

DISPOSAL OF CHEMICAL AGENTS AND MUNITIONS STORED AT UMATILLA DEPOT ACTIVITY, OREGON

**REVISED FINAL
ENVIRONMENTAL IMPACT STATEMENT**



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PROGRAM MANAGER FOR CHEMICAL DEMILITARIZATION

ABERDEEN PROVING GROUND, MD. 21010-5401

SUMMARY

This Environmental Impact Statement (EIS) assesses the potential environmental impacts of on-site destruction (using the reverse assembly and incineration process) of the lethal unitary chemical agents and munitions stockpiled at the Umatilla Depot Activity (UMDA). UMDA is situated on the county line between Morrow and Umatilla counties in the state of Oregon and encompasses about 7,990 ha (19,700 acres). It is one of eight U.S. Army installations in the continental United States (CONUS) where lethal unitary chemical agents and munitions are stored. A Final Programmatic Environmental Impact Statement (FPEIS) for destruction of the entire CONUS stockpile was issued in January 1988, and it identified on-site disposal as the environmentally preferred alternative. [Copies of the FPEIS may be obtained by contacting the U.S. Army at the following address: Program Manager for Chemical Demilitarization, ATTN: SFAE-CD-ME, Aberdeen Proving Ground, Maryland 21010-5401.] Based on the FPEIS, as well as consideration of additional factors such as logistics and security, the resultant Record of Decision selected on-site disposal for implementation at each of the eight CONUS storage sites. A subsequent report, the UMDA Phase I report, evaluated environmental data and disposal technology data that became available after the FPEIS was published. This report concluded that on-site disposal remained valid as the environmentally preferred alternative for UMDA. This EIS thus addresses site-specific impacts associated with the proposed on-site disposal activities at UMDA.

Approximately 11.6% (by weight) of the total U.S. stockpile of lethal unitary chemical agent is currently stored at UMDA. This represents the third largest chemical agent inventory among the Army's eight CONUS storage sites. The chemical agent inventory at UMDA is stored in liquid form inside both explosive and nonexplosive items. These items include almost all of the types of munitions and bulk items found in the U.S. stockpile. The chemical agents are of the nerve type (GB and VX) and of the blister type (HD), also called mustard agent. There are no mustard-filled items at UMDA other than non-explosive ton containers, which are stored inside a single warehouse. All other items are stored inside concrete, earth-covered structures called igloos.

The proposed disposal facility would include a munitions demilitarization building (MDB) that will house the entire disposal process, a container handling building (CHB) for temporary storage of munitions prior to processing, and associated support facilities needed for operations and maintenance. Process-support areas would include the pollution abatement system located adjacent to the MDB, the process utilities building, a personnel and maintenance building, a process support building with an entry control facility, a laboratory, and an enclosed transfer corridor between the CHB and the MDB. The site of the disposal facility would be enclosed by a double security fence and would have an entry control point to ensure that access would be restricted. The preferred siting of the facility is adjacent to the existing chemical agent storage area.

The demilitarization process involves three major steps: (1) the handling and transport of munitions from the existing chemical storage area to MDB, (2) the reverse assembly and incineration of munitions and agents within the disposal facility, and (3) the management of

the waste materials that remain at the completion of the incineration process. Five incinerators would be used primarily as follows: two liquid incinerators for chemical agent destruction, a furnace for incineration of the explosive components of the munitions, a furnace for decontamination of metal parts and munition bodies, and an incinerator for disposal of dunnage. The proposed disposal facility, including these incinerators, would meet stringent permitting requirements of the Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act, and Clean Air Act. The disposal facility would not discharge any liquid wastes other than sanitary sewage. Nonhazardous solid process wastes would be shipped off-site to a permitted landfill, although some decontaminated process scrap metal would be sold to a scrap dealer or smelter for reuse. RCRA hazardous wastes would be characterized, appropriately packaged, and shipped off-site to a permitted disposal facility.

