VERIFIGLOBAL NEWSLETTER

Benefits of ISO 14034 Verification

Accurate, Reliable, Credible

Comprehensive performance verification with global market reach

The ISO 14034 Environmental Technology Verification (ETV) standard, published in November 2016, facilitates a market-driven approach to technology performance verification. Stakeholder groups and communities of interest can collaborate in defining appropriate performance parameters and verification requirements, reflecting their particular needs. ISO 14034 enables an open market approach to technology evaluation based on a standardized procedure that encourages the sharing of verification results across multiple jurisdictions.

SEPTEMBER 2017

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VerifiGlobal - Creating value through informed decisions and sustainable results

Market Drivers for Implementing ETV

Environmental technology verification (ETV) facilitates informed decision-making through third-party confirmation of the performance of innovative solutions, technologies, products and practices based on independent data. ETV is particularly effective in understanding and evaluating proposed solutions and potential outcomes that have features and characteristics not fully addressed by existing standards. ETV assists in addressing complex challenges where commitment to a proposed solution may involve tradeoffs about expected results and whether or not the proposed solution will result in substantial improvements. ETV also supports advancement of innovative solutions that address social, economic and environmental priorities, emphasizing incremental value, beyond "business as usual".

Verification of Innovative Technologies

Are you a technology company with a new innovative environmental technology?
If so, you may be interested to learn about a new pilot project for innovative technology verification in Ontario, Canada.

The **Ontario Ministry of the Environment and Climate Change (MOECC)** is funding a pilot project for innovative technology verification. The first phase of this pilot project focuses on innovative municipal wastewater treatment technologies.

If you have an innovative, market ready environmental technology for municipal wastewater treatment, you may be eligible to participate in the pilot, which aims to streamline the application process for Ontario MOECC Environmental Compliance Approval (ECA).

The MOECC pilot is based on the new international standard for environmental technology verification, ISO 14034.

ISO 14034 is particularly applicable to environmental technologies with innovative features or performance that cannot be fully assessed using existing standards. Through the provision of objective evidence, the application of ISO 14034 provides an independent and impartial confirmation of the performance of a technology based on reliable test data.

The ISO 14034 standard aims to strengthen the credibility of environmental technologies by supporting informed decision-making among interested parties.

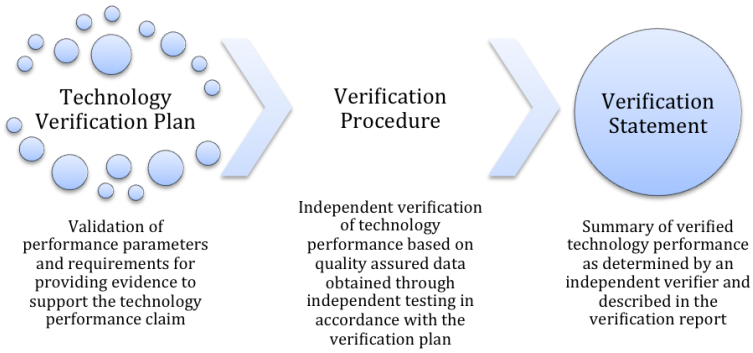
Verifications are based on reliable test results and robust procedures, and facilitated by competent third-party verifiers so that methods and data are fully disclosed and reports are clear, complete, objective, and useful to interested parties.

Applying the ISO 14034 process to verify credible and impartial evidence of performance claims benefits all parties, including technology companies and their customers.

More information on the Ontario pilot project is available at:
https://www.ontario.ca/page/environmental-compliance-approval#section-3

VerifiGlobal Alliance members, CAWT and GHL, are providing technology testing and verification support to the MOECC pilot project.

Verification Process Requirements Based on ISO 14034



Verification based on ISO 14034 involves preparation of a verification plan, implementation of a verification procedure, and issuance of a verification statement.

The **ISO 14034** process is a quality assured, evidence-based approach for the identification of credible performance parameters and supporting metrics that have a higher probability of market acceptance. The ISO 14034 process permits independent verification of the actual performance of technologies, enabling informed and effective decisions.

