

1 DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

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4 Solid and Hazardous Waste Commission/Hazardous Materials and  
5 Waste Management Division  
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8 6 CCR 1007-3  
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11 HAZARDOUS WASTE  
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13 Proposed Amendment of Part 261, Appendix VII and Appendix VIII Regarding the  
14 Addition of Lewisite to the K901 and K902 Listings.  
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17 1) Appendix VII of Part 261 is amended by revising the K901 and K902 listings to read as  
18 follows:  
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Appendix VII -- Basis for Listing Hazardous Waste

EPA hazardous waste No.	Hazardous constituents for which listed
*****	*****
K901	0-isopropyl methylphosphonofluoridate (Sarin, GB), bis(2-chloroethyl)sulfide (Mustard, Mustard Agent, Mustard Gas, H, HD), bis(2-chloroethylthio)ethyl ether (Mustard T), Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver, 1,2 – Dichloroethane, 1,1 – Dichloroethylene, <u>Lewisite</u> , Tetrachloroethylene, Trichloroethylene, Vinyl Chloride.
K902	0-isopropyl methylphosphonofluoridate (Sarin, GB), bis(2-chloroethyl)sulfide (Mustard, Mustard Agent, Mustard Gas, H, HD), bis(2-chloroethylthio)ethyl ether (Mustard T), Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver, 1,2 – Dichloroethane, 1,1 – Dichloroethylene, <u>Lewisite</u> , Tetrachloroethylene, Trichloroethylene, Vinyl Chloride.
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2) Appendix VIII of Part 261 is amended by adding a listing of lewisite to read as follows:

Appendix VIII -- Hazardous Constituents

Common name	Chemical abstracts name	Chemical abstracts No.	Hazardous waste No.
*****	*****	*****	*****
Lead subacetate	Lead, bis(acetato-O)tetrahydroxytri-	1335-32-6	U146
<b><u>Lewisite 1</u></b>	<b><u>(2-chloroethenyl) arsonous dichloride;</u></b> <b><u>Chlorovinylarsine dichloride</u></b>	<b><u>541-25-3</u></b>	<b><u>K901 &amp;</u></b> <b><u>K902</u></b>
<b><u>Lewisite 2</u></b>	<b><u>2-Chlorovinyl dichloroarsine; Bis (2-chlorovinyl)</u></b> <b><u>Chloroarsine</u></b>	<b><u>40334-69-8</u></b>	<b><u>K901 &amp;</u></b> <b><u>K902</u></b>
<b><u>Lewisite 3</u></b>	<b><u>Arsine, tris(2-chloroethenyl); tris-(2-Chlorovinyl) arsine</u></b>	<b><u>40334-70-1</u></b>	<b><u>K901 &amp;</u></b> <b><u>K902</u></b>
Lindane	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)-	58-89-9	U129
*****	*****	*****	*****

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33 **3) Section 8.87 {Statement of Basis and Purpose for the Rulemaking**  
34 **Hearing of February 21, 2017} is added to Part 8 of the Regulations to read**  
35 **as follows:**

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**Statement of Basis and Purpose**  
**Rulemaking Hearing of February 21, 2017**

40 8.87                    Basis and Purpose.

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These amendments to 6 CCR 1007-3, Part 261 are made pursuant to the authority granted to the Hazardous Waste Commission in § 25-15-302(2), C.R.S.

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Introduction

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The Colorado Hazardous Waste Regulations (CHWRs), 6 CCR 1007-3, Part 261, Subpart B allow chemicals or other materials that are solid wastes to be added to the hazardous waste listing if the chemical or material can be shown to meet any of the criteria listed in 6 CCR 1007-3, Section 261.11(a). Pursuant to 6 CCR 1007-3, Section 261.11(b), classes or types of solid waste may also be listed as hazardous waste if wastes within the class or type of waste are, typically or frequently hazardous under the definition of hazardous waste found in the Colorado Hazardous Waste Act. That is, a "hazardous waste" means a solid waste which may "cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness or poses a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." C.R.S. § 25-15-101(6)(a).

