifers and surface water reservoirs will occur in these areas as withdrawals exceed natural replenishment. This is already affecting agricultural practices and driving migration of human populations to areas where this precious resource may be found, resulting in conflict and/or political unrest. In addition, anthropogenic activities have contaminated some water resources and have made these resources locally unusable or require expensive treatment.

The national conference provides opportunities to present and learn from experts in various geology and geoscience fields, with networking opportunities throughout the conference. Earn CEUs too!

To have your abstract considered for an oral presentation or poster presentation, please complete the Abstract Submittal Form by the deadline of May 9, 2022. Abstracts must be in Word format, single-spaced, 12 point Times New Roman or Arial, and should not exceed one page. No tables or pictures will be accepted. You will be notified by May 23, 2022, if your abstract has been accepted. Technical presentations will be scheduled for Monday, August 8th. Posters will also be presented on Monday, August 8th. Authors who wish to publish a paper in AIPG's *The Professional Geologist* (TPG) can contact AIPG for additional information at <u>aipg@aipg.org</u>.

AIPG will review, edit, and publish a digital pdf of the conference abstracts on their website and in the conference app. A printed program will also contain all accepted abstracts.

An author who submits an abstract must have the intention of attending, registering, and presenting at the conference once the submission is accepted for either an oral presentation or poster presentation. Repeated or consecutive last-minute cancellations by presenters may result in future submissions being denied.

AIPG Student Poster Contest

Students can submit an abstract for a poster presentation and enter the poster contest to win cash prizes! The two categories for the student poster contest are:

Undergraduate Cash Prize - 1st Place: \$500, 2nd Place: \$200, 3rd Place: \$100 Graduate Cash Prize -1st Place: \$600, 2nd Place: \$250, 3rd Place: \$100

- To be entered into the student poster competition you must be a student member of AIPG. Go to <u>www.aipg.org</u> to join for free.
- Poster contest categories (undergraduate and graduate) will be based on the student's enrollment at the time the abstract is submitted.

JOB OPENINGS

Geologist/Environmental Scientist (2-5 years experience), Wood Novi, MI

Key Responsibilities:

- Work under the supervision of a Certified Professional Geologist
- Plan, coordinate and schedule field sampling events
- Conduct soil, surface water, sediment, soil gas, air and groundwater sampling events in various site settings
- Perform oversight of drilling operations including soil boring advancement and the installation of groundwater monitoring wells and/or piezometers
- Assist with collection of data during short and long-term aquifer pumping tests
- Perform remediation system operation and maintenance activities
- Prepare soil boring logs, monitoring well installation logs, and geologic cross sections using computer programs
- Assist senior staff with the preparation of technical reports including compiling analytical data, preparing potentiometric maps, developing data summaries, and writing report text
- Perform quality assurance and quality control checks on project level data and report components
- Daytime travel and occasional overnight travel required, with less frequent longer travel (up to a week or more) as needed
- Overtime required, as needed
- Have and maintain a valid driver's license, work outdoors in various weather conditions and frequently lift up to 35 pounds
- Although variable assignments are expected, this position will initially require approximately 75% field work and 25% office work
- Follow Wood safety standards, participate in safety training and prepare and implement site specific health and safety plans

Field Geologist, Atlas Humboldt, MI

Responsibilities Include But Are Not Limited To:

- Conduct soil and groundwater drilling and sampling activities
- Groundwater monitoring (various)
- Technical report production for the Petroleum / Remediation service line
- Conduct construction materials testing (soil, concrete, asphalt)
- Support Phase I and Phase II Environmental Site assessments for the Due Diligence Group.
- Conduct asbestos/Lead inspections and sampling
- Abide by Atlas's Health and Safety policies and procedures

Environmental Scientist/Geologist, Arcadis Novi, MI

Field activities may include the following:

- Field work such as: environmental groundwater, soil, and vapor sampling; environmental drilling and excavation oversight; remediation system operations & maintenance.
- Oversight of remedial system installations.
- Implementation of injection or other in-situ-based remedial technologies.
- Subcontractor and/or Health and Safety oversight.

