06 January 2009

Dear Industry Colleagues:

Happy New Year!

In keeping with tradition, we take this time to offer you best wishes for a successful 2009, and news from the TRI Geosynthetic Services Division. We have just completed a successful 2008 effort and are anticipating a productive Geosynthetics 2009 Conference in Salt Lake City, February 25-27, where we hope to have the opportunity to visit with many of you at our booth and in technical sessions.

While remaining a small business in operation and staffing, TRI is extremely proud of our growing international reputation for the excellent quality and significance of testing services provided. There has been nothing small about 2008 for TRI and our clients, our collective work reaching worldwide in applications and acknowledgment.

Some news regarding our staff and services follows.

TRI Staff News

In response to continued growth in laboratory resources and sponsored work, TRI was pleased to welcome the permanent relocation of Mr. Richard Lacey, P.E. and TRI's Senior Engineer, to our Austin, Texas testing and research facilities from his previous home in Pittsburgh, PA. Mr. Lacy joins our other existing senior staff which includes Rick Thomas, Jacqueline Dettman (Mgr. of Project Development), Dr. Mansuk Patel (Laboratory Director), Jarrett Nelson (Special Projects Manager), Melissa Hunter (Senior Project Manager), and Jennifer Tenney (Project Manager). Rich (as most refer to him) has excelled in his new location contributing to special projects, quality assurance maintenance and our growing list of accreditations. Please help us welcome him at RLacey@tri-env.com or 800-880-8378 (512-263-2101) ext. 133.

John Allen, TRI's Director of the Geosynthetics-Soils Interaction Laboratory, wrote his Texas Professional Engineering Exam and achieved PE status at first exam sitting. We congratulate John as he joins TRI's other professional engineers Joel Sprague and Richard Lacey.

Due to unequalled TRI staff performance, turnaround time in conformance/verification testing was never better than in 2008 with service records enjoyed throughout the company. This was a result of the staff's robust equipment maintenance, achieved system efficiencies and 24-hour full time laboratory operations during peak demand periods.

Laboratory Equipment, Infrastructure, Credentials and Growing Technologies

A laboratory's responsiveness is based largely on its own internal resources. Our growth in this regard is testament to your critical support and our continuing reputation as "the industry's lab". For this we are profoundly grateful.

Geosynthetic Conformance/Verification and Interface Friction Testing

TRI's geosynthetic laboratory experienced an exceptional year in 2008. We were pleased to add key laboratory equipment that substantially increased our position as a full service and rapid turnaround time laboratory. Most significant in these additions was four new interface friction boxes, including two unique low-load friction test frames designed to negate the bias associated with test system friction and the need for drag correction. This world-class lab now houses fifteen interface friction test frames with loading capacities from <100 psf to as high as 60,000 psf. This capacity has assisted with TRI's

unequalled turnaround time and service excellence as well as ongoing research projects. Research efforts include the maintenance of a web-based friction database (available to clients) and ongoing GCL research investigating the hydration and accelerated consolidation procedures for GCLs and GCL interfaces, as well as drained condition strain rates associated with interfaces with variable clayey soils.

The consolidation and closing of some industry laboratories also afforded TRI with the opportunity to realize significant equipment expansions. This was especially true in the areas of geotechnical testing as TRI added several permeameters and routine soils index test measuring instruments. Also added were tensiometers, melt index and Mullen burst apparatus.

Finally, TRI significantly upgraded and expanded its accelerated creep testing capabilities. The Stepped Isothermal Method (SIM) was developed here at TRI and we remain the leaders in this important technology as the pipe industry has now joined the geosynthetic reinforcement industry as users of this test for compliance testing. In addition to added SIM test chambers for tension creep, we manufactured slope related test capabilities for compression loaded SIM testing of geosynthetic planar drains.

Growing Laboratory Credentials

When a geosynthetics testing laboratory performs geosynthetic interaction tests involving soils, aggregates, etc., what gives this laboratory the credentials related to proper training and expertise related to experience with these non-geosynthetic materials? TRI has performed literally hundreds of internal clay shear tests to provide much needed context for friction testing results. We have remolded thousands of soil specimens based on Proctor data to support friction, clogging, pull-out and large scale puncture tests. Sometimes the Proctor data was generated at TRI based on rush construction project schedules and urgent need.