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The Division has previously requested listing of other chemical agents in the past. The Division submitted a proposal to the Hazardous Waste Commission to list Mustard Agents as acute hazardous (P listed) wastes in June, 1997. The Commission adopted these changes at the rulemaking hearing on August 19, 1997. Additionally, the Division previously requested addition of chemical weapons containing Sarin and Mustard agents and environmental media, debris, and containers contaminated through contact with these agents to the specific source hazardous wastes, K901 and K902 listed hazardous wastes respectively in June, 2001. The hazardous constituents that formed the basis for listing the K901 and K902 hazardous wastes in 6 CCR 1007-3, Part 261, Appendix VII were Sarin and both types of sulfur Mustard agents, HD and HT. The Commission adopted these changes at the rulemaking hearing on June 19, 2001.

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Currently, K901 wastes are described as waste chemical weapons using or containing any chemical compound identified in Appendix VII of Part 261 as the basis for the listing. K902 hazardous wastes consist of "Any soil, water, debris or containers contaminated through contact with waste chemical weapons listed as K901. Acute hazardous wastes are subject to more stringent management requirements than wastes that are not acute, including limited waste accumulation volumes.

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Until recently, it was believed that Sarin and the Mustard agents wastes were the only chemical agent wastes that existed in Colorado. However, during the last year it was discovered that Lewisite chemical agent wastes may also be buried at the Pueblo Chemical Depot. Currently, the Army is formulating plans to excavate two Solid Waste Management Units (SWMUs 12 and 13)

81 at the Pueblo Chemical Depot. There are reports indicating that between 1944 and 1946, an  
82 unspecified number of Lewisite –containing munitions (possible maximum of 160 M70 bombs  
83 and various shells) may have been buried in at least one of these areas onsite.

84  
85 When Lewisite agent is discarded as defined in 6 CCR 1007-3, Section 261.2(a)(2), the agent  
86 becomes a solid waste and meets at least one of the regulatory criteria set forth under 6 CCR 1007-  
87 3, Section 261.11(a). Accordingly, if Chemical Weapons, or Environmental Media, Debris, and  
88 Containers Contaminated through Contact with Waste Chemical Weapons containing Lewisite are  
89 discarded as defined in 6 CCR 1007-3, Section 261.2(a)(2), they pose a substantial present and  
90 potential hazard to human health or the environment if they are improperly treated, stored,  
91 transported, disposed of, or otherwise managed. For this and other reasons presented herein,  
92 Waste Lewisite Chemical Weapons, or Environmental Media, Debris, and Containers  
93 Contaminated through Contact with Lewisite should be added to the existing K901 and K902 -  
94 listed hazardous wastes.

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96 Statement of Basis and Purpose

97 These amendments to the CHWRs are made pursuant to the authority granted to the Hazardous  
98 Waste Commission in C.R.S. § 25-15-302(2).

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100 The Colorado Department of Public Health and Environment, Hazardous Materials and Waste  
101 Management Division (the Division) is proposing two revisions to 6 CCR 1007-3, Parts 261. The  
102 proposed revisions provide for the following amendments to Part 261 of the CHWRs:

- 103  
104 1) Addition of Lewisite Agent (L) (2-Chlorovinylarsine dichloride (L1),  
105 Dichlorovinylchloroarsine (L2), and 2,2',2''-Trichloro-trivinylarsine (L3)) to Appendix  
106 VIII “Hazardous Constituents”; and,  
107  
108 2) Addition of Lewisite Agent (L1, L2, L3) to Appendix VII – “Basis of Listing Hazardous  
109 Waste” for K901 and K902 hazardous waste listings.

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111 Adding Lewisite to the list of hazardous constituents for the existing K901 and K902 listings will  
112 allow for a more robust ability to manage and regulate both the acute toxic Lewisite agent as well  
113 as secondary wastes contaminated through contact with the material.

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115 **Lewisite (L)** is an organoarsenic compound. It was once manufactured in the U.S., Japan, and  
116 Germany for use as a chemical weapon, acting as a vesicant (blister agent) and lung irritant.