Basic requirements of the ISO 14034 process include:

- **Technology Verification Plan** - Validation of technology performance parameters and requirements for providing evidence to support a technology performance claim

- **Verification Procedure** - Independent verification of technology performance based on quality assured data obtained through independent testing in accordance with the verification plan

- **Verification Statement** - Summary of verified technology performance as determined by an independent verifier and described in the verification report.

Technology Focus:

RemScan™ portable hand-held instrument for rapid field measurements of total petroleum hydrocarbons (TPH) in soil

RemScan™ is a portable hand-held instrument used to perform rapid field measurements of total petroleum hydrocarbons (TPH) in soil. It is a rugged, weatherproof and portable instrument capable of measuring TPH concentrations in less than 20 seconds in any location where a soil sample can be accessed.

RemScan™ is equipped with two batteries, each of which allows continuous use for 4 hours (i.e. a total of 8 hours of continuous use). The charge cycle takes less than 4 hours. The unit also is equipped with a power cord, which can be used when local power is available and continuous extended use of the unit is expected. The unit is equipped with a personal data assistant (PDA), providing a user-friendly interface for entering sample information such as identification names and dates, performing calibration checks, and allowing data access and export. The PDA battery provides at least 8 hours of continuous use.

The RemScan™ technology is based on a diffuse reflectance infrared Fourier transform (DRIFT). It shoots a mid-infrared beam at the soil and the reflected light is captured in a detector. The instrument software then converts the unique reflected signal into an accurate TPH (C10 to C36) readout in milligrams (mg) of TPH per kilogram (kg) of soil.

ziltek

Battelle Memorial Institute (Columbus, OH USA) has verified the performance of the RemScan™ technology in accordance with ISO 14034:2016, and the VerifiGlobal Performance Verification Protocol.

BATTELLE

VerifiGlobal

Soil samples are analyzed by first air-drying the surface of the sample so that it contains less than 5% free moisture content. This can be achieved in less than 30 minutes for sandy and clayey soils using a field portable soil drying unit that is available with the RemScan™. The sample is then gently tamped to form a flat surface. The nosecone of the RemScan™ is placed against the soil in a perpendicular position and the trigger is pressed once and released. After 20 seconds, the sample measurement is complete. A result is then displayed for TPH (C10 to C36) in mg/kg and the data is automatically saved to a standard secure digital (SD) card. Data can be downloaded from the SD card to a computer as a .csv file that can be opened in Microsoft Excel®.

The high throughput and low incremental cost per sample means that RemScan™ can take many times more soil measurements at a site than is feasible using conventional laboratory analysis. This leads to a high degree of confidence in crucial on site decision-making.

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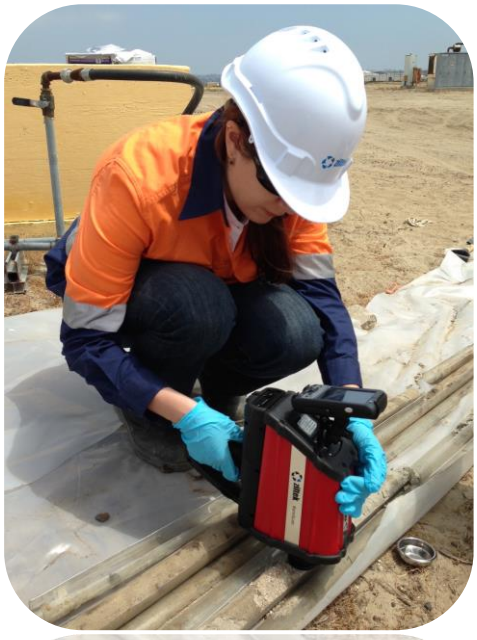

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Ziltek, an Australian-based company that develops and markets innovative environmental technologies, is the licensed distributor of the RemScan™ technology, with global, exclusive rights for 20 years. The technology owner is the **Commonwealth Scientific and Industrial Research Organization (CSIRO**), the Australian

Government's leading national research body.

