

Identifying Emerging Contaminants

By Shannon Cunniff

Imagine if the U.S. Department of Defense (DOD) and, by extension, its supporting industries could identify strategic risk management investments that both reduce the potential for adverse health effects and improve DOD's capability to achieve its mission. That's the basic idea behind a program initiated in 2006 by the Office of the Deputy Under Secretary of Defense for Installations & Environment. The Emerging Contaminants Directorate aims to help DOD more proactively address emerging contaminants.

Emerging contaminants either do not have regulatory peer-reviewed human health standards or the regulatory standards are evolving due to new science, detection capabilities, or pathways. They are defined as chemicals or materials that have pathways to enter the environment and present potentially unacceptable human health or environmental risks.

DOD is determined to understand better and act early to manage risks from emerging contaminants. This approach strengthens DOD's ability to respond early to human health and environmental risks, and makes good business sense. Strategic risk reduction investments enable DOD to protect people proactively, sustain its operational capabilities and minimize the likelihood of unanticipated future costs, ideally avoiding such costs altogether.

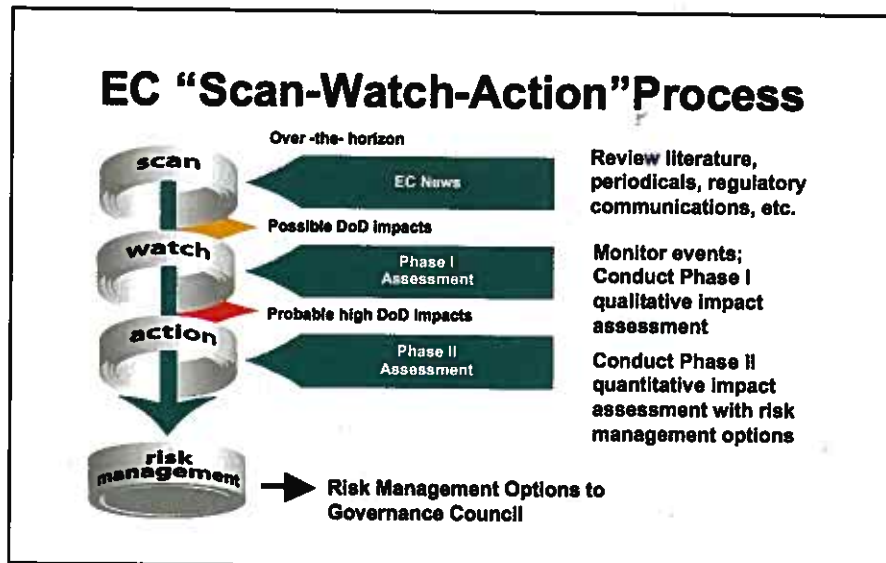
Emerging contaminants can have adverse health effects on operating forces, DOD support personnel and the public. They can affect military training and readiness through restrictions on DOD facilities. Several years ago, for example, concerns over perchlorate contamination led to restricted access

to two DOD ranges. Similarly, concerns over a contaminant's adverse health effects can result in restricted availability of materials, which, in turn, can impact mission-critical industrial applications. Increased regulation of a contaminant can result in increased research, development, cleanup, and maintenance and disposal costs, which drain resources from other mission needs.

The Emerging Contaminants Directorate was the first of its kind to be established among regulated federal agencies; however, other agencies are now focusing on similar issues. The U.S. Environmental Protection Agency (EPA) has established a working group to address emerging contaminants. The EPA Design for Environment program works in partnership with industry to compare and improve performance while addressing human health and environmental risks and costs of existing and alternative products, processes and practices. The U.S. Geological Survey is also focusing on this issue by leading

A recently-created directorate is helping DOD proactively manage potential risks associated with emerging contaminants.

The DOD Emerging Contaminants Directorate uses a three-step approach to identify and address contaminants of new concern.



interagency working groups focused on improving the scientific understanding of emerging contaminants such as pharmaceuticals in the environment. States are engaging in this issue, too; the Commonwealth of Massachusetts, for example, has established a new strategy for managing "unregulated contaminants of new concern."

