VerifiGlobal Newsletter – June 2021

VerifiGlobal

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1. Clean Technology Innovation Initiative Online Workshop

Save the date: Wednesday, 22 September 2021 - 10:00 -11:30 EDT

VerifiGlobal, in collaboration with the Standards Council of Canada (SCC), is launching a new initiative to raise awareness, knowledge and understanding for mobilizing and applying standardization to advance global sustainability.

Innovative technologies are critical to achieving sustainability goals. There is a need to strengthen capacity to assess the benefits and risks of these technologies to enable selection and deployment of effective solutions with sustainable outcomes.

Market Drivers

Public and private organizations are challenged, when considering environmental issues and new international agreements in the context of their activities and business operations. They are often not fully aware of the benefits and pivotal role of standards in assessing environmental performance. They may also have limited or no knowledge about the way products or firms are certified, or how innovative technologies are verified.

With growing demand for green technologies, products and services, environmental performance standards need to be better understood and positioned to effectively support the achievement of sustainable development goals. Ensuring market relevance of these products, technologies, and services requires mutual understanding and trust among stakeholders through meaningful engagement and the articulation of shared performance objectives, with a focus on evidence-based outcomes.

On 22 September 2021, please join us at an interactive online workshop on the Clean Technology Innovation Initiative to explore key process elements and relationships to enable the development and deployment of innovative environmentally sound solutions.

Clean Technology Innovation Initiative - Links to ISO TC 207 and the UN SDGs:

ISO TC 207- Canada chairs the International Organization for Standardization Technical Committee for Environmental Management (ISO TC 207). TC-207 seeks to achieve common goals outlined nationally and internationally through environmental treaties and agreements, leading to sustainable and responsible development and trade. With a focus on environmental performance, reducing waste and continuously improving the effectiveness of operations, ISO TC 207 standards assist industries and stakeholders in addressing environmental challenges and opportunities, contributing to positive outcomes.

UN SDGs - In 2018, VerifiGlobal conducted a review of the United Nations Sustainable Development Goals (UN SDGs) to better understand the effective translation of sustainable development commitments into tangible outcomes. The review noted the importance of international trade as an engine for development and sustained economic growth, and the need for an equitable, rules-based, multilateral trading system, which uses standards to assess, evaluate and verify the performance of technologies and products.

The Clean Technology Innovation Initiative has two parts:

Part one aims to reach consensus on the principal process elements and relationships that enable the development and deployment of innovative environmentally sound solutions, and the essential linkages to existing and proposed standards. These key relationships will be represented in the form of a generic relationship diagram to be presented at the September workshop.

Part two involves assessment and analysis of key issues and opportunities in selected sectors where the relationship diagram "tool" could effectively be applied. The initial examples will be used to illustrate solution pathways, exemplifying how relationship mapping and performance benchmarking can be applied to untangle complex issues and add value.

Clean Technology Innovation Initiative - Anticipated Outcomes:

Increased awareness and understanding regarding mobilizing and applying standardization process for global sustainability.

An **interactive, visual tool** for the global innovation system to demonstrate how the 'cross-cutting' family of ISO TC207 standards are relevant to global and national challenges and opportunities.

A **web-based integrative relationship map** to visualize how global sustainability goals and international standards interact and relate to each other in a systemic way. It will enable and encourage the application of existing and proposed environmental standards for technology innovation and attaining global sustainability objectives.

The 'Innovation' relationship map will be posted on the VerifiGlobal website and publicly accessible. For more information on this new Initiative and the forthcoming workshop, please contact:

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The Clean Technology Innovation Initiative will facilitate greater awareness and a better understanding of the role of ISO 14034 in advancing innovative clean technologies

Why ISO 14034 ETV was developed

The ISO 14034 Environmental Technology Verification (ETV) standard was developed to provide a framework for third-party verification of performance claims for environmental technologies. It is a rigorous process with specific requirements for conducting an independent assessment and verification of a technology performance claim.

The goal of ISO 14034 is to provide a high level of confidence to regulatory agencies, technology specifiers and technology buyers that a verified technology will indeed perform in the real world consistent with the manufacturer's advertised performance claims.

Key principles – ETV is based on the following principles, which aim to ensure that verifications are performed and reported accurately, clearly, unambiguously, and objectively:

Factual approach – Verification statements are based on factual and relevant evidence collected through an objective confirmation of the performance of environmental technologies

Transparency and credibility – ETV is based on reliable test results and robust procedures. The process is facilitated such that, to the greatest extent feasible, methods and data are fully disclosed, and reports are clear, complete, objective, and useful to the interested parties.

Sustainability – ETV serves as a tool in support of sustainable development goals, by providing credible information on the performance of environmental technologies.