Office responsibilities may include the following:

- Data management (compilation, manipulation, and evaluation of data)
- Health and Safety reporting
- Assisting with writing and preparing technical reports, work plans, letters, and memoranda
- Coordinating work schedules with subcontractors
- Developing figures/template reports and data QA/QC
- Boring log production

Staff Geologist / Engineer, Tetra Tech Ann Arbor, MI

Your Role:

- Performance of field tasks including treatment system operation, optimization, and maintenance, soil and groundwater sampling, vapor intrusion sampling (soil gas, subslab and indoor air); environmental assessments and site inspections, remediation implementation including both self- performance and oversight of subcontractors.
- Performance of office tasks including work plan development, remediation design, data evaluation and reporting. Tasks associated with reporting may include preparation of text, tables, charts, and figured.
- Management of tasks and small projects under guidance of Senior Project Manager supporting development as a Project Manager.

Environmental Geologist, Scientist or Engineer (Mid-Level), Antea Group USA Detroit, MI

Minimum Requirements: Please include a technical writing sample along with your application submission.

- Minimum of a bachelor's degree in Geology, Environmental Science, Environmental Engineering, Occupational Health and Safety or relevant field;
- 3 to 7 years of related environmental experience; Remediation System Operation and Maintenance a plus.
- Ability to drive project closure strategies and lead day to day activities for multiple project teams;
- Responsible for executing scope and maintaining schedule and budget goals;
- Ability to work independently with minimal supervision simultaneously for multiple project teams;
- Demonstrated organizational and communication skills, particularly proficiency in technical writing;
- Strong data collection, evaluation, and technical writing skills;
- Experience in one or more areas; drilling, environmental media sample collection, evaluation and implementation of remedial technologies, groundwater modeling, risk/impact assessments, environmental compliance programs, environmental permitting, and due diligence, air modeling, industrial hygiene;
- Must be willing and able to lift up to 50 pounds, work in wooded or rugged terrain, and handle seasonally high temperatures based upon project needs;
- Knowledge of industry regulations (EGLE technical guidance/requirements);
- Professional certification in a related field (PE, PG, etc.) a plus;
- Valid driver's license and safe driving record;
- Authorization to work in the United States without sponsorship, now or in the future.
- Compliance with any client requirements, including but not limited to COVID-19 vaccine mandates.
- Ability to successfully pass a company paid physical examination and drug screen.

Geologist 12 - Senior Hydrogeologist, Michigan Department of Environment, Great Lakes, and Energy Lansing, MI

This position serves as the recognized resource hydrogeologist for the evaluation of source water resources. This position will serve as the lead hydrogeologist responsible for analyzing, critiquing, and developing hydrogeological assessments for water withdrawal applications, source water protection plans, and water well construction specifications for the most controversial and complex projects. The assessments and plans often contain complex groundwater modeling applications that require review for use of appropriate parameters and verification of model outputs. Suitability of the model for the application is another critical part of the review. The employee is responsible for coordinating activities with the water use and water withdrawal programs in the development of public water supply sources, including water withdrawal impact assessments and large quantity water registration. Engineering firms, water supply contractors, local health departments and other agencies routinely rely on advice on various aspects of rules and regulations, water withdrawals, construction of wells and groundwater contaminant investigations in relation to development of the groundwater resource. The employee serves as a point of contact for the more complex requests and collaborations relative to quantitative and qualitative assessments of surface water and groundwater resource impacts. The employee also responds to requests and initiates discussions with public water supplies on requirements in construction of wells and applying the rules to complex site-specific problems.

Geologist/Environmental Scientist, GEI Consultants, Inc. Lansing, MI

Essential Responsibilities & Duties:

- Support environmental site assessments and permitting, remedial and pre-design investigations, test borings, well installations, environmental sampling of various media, aquifer testing, pilot tests, and technical oversight of subcontractors.
- Support remedial construction management services including coordination with design engineers and clients, specification and submittal review, project tracking and documentation, participating in or leading construction team meetings, acting as a client liaison, assisting with the preparation of final engineering or construction completion reports.
- Support data management and analysis, preparation/review of work plans and technical reports, and assist in preparation of presentations and proposals to clients and regulators.
- Support the development/refinement of investigation and remedial strategies for various types of sites and contaminants, and the design and installation of remediation systems.
- Interact with subcontractors, clients and regulatory agency representatives.

