



TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

Austin, TX - USA | Anaheim, CA - USA | Anderson, SC - USA | Gold Coast - Australia | Sao Paulo - Brazil | Suzhou - China

February 2018

Dear Industry Colleague,

Happy New Year! In keeping with tradition, we take this time to offer you best wishes for a successful 2018, and news from TRI. We have just completed a successful, if not arduous 2017 effort involving needed internal infrastructure development as well as continued business growth. We give thanks for the many blessings we have received along the way as we continue to adapt and grow for continued service to our clients.



Sam R. Allen

Vice President & Division Manager

NEW LOGO

You will note the new logo in our letterhead. This new design represents a cleaner and simpler format. We will utilize this three-angle triangle design for TRI's product inspection and marking program. You will begin seeing this new logo on correspondence and testing reports.



INTERNAL DEVELOPMENTS

Many new infrastructure improvements were carried out in 2017 including new accounting, business and sample tracking systems and testing capability expansions. Each development was equal parts exciting to realize and very demanding in their associated on-boarding efforts. We are pleased to shift from development and implementation efforts to full beneficial employment of these systems in 2018. These new systems significantly advance our business and customer response systems and laboratory throughput capabilities, enhancing our customer service to a growing materials testing community.

STAFF NEWS

TRI was very pleased to welcome **Patricia Zabaleta** as a Senior Project Manager in our Geosynthetic Conformance Laboratory. Patricia has a wealth of experience in geosynthetic manufacturing, installation and specification review, having begun her career in the geosynthetic manufacturing and installation businesses. This experience equips her to work with clients who are responding to the various state and federal materials testing requirements. She was immediately at home in assisting clients with their laboratory specification requirements and associated CQA plans. Patricia's experience and professionalism have made her a hit with our clients and we are proud to have her as part of our customer response and project management staff. Patricia may be reached at **PZabaleta@tri-env.com** or +1 512 263 2101, ext. 140.



Patricia Zabaleta
TRI Senior Project Manager

TRI was also very excited to welcome **Eli Cuelho, P.E.**, a Senior Engineer and Director of TRI's Transportation Testing and Research Services. Eli has over twenty years in geosynthetic application research as well as other transportation research areas. In this relatively short time he has already shown industry leadership and innovation in his testing and research efforts. He is well-published and active on numerous federal, state and industry research efforts. Eli is working closely with TRI's Southeast large-scale testing laboratories to assist clients with geosynthetic system performance testing. Eli may be reached at **ECuelho@tri-env.com** or +1 406 600 3947.



Eli Cuelho, P.E.
TRI Director of Transportation Testing and Research Services

In other staff news, **Joel Sprague**, a senior engineer for TRI Environmental and the Director of TRI – Southeast, received the Award of Merit from ASTM International's Committee D35 on Geosynthetics. The Award was presented on Thursday, June 15, 2017 as part of the D35 Committee Meeting Week in Toronto, Canada. The prestigious award bestowed upon him the honorary title of Fellow. It is the standards organization's highest recognition for individual contributions to standards development.

Joel Sprague has been a member of ASTM International for more than 30 and has previously received the ASTM Award of Appreciation (2000), the GTJ Outstanding Article Award (2003), and the Richard S. Ladd Standards Development Award (2004).



TRI Environmental's Senior Engineer Joel Sprague (left) receives the ASTM Award of Merit from the 2017 ASTM International Chairman of the Board, D. Thomas Marsh

TRI SOUTHEAST EXPANSION

TRI's southeastern laboratory operations, previously concentrated at our Anderson, South Carolina facility, expanded to include a new 7000 ft² (650 m²) laboratory/office facility in Greenville, SC. The new lab is adjacent to TRI's newly acquired 10 acres (4 ha) of land including a 4.5 acre (1.8 ha) fresh water lake to supply the very significant water resources needed to support our large scale erosion testing efforts. The significant land expansion also enhances the trafficking and deep burial application studies that TRI Southeast provides. The new laboratory and office is located approximately 20 minutes from the Greenville-Spartanburg airport, making it even more accessible for clients to visit, meeting with TRI Southeast staff, and observe testing. We look forward to welcoming you in Greenville.



The 4.5 acre "Lake TRI" in Greenville, SC facilitates large scale hydraulic testing

ACCELERATED PAVEMENT TESTER

Occupying some of the new laboratory space in Greenville will be a newly acquired Accelerated Pavement Tester (APT). TRI's APT rolling wheel load test is very similar to a real roadway, but is built in a more controlled environment. This test minimizes potential environmental effects (temperature, precipitation, etc.), increases the controls on construction since it is built at full-scale in a concrete-lined pit rather than in a soil trench, uses a rolling wheel to apply the load, and is quicker to traffic since it is done with an accelerated testing device rather than an actual vehicle. The road system test pit is 11 ft wide x 36 ft long x 4 ft deep (~ 3.35 x 11 x 1.2 meters) Please contact Eli Cuelho (contact information on page 2) for more information.