Battelle Memorial Institute has verified the performance of the **RemScan™** technology in accordance with ISO 14034:2016, and the VerifiGlobal Performance Verification Protocol. The RemScan™ performance claims of accuracy, repeatability and detection limit were verified. The **RemScan™ Verification Statement** is posted on the VerifiGlobal website:
http://www.verifiglobal.com/en/solutions-network

For more information, contact:
Ziltek Pty. Ltd.
Thebarton SA 5031 AUSTRALIA
Website: *http://www.ziltek.com*

ETV Customers and Stakeholders

ETV customers and key stakeholders include:
- Technology developers and vendors
- Technology buyers and users
- Investors and insurance companies
- Governments and regulatory bodies
- Others that facilitate or enable technology adoption

Both supply-side and demand-side market drivers shape the way that ETV services are delivered to clients:

Supply-side – where a solution provider (i.e., developer, vendor, proponent) puts forward a performance claim supported by quality-assured data from an independent source.

Demand-side - where interested parties (i.e., users, buyers, regulators and other stakeholders) determine key parameters prior to submission of performance data.

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www.verifiglobal.com

VERIFIGLOBAL ALLIANCE MEMBERS

North America:

Battelle
Columbus, OH USA

Centre for Advancement of Water and Wastewater Treatment (CAWT)
Lindsay, ON Canada

Good Harbour Laboratories (GHL)
Mississauga, ON Canada

The Living City Campus (LCC)
Vaughan, ON Canada

Europe:

ETA-Danmark
Nordhavn, Denmark

RESCOLL
Bordeaux, France

VTT Expert Services Ltd
ESPOO, FINLAND

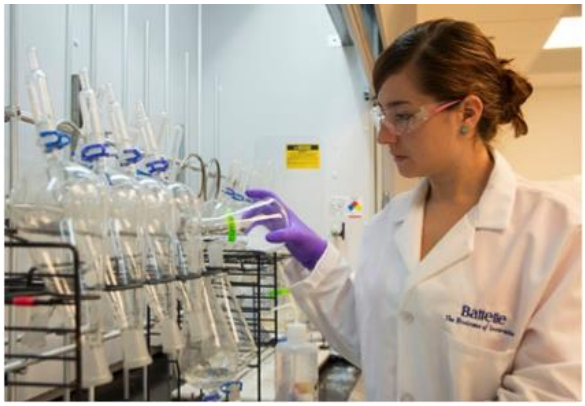
Battelle Memorial Institute (Battelle) maintains more than 60 locations worldwide, putting its resources where clients need them most. Headquartered in Columbus, Ohio since 1929, Battelle serves the national security, health and life sciences, and energy and environmental industries.

Battelle's mission is to translate scientific discovery and technology advances into societal benefits. As a 501(c)3 charitable trust in the State of Ohio, Battelle is committed to advancing research for the greater good. Battelle was founded on industrialist Gordon Battelle's vision that business and scientific interests can go hand-in-hand as forces for positive change.

From 1997 until the program ended in 2014, Battelle managed the Advanced Monitoring Systems Center within U.S. Environmental Protection Agency's Environmental Technology Verification (ETV) Program. During this time, Battelle managed multiple, concurrent field and laboratory projects for testing over 162 innovative technologies, including 71 air monitoring, 88 water monitoring, and 3 site characterization technologies.

Battelle facilities include manufacturing centers; software and technology offices; and analytical, chemical, biological and material science laboratories.

Multiple sets of equipment and instruments in the Battelle Norwell Operations analytical laboratories ensure that large tasks can be accommodated.



For more information, contact:
Battelle Memorial Institute (Battelle)
505 King Avenue, Columbus, OH 43201
USA
https://www.battelle.org

Peer Assessment undertaken by **VerifiGlobal** confirms that **Battelle** meets the requirements of ISO 17020 (Requirements for the operation of various types of bodies performing inspection) when providing verification services in accordance with the ISO 14034 (Environmental Technology Verification) process standard.

Fleming College's **Centre for Advancement of Water and Wastewater Technologies (CAWT)** is a water and wastewater research centre located at the college's Lindsay Campus in Ontario, Canada.

CAWT areas of expertise include biological treatment (including biofilms and anaerobic biofilters), membranes and filtration, advanced oxidation technologies, low energy and remote systems, stormwater management, cold climate treatment, and innovative technologies that target nutrients, heavy metals, and pharmaceuticals.

Designed for customizable operations and project implementation, the CAWT facility allows for a range of projects and activities to be housed on-site at any one time. The CAWT is a unique centre with advanced infrastructure and on-site facilities comprised of three key elements: outdoor research test cells and ponds, indoor greenhouse research facility, and two laboratories (analytical and biological). The CAWT research and testing team is not confined to their on-site facilities and has vast experience in working off-site and in remote locations.

