

Environmental Technology Verification Program

April 2003

ETV Verifies Six Portable Cyanide Analyzers

Technologies that can detect chemical or biological agents and are applicable to water security needs are being prioritized for verification testing by the ETV Advanced Monitoring Systems (AMS) Center and its stakeholders. The AMS Center, operated by Battelle, recently verified the performance of six portable cyanide analyzers to detect cyanide in water. Verification testing was conducted from late January to early February. Two types of portable water analyzers/test kits were tested—colorimeter test kits and ion selective electrodes. [See “ETV Program Verifies Over 200 Technologies” for a list of the technologies and technology developers.]

The verifications were based on comparing the cyanide concentrations of water samples determined by the six analyzers with cyanide concentrations determined by a laboratory-based reference method (EPA Method 335.1, *Cyanides Amenable to Chlorination*). Samples used in the verification tests included quality control samples, performance test (PT) samples, lethal/near-lethal concentration samples, drinking water samples, and surface water samples.

The verification reports and statements for the cyanide detectors are available on the ETV Web Site.

A second set of water security-related verification tests is scheduled to occur this summer.

Currently, six vendors are expected to participate in the verification test of seven technologies that can rapidly detect toxicity in water sources. Until recently, these technologies have been used to monitor the potential ecological impacts of effluents discharged from facilities, such as industrial production facilities. A new use for these technologies will be monitoring water sources for early signs of biological or chemical terrorism.

AMS Pursues Multiple Partnering Opportunities with NOAA

Two multi-parameter water probes were recently verified by the ETV AMS Center in collaboration with the National Oceanic and Atmospheric Administration (NOAA), Center for Coastal Environmental Health and Biomolecular Research (CCEHBR) in Charleston, SC, in the summer of 2002. The CCEHBR is one of five National Centers for Coastal Ocean Science (NCCOS) under the National Ocean Service (NOS). The mission of the CCEHBR is to provide scientific information needed to manage and protect coastal resources. In addition to expert technical input, NOAA provided the facilities and labor necessary to perform the test and collect data used in verifying the probes.

Two vendors participated in the first round of the collaborative multi-parameter probe tests. Both technologies were evaluated by comparing pre- and post-calibration results and their measurements with standard reference measurements and handheld calibrated probes. The probes were deployed in saltwater, freshwater, and laboratory environments near Charleston, during a 2.5-month test. Performance of the two probes was assessed in terms of pre- and post-

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ETV Air Pollution Control Technology Center

- Completed verification testing of the Donaldson Company, Inc.'s diesel mobile source air pollution control systems
- Conducted a workshop on ETV verification activities for the Virginia Department of Environment permit staff in December
- Participated in the 3rd Annual Clean Heavy-Duty Vehicles Conference in February
- Held a meeting of the stakeholders advisory committee on March 5, in Research Triangle Park, NC
- Presented at the Texas Technology 2003 Showcase in March
- Presented at the National Defense Industrial Association Conference in April

ETV Drinking Water Systems Center

- Completed verification testing of the Polymem UF 120 SF Ultrafiltration Membrane Module at a site in Green Bay, WI
- Held a meeting of the stakeholders Steering Committee on November 19, at the NSF Headquarters in Ann Arbor, MI
- Exhibited at the American Water Works Association (AWWA) Water Quality Technology Conference and Exhibition in November
- Presented a paper on ETV verification of on-site disinfection at the North Carolina Water Environment Association 82nd Annual Conference in November
- Participated in a video-conference among participants of the World Health Organization Inter-Country Workshop on Verification of Arsenic Mitigation Technology and Field Test Methods in December, held in Kolkata, India
- Presented at the Annual Meeting of the Interagency Consortium for Desalination and Membrane Separation Research in January
- Completed revisions to the Protocol for Equipment Verification Testing for Inactivation of Microbiological Contaminants, and to the test/quality assurance (QA) plans for ozone-based and advanced oxidation, on-site generation of halogen disinfectants, and ultraviolet radiation technologies
- Participated in the Water Quality Association Annual Convention and Exposition in March
- Participated in the AWWA Water Security Congress in March
- Began verification testing on the Kinetic Model AA08AS Para-Flo™ PF60 Backwashing Filter containing Alcan AAFS-50 Media

