



U.S. ARMY CHEMICAL MATERIALS ACTIVITY FACT SHEET

ACUTE EXPOSURE GUIDELINE LEVELS (AEGLs) FOR PROTECTING THE PUBLIC

Acute Exposure Guideline Levels (AEGLs) are a critical metric used to help local authorities recognize the potential health effects and protect the general population from inhalation exposure to airborne chemical agents¹. AEGLs are available for many toxic industrial chemicals, as well as chemical warfare agents stored at the Blue Grass Army Depot (BGAD) and Pueblo Chemical Depot (PCD). AEGLs are determined based on total exposure of a person who

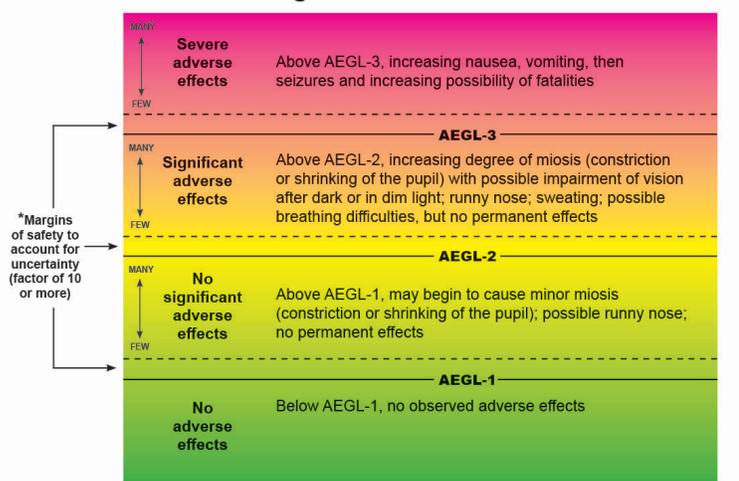
takes no actions to protect themselves from exposure. They are dosage-based exposure thresholds calculated based on the amount of airborne agent present over the duration of exposure. There are three defined AEGL levels, described below. Symptoms associated with AEGLs are further illustrated for mustard and nerve agents in the charts below.

AEGL-1 levels indicate **no significant adverse effects**. This level of exposure may result in notable discomfort or irritation, but the effects are not disabling and are reversible after the exposure stops.

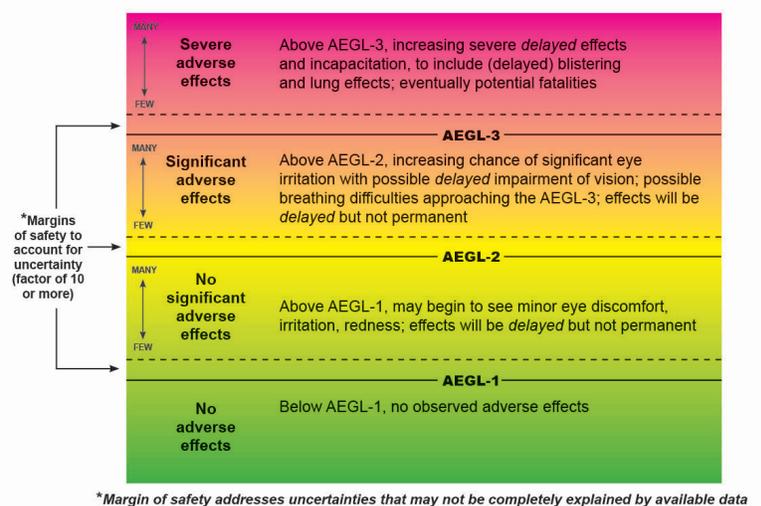
AEGL-2 levels indicate **significant adverse effects**. This level of exposure could result in serious, long-lasting health effects, or an impaired ability to escape

AEGL-3 levels indicate **severe adverse effects**. This level of exposure could result in life-threatening health effects or death.

Nerve Agent Health Effects & AEGLs



Sulfur Mustard Health Effects & AEGLs



¹AEGLs were developed by the Environmental Protection Agency in consortium with the Centers for Disease Control, U.S. Army, and National Research Council, for a wide array of airborne toxic chemicals.

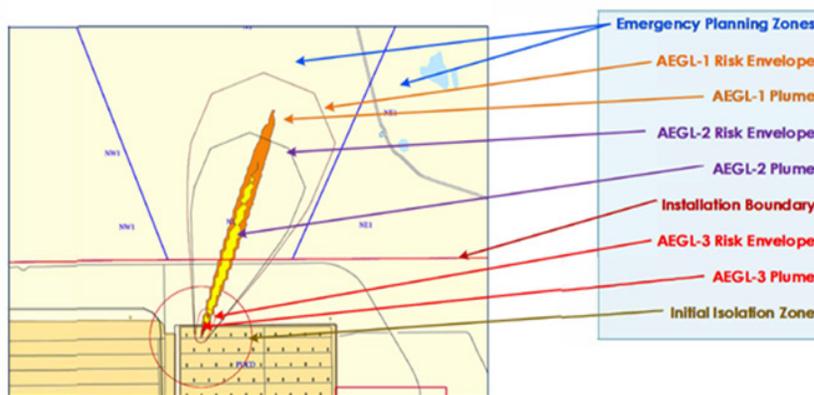




ACUTE EXPOSURE GUIDELINE LEVELS (AEGLs) FOR PROTECTING THE PUBLIC (CONTINUED)

How AEGLs Are Used

- AEGLs are used both to prevent exposure on a daily basis and minimize exposure in emergencies if a chemical agent accident occurs – such as a spill, fire or explosion.
- Hazard analysts at U.S. Army depots use WebPuff® incorporating current and forecast weather data, the agent/munition combination, the release type (fire, explosion, spill), agent amount, and release duration to produce the predicted AEGL plume.
- On a daily basis, agent releases are modeled to capture potential accidents for the agent/munition configuration being moved known as *Maximum Credible Events* (MCEs). Operations are halted or modified when a predicted AEGL-3 risk envelope extends beyond the installation boundary. The risk envelope accounts for wind shifts which may not be captured in WebPuff® on a timely basis.
- For an accidental release, hazard analysts use the MCE most similar to the event to produce a predicted plume and determine what areas in the surrounding community could be affected. Ground truth information may be used instead provided sufficient information is available.
- Protective action recommendations (PARs) issued to the surrounding community (e.g., shelter in place, evacuation, and exit shelter) are based on the predicted AEGL-2 risk envelope shown in the plot below.



Interpretation of AEGLs in WebPuff®

- The AEGL plot in WebPuff® is a *prediction* based on information from the accident scene and meteorological conditions for the entire duration from the time of the accident lasting until when exposure ceases beyond the end of the release.
- WebPuff® scenarios are designed to provide a safe-sided depiction of the hazard.
- The “Acute” in AEGLs means “short-term.” AEGLs do not consider the potential long-term effects of chemical agent exposure (e.g., carcinogenic effects with mustard).
- Chemical exposure can still occur below the AEGL-1, shown as “No Adverse Effects” in the charts above.
- A safety margin is built into the AEGL levels. Further, individuals may react differently and have different breathing rates. Therefore, all individuals are not expected to suddenly start experiencing negative effects at AEGL-1.
- The AEGL hazard plot does **not** show where the plume is located at specific times. Rather, it includes the entire scenario – from initial release until the agent is dispersed.
- Other WebPuff® plots such as *Concentrations* are more appropriate for showing the movement of agent in the atmosphere at any moment, but **are not used to determine re-entry decisions**. Additional details are provided in the recovery sampling and analysis plans for each site.