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118 The regulatory criteria for listing a hazardous waste or listing classes or types of solid waste can  
119 be found in 6 CCR 1007-3, Section 261.11. In summary a solid waste can be listed as a hazardous  
120 waste if it meets any one of three (3) criteria: first, if the solid waste exhibits any characteristic of  
121 a hazardous waste; second if a solid waste presents or is suspected to present certain acute human  
122 health hazards; and third, if it is capable of posing a substantial present or potential hazard to  
123 human health or the environment when improperly managed. The second criterion applies to  
124 Acute Hazardous Waste, as the Division has proposed for the Lewisite Agent, Waste Chemical  
125 Weapons, and Environmental Media, Debris, and Containers Contaminated through Contact with  
126 Waste Lewisite Chemical Weapons.

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128 Currently, the only facility in Colorado known to have material affected by this hazardous waste  
129 listing is the Pueblo Chemical Depot (PCD). This facility is owned and operated by the United  
130 States Army (the Army).

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### 132 Overview of Chemical Weapons, Lewisite Agent L

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134 In the past, international agreements such as that arising from the 1972 Biological and Toxin  
135 Weapons Convention focused on the destruction of biological and toxin weapons that were  
136 manufactured and stockpiled as a result of their production during wartime. These agreements  
137 have left nations with the formidable task of treating and disposing of these lethal weapons.

138

139 The Chemical Weapons Convention (CWC), the most recent of such agreements sought to clarify  
140 both the definition of Chemical Weapons and the prohibitions on the development, production,  
141 acquisition, stockpiling, destruction, and use of chemical weapons. Article II of the CWC defines  
142 chemical weapons in three parts. First, chemical weapons are “identified as all toxic chemicals  
143 and their precursors, except those intended for purposes allowed by the CWC,” second as  
144 “munitions and devices specifically designed to release these toxic chemicals,” and third as “any  
145 equipment specifically designed for use with such munitions or devices.”(OPCW Fact Sheet 2,  
146 2001).

147

148 Chemical weapons are defined in Section 260.10 of the CHWRs to clearly define the K-waste  
149 listing. The regulatory definition closely follows the definition for “chemical agent and  
150 munitions” found in 50 USC 1521(j) which is used by both the U.S. Environmental Protection  
151 Agency and the Department of Defense. In proposing this regulatory definition the Division  
152 reviewed the comprehensive definition provided by the CWC to ensure that the definition “does  
153 not unnecessarily hinder the legitimate use of chemicals and the economic and technological  
154 development to which such uses may lead” (OPCW Fact Sheet 4, 2001). The Division believes  
155 that the definition for lewisite-containing chemical weapons is consistent with that provided by the  
156 CWC.

157

158 Lewisite was developed as a chemical warfare blister agent during World War I and was named  
159 after its inventor Captain W. Lee Lewis. It is no longer produced in the United States. The general  
160 population will not be exposed to Lewisite. People that are potentially exposed to Lewisite are  
161 soldiers or people who work at military sites where Lewisite may be stored or disposed.

162

163 Pure Lewisite is a colorless, odorless oily liquid; however, synthesized agent is amber to dark  
164 brown liquid with a geranium like odor. Lewisite may exist as the *trans* or *cis* isomer. In basic  
165 solution, the *trans* isomer of Lewisite is cleaved to yield acetylene and sodium arsenite. In  
166 addition, the *cis* isomer of Lewisite may be photoconverted to the *trans* isomer, and the trivalent  
167 form of arsenic in Lewisite oxide is generally oxidized to pentavalent arsenic under environmental  
168 conditions. Lewisite is an unstable compound; thus, environmental exposures may be to a mixture  
169 of Lewisite with one or more of its degradation products and/or frequently occurring impurities.  
170 Lewisite has moderate vapor pressure, and if released into the air, it is expected to exist solely in  
171 the vapor phase. Once in the air, Lewisite is expected to degrade slowly (may persist for a few  
172 days before being broken down). Lewisite has low water solubility, but it rapidly hydrolyzes in  
173 water forming the water-soluble product 2-chlorovinyl arsonous acid (CVAA) and hydrochloric  
174 acid, but small amounts may evaporate. Lewisite will be broken down in moist soil quickly, but  
175 small amounts may evaporate. Lewisite does not accumulate in the food Chain.