ETV Greenhouse Gas Technology Center

- Completed the test/QA plan for Combined Heat and Power at a Commercial Supermarket Capstone 60 kW MicroTurbine™
- Completed the test/QA plan for the Swine Waste Electric Power and Heat Production Systems: Capstone MicroTurbine™ and Martin Machinery Internal Combustion Engine
- Presented at the CBI 2nd Annual Conference: Progressing Commercialization of Energy Technologies in November
- Participated in Power-Gen International 2002 in December
- Held a meeting of the Advanced Electricity Stakeholder Group sub-committee in December, in Orlando, FL
- Distributed a press release on the COMM Engineering, USA Environmental Vapor Recovery Unit (EVRU™), and published a paper on the EVRU™ in *Oil and Gas Journal*
- Participated in the NEGC New England Energy Technologies Forum in February
- Participated in the 3rd Annual Clean Heavy-Duty Vehicles Conference in February
- Completed the test/QA plan and conducted verification testing for Residential Electric Power Generation Using the Plug Power SU1 Fuel Cell System
- Completed verification testing of Engineered Concepts Quantum Leap Gas Dehydrator
- Completed the test/QA plan and began verification testing for ConocoPhillips Fuel-Efficient High-Performance SAE 75W90 Rear Axle Gear Lubricant

ETV Advanced Monitoring Systems Center

Advanced Monitoring Systems

- Completed first round verification testing of a portable multi-gas emission analyzer
- Completed verification testing of an on-board vehicle emission monitor (OEM)
- Presented at the World Health Organization Inter-Country Workshop on Verification of Arsenic Mitigation Technology and Field Test Methods in December, in Kolkata, India
- Held a meeting of the Air Stakeholder Group on January 30-31 in Riverside, CA
- Held a meeting of the Water Stakeholder Group on March 26-27 in St. Petersburg, FL
- Completed verification testing of six technologies for detecting cyanide in water
- Completed second round verification testing of portable water detectors for arsenic at the Battelle Duxbury laboratory in Massachusetts

Site Characterization and Monitoring Technologies

- Completed verification testing of lead-in-dust detection technology at an EPA Region 1 laboratory
- Completed verification testing of a ground-water sampling technology

ETV Water Quality Protection Center

- Held a meeting of the Stakeholder Advisory Group on November 20-21, in Ann Arbor, MI

Source Water Protection Technologies

- Completed a test/QA plan for Quality Water Systems, Inc., Model 6000 Sequencing Batch Reactor
- Presented a poster at the AWWA Source Water Protection Symposium in January
- Participated in the Underground Construction Technology Conference in January
- Began verification testing of the BioConcepts decentralized wastewater treatment system for residential nutrient reduction at a site in Buzzard's Bay, MA
- Presented on ETV ballast water efforts at the EPA Technology Transfer Conference for Coastal Areas in January, and at the Scientific Workshop on Ballast Water Treatment Standards and Type Testing Procedures in February

Wet Weather Flow Technologies

- Completed verification testing of two ADS Corporation open channel flowmeters, models 3600 and 4000
- Presented at the National Total Maximum Daily Load Science and Policy Conference 2002 in November
- Held a meeting of the High-Rate Disinfection Technologies Technical Panel on November 21, in Ann Arbor, MI
- Held a meeting of the Stormwater Treatment Technologies Technical Panel on November 21, in Ann Arbor, MI
- Held a meeting of the Wet Weather Models Technical Panel on December 12
- Presented a poster at the National Urban Storm Water Conference in February
- Began verification testing of the Vortices stormwater treatment technology at a site in Milwaukee, WI
- Completed verification testing of the Brome Agri solids separator at North Carolina State University
- Completed verification testing of the HydroCompliance Management, Inc., in-drain treatment device

ETV P2 Coatings and Coating Equipment Pilot

- Held a meeting of the stakeholder group on April 22, in Research Triangle Park, NC
- Completed the Allied Photochemical KrohnZone™ 7014 Testing and Quality Assurance Project Plan, and completed application testing of KrohnZone™ 7014

calibration results, relative bias, precision, linearity, and inter-unit reproducibility. A second round of verification tests is currently being planned by the AMS Center. These tests, which are expected to occur over a 3-month period in the summer of 2003, will also be conducted in collaboration with NOAA.