Geophysicist, Atlas Professionals United States

Required Certificates/Documents

- TWIC
- Seaman's Book
- BOSIET / FOET / T-HUET with CA-EBS
- OGUK Medical
- Fall Protection
- Basic Rigging
- Safe Gulf / Safe Land OR RigPass
- CPR / First Aid
- COVID Vaccination

Entry-Level Engineering Consultant/Geologist, Ramboll Ann Arbor, MI

Your Key Tasks And Responsibilities Will Be:

- Assisting with development and implementation of comprehensive site investigations by participating in scope of work development, field work, and data analysis to characterize contaminants in sediments, soil, surface water, and groundwater.
- Providing technical assistance on environmental permitting and compliance, site investigation and remediation, and due diligence transaction projects.
- Evaluating environmental data to support environmental fate and transport assessments and extent and magnitude of contamination determinations for the evaluation of site closure options.
- Applying engineering design and evaluation skills to solve environmental problems.
- Evaluating federal, state and local environmental regulatory requirements for waste, air quality, and water quality programs and preparing associated plans, permits, and reports.
- Developing clean-up goals for contaminated sites using federal and state environmental regulations.
- Assisting with the development and evaluation of remediation alternatives for contaminated sites to achieve sitespecific clean up objectives.
- Assisting in the preparation and editing of technical reports.
- Completing environmental site assessments of vacant, commercial, and industrial sites and preparing written reports summarizing conclusions of the assessment.
- Interactions with clients, agency, and the public.
- Oversight of field projects and management of subcontractors.
- Collection and management of environmental and/or residential/institutional samples.
- Formulating conclusions and opinions and communicating with clients.

Hydrogeologist/Environmental Scientist/Engineer, TRC Companies, Inc. Ann Arbor, MI

KEY RESPONSIBILITIES & TASKS Include The Following:

- Demonstrate excellence and efficiency in writing, communication, data analysis, professional judgment, and knowledge of scientific principles.
- Coordinate and lead investigation field work for a variety of media and pathways, including soil, groundwater, sediment, surface water, and vapor intrusion.
- Prepare, implement, and oversee remedial investigation and response action work plans.
- Manage scope, schedule, and budget for projects.
- Interface with clients and work with account leads in securing and growing new and flow business.
- Mentor junior staff.
- Demonstrate strong quality assurance/quality control skills to perform technical, style and consistency reviews.
- Manage time effectively and balance multiple fast-paced project assignments.
- Understand standards, regulations, and guidance that apply to environmental due diligence.
- Prioritize safety and have working knowledge of industry health and safety practices.
- Are conversant with Microsoft Word, Excel, Access, and Project.

Due Diligence Environmental Scientist/Engineer, TRC Companies, Inc. Ann Arbor, MI

- Perform due diligence assessments consistent with ASTM Phase I Environmental Site Assessment (ESA) standards, including broad-based limited compliance assessments, at industrial and commercial facilities. This includes conducting the field work, completing appropriate research, file reviews, and interviews, and writing reports.
- Participate in a variety of environmental-focused project work in the due diligence and compliance fields across a variety of industries.
- Demonstrate excellence and efficiency in writing, communication, and professional judgment.
- Demonstrate strong quality assurance/quality control skills to perform technical, style, and consistency reviews.
- Manage time effectively and balance multiple fast-paced project assignments.
- Have a strong sense of responsibility and work ethic.
- Prioritize safety and have working knowledge of industry health and safety practices.
- Interface with clients and work with client service managers and account leads in securing and growing new and repeat business.
- Understand standards, regulations, and guidance that apply to environmental due diligence and/or compliance projects and perform regulatory program file reviews.
- Manage scope, schedule, and budget for assigned projects.

INSTRUCTOR OF GEOSCIENCES, Monroe County Community College Frenchtown, MI

Instruction of earth and physical science courses including Earth Science, Physical Geography and Physical Science. Other responsibilities and duties will include participating in division-wide program and curriculum planning as well as the assessment of student learning outcomes. Preparing instructional strategies and materials to meet the needs of the students including the revision, planning and development of courses and course delivery methods. Utilization of distance learning and online strategies will be necessary. As an integral member of the Division, the individual is expected to develop effective collegial relationships, and work closely with students and local employers, and promote division programs and the College in general. Master's degree in Earth Science or Geology with graduate coursework in one of the following subfields: geophysics, geochemistry, hydrogeology, mineralogy, petrology, volcanology, glaciology, or sedimentology, OR Master's degree with 18 graduate credits in Earth Science or Geology and graduate coursework in any of the above subfields; Master's degree in Physical Geography, Geology, Earth Science, Geomorphology, Atmospheric Science, or Biogeography, OR Master's degree with 18 graduate credits in any of the above disciplines Master's degree in Earth Science or Celose with 18 graduate credits in any of the above disciplines Ability to develop additional curriculum that can support the Geoscience/Earth Science transfer pathway is highly preferred. Experience with the use of technology in the classroom and distance-learning techniques is a must.