176 Lewisite is an organic arsenical with vesicant properties. Lewisite-1 (L-1) is formed by the  
177 reaction of acetylene with arsenic trichloride using aluminum trichloride as a catalyst. Arsenic  
178 trichloride, Lewisite-2 (L-2; bis(2-chlorovinyl) chloroarsine), and Lewisite-3 (L-3; tris(2-  
179 chlorovinyl) arsine) are co-products/impurities concurrently formed with L-1. L-1 yield is greater  
180 than 65%, and approximate yields of arsenic trichloride, L-2, and L-3 are 16-21%, 7-10%, and 4-  
181 12%, respectively. Therefore, an accidental release from storage tanks or disposed chemical  
182 weapons of L will likely be the release of a mixture of L-1, L-2, L-3, and arsenic trichloride.  
183 Exposure will be to these compounds and to potential hydrolysis products, sodium arsenite  
184 (NaAsO<sub>2</sub>) and arsenic acid (H<sub>3</sub>AsO<sub>4</sub>). Toxicity data on arsenic trichloride are limited; however,  
185 effects are similar to those of L-1. With regard to lethality, arsenic trichloride appears to be  
186 approximately 2-3 times less toxic than L-1.  
187

### 188 Health Effects of Lewisite

189  
190 As summarized by the National Research Council (NRC, 2013)<sup>1</sup>, Lewisite is readily absorbed  
191 through the mucous membranes, and is also readily absorbed through the skin because of its  
192 lipophilicity. Lewisite causes local corrosive damage and may cause systemic poisoning after  
193 absorption through skin or mucous membranes. Lewisite is immediately and highly irritating at  
194 concentrations of about 6-8 mg/m<sup>3</sup>. The geranium-like odor is reportedly detectable at 14-23  
195 mg/m<sup>3</sup> (Gates et al. 1946 as cited by NRC, 2013).  
196

197 Exposure to lewisite causes almost immediate irritation and burning sensation of the eyes, skin,  
198 upper respiratory tract, and lungs. Death may result from direct pulmonary damage or circulatory  
199 failure from fluid loss and arrhythmia. Death that occurs within 24 h of exposure is likely due to  
200 pulmonary damage. According to ATSDR (2014)<sup>2</sup>, exposure to very high levels of lewisite may  
201 cause liver and kidney damage. Additionally, chronic respiratory diseases and severe damage to  
202 the eye may be present for a long time following exposure to large amounts of lewisite. Chronic  
203 exposure to lewisite may lead to arsenical poisoning.  
204

205 Human exposure data are dated and many studies are not well described. No information  
206 concerning developmental or reproductive toxicity or genotoxicity with regard to Lewisite  
207 exposure in humans was identified. Information suggesting an increased cancer incidence in  
208 workers from a Japanese poison gas factory is confounded because workers were exposed to  
209 several chemicals.  
210

211 Animal data are limited but suggest that lewisite is highly irritating and corrosive, causing dermal  
212 and ocular lesions by contact with liquid or vapor inhalation. There is no evidence that Lewisite is

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<sup>1</sup> NRC (2013). Acute exposure guideline levels for selected airborne chemicals: Volume 15. Washington (DC): National Academies Press (US).

<sup>2</sup> ATSDR (2014). Medical Management Guidelines for Blister Agents: Lewisite (L)(C<sub>2</sub>H<sub>2</sub>AsCl<sub>3</sub>) and Mustard-Lewisite Mixture (HL). Available at: <https://www.atsdr.cdc.gov/mmg/mmg.asp?id=922&tid=190>

213 a reproductive or developmental toxicant in rats or rabbits in the absence of maternal toxicity.  
214 Genotoxicity assay results were generally negative; the only positive result was in chromosome  
215 aberrations in Chinese hamster ovary (CHO) cells. No information concerning carcinogenicity in  
216 animals was found.