A visiting client challenged us several months ago to demonstrate an independent third party opinion regarding our capabilities in this area of geosynthetics testing, that is, the geotechnical related areas involving soils. Finding much validity in this client's suggestion, TRI responded by seeking and being awarded geotechnical laboratory testing accreditation from the American Association of State Highway and Transportation Officials (AASHTO) accrediting arm, the American Materials Research Laboratory (AMRL). The AMRL audited TRI in the Winter of 2008 and TRI responded to achieve AMRL accreditation for the following geotechnical tests.

AASHTO R18

- ASTM D 421, *Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants*
- ASTM D 422, *Standard Test Method for Particle-Size Analysis of Soils*
- ASTM D 698, *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3))*
- ASTM D1140, *Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75-µm) Sieve*
- ASTM D 1557, *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))*

- ASTM D 2166, *Standard Test Method for Unconfined Compressive Strength of Cohesive Soil*
- ASTM D 2216, *Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass*
- ASTM D 2434, *Standard Test Method for Permeability of Granular Soils (Constant Head)*
- ASTM D 2435, *Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading*
- ASTM D 2487, *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)*
- ASTM D 2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*
- ASTM D 2850, *Standard Test Method for Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils*
- ASTM D 3080, *Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions*
- ASTM D 4318, *Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils*
- ASTM D 4767, *Standard Test Method for Consolidated Undrained Triaxial Compression Test for Cohesive Soils*
- ASTM D 5084, *Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter*

We believe this accreditation adds much needed validity to the already robust geotechnical testing services we routinely provide. We also believe the addition of these accredited tests to our world-leading accreditations further supports TRI as an unequalled source for geosynthetics evaluation. In addition to responding to specification compliance and design verification projects for synthetics, TRI is fully capable and qualified to support all other construction material verification work.

TRI is the first laboratory to achieve accreditation from the Geosynthetics Accreditation Institute (GAI). 2008 represented the fourteenth year of accreditation for many of our test procedures and, as such, our Division was once again audited via proficiency testing. We are pleased to report that we again were awarded continued accreditation. We currently maintain a repertoire of 118 accredited tests.

Electrical Resistivity Testing - Leak Location Training and Equipment

TRI, in concert with ICORP International and Dr. Ian Peggs, has been providing training and technician certification for leak location testing field personnel. The training program and curriculum was developed with the assistance of a Steering Committee comprised of practitioners and regulators responding to leak location technology use. Several students have successfully passed the course and a growing number of certified personnel offer leak location testing services.

3G Meter

After teaching the course for over three years and observing the varied equipment developed and employed for field surveys, in 2008 TRI-CORP committed to manufacturer equipment designed specifically for the field performance of electrical leak location services. The equipment is not converted from other applications for this use. Instead it is manufactured specifically for this application and to directly assist the field technician performing a leak location survey. The product is called the 3G (third generation) Smart Applied Potential Geomembrane Liner Integrity/Leak Location Survey Equipment.

The 3G leak survey equipment, sold as a kit, includes the following.

- 600 VDC power supply requiring 110/220 VAC source with voltage and current control.
- 2 lengths of 250 ft (76 m) 14 gauge stranded copper wire.
- 2 stainless steel current injector/return electrodes.
- 2 artificial calibration holes: 0.01 in. (2.5 mm) and 0.25 in. (6 mm) diameter with 25 ft (8 m) wire.
- Scissor action water survey probe, protected electrodes to minimize noise level.
- One meter wide soil probe with pointed stainless steel electrodes for enhanced surface penetration.
- Water lance survey probe with internal electrodes and venturi outlet for long solid water stream.
- Belt-pack to carry meter batteries and other necessities.
- Meter mount on survey probes.
- Compact signal/monitoring meter with:
  - >12 hour battery life
  - Rapid battery charger
  - Digital volt meter
  - Light bar signal intensity display
  - Analog type signal intensity and polarity display
  - Audio signal monitoring with headphones
  - Single scale and infinitely adjustable gain controls
  - Blue/red arrows that indicate approaching/receding leak
  - Data output capacity
- Instruction manual
- Wheeled shipping case


Soil Covered Probe

TRI maintains inventory of this test equipment and is able to ship to users immediately. Those interested may contact Sam Allen, Vice President at 800, 880, 8378, ext. 138, or SAllen@tri-env.com.