Flexibility – Environmental technology verification allows for flexibility in the specification of performance parameters and test methods. This is achieved through dialogue among the applicant, verifier and interested parties to maximize utility of environmental technology verification.

Clean Technology Innovation Initiative – Target Sectors and Relevance

Potential target sectors:

- Water (e.g. – stormwater management; onsite systems)
- Agriculture (e.g. - nutrient management; biotechnology; integrated pest management)
- Energy (e.g. – storage; renewables; carbon capture and utilization)
- Transportation (e.g. – electric vehicles; hydrogen; green mobility)

Each sector-specific relationship diagram will serve as roadmap for that sector (or sub-sector).

Challenges/opportunities:

- Clean technology and green infrastructure
- Climate change mitigation and adaptation
- Water/air/soil pollution, control and remediation
- Waste minimization and the circular economy
- Advanced monitoring, control and surveillance
- Eco-systems diversity and preservation
- Green finance and procurement.

Integration in policies and regulations to support:

- Innovative technology development and deployment
- Investment in sustainable, environmentally sound solutions
- Comprehensive life cycle assessment of technologies, products and services
- Effective use of environmental monitoring and reporting.

ISO International Organization for Standardization

How the ISO 14034 ETV process works

The verification process is initiated by the technology owner or proponent (i.e., the applicant) through an application for technology verification submitted to a recognized verification body operating in accordance with the requirements of ISO 17020 (the conformity assessment standard for inspection bodies). The entire technology verification process is guided by a verification plan prepared by the verification body to ensure that the requirements of ISO 14034 are met.

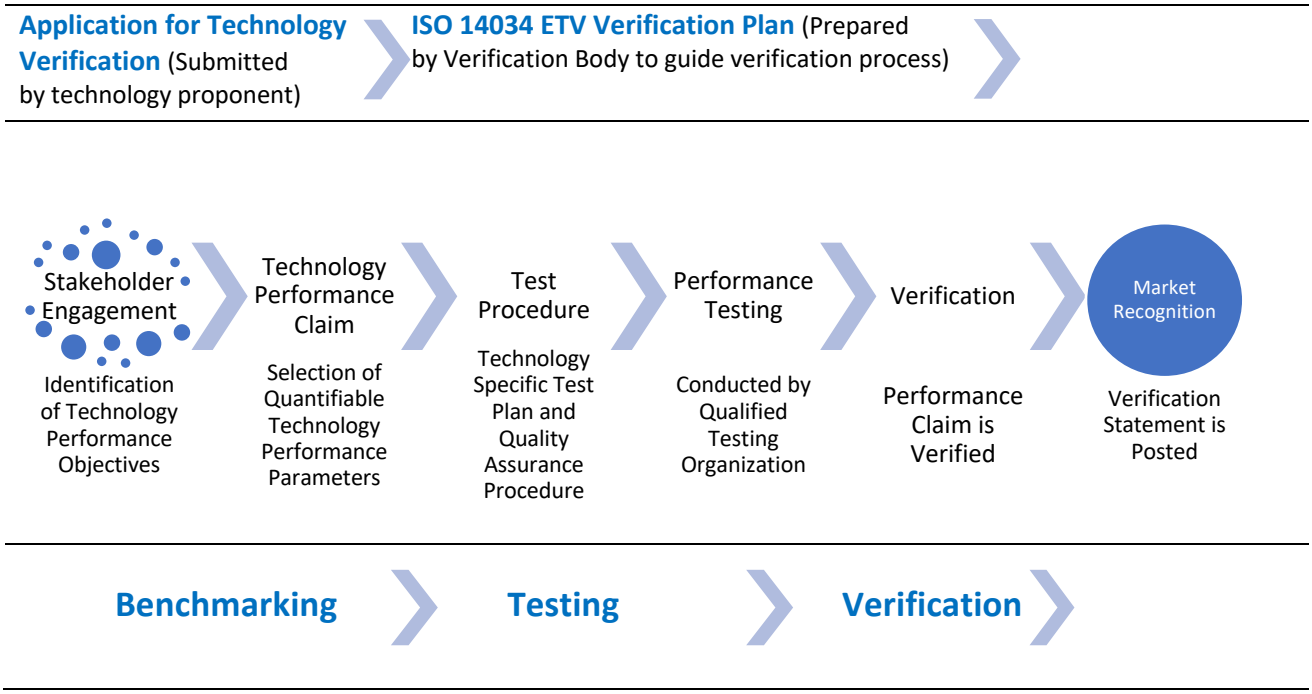
The ISO 14034 ETV standard is not a testing procedure, but rather provides a detailed methodology for determining whether performance testing of a technology was conducted in scientifically sound way by a qualified testing organization and that the performance data generated provides sufficient evidence to support a technology performance claim.