NOAA is also expected to collaborate with the AMS Center in the verification of test kits to detect pesticides in water. Vendors are currently being sought for this verification test, which is expected to occur late in the summer of 2003.

ETV team representatives toured the NOAA CCEHBR and the Hollings Marine Laboratory during the ETV spring team meeting held April 1-3, 2003, in Charleston, SC. The tour was hosted by Dr. Geoffrey Scott, Acting Director of the CCEHBR, and Dr. Frederick Holland, Acting Director of the Hollings Marine Laboratory.

ETV Partnering with NYSERDA

The ETV Greenhouse Gas Technology (GHG) Center and the New York State Energy Research and Development Authority (NYSERDA) have agreed to collaborate and share the cost of verifying several new advanced electricity production technologies associated with distributed electrical generation (e.g., microturbines, fuel cells, stirling engines), biomass power production, combined heat and power, and renewable energy throughout the state of New York. In addition to reviewing the test plans and the resulting technology verification reports, NYSERDA will also help coordinate testing activities at the different sites and provide onsite technical assistance.

Thus far, the GHG Center plans to verify the following technologies in partnership with NYSERDA: Plug Power PEM fuel cell; Capstone Turbine Corporation 60 kW microturbine CHP system; Ingersoll-Rand Energy System PowerWorks™ microturbine CHP system; Capstone Turbine Corporation 30 kW microturbine CHP system; and UTC Fuel Cells phosphoric acid fuel cell.

The Ingersoll-Rand Energy Systems PowerWorks™ microturbine CHP system has been tested at a community center in Morrisville and the draft verification report has been developed. Testing of the Capstone Turbine Corporation 60 kW microturbine CHP system is scheduled to begin in early May at a supermarket in Hauppauge. The Ingersoll-Rand Energy Systems CHP system is a 70 kW microturbine CHP fired by natural

gas. The Capstone Turbine Corporation CHP system is a 60 kW microturbine CHP with heat recovery for desiccant drying and space heat. Test plans are available on the ETV Web Site for both systems.

Test plans are being developed for the Plug Power PEM fuel cell, Capstone Turbine Corporation 30 kW microturbine CHP system, and UTC Fuel Cells phosphoric acid fuel cell. The Plug Power fuel cell, which is a 5 kW residential-scale PEM fuel cell that uses natural gas, will be tested at a private residence in Lewiston. The Capstone Turbine Corporation microturbine will be tested using renewable anaerobic digester gas from a dairy farm animal waste management system in Homer. The 200 kW phosphoric acid fuel cell, developed by UTC Fuel Cells, will be tested at a waste water treatment plant in Brooklyn, using renewable anaerobic digester gas generated by the treatment plant.

ETV Program Verifies Over 200 Technologies

The ETV Program has completed technology verifications for over 200 innovative environmental technologies! The ETV AMS Center, operated by Battelle, recently completed 9 verifications, increasing the total number of technologies verified by the ETV Program to 203.

