

Summary of *State of Knowledge Assessment: COPC/Exposure Limits (PNNL-25790)*

In response to the Tank Vapor Assessment Team Recommendation Dose Recommendation #2 (DR2), Pacific Northwest National Laboratory (PNNL) evaluated the current Hanford Tank Farm Occupational Exposure Limits (HTFOELs) for 59 chemicals of potential concern (COPCs). The [State of Knowledge Assessment: COPC/Exposure Limits \(PNNL-25790\)](#) investigates if there is sufficiently new technical data to prompt a re-evaluation of the current COPC HTFOELs. One recommendation made in PNNL-25790 is to add 2-propenal, N-nitroso-n-butyl-1-butanamine, and dimethyl mercury to the list of COPCs. If implemented, their addition would expand the COPC list from 59 to 62 chemicals.

The report recommends that the HTFOELs be re-evaluated. No changes were suggested for six chemicals on the COPC list. The recommended changes to the remaining 53 HTFOELs are based on the following:

- Changes in regulatory guidelines for individual chemicals
- Changes in regulatory guidelines for surrogate chemicals used to develop 26 HTFOELs
- Addition of new chemicals to the COPC list (3 total) that were not previously evaluated

Since the COPC list was created, “[t]wenty-six (26) COPCs were identified for re-evaluation because of a change to the regulatory values for the surrogate chemical upon which the current HTFOEL was based. In addition, new acute regulatory guidelines have been established...for many COPCs, prompting re-evaluation of chemicals within the context of acute exposure...” (PNNL-25790, pg. vi). Overall, there has been sufficient new regulatory information during the last 10 years to warrant re-evaluation of current HTFOELs.

Questions

- 1) What are surrogate chemicals?

Surrogate chemicals are those chemicals deemed adequate stand-ins for the structurally related chemical for which there is no established OEL. The surrogate’s adequacy is established by choosing a structurally related chemical of similar toxicological profiles (i.e., chemicals with similar target organs and response). The surrogate may have a greater or lesser potency than the original chemical of concern.

- 2) What databases were searched for this study?

The following internet databases were utilized as primary sources for a COPC:

- The Toxicology Data Network (TOXNET)
- PubMed
- The Comparative Toxicogenomics Database (CTD)
- HAZMAP®, Hazardous Substances Data Bank (HSDB)
- Integrated Risk Information System (IRIS)

- Registry of Toxic Effects of Chemical Substances (RTECS)
- Toxicology Literature Online (Toxline)
- Acute Exposure Guideline Levels (AEGL)
- Protective Action Criteria (PAC).

If information in one or more of the above sources was incomplete, in conflict, or considered insufficient, other sources were used to find additional information, such as:

- The National Institute of Environmental Health Sciences (NIEHS)
- National Toxicology Program (NTP)
- International Agency for Research on Cancer (IARC)
- U.S. Environmental Protection Agency (EPA)
- The Agency for Toxic Substances and Disease Registry Monographs (ATSDR)
- A Google search.

3) What 6 chemical _{HTF}OELs are not recommended for re-evaluation?

- Methanol
- Methyl Nitrate
- Butly Nitrite
- Butly Nitrate
- Chlorinated Biphenyls
- Biphenyl.

4) What is an Acute Exposure Guideline Level (AGEL)?

The AGEL is an EPA database describing the human health effects from once-in-a-lifetime, or rare, exposure to airborne chemicals. AGELs are typically used by emergency responders when dealing with chemical spills or other catastrophic exposures. AEGLs are set through a joint effort of the public and private sectors worldwide. (<https://www.epa.gov/aegl>)

5) What is the Protective Action Criteria (PAC)?

The Protective Action Criteria dataset is a hierarchy-based system of the three common public exposure guideline systems: AEGLs, Emergency Response Planning Guidelines (ERPGs), and Temporary Exposure Limits (TEEL). A particular hazardous substance may have values in any, or all, of these systems. (<http://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/protective-action-criteria-chemicals-pacs.html>)

6) How are chemicals of potential concern selected?

More than 1800 chemicals have been identified in the tank waste. Out of these chemicals, those identified as carcinogens, or found at concentrations greater than 10 percent of their respective OELs, were deemed COPCs and added to the list.

- 7) Does WRPS manage worker exposure to concentrations to a value that is 10 percent of their respective OEL?

No. To ensure that worker exposure does not exceed the _{HTF}OEL, WRPS implements controls (engineering, administrative, and/or Personal Protective Equipment) to ensure worker exposure does not exceed the respective _{HTF}OELs.

- 8) Are AEGLs, PACs, ERPGs, and TEELs occupational exposure limits?

No. These limits are typically used by emergency responders and communities for protection against once in a life time exposure. Occupational exposure limits are designed to protect workers from harmful chemical exposure for an 8-10 hour work day over a 40 hour work week. Permissible Exposure Limits (PELs), threshold limit value (TLV), and Recommended Exposure Limits (REL) are occupational exposure limits set by the Occupational Safety and Health Administration (OSHA), American Conference of Governmental Industrial Hygienists (ACGIH), and National Institute for Occupational Safety and Health (NIOSH) respectively.