As illustrated below, ISO 14034 requires the identification of technology performance objectives and selection of quantifiable parameters that can serve as the basis of a technology performance claim, which can be measured by following a technology-specific test plan.

The performance testing must be conducted by an independent testing organization with a quality management system in place that meets the requirements of ISO 17025 (the conformity assessment standard for analytical laboratories). The test procedure can be specific to the technology or applicable to a defined type or category of technology.

The performance test results provide verifiable evidence of the performance of the technology, which the verification body uses to verify the technology performance claim. A Verification Statement is prepared by the verification body and posted on a publicly accessible website.

ISO 14034 ETV – Verification Process



What is a Verification Body?

A Verification Body is an independent organization tasked to objectively review and verify technology performance claims. The verification process typically involves designated domain experts, given the variability and technical complexity of specific technology performance claims, and the extensive range of technology areas where ISO 14034 can be applied.

Verification Body Responsibilities

Verification bodies must have in place a framework and protocol for verifying technology performance claims in accordance with the ISO 14034:2016 ETV standard. This includes guidance and specific procedures to be followed to ensure independent verification at the highest level of quality and credibility. Verification bodies are required to:

- Review and provide input to the Application for Verification and supporting documentation
- Prepare a Verification Plan for the technology to be verified
- Designate a suitable independent domain expert to review and provide technical input to the Verification Plan, review the Test Plan and test results, and prepare the Verification Report
- Provide direction on the implementation of site visits and audits of test procedures, if required
- Provide direction on the verification of the test results, in accordance with the ISO 14034 standard
- Approve the Verification Report and prepare the Verification Statement in consultation with the applicant
- Post the Verification Statement for the verified technology on a publicly accessible website.

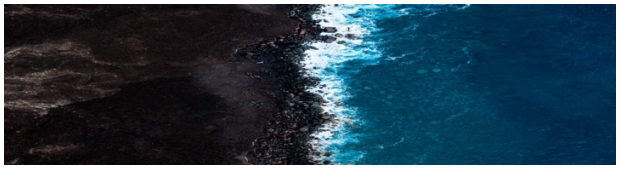
Verification Body Recognition

Within the context of ISO 14034, a Verification Body must be recognized or accredited as competent to work to specified standards. ISO 14034 specifies that, when verifying the performance of environmental technologies, the requirements of ISO 14034:2016 and ISO/IEC 17020:2012 “shall be applied and demonstrated”. As such, it is essential for verifiers to demonstrate the necessary capabilities for their defined scope.

Many of the criteria to determine competence in applying ISO 14034 in accordance with ISO/IEC 17020 are technical in scope, requiring assessment by individuals with substantive domain expertise.

Currently, there are two options for demonstrating conformity with the requirements of ISO 14034 and ISO 17020:

- Through a peer assessment process designed in accordance with the requirements of ISO 17040 (General requirements for peer assessment of conformity assessment bodies and accreditation bodies); and
- Through ISO 17020 accreditation by a National Accreditation Body that is a member of ILAC (International Laboratory Accreditation Cooperation), the international organization for accreditation bodies operating in accordance with ISO/IEC 17011 and involved in the accreditation of conformity assessment bodies.



The VerifiGlobal Alliance is an international platform of technology performance testing and verification organizations, which works collaboratively to assess innovative technology challenges and opportunities in conjunction with governments, infrastructure development agencies and the private sector.

The technology performance measurement and verification procedures, protocols and quality management plans developed and implemented by VerifiGlobal support informed regulatory, financial and investment decisions, and the successful realization of sustainable development goals.

VerifiGlobal Alliance members are proactive in addressing innovative technologies within their respective areas of expertise. Consultation and cooperation with affected stakeholders across multiple jurisdictions facilitate mutual recognition of verified technology performance information and the increased probability of market acceptance.

2. Supporting Innovation: Verification of Carbon Utilization Technologies

Contact - https://350solutions.com

The CCUS (carbon capture, utilization and storage) industry has grown rapidly in recent years: corporate and venture capital investments in CCUS technologies have exceeded $460 million over the last four quarters, with Q1, 2021 including over $250M in investment. In the United States alone, strategic funding by the US Department of Energy for CO2 utilization development projects, as well as the advancement of large, heavily funded global competitions, such as the $20M NRG COSIA Carbon XPRIZE, have pushed technology companies to develop and, most importantly, rapidly scale, CO2 capture and utilization technologies. As increasing numbers of technology developers propose innovations with claimed abilities to capture and use CO2 at significant levels, independent verification approaches can provide needed credible information to an emerging market.

Methodologies for evaluating the technologies and verifying their performance claims are also being developed, with several approaches emerging for evaluating CCU technologies against several different contexts. The US Department of Energy has developed CO2 emissions lifecycle assessment (LCA) guidelines as well as technoeconomic assessment (TEA) guidance for projects implemented using DOE funding. The Global CO2 Initiative has developed technical, economic, and life cycle assessment guidelines for CCU technologies, with protocols provided publicly.