The CAWT is ISO/IEC 17025:2005 certified by the Canadian Association for Laboratory Accreditation (CALA), participates in the CALA Proficiency Testing Program, and has passed the VerifiGlobal Peer Assessment (ISO/IEC 17020:2012 Conformity Assessment in the scope of ISO 14034:2016 Environmental Management – ETV).

For more information, contact:
Centre for Advancement of Water and Wastewater Technologies (CAWT)
c/o Fleming College
200 Albert Street S.
Lindsay, ON K9V 5E6 Canada
http://cawt.ca

Peer Assessment undertaken by **VerifiGlob**al confirms that **CAWT** meets the requirements of ISO 17020 (Requirements for the operation of various types of bodies performing inspection) when providing verification services in accordance with the ISO 14034 (Environmental Technology Verification) process standard.

Good Harbour Laboratories (GHL) is an environmental technology testing and verification company that provides unbiased, independent test results to equipment manufacturers, end users and regulators. Over the past 15 years, GHL has helped its clients to certify their products, validate their test results and achieve full compliance with regulatory authorities.

Located in Ontario Canada, GHL has over 10,000 square feet of pilot lab space that can be configured to accommodate a variety of different equipment test conditions. GHL assists clients by completing performance testing based on existing or new technology specific protocols. GHL's flexible hydraulic testing and onsite analytical facilities permit quick turnaround of test results.

GHL performance testing and verification services cover the following technology areas:
- industrial/commercial filtration systems
- stormwater treatment devices
- grease interceptors
- rainwater harvesting systems
- grey water treatment systems
- wastewater treatment devices
- water softeners
- pH neutralization systems
- colour removal systems.

GHL's fully documented quality system ensures that clients get accurate, reliable results for product development, regulatory approvals, grant applications, reporting to funding agencies and marketing purposes.

GHL is ISO 9002 accredited by the British Standards Institute and is recognized by the International Association of Plumbing and Mechanical Officials (IAPMO) as ISO 17025 compliant for performing tests on septic systems and grease interceptors.

For more information, contact:
Good Harbour Laboratories (GHL)
2596 Dunwin Drive,
Mississauga, ON L5L 1J5 Canada
https://www.goodharbourlabs.com

Standpipe on inlet side of the stormwater testing lab

Isokinetic sampler in action

The GHL interceptor test lab

Peer Assessment undertaken by **VerifiGlobal** confirms that **GHL** meets the requirements of ISO 17020 (Requirements for the operation of various types of bodies performing inspection) when providing verification services in accordance with the ISO 14034 (Environmental Technology Verification) process standard.

The Living City® CAMPUS

Living Laboratories

Over the past 10 years, a number of 'Living City Laboratories' or field test facilities have been constructed at **the Living City Campus (LCC)** in Ontario Canada to help advance new concepts in green infrastructure and building design, and provide a controlled environment for the evaluation of innovative products and practices.

The living labs are equipped with state-of-the-art monitoring instruments and most are integrated into a central data acquisition and storage network that allows for real-time performance display and enables project partners to have instant access to data.

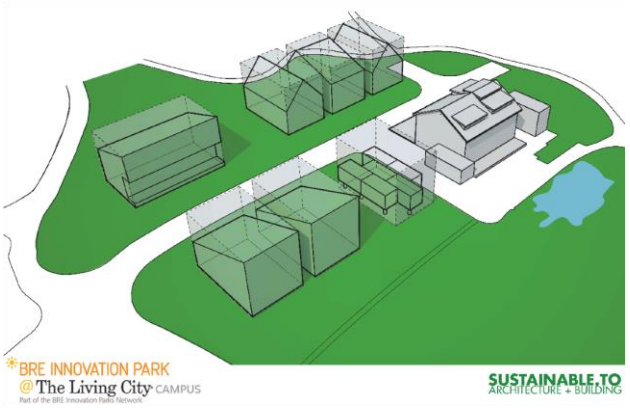
Experienced staff work closely with academia and industry partners to design and operate the labs, conduct independent third-party product evaluations and provide logistical services tailored to client needs.