Towards Recycled Resin Use

TRI was awarded a National Cooperative Highway Research Program (NCHRP) Project (04-32) to study the feasibility of and develop a specification for the use of recycled HDPE in corrugated plastic pipe for highway applications. This research has been under the direction of Mr. Rick Thomas of TRI and has significantly increased activity in plastic blending, stress crack resistance testing and thermal analysis. TRI is in the unique position of being intimately familiar with post-industrial and post-consumer recycled polyethylene as well as polyethylene resins used for geomembranes, nets, grids, and pipe. Key to our success in this new area was the acquisition of a new laboratory scale twin screw extruder allowing our technical staff capacity for melt blending and thermal variables and draw ratio studies.


Twin Screw Extruder

Other new service offerings to the polyethylene manufacturing and user communities include:

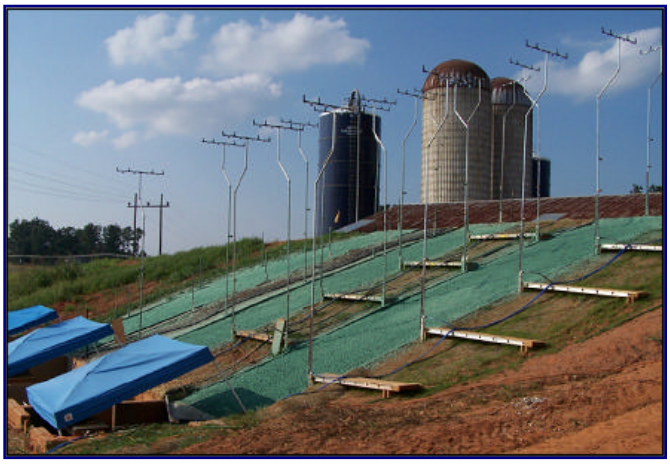
- Trial blending of virgin and recycled resins to determine the optimum blend ratio for key performance properties.
- Identification of recycled content in polyethylene blends.
- Service lifetime predictions or design strength determinations based on long-term stress crack resistance.
- Determination of long-term elastic modulus for design.
- How to evaluate and specify recycled polyethylene.

The results of the NCHRP study will allow those interested in using recycled HDPE in their products to select, evaluate, and specify resin formulations for a wide variety of products.

Continuing Development of TRI's Denver Downs Research Facility for Erosion Control Studies

In 2006, TRI realized the successful development and activation of a large-scale erosion and sediment control testing facility in Anderson County, South Carolina. Joel Sprague, P.E., of TRI's Southeast Area Office in Greenville, SC manages this large-scale research and testing facility. 2008 realized a significant client-driven growth of our testing capabilities as the following were brought on-line for service to customers.

- Evaluation of shoreline lining protection systems under wind-induced wave action
- Evaluation of impoundment capacity and inlet protection capability of a sediment retention system
- Evaluation of storm water inlet protection provided by sediment retention devices in curb and gutter applications
- Evaluation of vegetated RECP shear testing in 10% channels in accordance with ASTM D 6460
- Evaluation of large-scale germination and functional longevity testing using vegetated and unvegetated outdoor plots



These capabilities add to TRI's well established standardized testing capabilities performed in accordance with the following standards.

ASTM D 6459, *Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Hillslopes from Rainfall-Induced Erosion*
ASTM D 6460, *Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion*
ASTM D 7208, *Determination Of Temporary Ditch Check Performance In Protecting Earthen Channels From Stormwater-Induced Erosion*
ASTM D 7351, *Determination Of Sediment Retention Device Effectiveness In Sheet Flow Applications*

DDRF is located just a mile off Interstate 85 about 25 miles southeast of Greenville, in Anderson County, SC. Contact Joel Sprague, P.E. at 864 242 2220 or JSprague@tri-env.com for facility descriptions and testing information. You may also visit www.erosiontest.com for additional information.

Conclusion

TRI appreciates your support and business, and this opportunity to share with you our efforts to continually improve as your choice for geosynthetic testing and research services. We love what we do here at TRI and commit again each year to bringing you the best, independent, third-party, most responsive service, assisting you to realize success with geosynthetic projects.

Please contact us if you have any questions, suggestions, or comments. We look forward to working with you during a very successful 2007.

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