The schedule, which is tentative, calls for construction of the disposal facility to begin in early 1997, with preoperational testing (i.e., systemization) to commence in late 1999 and disposal operations to begin in late 2001. This schedule would allow time to incorporate lessons learned from the Johnston Atoll Chemical Agent Disposal System and would allow time for the regulatory review process for the RCRA permit application. The disposal operations are expected to take approximately 3 years. The construction work force is estimated to peak at about 550 individuals; the estimated operating work force is about 586 individuals with about 150 depot support staff members.

The site and environs of UMDA would be impacted, although minimally, from construction and disposal operations. Operations would involve a risk of low-probability, high-consequence accidents, as discussed below, that could release chemical agent into the environment. The potential impacts of dismantling and closing the disposal facility are not assessed but will be examined in a subsequent National Environmental Policy Act document. Closure of the facility is also addressed in the RCRA permit application. The principal findings of this EIS are listed below for each area of consideration.

CONSTRUCTION ACTIVITIES

The potential environmental impacts associated with construction activities would be minimal. Construction of the disposal facility is expected to be typical of that for any medium-scale industrial facility. A total of about 23 ha (58 acres) of the UMDA installation would be disturbed during construction activities. In addition, a new natural gas line approximately 8.8 km (5.5 miles) in length would connect to an existing natural gas supply between UMDA and the Columbia River, and two new 115-kV power lines totaling 8 km (5 miles) in length would connect to two existing power lines north and east of UMDA. The total area to be disturbed by all construction on and off the UMDA installation would be roughly 30 ha (75 acres).

Construction activities would result in emissions from construction vehicles and increased levels of airborne dust. The National Ambient Air Quality Standard (NAAQS) for particulate matter concerns particles less than 10 μm in diameter (PM_{10}). The dust generation rate for these particles would be about 27 tons/month from construction of the proposed disposal facilities if the entire 30-ha (75-acre) area were disturbed simultaneously

and no dust suppression measures were used. The estimated PM_{10} concentrations from construction, when added to the existing background levels in the area, could result in short-term exceedances of the NAAQS for PM_{10} . However, good engineering practices, including wetting of disturbed surfaces, would be employed during excavation and construction to minimize fugitive dust and erosion, and only a small part of the 30 ha (75 acres) would be disturbed at any one time. Emissions from commuter and construction vehicles would contribute relatively minor amounts of criteria pollutants. Construction activities could also result in short-term increases in ambient noise levels near off-site residences, but annual average noise levels should remain below the 55 dB(A) level recommended by the U.S. Environmental Protection Agency (EPA). Disposal of nonhazardous construction wastes at an off-site permitted landfill would not result in significant adverse impacts.

The anticipated influx of workers into the UMDA area within the 34-month construction period could cause some stress to the existing socioeconomic infrastructure. The total influx of workers, resulting from UMDA disposal facility construction and the proposed commercial developments in the area, may be as high as 1540 individuals. The existing labor pool in the two-state region could be adequate to meet most of the employment demand, in which case worker in-migration would be limited. However, if all workers and their families in-migrated to Morrow and Umatilla counties, adverse impacts would occur to existing housing and schools, both of which are locally at capacity.

Water use during construction would result in a minor increase in water withdrawal from existing UMDA wells. No prime farmland, threatened or endangered species, wetland, or floodplain would be affected by construction, with the exception of a small amount of wetland that may be disturbed by gas line construction. Erosion would be minimized by appropriate site drainage and runoff control, including the construction of a stormwater retention pond. The new natural gas line would cross the Immigrant Wagon Road, a cultural resource.

INCIDENT-FREE OPERATION

Incident-free operations (i.e., no accidents) would result in minimal impacts to the environment and to disposal plant personnel. Potential impacts could be produced by disposal plant emissions; emissions from transport vehicles; water withdrawal from existing UMDA wells; solid waste generated from incineration of the chemical agents and other wastes; and potential worker exposure to low levels of chemical agent. No significant adverse impacts would be expected from these activities.