LCC also conducts its own studies at these sites and communicates results and provides best practices guidance to industry and government.

The following living labs are currently operating at the Living City Campus:
- Photovoltaics
- Wind Turbines
- Green Buildings (Archetype Sustainable Houses)
- Permeable Pavements
- Bioretention
- Infiltration Trenches
- Off Grid Learning Centre
- Soil Test Plots.

For more information, contact:
The Living City Campus,
Vaughan, Ontario, Canada
www.thelivingcitycampus.com

LCC recently joined the VerifiGlobal Alliance and will soon be completing VerifiGlobal Peer Assessment to ensure conformity with the requirements of ISO 17020 when providing verification services in accordance with ISO 14034



VTT EXPERT SERVICES OY

VTT Expert Services Ltd. was formed in 2010 as an independent, impartial organization owned by the VTT Technical Research Centre of Finland Ltd. VTT Expert Services Ltd operates with 200 professionals in four locations (Espoo, Tampere, Vihti and Oulu).

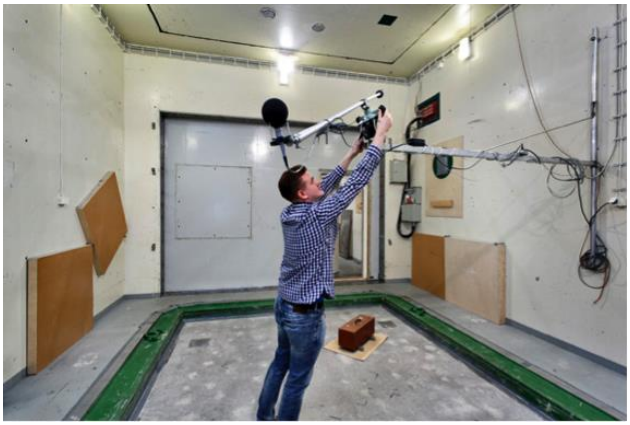
VTT Expert Services Ltd. offers versatile expert services, certification and approval services, testing and inspection services, and calibration services. VTT services are accredited by the Finnish national body, FINAS, or qualified by competent authorities. VTT's operating system is ISO 9001 and ISO 4001 certified.

VTT Expert Services Ltd supports clients in the development of products, services, processes and equipment maintenance as well as during product market launch. Services include: Performance and structural strength analysis; Product safety and chemical analysis; Damage and material failure investigations; Fire safety; and Inspection and certification of management systems and products.

In addition to environmental technologies, VTT expertise and facilities for testing and modeling cover a wide range of technologies, including:
- Building products and materials
- Packaging, furniture and interior textiles
- Energy efficiency and indoor air quality
- Electronic products
- Vehicles, work machines and tractors
- Marine equipment and small crafts
- Machinery and equipment
- Stoves and boilers

For more information, contact:
VTT Expert Services Ltd
P.O.Box 1001, FI-02044 VTT, Finland
http://www.vttexpertservices.fi/

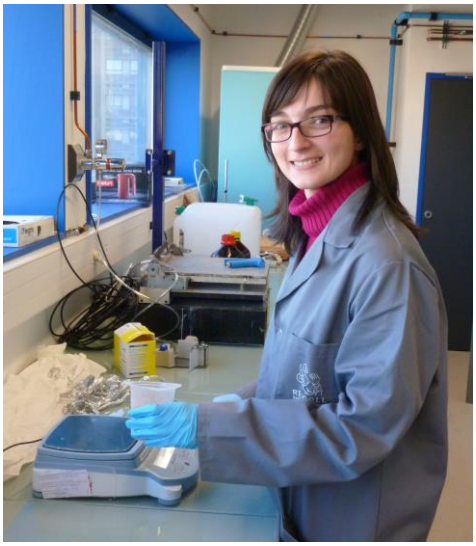
VTT is accredited by the Finnish Accreditation Service (**FINAS**) to perform environmental technology verifications. The accreditation includes: Water treatment and monitoring; Materials, waste and resources; Energy technologies.



RESCOLL is a privately held technology services company, dedicated to materials testing and industrial research, with more than 7000 m² of laboratories, at two locations in France, Pessac and Rochefort.