Scan, Watch, Action

The Emerging Contaminants Directorate implements a process to facilitate informed risk management decisions to protect human health and DOD operational capabilities. The process begins with the early identification of emerging contaminants and an assessment of evolving science and the likelihood of regulatory shifts.

With support from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), the directorate conducts an over-the-horizon search for emerging contaminants. USACHPPM reviews periodicals, scientific journals, regulatory communications and other media to identify emerging contaminants that may be of interest to DOD. By scanning this information, the directorate is able to identify chemicals or materials that are currently in use or that could be in future use by DOD that have the potential to adversely affect DOD's mission, its personnel, the public, or the environment.

Phase I Impact Assessment. Once an emerging contaminant has been identified, a qualitative, two-part Phase I Impact Assessment is conducted. First, the likelihood of changes in toxicity values and regulatory status is evaluated. The assessment then estimates the prospect of a specific impact to five functional areas: environment, health and safety; military readiness and training; acquisition and research; production, operations, maintenance and disposal of DOD assets; and contaminated site cleanup.

The goal of the Phase I Impact Assessment is to forecast quickly the potential risks associated with the continued acquisition, use, treatment, transportation and disposal of an emerging contaminant. To date, 24 contaminants have been assessed and eight have been found to warrant a more in-depth review because

their potential impact to DOD appears to be significant. These include: perchlorate, an oxidizer used to propel missiles, flares and munitions; the explosive RDX; the solvent TCE; the fuel constituent naphthalene; hexavalent chromium, a heavy metal used in coatings; PFOA, a chemical used to make fluoropolymers and fluoroelastomers; the heat-resistant metal beryllium; and sulfur hexafluoride, a nontoxic gas used in electronics. Most of these chemicals are well known; DOD considers them "emerging" because evidence suggests that regulators are reassessing their human health or environmental effects in a manner that may trigger stricter regulation.

Phase II Assessment. The next step for these contaminants, and any future contaminants for which a potential impact is determined to be significant, is to conduct a Phase II Impact Assessment, which is a more thorough, quantitative evaluation of the likely impacts and costs. More importantly, this assessment identifies risk management options for DOD program managers. These options range from developing substitute materials to implementing new pollution prevention measures to investing in treatment technology.

DOD may also work with regulators to conduct independent, peer-reviewed toxicological studies to strengthen the scientific rigor that forms the basis of regulatory risk assessments.

The results of the Phase II Assessment are presented to the Emerging Contaminants Governance Council, which is composed of senior DOD leaders. In addition to sharing information across DOD, the council makes decisions on strategic investments and policies and can endorse the implementation of risk management options that will bring future benefit to DOD.

Partnerships

To advance information gathering and dissemination throughout the services, the Emerging Contaminants Directorate established the Materials of Evolving Regulatory Interest Team (MERIT). MERIT consists of individuals from the military services and involves program offices from across DOD. MERIT is open to any member

of the DOD workforce with an interest and job responsibility that is potentially affected by emerging contaminants. MERIT assists in the rapid compilation and distribution of information on the current status of contaminants and the best available science and technology.

The directorate has partnered with the Environmental Council of the States to form a task group on mutually acceptable processes and has completed four work products, including a survey of states' interests and activities related to emerging contaminants; emerging contaminants risk communication principles; an issue paper addressing the selection of toxicity criteria for risk; and an issue paper on initiating actions and funding for response to emerging contaminants. The latter two have been adopted as DOD policy.

DOD also is building partnerships with industry to identify opportunities and obstacles to adopting alternative chemicals or other improvements in industrial materials and processes. Recent efforts have involved actively working with NAEM (formerly known as the National Association for Environmental Management) and industry to identify and respond to the challenges posed by the European Union's new chemical regulation, known as "REACH." The emerging contaminant program also is involved with efforts to benchmark the variety of methods being used to rank chemical hazards and efforts to improve chemical management systems.

This year the directorate has completed an evaluation of risks to operational ranges, summarized and released the results of more than 45,000 perchlorate samples collected nationwide, and is generating toxicity criteria guidance that can be used during DOD's development and acquisition process to reduce risks and costs. In addition, testing for naphthalene content in DOD fuels is underway, a new policy on managing the risks posed by engineered nanomaterials was issued, and new risk management options for several high-priority emerging contaminants will be released in the near future. EM

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