Members of the 350Solutions verification team on-site in Alberta, Canada at the Alberta Carbon Conversion Technology Center during the final phase of the NRG COSIA Carbon XPRIZE.

Each of these efforts shares a common set of goals:
- Understand the carbon balance of CCUS systems to ensure that the carbon mitigation benefits are established
- Understand the technical performance of the candidate technology as well as any technical barriers which hamper performance
- Understand the economic potential and risks which may influence a technology's ability to attract investment and scale.

While there is not yet consensus on a single approach to CCUS technology evaluation, there is a strong need to ensure that credible, high quality data is used as the basis for every evaluation.

This need for high quality data can be addressed by independent verification approaches and guidelines which can provide a means to obtain credible information for an emerging market.

The ISO 14034:2016 – Environmental Management: Environmental Technology Verification (ETV) standard can serve as a foundational platform to ensure consistency, quality, and credibility of data on CCU technology performance, enabling direct comparisons between technologies, reducing risk to decision-makers regarding potential investment, future deployment, and ultimate impacts of CCU innovations.

Applying the Principles of ISO 14034 ETV within the NRG COSIA Carbon XPRIZE

350Solutions is a privately held engineering firm founded in 2019. Based in Raleigh, North Carolina, the company offers independent, accredited ISO 14034 technology verifications.

In April of 2021, 350Solutions completed its responsibilities as the independent, third-party verifier for the $20M global NRG COSIA Carbon XPRIZE competition. The firm's responsibilities during the competition included working with XPRIZE to establish the technically and environmentally focused verification protocols and metrics for each of the carbon utilization technologies, as well as completing the independent verifications of each technology's performance. The executed verification approach utilized the principles established in ISO 14034 as a foundation for its assessments of the nine technologies to ensure that the evaluation of competitors was high quality and consistent across technologies, while meeting the information needs of the XPRIZE judges.

350Solutions worked extensively with each of the finalists, designing verification procedures that were consistent across all participants, using common metrics for direct comparison of technologies, and adhering to the rules, regulations, and needs of the larger XPRIZE competition, ensuring that the unique aspects of each technology were appropriately evaluated. 350Solutions worked with each finalist to account for all the resources used (i.e., feedstocks, materials, energy) and created (products, by-products, wastes). Additionally, 350Solutions installed independent instrumentation and monitoring equipment to measure how much CO2, energy, and water each team was using. 350Solutions then collected samples of the final products and had them analyzed to ensure that they were viable, market-competitive products. Verified data from each technology's operations was also used as inputs for life cycle analysis, economic assessment, and XPRIZE-specific scoring.

During the course of the evaluations, 350Solutions reviewed a total of 27,828,703 data points which typically included second-by-second or minute-by-minute data on each of the processes. Each process may have then included a few to dozens of different measurements involved in calculating how much of each resource was utilized during operation. Reviewing detailed data sets allowed 350Solutions to observe inconsistencies in operation, instrument malfunctions, and ensured the reporting of true process performance results.

As a result of the thorough data gathering process, which included flow meters and CO2 analyzers on each input stream of each process, and the independent analysis of the final product, 350Solutions was able to calculate that 18.1 tonnes of CO2 was converted into product by the nine teams during the finals, equivalent to the amount of CO2 produced by 2.3 U.S. homes in one year. This was viewed as a noteworthy accomplishment for the competition, considering that some of the competitors were operating at small scale, or only able to operate for a day or two during the demonstration period.

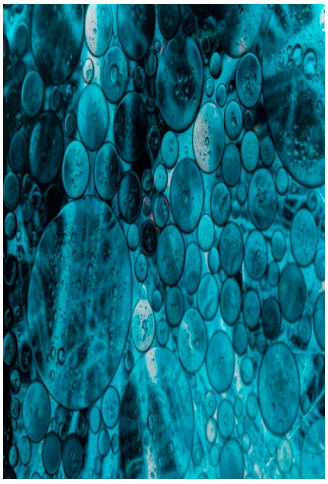
During the implementation of the ISO 14034 process in the evaluation of CCU technologies for the NRG COSIA Carbon XPRIZE, some specific considerations and limitations of the application of the ISO 14034 standard were identified including: increased costs from performing a thorough verification, too much flexibility versus more conformity to allow for comparisons between like technologies, stage of technology development may not always warrant or be practical for a full ISO, and concerns regarding release of proprietary information or performance data.

Conversely, the ISO 14034 framework also served a strong backbone to the verification procedures of the competition, allowing for consistency, flexibility, high quality data, and the cross-checking that comes from a third-party perspective.