RESCOLL serves its customers through all stages of product definition, formulation and development, including product commercialization and regulatory approvals. Its range of services includes inspection, analysis, training and technical assistance, as well as materials and equipment testing based on national and international standards.

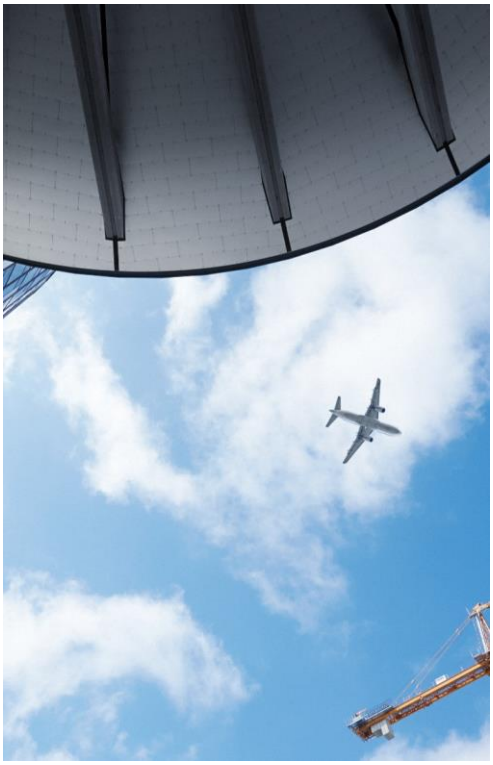
The company specializes in:
- Environmental technical assistance and training related to eco-design, life cycle assessment (LCA) and environmental technology verification (ETV);
- Physical/chemical analyzes and mechanical testing related to material corrosion, fatigue, aging and fire resistance;
- Performance and reliability evaluations of materials and equipment under extreme conditions and in severe environments; and
- Applications of polymer materials (i.e., composites, adhesives, paints, resins) across numerous sectors



For more information, contact:
RESCOLL
8 Allée Geoffrey Saint Hilaire
33615 Pessac, France
https://rescoll.fr/rescoll/

RESCOLL is accredited by the French Accreditation Committee (**COFRAC**) to perform environmental technology verifications. The accreditation includes: Water treatment and monitoring; Materials, waste and resources; Energy technologies.

ETA-Danmark currently hosts the VerifiGlobal Secretariat



ETA-Danmark A/S is a subsidiary of Danish Standards and is the Danish verification body for Environmental Technology Verification. The scheme is established in a partnership with DANETV, a conglomerate of two Danish technological service centers, providing experts and test facilities for the verification procedure. The partners are the Danish Technological Institute and FORCE Technology.

ETA-Danmark A/S is strongly committed to its value proposition of contributing to the growth of its customers while ensuring societal well-being and sustainability. ETA-Danmark does this by providing competent and impartial third party verifications and assessments together with its Danish and international partners. Its approach is customer oriented, addressing projects in a pragmatic and cooperative manner without compromising integrity.

ETA-Danmark has, both directly and through Danish Standards, contributed actively to the development of ISO 14034, and will continue efforts to promote and enhance the use of the standard.

ETA-Danmark is also the Danish approval body for construction products and ETA-Danmark A/S is accredited and notified as the Danish Technical Assessment Body (TAB) issuing European Technical Assessments as specified in the Construction Products Regulation (EU) 2011/305.

For more information, contact:
ETA-Danmark A/S
Göteborg Plads 1, DK-2150
Nordhavn, Denmark
http://www.etadanmark.dk/en

ETA-Danmark is accredited by Danish Accreditation (**DANAK**) to perform environmental technology verifications. The accreditation covers seven technology areas including: Water treatment and monitoring; Materials, waste and resources; Energy technologies; Soil and groundwater monitoring and remediation; Cleaner production and processes; Environmental technologies in agriculture; Air pollution and abatement.

VerifiGlobal Peer Assessment Process

VerifiGlobal is an international platform that provides comprehensive performance measurement and verification capability across multiple sectors and areas of expertise. Competent testing and verification organizations participate in the platform through membership in the VerifiGlobal Alliance. VerifiGlobal Alliance member organizations currently include: Battelle (US), Centre for Advanced Water and Wastewater Treatment (Canada), ETA-Danmark (Denmark), Good Harbour Laboratories (Canada), Rescoll (France), The Living City Campus (Canada), andVTT (Finland). Other organizations are exploring the possibility of joining.