217

## 218 **Acute lethality**

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### 220 Inhalation

221 The inhalation LC<sub>50</sub> for lewisite vapor in humans was estimated to be 120 mg/m<sup>3</sup>  
222 for 10 min and 50 mg/m<sup>3</sup> for 30 min.

223

224 In rabbits, 7.5-min LC<sub>50</sub> of 160 mg/m<sup>3</sup> and a 60-min LC<sub>50</sub> of 25 mg/m<sup>3</sup> was reported (Gates et al.  
225 1946 as cited by NRC, 2013). In guinea pigs, a 9-min LC<sub>50</sub> of 111 mg/m<sup>3</sup> and a 60-min LC<sub>50</sub> of 8  
226 mg/m<sup>3</sup> were reported (Gates et al. 1946 as cited by NRC, 2013).

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### 228 Dermal

229 In humans an LC<sub>50</sub> of 3,300 mg/m<sup>3</sup> for 30 min for lewisite vapor absorption through the bare skin  
230 was estimated. This estimate is based on animal data and assumes that absorption of lewisite  
231 through skin is a function of the ratio of surface exposed to body volume. A dermal LD<sub>50</sub>  
232 of more than 40 mg/kg was also estimated based on animal data (NRC 2013).

233

234 In rabbits, dermal LD<sub>50</sub> of 6 mg/kg and intravenous LD<sub>50</sub> of 0.5 mg/kg were reported (Cameron et  
235 al. 1946 as cited by NRC, 2013). In guinea pigs, a dermal LD<sub>50</sub> of 12 mg/kg and subcutaneous  
236 LD<sub>50</sub> of 1 mg/kg were also reported (Cameron et al. 1946 as cited by NRC, 2013).

237

### 238 Ingestion

239 Ingestion of Lewisite is an uncommon route for exposure but can lead to local effects and systemic  
240 absorption. Ingestion of Lewisite may cause severe stomach pain, nausea, vomiting, and bloody  
241 stools ATSDR (2014)<sup>2</sup> and ATSDR (2002)<sup>3</sup>.

242

### 243 Regulatory Evaluation

244 The regulatory criteria for listing a solid waste as a hazardous waste can be found in 6 CCR 1007-  
245 3, Section 261.11. As explained previously, this proposed listing applies to Lewisite Agent, and  
246 Environmental Media, Debris, and Containers Contaminated through Contact with Waste  
247 Chemical Weapons containing Lewisite that have been determined to be solid wastes.  
248 Solid waste that has been found to be fatal to humans in low doses, or in the absence of data on  
249 human toxicity, has been shown in studies to have certain specific levels of toxicity in animals,  
250 may be listed as hazardous waste by the Division. As discussed above, Lewisite Agent, by its  
251 inherent design as a lethal chemical agent, is fatal to humans in low doses. Toxicological data and  
252 other information are readily available to establish that Lewisite is fatal to humans in low doses.

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<sup>2</sup> ATSDR (2014). Medical Management Guidelines for Blister Agents: Lewisite (L)(C<sub>2</sub>H<sub>2</sub>AsCl<sub>3</sub>) and Mustard-Lewisite Mixture (HL). Available at:  
<https://www.atsdr.cdc.gov/mmg/mmg.asp?id=922&tid=190>

<sup>3</sup> ATSDR (2002). FAQs on Blister agents: Lewisite and Mustard-Lewisite Mixture. Available at:  
<https://www.atsdr.cdc.gov/toxfaqs/tfacts163.pdf>