3. Supporting Permitting & Approvals: Verification of Stormwater Technologies

Manufactured stormwater treatment devices, such as oil-grit separators (OGS) and filters, are widely deployed in metropolitan areas to capture pollutants in urban stormwater runoff. These treatment devices vary in design and technology employed to remove sediment, hydrocarbons, metals, and nutrients, and each manufacturer advertises the performance features and advantages of their respective technology. Since a manufacturer's performance claims for a device are typically based on some limited laboratory or field testing, it is important that a technically competent third-party process be used to assess the technology and its test data to ensure that marketed performance claims are credible.

Why verification of stormwater technology performance?



Different regulatory agencies and permitting authorities in different countries may have different requirements and performance criteria for approval and acceptance of various stormwater treatment devices for specific applications and operating conditions. To support their decisions, these agencies and authorities can benefit from scientifically defensible, verifiable performance data applicable to a range of possible end use requirements and operating conditions.

The ISO 14034 ETV standard, by design, provides an opportunity for a technology proponent to specify a performance claim that can be independently verified based on quality assured performance data generated by an independent testing organization using a 'technology specific test plan'. While the 'technology specific test plan' is the default requirement, it is understood that an existing test procedure can be used for defined categories of technology (e.g., oil-grit separators) where there has been demonstrated effort to identify and document quantifiable performance parameters that are relevant to the intended market and a robust quality assured testing process.

How does ISO 14034 ETV support stormwater technology verification?

Stormwater Technology Verification in Canada

Based in Ontario, Canada, the **Sustainable Technologies Evaluation Program (STEP)** is a conservation authority-led initiative that supports broader implementation of sustainable technologies and practices within the Canadian context. STEP works to achieve this overarching objective by:

- Carrying out research, monitoring and evaluation of clean water and low carbon technologies
- Assessing technology implementation barriers and opportunities
- Developing supporting tools, guidelines, and policies
- Delivering education and training programs
- Advocating for effective sustainable technologies
- Collaborating with academic and industry partners.

What is the "Sustainable Technologies Evaluation Program" (STEP)?

Sustainable Technologies EVALUATION PROGRAM

Technologies evaluated under STEP are not limited to physical devices or products; they may also include preventative measures, implementation protocols, alternative urban site designs, and other innovative practices that help create more sustainable and liveable communities.

STEP was founded by the Toronto and Region Conservation Authority (TRCA). Other partners include Credit Valley Conservation and the Lake Simcoe Region Conservation Authority. For more information, go to - https://sustainabletechnologies.ca

Toronto and Region Conservation Authority (TRCA).

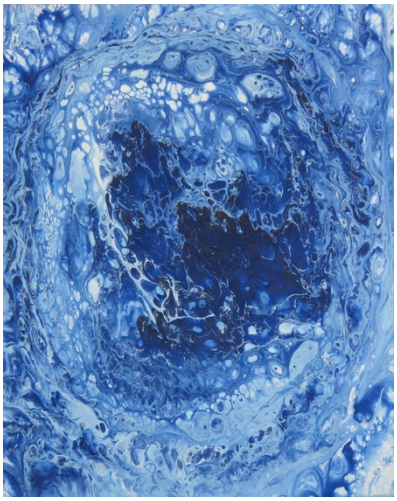
The STEP website provides information on stormwater management technologies and best practices, including low impact development and erosion control. area in Canada. For example:

- **SWAMP** - Stormwater Assessment Monitoring and Performance (https://sustainabletechnologies.ca/about-step/about-swamp/),
- **Hydrodynamic Separators** (https://sustainabletechnologies.ca/home/urban-runoff-green-infrastructure/conventional-stormwater-management/hydrodynamic-separators/),
- **Procedure for Laboratory Testing of Oil-Grit Separators** (https://sustainabletechnologies.ca/home/urban-runoff-green-infrastructure/conventional-stormwater-management/hydrodynamic-separators/procedure-for-laboratory-testing-of-oil-grit-separators/).
- **Engineered Biofiltration Devices** (https://sustainabletechnologies.ca/home/urban-runoff-green-infrastructure/low-impact-development/bioretention-and-rain-gardens/filterra-high-rate-treatment-filter-media-bioretention/).

STEP also provides guidance on a range of technologies through its 'wiki LID Planning and Design' website, which makes references to different proprietary technologies, without endorsing them. (https://wiki.sustainabletechnologies.ca/wiki/Infiltration_chambers)

The plan is to make this 'wiki' guide a 'one stop shop' for planning, design (sizing) and operation and maintenance of various stormwater management technologies, starting with those classified as low impact development (LID). Other proprietary technologies, such as catch basin filters and shields, and hydrodynamic separators will also be added as these have the potential to provide a critical role in centralizing sediment and pollutants upstream of LID practices, which reduces long term maintenance costs and enhances the function of these practices. This website is funded in part by the Ontario Ministry of Environment Conservation and Parks (MECP), which references the site in its own draft LID manual that lays out approval criteria for LID and presents other relevant considerations in relation to climate change and other topics.

