

Table 1. Chemical Agent Air Standards Status Table: Existing and Proposed Standards as of 4/5/03 POC: V. Hauschild, USACHPPM, 410-436-5213

Media- AIR	Standard Name	Population	Exposure Scenario	H/HD/HT	GA (Tabun)	GB (Sarin)	GD/GF	VX	Lewisite	Notes/ Status
Airborne Exposure Limits (AELs) mg/m ³	IDLH (Immediately Danger to Life/health)	civilian/ DoD worker	1 time exposure	NA 2 ^{d,i}	0.2 ^{a,c} 0.1 ^{e,h}	0.2 ^{a,c} 0.1 ^{e,h}	0.06 ^{a,c} 0.05 ^{e,h}	0.02 ^{a,c} 0.01 ^{f,h}	NA NA	-- Existing criteria in RED/GREEN are currently listed in 1990 and 97 DA pams – the IDLH, WPL, STEL*, and GPL values in BLACK are from Final Army technical re-evaluation reports and are currently being staffed (Feb-April 03) in the draft Jan 03 revision of DA pams 40-8 and 40-173 (RED values show where changes are to existing values) -- *STEL is new proposed standard not previously established NOTE: CDC had proposed modifications to the new nerve agents AELs (in BLACK) in the Federal Register in Jan 8 2002; 67 FR: 894-901) However, the Army non-concurred with the CDC modifications (see reference k). As of 4/03 no final CDC position has been documented. - No re-evaluation of Lewisite has been performed. Lewisite values are based on detection limits; no true IDLH exists (AR 385-61, Table 2-2, 2-3)
	*STEL (Short Term Exposure Limit)	civilian/DoD worker	occasional 15-minute exposure (4x ea day)	0.003 ^{d,i}	0.0004 ^{e,h}	0.0004 ^{e,h}	0.0002 ^{e,h}	0.00004 ^{f,h}	NA NA	
	WPL (Worker Population Limit)	civilian/DoD worker	8-hr, daily/ 30-yr. Time-weighted average	0.003 ^{b,c,g} 0.0004 ^{d,i}	0.0001 ^{a,c,g} 0.0001 ^{e,h}	0.0001 ^{a,c,g} 0.0001 ^{e,h}	0.00003 ^{a,c,g} 0.00003 ^{e,h}	0.00001 ^{a,c,g} 0.00001 ^{f,h}	0.003 ^c --	
	GPL (General Population Limit)	civilian population	24-hr/daily, lifetime time-weighted avg.	0.0001 ^{b,c,g} 0.00002 ^{d,i}	0.000003 ^{a,c} 0.000003 ^{e,h}	0.000003 ^{a,c} 0.000003 ^{e,h}	0.000001 ^{a,c} 0.000001 ^{e,h}	0.000001 ^{a,c,g} 0.000003 ^{f,h}	0.003 ^c --	
AEGLs mg/m ³	Acute Exposure Guideline Levels	Emergency/ Accident scenario	1 time exposure :	HD	GA	GB	GD/GF	VX	L	
	AEGL - LEVEL 1 Potential minor discomfort or noticeable effects; reversible	civilian population	10 MIN:	0.40	0.0069	0.0069	0.0035	0.00057	NA	see ref L Final Sulfur Mustard AEGLs have been published by National Research Council (NRC) Committee on Toxicology (COT) (to be available on www.nap.edu) as of 4/03; (Final values include some minor changes to those that were initially proposed in the Federal Register in 2000)
			30 MIN:	0.13	0.0040	0.0040	0.0020	0.00033	"	
			1 HR:	0.067	0.0028	0.0028	0.0014	0.00017	"	
			4 HR:	0.017	0.0014	0.0014	0.00070	0.00010	"	
			8HR:	0.0083	0.0010	0.0010	0.00050	0.000071	"	
	AEGL- LEVEL 2 Level where more obvious effects begin; Potentially impacting functional abilities or ability to Escape; Potential delayed recovery	civilian population	10 MIN:	0.60	0.087	0.087	0.044	0.0072	"	(no changes to values in this Table – Sept 11 02 Table had final values)
			30 MIN:	0.20	0.050	0.050	0.025	0.0042	"	
			1 HR:	0.10	0.035	0.035	0.018	0.0029	"	
			4 HR:	0.025	0.017	0.017	0.0085	0.0015	"	
8HR:			0.013	0.013	0.013	0.0065	0.00104	"		
AEGL - LEVEL 3 Life threatening; Level of potential initial fatalities	civilian population	10 MIN:	3.9	0.76	0.38	0.38	0.029	"	see ref L Nerve agent (G-Agents, VX) AEGLs have been published by National Research Council (NRC) Committee on Toxicology (COT) (to be available on www.nap.edu) as of 4/03; (Final values include some minor changes to VX AEGLs from those initially proposed in the Federal Register in May 01)	
		30 MIN:	2.7	0.38	0.19	0.19	0.015	"		
		1 HR:	2.1	0.26	0.13	0.13	0.010	"		
		4 HR:	0.53	0.14	0.070	0.070	0.0052	"		
		8HR:	0.27	0.10	0.051	0.051	0.0038	"		
MEGs mg/m ³	Military Exposure Guidelines (Air) ** NOTE: refer to AEGLs above; for durations > 24 hrs additional guidelines are provided:	Effect level	Exposure duration	HD	GA	GB	GD/GF	VX	L	CHPPM-recommended values for certain Force Health Protection applications - Based on AEGLs, plus a MEG for 24-hr exposures (ref m). Considered conservative but appropriate for diverse military population with some genetically susceptible individuals, just as in general population – However, additional (military specific) interim toxicity criteria are also available for certain applications (see references n, o)
		None-minimal	1time –24 hour	((0.003)	((0.0003)	((0.0003)	((0.0002)	((0.000027)	NA	
		None-minimal	See AEGL 1 durations and associated values above values						0.003	
		Significant	See AEGL 2 durations and associated values above values						NA	
	Severe	See AEGL 3 durations and associated values above values						0.003		