253 Pursuant to the CHWRs, materials exhibiting these criteria will be designated as Acute Hazardous  
254 Wastes.

255  
256 Chemical weapons containing Lewisite, are designed to pose similar hazards to human health and  
257 the environment, as do the pure chemical agents. These hazards are due both to the presence and  
258 demonstrated high toxicity of the chemical agents themselves. The Division is seeking the  
259 addition of Lewisite to the Waste Chemical Weapons as a general class of hazardous waste  
260 because the weapons themselves, i.e. the shell casings and other material composing the "chemical  
261 weapon", are contaminated with the chemical agent. In addition, any Environmental Media,  
262 Debris, and Containers which are solid wastes that have been generated as a result of the  
263 treatment, storage, or disposal of Chemical Weapons, frequently or typically pose a hazard to  
264 human health because these materials can also be contaminated with the chemical agent contained  
265 in the weapon. Accordingly, Waste Chemical Weapons and Environmental Media, Debris, and  
266 Containers Contaminated through Contact with Waste Chemical Weapons "pose a substantial  
267 present or potential hazard to human health or the environment when improperly treated, stored,  
268 transported, or disposed of, or otherwise managed." C.R.S. § 25-15-101(6)(a).

269  
270 The Division believes that shell casings, munitions, devices, and other equipment used to contain,  
271 and release chemical agents as part of a Waste Chemical Weapon can be assumed to be  
272 contaminated with chemical agent as these components are often in direct contact with the  
273 chemical agent. While it may be true that some of the components of a Waste Chemical Weapon  
274 may not be in direct contact with the chemical agent itself, the Division believes that the potential  
275 for these components to become contaminated with the chemical agent as a result of the agent  
276 leaking out is a realistic concern.

277  
278 The Division also believes that Environmental Media, Debris, and Containers which are  
279 solid wastes generated as a result of the treatment, storage, or disposal of Waste Chemical  
280 Weapons frequently or typically pose a hazard to human health because these materials  
281 can also be contaminated with the chemical agent contained in the weapon. In fact, the  
282 "Army generates a number of secondary waste streams, primarily from treatment of  
283 wastes to remove or destroy chemical agent, that may contain minute amounts of the  
284 agents or associated compounds." (Army Vol. 1, pg. 40, 1999).

285  
286 In order to assure that these secondary wastes are handled and disposed of appropriately,  
287 the Division is proposing the addition of Lewisite to the existing K901 and K902 listing  
288 for Waste Chemical Weapons and Environmental Media, Debris, and Containers  
289 Contaminated through Contact with Waste Chemical Weapons to the hazardous waste  
290 listings. Wastes that meet the K902 listing description would not carry the listing code  
291 for Waste Chemical Weapons (K901) which might otherwise be applied to these wastes  
292 based on the mixture and derived from rules. The Army appears to agree with this  
293 contention. For example, the Army has proposed to list the following wastes as K-  
294 hazardous wastes in Utah: spent chemical neutralization solutions used to neutralize  
295 chemical agents, miscellaneous solids such as glass, metal, and wood contaminated with  
296 chemical agents, spent laboratory or monitoring and testing materials such as rags, wipes,  
297 gloves, aprons, and ppe contaminated with chemical agent, antifreeze, hydraulic fluid and  
298 refrigerants contaminated with chemical agents, spent carbon from air filtration  
299 equipment contaminated with chemical agent, ash, cyclone residue, baghouse dust, slag  
300 and refractory contaminated with chemical agent, and brine salts, liquids, solids and  
301 sludges generated from pollution abatement systems designed for treatment of chemical



302 agents. The Army contends that these "waste streams are all proposed to be listed  
303 because they typically or frequently contain (or at one time contained) toxic constituents  
304 B specifically one or more of the chemical agents . . ." (Army Vol. 1, pg. 69, 1999).

305  
306 Based on the above regulatory evaluation, Waste Chemical Weapons and Environmental  
307 Media, Debris, and Containers Contaminated through Contact with Waste Chemical  
308 Weapons meet the necessary criteria presented in Section 261.11(b) of the CHWRs for  
309 listing as a class of hazardous waste. In addition, waste Lewisite Agent meets the  
310 necessary criteria presented in Section 261.11(a) of the CHWRs for listing as an acute  
311 hazardous waste. Therefore, the Division proposes that Waste Chemical Weapons and  
312 Environmental Media, Debris, and Containers Contaminated through Contact with Waste  
313 Chemical Weapons and Lewisite Agent be added to the K-listed wastes found in Sections  
314 261.32 and 261.33 of the CHWRs respectively. The Division specifically proposes to  
315 add Lewisite to the waste codes K901 for Waste Chemical Weapons, K902 for  
316 Environmental Media, Debris, and Containers Contaminated through Contact with Waste  
317 Chemical Weapons.