How is STEP demonstrating leadership in the stormwater area?



What is the STEP 'wiki' website?

Prepared by Toronto and Region Conservation Authority (TRCA), the ***"Procedure for Laboratory Testing of Oil-Grit Separators"*** provides a common procedure for testing and verifying the performance of treatment devices under controlled conditions, in an independent, transparent manner. Independent verification of the performance data assists regulatory agencies, permitting authorities and other affected stakeholders in evaluating treatment technology options.

While the performance testing procedure is not a compulsory standard, it does represent an effective approach for conducting testing to produce verifiable performance data on specific technologies under defined operating conditions. Use of this testing procedure helps reduce uncertainty and improve acceptance of independently generated performance data, thereby contributing to better informed technology decisions. The ultimate decision to approve, select and implement a particular technology rests with the technology buyer, guided by the requirements of the respective permitting authorities within the affected jurisdiction(s).

What is the TRCA "Procedure for Laboratory Testing of Oil-Grit Separators"?

Stormwater Technology Verification in Washington State, USA

Washington State Technology Assessment Protocol – Ecology (TAPE)

Stormwater treatment technologies are reviewed and certified by the Washington State "**Technology Assessment Protocol – Ecology**", also known as the **TAPE Program**. TAPE provides a peer-reviewed regulatory verification and certification process for emerging stormwater treatment technologies. The program is administered by the Washington State Department of Ecology, with assistance from the Washington Stormwater Center (www.wastormwatercenter.org/), which provides stormwater management assistance including guidance on certification of emerging treatment technologies.

The Department of Ecology updated the TAPE Technical Guidance Manual in September 2018. Specific guidance for designing, executing, and reporting on performance monitoring is detailed in two companion documents:

- Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) (Publication 11-10-061) (aka, TAPE Technical Guidance Manual)
- Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (Publication 04-03-030).

The Department of Ecology and the Washington Stormwater Center established a Board of External Reviewers (BER) to: Review emerging treatment technology design and performance data and recommend whether or not to certify the technology; and provide overall advice and guidance as the TAPE program evolves and improves.

Proponents must demonstrate performance by testing their stormwater treatment technology at field sites in the Pacific Northwest or at pre-approved testing sites located in other parts of the United States. The testing protocol is specifically designed to evaluate flow-through best management practices (BMPs) with relatively short detention times and may not be suitable for all stormwater treatment technologies. The Department of Ecology has developed an alternative monitoring protocol that applies to long-detention BMPs (e.g., wet ponds). This document is included as an Appendix in the Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies.

Based on BER technical reviews, Washington Stormwater Center staff advise the Department of Ecology regarding which new stormwater treatment technologies meet performance goals and therefore, should be added to the list of approved technologies in the stormwater management manuals. The Department of Ecology makes the final decision to certify new stormwater treatment technologies. TAPE certification of emerging technologies depends on their performance relative to one or more of five performance goals: Basic Treatment; Dissolved Metals Treatment; Phosphorus Treatment; Oil Treatment; and Pre-treatment.

The Department of Ecology evaluates the existing data on a stormwater treatment technology to assign use level designations that determine how many installations may occur in Washington and what the monitoring requirements are for obtaining additional data on treatment performance. Depending on the relevance, amount, and quality of performance data provided with the application for certification, the Department Ecology initially places the technology into one of two use level designation categories: pilot use level designation (PULD) or conditional use level designation (CULD).

PULDs are typically given when there are sufficient laboratory data available to indicate a treatment technology may meet the performance goals for TAPE. The Department typically issues CULDs when there are both laboratory and field data available for a treatment technology that would indicate an even greater likelihood of meeting these performance goals. Applicants may use field data that does not meet the data requirements of TAPE for CULD approval. The PULD and CULD allow installation and operation of the technology in the state of Washington to gather the performance data required for final general use level designation (GULD) certification.

The Department Ecology designed the TAPE certification process to ensure that the approved treatment technologies meet applicable design criteria and performance goals for new development and redevelopment. TAPE certification means that the new technology has successfully met the TAPE performance goals, when the device is properly installed, operated, and maintained. However, TAPE certification does not mean the technology is appropriate for all stormwater treatment applications. The TAPE certification process represents specific influent concentration ranges and does not typically include an assessment of long-term performance or a specific analysis of maintenance frequency. Furthermore, TAPE performance goals do not address capital costs, costs for operation & maintenance (O&M), or costs for material disposal.