Environmental Compliance Scientist/Engineer, Tetra Tech Ann Arbor, MI

Your Role:

- Interact with commercial/industrial clients to identify needs, collect data, develop and process solutions for task completion
- Perform data analysis utilizing software, spreadsheets, databases, or other novel solutions to assist with resolving client problems
- Engage in diverse client projects that may involve multi-media knowledge including Air, Water, Waste, Hazardous Material Management, or Emergency Response/Prevention
- Develop and deliver proficient technical documents, presentations, and/or training sessions on regulatory compliance concepts, industry trends, and emerging issues
- Review and monitor changes in environmental regulations working with Sr. staff to develop client solutions
- Support client project teams and internal business development initiatives
- Apply knowledge gained in previous assignments

Principal Environmental Consultant (Mid-Senior Level), ERM: Environmental Resources Management Novi Responsibilities:

- Oversee, manage and provide technical expertise on site investigation and remediation projects for a variety of clients with complex technical/regulatory issues in the chemical, manufacturing, and other industrial sectors.
- Design and negotiate remedial solutions for contaminated soil, groundwater, vapor, and sediment, using innovative and emerging remedial treatment technologies as well as traditional systems.
- Oversee multiple projects within client's scope/budget/schedule expectations and ensure quality standards on project deliverables across ERM's LPMR service lines [e.g., Brownfields redevelopment, site investigation and remediation, liability evaluation and cost estimation, risk assessment, and site closure].
- Assist clients in developing and implementing contaminated site management strategies.
- Evaluate various remedial technologies for applicability at specific sites (e.g. feasibility screening).
- Perform remediation design tasks including evaluating field data, performing calculations, estimating quantities and costs, and preparing design reports
- Appropriately delegate project assignments to project teams and mentor junior staff.
- Develop and expand client relationships that generate repeat business to grow the LPMR area in the Midwest and across the chemical and manufacturing sectors.
- Prepare technical proposals and participate in business development with existing clients and identified leads.
- Build strong collaborative relationships with other ERM employees.

Environmental Engineer - Mid Level (Remediation Focus), Barr Engineering Co., Grand Rapids, MI

Barr is seeking an environmental engineer or geologist to join its Grand Rapids office and undertake challenging and progressive work on projects related to the investigation, evaluation, and remediation of contaminated sites. Assignments may include working as an individual or as part of a project team to assist with preparing technical work plans and reports; coordinating ASTM Phase I environmental site assessments; investigating contaminated soil, sediment, groundwater, and vapor intrusion; conducting remediation technology evaluations and feasibility studies; developing site management strategies, remedial design, and response action plans; and coordinating site remediation activities. Responsibilities will also include preparing cost estimates and contracting for investigation activities. Other responsibilities may include on-site investigations of contaminated soil, sediment, groundwater, surface water, and soil gas; aquifer test performance and analysis; and construction observation. On-site investigation tasks may involve observing drilling and monitoring well installation, classifying soil and bedrock samples, and collecting samples for field screening and laboratory analysis. Fieldwork opportunities for this position may be year-round and will likely include some out-of-town travel. This position can also be located in our Ann Arbor office.

Staff Environmental Engineer or Scientist, Geosyntec Consultants Ann Arbor, MI

Essential Duties And Responsibilities:

Some of the key responsibilities for the position include:

- Fieldwork such as soil, vapor, and groundwater sampling; drilling and contractor oversight; and remediation treatment system operation and maintenance;
- Chemical data and contaminant fate & transport evaluation;
- Well installation, aquifer testing, and groundwater monitoring;
- Groundwater, soil, and vapor intrusion remedy evaluation, cost estimation, design calculations, and implementation;
- Evaluation of emerging contaminants such as PFAS;
- Environmental due diligence, regulatory compliance services, and permitting;
- Data analysis, including preparing maps, tables, and figures; and
- Preparation of technical reports, letters, memoranda, plans, specifications, and proposals.