318  
319 Lewisite Agent is also proposed for addition into Appendices VII and VIII of Part 261 of  
320 the CHWRs to identify the specific chemicals which form the basis for the K-listings. As  
321 previously stated, Mustard Agents are already P-listed hazardous wastes in the CHWRs.  
322 Addition of Lewisite to Appendix VII identifies the specific chemical agents that pose the  
323 acute health hazard (basis for listing) in the proposed listings.

324  
325 Benefits of Listing Lewisite as a hazardous constituent forming the basis for the K901  
326 Waste Chemical Weapons, and K902 Environmental Media, Debris, and Containers  
327 Contaminated through Contact with Waste Chemical Weapons as Hazardous Waste

328  
329 The principal benefits of listing Lewisite as hazardous wastes include the following:

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331 1) The State will have an increased regulatory framework for management of waste  
332 Lewisite Agent, Waste Chemical Weapons containing Lewisite, and any Environmental  
333 Media, Debris, and Containers Contaminated through Contact with Waste Chemical  
334 Weapons which contain concentrations of the chemical agents. Approving the proposed  
335 listing will require more complete and appropriate treatment, as well as adequate record  
336 keeping and management of current and future inventories of these waste streams under  
337 the CHWRs.

338  
339 The Division believes this proposed listing is appropriate given the extreme toxicity of  
340 Lewisite agent and the potential for solid waste generated during management of  
341 chemical weapons to be contaminated with chemical agents. The Department will have  
342 additional accountability from the Army thereby ensuring protection of human health and  
343 the environment during management of waste Lewisite Agent, Waste Chemical  
344 Weapons, or Environmental Media, Debris, and Containers Contaminated through  
345 Contact with Lewisite-containing Waste Chemical Weapons. Management of these  
346 wastes will include the time during interim management (the time between recovery and  
347 treatment) of the wastes, during treatment and destruction of the wastes, and throughout  
348 disposal of the wastes.

349

- 350 2) There will be an increase in the regulatory guidelines and enforcement accountability for  
351 the treatment and management of associated waste streams including munitions parts,  
352 personnel protective equipment (PPE), dunnage, etc. If the proposed listing is approved,  
353 Lewisite-containing wastes would carry the listings until they are either delisted, fully  
354 treated or decontaminated, or properly disposed of. These associated waste streams,  
355 resulting from the demilitarization process, may be large in volume, and could potentially  
356 have significant impacts on human health and the environment if improperly managed.  
357
- 358 3) Under the proposed listings, any spills (to soil or otherwise) or other impacts to  
359 environmental media would require cleanup and disposition as listed wastes under the  
360 "mixture rule." The mixture rule provides that material mixed with a listed hazardous  
361 waste become a hazardous waste. This provision helps ensure that waste quantities are  
362 minimized, and ensures the protection of public health and the environment through  
363 proper management of these contaminated wastes.  
364
- 365 4) This listing will require the Army to consider waste management planning as a factor in  
366 the Chemical Demilitarization Process which will be chosen for any Lewisite agent  
367 rounds recovered and stored at the Pueblo Chemical Depot. All listed waste streams  
368 must be managed adequately to protect public health and the environment. In addition,  
369 the planning process may result in the minimization of waste generation in the excavation  
370 and cleanup of burial areas.

371  
372 The anticipated costs to the Army related to the impact of these proposed listings are  
373 minimal when compared to the overall cost of treatment and destruction of chemical  
374 agents and the decommissioning and disposal of any recovered chemical weapons. Many  
375 of the costs to manage these wastes streams are already required to ensure worker safety.  
376