Stack emissions would be controlled to levels below regulatory requirements and would therefore comply with applicable ambient air quality standards; thus, minimal air quality impacts would be expected from routine operations.

Emissions of dioxins and furans were measured during trial burns at the Johnston Atoll Chemical Agent Disposal System (JACADS), which has demonstrated the incineration technology to be used at the proposed UMDA facility. Only extremely small quantities of dioxins and furans were emitted from the JACADS incinerators. The measured emissions of

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dioxins and furans from the various incinerators and furnaces ranged from 0 to 1.48 ng/m³; this is in the parts-per-trillion range. No 2,3,7,8-tetrachlorinated dibenzo-*p*-dioxin was detected. The toxicity of the JACADS dioxin emissions is roughly equivalent to one diesel truck traveling at approximately 40 miles per hour. A similar comparison can be made of the dioxin content of mainstream cigarette smoke: JACADS emits the equivalent dioxin of between one and ten packs of cigarettes per second.

Emissions of dioxins and furans were included in a draft health risk assessment conducted by the state of Oregon as part of the permitting process for the proposed UMDA facility under the Resource Conservation and Recovery Act. The health risk assessment included a multi-chemical, multi-pathway analyses of the potential impacts from facility emissions. That is, it included a prediction of the exposures via air-, soil- and waterborne contaminants to hypothetical residents at maximally impacted locations. The results show that the risks to current populations are less than the regulatory benchmarks established by the Oregon Department of Environmental Quality (i.e., a lifetime excess cancer risk of 10⁻⁵ and a total hazard index of 0.25 for noncancer risks). None of the potentially exposed populations in the vicinity of UMDA (particularly those outside of the UMDA fence-line) are expected to be exposed to emissions constituents at levels in excess of regulatory benchmarks.

The draft health risk assessment also included a screening-level ecological risk assessment. The Umatilla assessment concludes that there is little or no potential for the emissions from the proposed UMDA facility to negatively impact terrestrial vegetation or soil invertebrates. No potential adverse effects of routine, daily emissions were predicted on aquatic or benthic (sediment-dwelling) species in the nearby Umatilla River; however, the total hazard index indicates a slight potential for effects on aquatic species in nearby wetlands at the Conforth Ranch, about 7 km (4.4 miles) northeast of the UMDA boundary. The surface water or sediment dioxin concentrations in these same two waterbodies did not exceed levels of concern for mammalian or avian wildlife.

On-site transport of agents and munitions between the existing storage area and the disposal plant would use special shipping packages to ensure containment of any agent in the event of leakage during transportation and to provide additional protection in the event of transportation accidents. Under incident-free conditions, no chemical-agent impact from transportation would be expected.

Some process residue from agent incineration would contain nonagent hazardous constituents (e.g., heavy metals). These wastes would be analyzed to ensure the absence of agent before being packaged, transported, and disposed of in a permitted waste disposal facility (or facilities) consistent with RCRA regulations.

Disposal plant workers would be afforded maximum protection through various facility design features, administrative procedures, individual protective clothing and equipment, training, and adherence to occupational safety and health procedures. Hence, no significant adverse impacts to worker health are anticipated.

Noise levels at the nearest residence would be well below the 55 dB(A) level recommended by EPA. Socioeconomic impacts would be minor due to the relatively small size of the work force. Water use at UMDA would increase as a result of disposal operations,

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and the increased water demand would be supplied by three existing UMDA wells, two of which would be upgraded. The third well would be used only if required for fire protection.

ACCIDENTS

Accidents involving explosions, fires, and spills could have major environmental consequences, including human fatalities, destruction of wildlife and wildlife habitat, destruction of economic resources, and contamination of water resources and water supplies. Such high-consequence accidents have extremely low probabilities of occurrence. For the FPEIS, a comprehensive study was performed to identify the credible accidents, their frequencies, dispersion of agents and pollutants into the environment, and potential effects on human health and the ecosystem. A supplemental analysis of possible accident impacts incorporating more recent site-specific information for UMDA and its environs was performed for this EIS.