Graduate Environmental Scientist/Engineer – Remediation, GHD Farmington Hills, MI

In this role, your responsibilities will include:

- Assist with multi-discipline industrial site restoration projects
- Effectively working with key technical specialists, project team members, and delivery managers
- Prepare, plan, and analyze/review technical studies, summary documents, and similar reports/documents
- Prepare budgets and schedules
- Report writing to document field activities and investigation findings
- Develop working relationships with state and federal agency staff, and community leaders/stakeholders.

Landfill Operations Manager Trainee, WM, Wayne, MI

The Disposal Operations Management Trainee (DOMT) position is part of a required developmental training program lasting up to 18 months. The duties and responsibilities are under the direction and supervision of WM frontline managers (e.g., Area Directors of Disposal Operations, Landfill District Managers, and Operations Managers) related to the operations of a landfill. The primary mentor for this position will be the Landfill District Manager at the training location to which the DOMT is assigned or the Area Director of Disposal Operations. The DOMT, through assigned work activities, a training curriculum, and hands-on projects, will develop a strong working knowledge of all aspects of the day-to-day disposal operations at a WM landfill, including but not limited to, safety, environmental protection and permitting, finance and accounting, personnel management, heavy equipment, community and customer service, construction and engineering, gas and leachate management, and waste streams and sales. The Disposal OMT training program is designed to develop individuals into Operations Managers and District Managers with a strong career path to Directors of Disposal Operations or other roles.

Environmental Engineer, WSP USA Gladstone, MI

Your Impact:

- Determine well-defined data collection methods for collecting, identifying, and compiling environmental data from samples of air, soil, water, sludge, and other matrices for projects, investigations, and surveys.
- Perform professional environmental engineering work and conduct investigations and inspections of air emission sources, hazardous or solid waste facilities, water supply facilities, industrial and agricultural facilities, pollution sources and proposed and existing site conditions, water resources, and underground storage tanks to determine conformance with applicable rules, standards, and construction or operating permits.
- Assist with environmental site assessments (Phase I and II).
- Research environmental hazmat databases regarding historical property land uses.
- Prepare data and visualizations such as tables, charts, accurate reports, and illustrations for the interpretation or presentation of data, findings, or analyses.
- Maintain quality control standards and procedures for accurate and precise measurements, statistical analysis, and reporting.
- Assist with development and scoping of medium-sized projects.
- Prepare technical reports and presentations that explain research, findings, and recommendations to prevent, control, restore, clean-up, or address environmental issues or problems.

- Assist in the analysis, evaluation, and interpretation of environmental data obtained during field investigations, offering input with developing action plans for moderate- to high-level threat mitigation activities.
- Work with cross-functional teams in executing project work.
- Prepare and implement site Health and Safety Plans (HASPs).
- Comply with regulatory requirements pertaining to the data integrity, documentation, procedures, training, monitoring systems, and record compliance and retention.
- Interact with regulatory agencies, subcontractors, and clients in a confident and professional manner.
- Remain current in latest environmental engineering techniques.

Geotechnical Engineer, Eagle Mine Big Bay, MI

Job Description

- Regular underground inspections of working areas to include geotechnical mapping, corrosion mapping, general inspections, and seismic re-entry inspections
- Reporting and documentation of all underground inspections and mapping
- QA/QC checks of all installed ground support systems, including site observations of bolting/drilling in progress
- Analyze and report on QA/QC results of ground support systems
- Responsible for installation and maintenance of all geotechnical monitoring equipment for surface and underground
- Collect, analyze, and report on all geotechnical monitoring data
- Training of underground workforce in geotechnical issues and ground support
- Other duties as assigned

Environmental/Civil Engineer, EA Engineering, Science, and Technology, Inc., PBC Brighton, MI

We have an excellent opportunity for a self-motivated experienced Environmental Engineer/Civil Engineer to support growing business opportunities out of our Brighton, MI office. Responsibilities for the position include project management, technical and cost proposal development, engineering analysis and design, preparation of reports and bid documents, construction oversight, other business development support, site investigation planning and field team management, management of subcontractors, and client interaction. Work will include participation in site investigations, RI/FS, remedial design, and remedial action; therefore, excellent technical writing skills are essential and examples of relevant work products demonstrating writing proficiency may be requested. This position will require some travel and working remotely on projects in other locations as needed.