Verification Bodies must be able to demonstrate the necessary capabilities for their defined scope and deal with the practical issues involved in conducting verifications and preparing verification reports. ISO 14034 (Environmental Technology Verification) was published in November 2016. In order to apply this standard, verifiers must meet the requirements of ISO 17020 (Requirements for the operation of various types of bodies performing inspection).

Many of the criteria to determine competence in

Judgment on whether a Verification Body meets the requirements of ISO 14034 and ISO 17020 requires assessment by individuals with sufficient technical expertise. It is recognized that a high level of assurance and confidence in the verification process and the verifiers is necessary to encourage mutual recognition of results obtained through ISO 14034.

Demonstrating conformity with ISO 17020 can be done in various ways. A peer assessment process within a group (or scheme) ensures that the work of each member of the group is assessed and determined to be acceptable to all the other members in the group. Through peer assessment, a high degree of confidence in the work undertaken by each verification organization can be achieved given that each member is assessed through a process agreed to by all the other organizations. Peer assessment provides a level of comparison across verification organizations, ensuring an acceptable level of performance is maintained.

ISO 17040 (General requirements for peer assessment of conformity assessment bodies and accreditation bodies) provides guidance on the requirements for peer assessment. This is the approach to demonstrating conformity with ISO 17020 currently

Some VerifiGlobal Alliance member organizations are currently accredited under ISO 17020 by their respective national accreditation bodies. Those that have not undergone independent accreditation are peer assessed through VerifiGlobal against predetermined criteria in relation to their defined scope of expertise.

Peer assessments undertaken by VerifiGlobal confirm that Battelle, Good Harbour Laboratories (GHL), and the Centre for the Advancement of Water and Wastewater Technologies (CAWT) meet the requirements of ISO 17020 when providing verification services in accordance with the ISO 14034 standard. The peer assessments were conducted following specifications outlined in the "VerifiGlobal Peer Assessment Process Document", which was developed based on ISO 17040.

Webinar on ISO 14034 Environmental Technology Verification

October 11, 2017 12:00 – 1:30 pm

Hosted by **The Living City Campus** and **VerifiGlobal**, the objectives of the webinar are to outline the principles, procedures and benefits of the new ISO 14034 standard and how environmental technology verification (ETV) can help accelerate the use and market acceptance of innovative technologies.

Who Should Attend?
- Technology vendors, solution providers and clean-tech investors
- Technology buyers/users, managers, regulators, and agencies

For more information contact:
Amanda Slaght at
aslaght@trca.on.ca

As municipalities worldwide adapt to extreme weather, the water sector is undergoing radical transformation to build resilience for future disasters and events. New actors are emerging and business models are being revamped to facilitate technology implementation and innovation.

We are on the cusp of a new wave of innovation, as we advance towards a smarter, more proactive future. Recent mergers and acquisitions signal a real need and desire by the private sector to expand and diversify portfolios

Now in its 5th year, **World Water-Tech North America**, hosted by WaterTAP Ontario and Rethink Events, will gather municipalities, private utilities, corporate investors, engineering giants and technology companies in Toronto, November 2 – 3, 2017. Never has there been a greater need to bring together the industry's brightest minds and decision makers as we pave the way for a more resilient future.

For full details on the World Water-Tech North America, part of Ontario Water Innovation Week, visit: *http://www.worldwatertechnorthamerica.com/brochure-download/*

xpv water partners · COLE ENGINEERING · FATHOM · rethink. · WaterTAP Technology Acceleration Project

AMERICAN WATER · AQUA America · aarhusvand · BLACK & VEATCH
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DOW · evoqua WATER TECHNOLOGIES · emerald Technology Ventures · United States Environmental Protection Agency
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TRUE NORTH VENTURE PARTNERS · San Francisco Water Power Sewer Services of the San Francisco Public Utilities Commission · SUEZ · xpv water partners

Why VerifiGlobal and the VerifiGlobal Alliance?

Creating value through informed decisions and sustainable results

VerifiGlobal: c/o ETA-Danmark A/S, Göteborg Plads 1 DK-2150 Nordhavn <www.verifiglobal.com>