The most significant impact from the proposed action would result from catastrophic events, such as a severe earthquake or the crash of a large aircraft directly onto the MDB. On an annual basis, there would be less than one chance in 500,000 or one chance in 60 million, respectively, that these events would occur and release chemical agent. Impacts under worst case (WC) meteorological conditions from such an event could include dispersion of potentially lethal doses of chemical agent for as far as 28 km (17 miles) and could create the potential for as many as 1,550 fatalities among the residential population around the UMDA area.

ALTERNATIVES

Alternative disposal technologies were examined in the FPEIS as part of the programmatic decision. Additionally, a comprehensive assessment of potential alternative technologies was performed by the National Research Council (NRC) in 1993-94. The NRC found that there was no alternative technology available which had been adequately demonstrated to allow for replacement of incineration. The NRC recommended that the Army proceed with disposal expeditiously using incineration while performing research into neutralization-based alternatives. The Army has initiated a program of research, development, test, and evaluation for neutralization technologies; however, none of these alternative disposal technologies are sufficiently mature to warrant replacement of the proposed incineration process at UMDA.

Alternatives include no action (continued storage) and consideration of alternative disposal facility sites at UMDA. Although the no action alternative is precluded by Pub. L. 99-145 (the Department of Defense Authorization Act of 1986, which requires that the stockpile be destroyed), it was analyzed for comparison with the proposed action. The alternative of transporting the agents and munitions stored at UMDA to another depot for disposal was addressed in the FPEIS and the Phase I report and is not considered further in this EIS.

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The FPEIS risk analysis and the Phase I report indicate that continued storage would result in greater risk to the public than the proposed on-site disposal. Continued-storage accidents, such as a severe earthquake or the crash of a large aircraft, could affect larger areas [areas within 100 km (62 miles)] than on-site disposal accidents [areas within 28 km (17 miles)] and thus cause a greater number of fatalities. However, the probabilities of such events are extremely low; on an annual basis there would be less than one chance in 70 million for the aircraft crash and less than one chance in 16,000 for the earthquake. The potential number of fatalities from a storage accident under WC meteorological conditions could be as high as 10,300, compared to 1,550 for the proposed on-site disposal activities.

Alternative sites at UMDA were identified using criteria based on safety and compatibility with current UMDA operations. Four alternative sites were identified, one of which is the Army's preferred site located in the northeastern quarter of the depot and adjacent to the southeast corner of the existing chemical storage area. Potential environmental impacts associated with facility construction and disposal operations were compared among the sites. The analysis indicated that the preferred site would involve potential human health impacts of equal or lesser magnitude than those estimated for the other three sites. Minimal differences among the four sites were identified for other environmental impacts.

The preferred alternative identified for the proposed disposal of chemical agents and munitions stored at UMDA is on-site disposal conducted at the proposed site in the northeastern quarter of the depot on a three shift per day operating schedule.

MITIGATION

Mitigation measures for the proposed UMDA disposal facility fall into three categories: safety enhancements, emergency planning, and operational constraints.

Safety enhancements are being considered for the design and proposed operating procedures. Efforts are underway to improve emergency planning for the Umatilla area; it is recognized that proper emergency response to accidental releases of chemical agents at UMDA has the potential to save lives.

Operational constraints are primarily concerned with limiting the daily period of demilitarization operations to daylight hours, when meteorological conditions would limit the downwind distance traveled by hazardous concentrations of accidentally released chemical agent. The hazard distances for agent releases from several types of disposal accidents would extend beyond the UMDA boundary under nighttime meteorological conditions but not under typical, daytime conditions. If disposal operations were limited to daylight hours, the period of agent and munitions storage would be increased, and the combined risk of storage plus disposal activities would be about three times greater than with 24-hr/day disposal operations. Consequently, there would be no benefit from operating the disposal facility only in the daytime.

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