The AMS Center has verified the performance of the Testo, Inc., Model 350 Portable Multigas Emission Analyzer. Model 350 is a self-contained emission analyzer designed to measure O₂, CO, NO, NO₂, SO₂,

Web Watch (April 2003)

- ETV ✓ **The ETV Program for Homeland Security Fact Sheet is available at http://www.epa.gov/etv/pdfs/fs/03_fs_hs.pdf.**
- ETV ✓ **The April 2003 issue of the AMS Center newsletter *The Monitor* is available at http://www.epa.gov/etv/pdfs/newletters/monitor/01_mon_apr03.pdf.**
- ETV ✓ **The *New Air Pollution Control Technology Center* fact sheet is available at http://www.epa.gov/etv/pdfs/fs/05_fs_apct.pdf.**
- ETV ✓ **The *New GHG Center* fact sheet is available at http://www.epa.gov/etv/pdfs/fs/03_fs_ghg.pdf.**
- ETV ✓ **The *New AMS Center* fact sheet is available at http://www.epa.gov/etv/pdfs/fs/01_fs_ams.pdf.**

ETV Calendar

Date	Location	Event
May 5-7	Washington, DC	ETV Program - ETV exhibit and posters at the EPA Science Forum 2003: Partnering to Protect Human Health and the Environment
May 6-8	Boston, MA	ETV Program - ETV exhibit at the EnviroExpo 2003
May 12-14	Kansas City, MO	ETV Water Quality Protection Center - Presenting at the 2003 American Water Resources Association (AWRA) Spring Specialty Conference, Agricultural Hydrology and Water Quality
May 19-22	Seattle, WA	ETV Program - ETV exhibit at the Real World Clean Air Symposium
May 21-23	Toronto, Ontario	ETV Program - ETV exhibit at the EECO 2003 Energy and Environmental Conference
June 3-5	New Orleans, LA	ETV Program - ETV exhibit at the WasteExpo 2003
June 3-5	Columbia, SC	ETV Program - ETV exhibit at the Environmental Restoration Technology End-user Conference (ERTEC) 2003
June 11-12	Seattle, WA	ETV Program - ETV exhibit at the Environmental Washington Conference
June 15-19	Anaheim, CA	ETV Program - ETV exhibit at the AWWA 2003 Annual Conference and Exposition
June 22-26	San Diego, CA	ETV Program - ETV exhibit at the Air & Waste Management Association (A&WMA) 96th Annual Conference and Exhibition "Energy, Economic, and Global Challenges: Environment in the Balance"
June 22-26	Chicago, IL	ETV Water Quality Protection Center - Presenting at the International Association for Great Lakes Research (IAGLR) 46th Annual Conference "Global Threats to Large Lakes: Managing in an Environment of Instability and Unpredictability"
July 14-16	Arlington, VA	ETV Program - ETV exhibit and presentation at the 2003 National Environmental Innovations Summit

For more details on ETV events, check out our online calendar at <http://www.epa.gov/etv/calendar/02-07.html>.

H₂S, and hydrocarbons in combustion engine sources, while capturing data on pressure, temperature, and flow. The verification test was conducted at the Bourns College of Engineering, Center for Environmental Research and Technology at the University of California-Riverside, and emissions were sampled from a commercial gas-fired cooktop and a small diesel-fueled engine driving an electrical generator.

The AMS Center also completed performance verifications of two multi-parameter water quality probes. The two probes tested were the General Oceanics, Inc., Ocean Seven 316 and the YSI Incorporated, 6600 Extended Deployment System. The probes were verified in cooperation with the NOAA CCEHBR in Charleston, SC.

Finally, the AMS Center verified the performance of six portable cyanide analyzers to detect cyanide in water.

The six verified analyzers are: CHEMetrics, Inc., VVR V-1000 Multi-Analyte Photometer/V-3803 Cyanide Module; LaMotte Company, 1919 SMART 2 Colorimeter/3660-SC Reagent System; Orbeco-Hellige, Mini-Analyst Model 942-032; Thermo Orion, AQ4000/AQ4006 AQUAfast IV; Thermo Orion, Model 9606 Cyanide Electrode with Model 290 A+ Ion Selective Electrode Meter; and WTW Measurement Systems, Cyanide Electrode CN 501 with Reference Electrode R503D and Ion Pocket Meter 340i.

The verification reports and statements for these technologies are available on the ETV Web Site at <http://www.epa.gov/etv/verifications/verification-index.html>.

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