What are use level designations?

***PULD** = Pilot use level designation*

***CULD** - Conditional use level designation*

***GULD** - General use level designation*

What does TAPE certification mean?

Although TAPE is a Washington State protocol, several other jurisdictions use TAPE certification as a factor in selecting and permit the installation of specific stormwater control and water quality treatment solutions.

Stormwater Technology Verification in New Jersey, USA

As a regulatory agency, the New Jersey Department of Environmental Protection (NJDEP) specifies the test protocols to be used for stormwater verification testing, and issues certifications of selected technologies that meet NJDEP performance requirements. Only NJDEP certified technologies may be used for stormwater compliance in New Jersey. Stormwater manufactured treatment devices (MTDs) must be New Jersey Corporation for Advanced Technology (NJCAT) verified and NJDEP certified when the MTD is used to satisfy the requirements of the New Jersey Stormwater Management rule (N.J.A.C. 7:8). An MTD which is not NJCAT verified or NJDEP certified may be used, provided that the MTD is not intended to satisfy the requirements of the Stormwater Management rule.

NJCAT is a private/public partnership that administers the NJDEP process. NJCAT issues verification reports for testing that fully complies with NJDEP requirements as well as for some studies that do not. All verifications whether certified or not are posted on the NJCAT Verification database: http://www.njcat.org/verification-process/technology-verification-database.html. Those studies which also receive NJDEP certification are distinguished by a certification letter on NJDEP's MTD website: https://www.nj.gov/dep/stormwater/treatment.html.

NJCAT provides innovators with regulatory, commercial, and technological assistance to help bring their ideas to market successfully.

For more information about NJCAT, contact: Dr. Richard S. Magee, Executive Director, at rsmagee@rcn.com

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NMSA Center for Stormwater Testing and Evaluation for Products and Practices (STEPP)

The National Municipal Stormwater Alliance (NMSA) is a not-for profit US organization with state and regional members that are Municipal Separate Storm Sewer System (MS4) permittees. NMSA is devoted to supporting MS4 communities by helping them tackle urban runoff and stormwater challenges, which are the most significant growing source of water pollution across much of the United States.

The NMSA Center for Stormwater Testing and Evaluation for Products and Practices (STEPP) is a Center of Excellence established to promote the development of a national testing and verification for proprietary products as well as public domain practices in the stormwater sector. The STEPP Center of Excellence is the home for the Stormwater Testing and Evaluation for Products and Practices (STEPP) program.

STEPP was initiated in 2012 by the Water Environment Federation (WEF) to explore the potential for a national stormwater testing and verification program. Numerous stakeholders across the stormwater sector were involved, including producers of manufactured treatment devices (MTDs), technical practitioners, researchers, federal and state regulators, non-profits, and municipal stormwater program leaders. A framework for a national testing and verification program was established, supported by a partnership with the Water Environment Research Foundation (now the Water Research Foundation) and funding from US EPA.

This led to the establishment of the WEF Stormwater Institute, in 2017, incorporating STEPP as designated program, and the development of a consortium of partner organizations committed to the concept of national stormwater testing and verification. These organizations include:
- WRF - Water Research Foundation
- ITRC - Interstate Technology Regulatory Council
- ASTM International
- GLSC - Great Lakes Stormwater Collaborative
- ACWA - Association of Clean Water Agencies
- TAPE - Washington Department of Ecology
- NJDEP - Department of Environmental Protection
- NJCAT Corporation for Advanced Technology
- SWEMA - Stormwater Equipment Manufacturers.

The current status of STEPP reflects a strategic shift in leadership from WEF to NMSA, leveraging the investment of WEF's incubation by bringing STEPP closer to the end users of stormwater products and practices.

NMSA is working to secure the necessary funding to support the activities needed to accelerate the development and eventual launch of STEPP as a fully functioning program in 2021 and beyond. The intent is to provide testing and verification for both proprietary stormwater products (i.e., MTDs) and public domain practices, focusing on the performance verification of stormwater products and practices as determined by standard laboratory-and field-testing protocols.

STEPP will seek to establish national testing and verification standards based upon sound technical knowledge and information in a fair, objective and transparent manner. Where feasible, STEPP will leverage widely accepted state protocol programs to optimize the efficiency of testing/ verification services and the protection of water quality.

To find out more about STEPP contact NMSA Executive Director, Seth Brown at seth.brown@nationalstormwateralliance.org.

New ASTM Stormwater Committee

ASTM International, formerly known as American Society for Testing and Materials, is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.

ASTM has been developing standards for stormwater treatment devices in Subcommittee C27.70, within the Pre-Cast Concrete Committee. Recognizing that there are many options beyond manufactured concrete products, ASTM established a new main committee, E64 Stormwater Control Measures, to accelerate development of innovative technologies.