TRI's Advanced Accelerated Pavement Tester

INTERFACE FRICTION / DIRECT SHEAR TESTING

TRI invested substantially in the infrastructure and bandwidth of our geosynthetic interface friction laboratory over the course of 2017. We were pleased to bring our total number of shear boxes to 26. This increase in equipment and the associated infrastructure was in response to the scale and frequency of interface friction testing associated with regulation of the coal ash industry and robust adherence to drained testing requirements requiring extended test times. The 26 shear boxes include five high-load and five low-load test frames. The high-load frames utilize hydraulics and enable the laboratory team to meet the increasing demands for testing under higher normal stresses. The low-load friction test frames are designed to negate the bias associated with test system friction and the need for a bearing correction.



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LEAK LOCATION SERVICES

The Electrical Leak Location/Liner Integrity Survey department of TRI experienced a record year. Forty seven survey projects were successfully completed by TRI, comprising over 15 million square feet. Additionally, TRI provided assistance, equipment, and/or training for 10+ surveys performed by other companies, enabling a handful of new ELL service providers throughout the world.

In-house manufacturing of the 3000 series LISA leak detection equipment was launched, with the end of the year marking the first successful assemblies of the electronics portion of the series. The 3000 series kits are expected to be available for sale by the middle of 2018. The 3000 series features multifunctional structures and electronics that are high precision GPS compatible.

Significant progress was also made in the creation of a new ASTM standard practice for electrical leak location, which may now be published by the end of 2018. The new standard aims to eliminate all leaks in installed geomembranes by addressing the limitations of the other existing standard methods.

Finally, the first episode of an Electrical Leak Location Webinar Series was broadcast by IGS North America. TRI's **Abigail Gilson** led the education, which included an overview of available ELL methods, the advantages and limitations of each, and how to choose a method for a particular site. Quarterly additions to the series are planned for 2018 – 2020 with increasingly advanced topics.



Abigail Gilson

Director of Liner Integrity Services

GEOTECHNICAL LABORATORY DEVELOPMENTS

TRI's AASHTO accredited geotechnical laboratory continues to serve our clients as an extension of their own in-house laboratory services. TRI's rapid turn time for advanced testing is supported by over 50 flexible wall permeability, 20 triaxial, 9 direct shear, 12 incremental consolidation, three CRS, and DSS capabilities. In addition to our traditional geotechnical testing capabilities, TRI supports our client's via our rock mechanics and wet chemistry laboratories. Our client experience within the geotechnical laboratory is now further supported through the addition of Ms. **Amanda Salinas**, our geotechnical laboratory coordinator. Amanda communicates sample receipt, confirmation of testing programs, and provides updates with our clients (geotech@tri-env.com).



Amanda Salinas

Geotechnical Coordinator

TRI SHORT COURSES AND 2018 TECHNICAL TRAINING SCHEDULE

2017 efforts in geosynthetic related education took TRI to different locations around the world. TRI curriculum related to electrical leak location and related CQA practices was delivered to a GIGSA (Geosynthetic Interest Group of South Africa) audience in Pretoria, South Africa. These same classes were offered in Melbourne Australia as organized by TRI Australasia. Dr. Jeffrey Kuhn, the director of our Geotechnical and Interaction laboratories, in conjunction with Dr. Ranjiv Gupta taught a two day short course in the spring of 2017 on Slope Stability of Containment Systems. Jeff and Ranjiv addressed issues related to slope stability design and interface friction testing – both performance and interpretation of test results.

Formal announcements regarding the course will be provided soon.



Abigail Gilson teaches students electrical leak location practice



Sam Allen with 2017 South African CQA class

CONCLUSION

TRI appreciates your support and business. You motivate us to continually improve our dedication to and services for geosynthetic testing and research. We are committed to assisting your drive for success with your geosynthetic and geotechnical projects by bringing you the highest quality and most responsive service in independent, third-party support.

Please contact us if you have any questions, suggestions, or comments. We look forward to working with you in 2018.

The following presents our Spring 2018 Course schedule.

All Spring courses will be held in Austin Texas at TRI headquarters.

May 7 – 8, 2018

Liner Integrity Surveys/ Assessments (LISA)

*w/Abigail Beck Gilson, P.E.
and Jeffrey Blum*

May 7 – 8, 2018

Slope Stability of Containment Systems

w/Dr. Jeffrey Kuhn, P.E. and guest

May 9, 2018

CQA/CQC for Geosynthetic Installations

w/Sam Allen and Mark Sieracke

May 10, 2018

CQA/CQC for CCL and GCL Lining Systems

w/Dr. Jeffrey Kuhn, P.E.

May 11, 2018

GSi GCI CQA Exams