Table 1. Chemical Agent Air Standards Status Table: Existing and Proposed Standards as of 4/5/03 POC: V. Hauschild, USACHPPM, 410-436-5213

HIGHLIGHTED values indicate changes from previous version of this Table (Sep 11 02)

() Numbers in parentheses are from draft documents

GREEN Numbers in Green are currently documented in official Army regulation/policy and are no changes expected

BLUE Numbers have been developed/endorsed by non-DoD federal proponents for Army and non-Army use

RED Numbers are still officially used/endorsed by Army/other approving entity source **but** revisions are proposed/underway (see below)

BLACK Numbers are final technical values but are not yet approved for official implementation by proponent agency

*STEL is new proposed standard not previously established

** Lewisite values are all based on detection; no true IDLH exists (AR 385-61, Table 2-2, 2-3)

PINK – regarding ongoing CDC review of AELs and potential changes to “new” (in black) Army proposed values

REFERENCES:

- a) DA Pamphlet 40-173: *Occupational Health Guidelines for the Evaluation and Control of Exposure to Nerve Agents GA, GB, GD, and VX*; Medical Services, 4 Dec 1990
- b) DA Pamphlet 40-8: *Occupational Health Guidelines for the Evaluation and Control of Exposure to Mustard Agents H, HD, and HT*; Medical Services, August 1991
- c) AR 385-61: *The Army Chemical Agent Safety Program*; Safety; 28 February 1997
- d) USACHPPM Technical Report: *Evaluation of Airborne Exposure Limits for Sulfur Mustard (HD): Occupational and General Population Exposure Criteria*, Technical Report 47-EM-3767-00, November, 2000
- e) Mioduszewski et al.; *Evaluation of Airborne Exposure Limits for G-Agents: Occupational and General Population Exposure Criteria*, ERDEC-TR-489; April 1998. (and February, 2000 Errata Summary)
- f) Reutter et al.; *Evaluation of Airborne Exposure Limits for VX: Occupational and General Population Exposure Criteria*; ECBC-TR-074; February 2000.
- g) The Centers for Disease Control (CDC) of the Department of Health and Human Services (DHHS) 1988. *Recommendations for Protecting Human Health and Safety Against Potential Adverse Effects of Long-Term Exposure to Low-Doses of Agents GA, GB, VX, Mustard Agents (H, HT, HD) and Lewisite (L)*, Federal Register, Vol. 53 No 50, page 8504, Tuesday, March 15, 1988.
- h) **Draft REV Jan 03** DA Pmt 40-173: *Occupational Health Guidelines for the Evaluation and Control of Exposure to Nerve Agents GA, GB, GD, and VX*; Medical Services,
- i) **Draft REV Jan 03** DA Pam 40-8: *Occupational Health Guidelines for the Evaluation and Control of Exposure to Mustard Agents H, HD, and HT*; Medical Services,
- k) March 14 2002, signed by Mr. Raymond J. Fatz, Deputy Assistant Secretary of the Army, (Environment, Safety and Occupational Health) OASA(I&E), addressed to Dr. Paul Joe, Centers for Disease Control (CDC); subject comments to Federal Register request for comments, (Jan 8 2002; 67 FR: 894-901).
- l) National Research Council (NRC) Volume 3, *Acute Exposure Guidelines for Selected Airborne Chemicals*, National Academy Press, Pre-Publication Advance Public copy 14 March, 2003, www.nap.edu
- m) USACHPPM Technical Guide (TG) 230, *Chemical Exposure Guidelines for Deployed Military Personnel*, Jan 02/Update April 03; **currently being reviewed by NRC, (report expected 2004)**
- n) Office of the Secretary of Defense –Chemical and Biological Defense (OASD-CBD) 2001. Johnson-Winegar, A., Deputy for Chemical/Biological Defense, Assistant to the Secretary of Defense, 3050 Defense Pentagon, Washington, D.C., Memo “Interim Certification of Chemical and Biological Data” for General Distribution from DOD Nuclear and Chemical and Biological Defense Programs, 27 Dec 2001).
- o) Grotte, JH and LI Yang, 2001. *Report of the Workshop on Chemical Agent Toxicity for Acute Effects*. Institute for Defense Analyses, 11-12 May, 1998. IDA Document D-2176, Institute for Defense Analyses (IDA), 1801 N. Beauregard St., Alexandria, VA (June 2001).