New ASTM International Committee E64 - Stormwater Control Measures

As a new committee, E64 has just established its executive and is starting to define its scope. Once these activities are complete the committee will begin developing standards. Initially, there are 3 active standards imported from C27.70. These are:

C1745/C1745M-18	C1746/C1746M-19	C1814/C1814M-20
Measurement of Hydraulic Characteristics of Hydrodynamic Stormwater Separators and Underground Settling Devices	Measurement of Suspended Sediment Removal Efficiency of Hydrodynamic Stormwater Separators and Underground Settling Devices	Measurement of Hydraulic Characteristics of Stormwater Filtration Elements

New standards under development are expected to form the basis of the STEPP testing requirements. These include:

- Practice for Laboratory Performance Verification of Hydrodynamic Separators for the Treatment of Stormwater
- Measurement of Suspended Sediment Removal Efficiency of Hydrodynamic Stormwater Separators and Underground Settling Devices
- Standard Test Method for Scour of Hydrodynamic Separators and Settling Devices
- Protocol for the Verification of Stormwater Filtration Devices using Silica Sediment
- Specification for Silica Test Sediments for the Evaluation of Stormwater Treatment Devices
- Test Method for Determining the Trash Removal Performance of Stormwater Treatment devices
- Standard Terminology for Standards relating to Stormwater Control Measures

For each of these standards, the title and scope are in draft form and under development within the ASTM E64 Stormwater Control Measures Committee.

Several of these standards are expected to be finalized this year. Once this happens, stormwater managers will be able to require that devices installed in their jurisdiction be tested according to ASTM and be confident that devices have been tested and verified in an independent and scientific manner.

Trash-Free Waters

An estimated 80 percent of trash found in the marine environment is associated with land-based sources. With a growing understanding of the impacts of trash and the occurrence of plastics and microplastics in our oceans and inland waters, the issue of trash, litter and debris in stormwater systems cannot be overstated. Unfortunately, while trash in water is widely acknowledged be a problem, there is no consensus on how, to deal with it.

In the US, municipal separate storm sewer system (MS4) programs are engaged in efforts to reduce, capture and/or remove trash from urban waterways, runoff collection, and conveyance systems. Routine inspection and maintenance efforts of stormwater systems include a focus on trash removal to reduce flow blockage and related localized flooding.

The U.S. EPA Trash Free Waters program has developed a compendium that lists examples of trash provisions in stormwater permits from across the US, illustrating the different ways that MS4 permits implement trash assessments, reduction, capture and removal efforts. EPA is working with industry organizations, such as the National Municipal Stormwater Alliance (NMSA) and the National Chemistry Council (NCC), to learn more about the details of stormwater trash issues and the need to effectively address trash in the aquatic environment.

The State of California has an advanced approach to reducing trash in waterways, as reflected in the 2015 "Trash Amendments" to the state "Ocean Plan" and "Inland Surface Water, Enclosed Bays, and Estuaries Plan". These Amendments have a statewide objective to reduce the amount of trash in state waterways, building upon the Total Maximum Daily Load (TMDL) requirements to reduce or eliminate trash in the 73 waterbodies in California with impaired water quality due to large amounts of trash.

California has also indicated that its Certified Full Capture System List of Trash Treatment Control Devices will be updated to include only devices that comply with the definition of a trash Full Capture System. Devices that are already on the list need to reapply for certification and all new devices will have to meet the new requirements. Certification by the California Water Board's (CWB) already requires demonstrating that a given device captures and retains trash greater than 5 mm. It also requires a statement as to the trash volume capacity of the device.

Moving forward, ASTM International is working on a standard that outlines a clearly defined, repeatable procedure to measure trash capture and retention. When this standard is published it will allow end users in any jurisdiction to easily implement a trash capture program by setting goals and requiring that all devices follow the ASTM standard.

In addition, the Stormwater Testing and Evaluation for Products and Practices (STEPP) program, now being led by NMSA, is leveraging existing state testing and verification programs, such as in Washington and New Jersey, to set up a national testing program to address common pollutants of interest, such as sediment, phosphorus, and trash. STEPP will work with the results from the ASTM Stormwater Control Measures committee to focus on testing and verification for trash assessment, capture and removal standards. This will provide watershed managers with effective, independently verified solutions to their trash problems.

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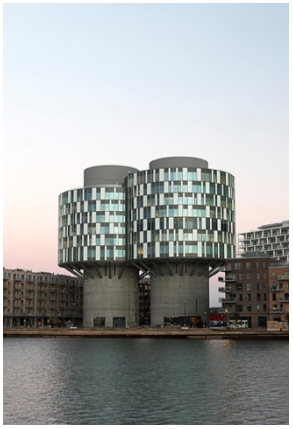

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