PROPOSED INSTALLATION AND OPERATION OF A SMALL-SCALE INCINERATION UNIT FOR THE DESTRUCTION OF CHEMICAL AGENTS TABUN AND LEWISITE AT THE DESERET CHEMICAL DEPOT IN UTAH

ENVIRONMENTAL ASSESSMENT

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U.S. ARMY CHEMICAL MATERIALS AGENCY
ABERDEEN PROVING GROUND, MARYLAND

ENVIRONMENTAL ASSESSMENT

Lead Agency: Department of the Army;
U.S. Army Chemical Materials Agency (CMA)

Title of Proposed Action: Proposed Installation and Operation of a Small-Scale Incineration Unit for the Destruction of Chemical Agents Tabun and Lewisite at the Deseret Chemical Depot in Utah

Affected Jurisdiction: Tooele County, Utah

RECOMMENDED APPROVAL:

18 Dec 08

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ORGANIZATION OF THIS ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) evaluates the environmental effects of the Army's proposed action: installation and operation of equipment and auxiliary systems at the Deseret Chemical Depot in Utah for the purpose of destroying the depot's inventory of the chemical agents Tabun (GA) and Lewisite. This EA provides information to be considered in making decisions regarding the proposed action and its alternatives.

SECTION 1 **INTRODUCTION** summarizes the purpose of and need for the proposed action and provides relevant background information about the chemical agents to be destroyed.

SECTION 2 **THE PROPOSED ACTION AND ITS ALTERNATIVES** describes the proposed action and the no-action alternative, as well as other alternatives to the proposed action.

SECTION 3 **THE AFFECTED ENVIRONMENT AND POTENTIAL ENVIRONMENTAL CONSEQUENCES** describes the existing environmental resources that could be affected by the proposed action, identifies potential environmental impacts of implementing the proposed action and no-action alternatives, and identifies proposed mitigation measures, as appropriate.

SECTION 4 **CONCLUSIONS** summarizes the findings about the potential environmental impacts for the proposed action and no-action alternative, and makes a recommendation on whether to proceed with a Finding of No Significant Impact.

SECTION 5 **PERSONS CONTACTED AND CONSULTED** provides a listing of those individuals who were contacted to provide data and information for the analyses in this EA, as well as those who contributed to the preparation of this EA through their analyses and expert reviews.

SECTION 6 **REFERENCES** provides bibliographic information for cited reference materials.

ACRONYMS AND ABBREVIATIONS

°C	degrees Centigrade
µg	micrograms (one millionth of a gram)
µm	micrometer (one millionth of a meter)
BRA	brine reduction area
CAMDS	Chemical Agent Munitions Disposal System
CAS	Chemical Abstracts Service
CFR	*Code of Federal Regulations*
cm^3	cubic centimeters
CMA	U.S. Army Chemical Materials Agency
CO	carbon monoxide
COPC	chemical of potential concern
CWC	Chemical Weapons Convention
DCD	Deseret Chemical Depot (in Utah)
DFS	deactivation furnace system
DNOP	di-n-octylphthalate
dscm	dry standard cubic meter
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
ESQ	ecological screening quotient
FR	*Federal Register*
ft^3	cubic foot
GA	a nerve agent, also called “Tabun”
GB	a nerve agent, also called “Sarin”
HD	mustard agent, also called “distilled mustard”
HEPA	high efficiency particulate air (filter)
Hg	mercury
HHRA	human health risk assessment
hr	hour
JACADS	Johnston Atoll Chemical Agent Disposal System
kg	kilogram
L	Lewisite, an arsenical chemical agent
L	liter
LIC	liquid incinerator (two of these already exist at the TOCDF)

m^3	cubic meter
MACT	maximum achievable control technology
mg	milligram (one thousandth of a gram)
mm	millimeter (one thousandth of a meter)
MPF	metal parts furnace
MW	megawatt (one million watts)
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
PAS	pollution abatement system
$PM_{2.5}$	particulate matter less than or equal to 2.5 micrometers in aerodynamic diameter
PM_{10}	particulate matter less than or equal to 10 micrometers in aerodynamic diameter
PPE	personal protective equipment
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
SLERA	screening-level ecological risk assessment
SO_2	sulfur dioxide
TCLP	Toxicity Characteristic Leaching Procedure
TOCDF	Tooele Chemical Agent Disposal Facility
UCON	a thickener investigated for use with chemical warfare agents
UDEQ	State of Utah, Department of Environmental Quality
UDSHW	State of Utah, Division of Solid and Hazardous Waste
U.S.	United States
VOC	volatile organic compound
VX	a nerve agent

1. INTRODUCTION

The Tooele Chemical Agent Disposal Facility (TOCDF) is currently destroying the stockpile of mustard agent munitions and the associated mustard secondary waste at the Deseret Chemical Depot (DCD) in Utah (see Figure 1). Since operations began in 1996, the TOCDF has successfully eliminated the GB (Sarin) and VX munitions stockpiles that had been stored at the DCD.

The DCD stockpile also includes small quantities of the agents Tabun (GA) and Lewisite (L) (see Table 1). The chemical agent GA is a non-persistent nerve agent in the organophosphate family similar to the nerve agent GB, and producing similar effects but not as toxic. Lewisite is a chlorinated arsenical blister agent producing effects similar to the mustard agents. Lewisite is also a systemic poison due to its high arsenic content.

The DCD stockpile (see Table 2) includes two ton containers[1] containing approximately 1.4 tons of agent GA and two ton containers referred to as "GA/UCON" that contain approximately 0.6 tons of agent GA. The two "GA/UCON" ton containers were originally thought to contain a mixture of GA and UCON (a thickener investigated for use during the 1950s and 1960s). Subsequent sampling and analysis has shown that these ton containers do not contain UCON; however, they are still referred to as "GA/UCON" ton containers in the DCD storage records. In addition, there are ten ton containers containing approximately 13 tons of Lewisite and ten "empty" Lewisite ton containers potentially containing Lewisite-contaminated residual solids, or "heel" material.

Originally, the GA and Lewisite were to be destroyed as part of the TOCDF operations (U.S. Army 1989). A project was initiated in the mid 1990s, but not completed, to utilize the Chemical Agent Munition Disposal System (CAMDS) facilities at DCD to destroy the GA by incineration and Lewisite through a neutralization process (U.S. Army 1995).

The U.S. Army Chemical Materials Agency (CMA) is now evaluating the proposed addition of a small-scale liquid incinerator system to thermally destroy both the GA and Lewisite, as well as the spent decontamination solutions generated during operations. This Environmental Assessment (EA) addresses the proposed action and discusses alternatives that were considered for the elimination of the GA and Lewisite items stored at the DCD.

[1] "Ton containers" are cylindrical, steel storage vessels that were designed to hold and transport industrial chemicals. Each ton container is approximately 30 inches in diameter and 7 feet long.

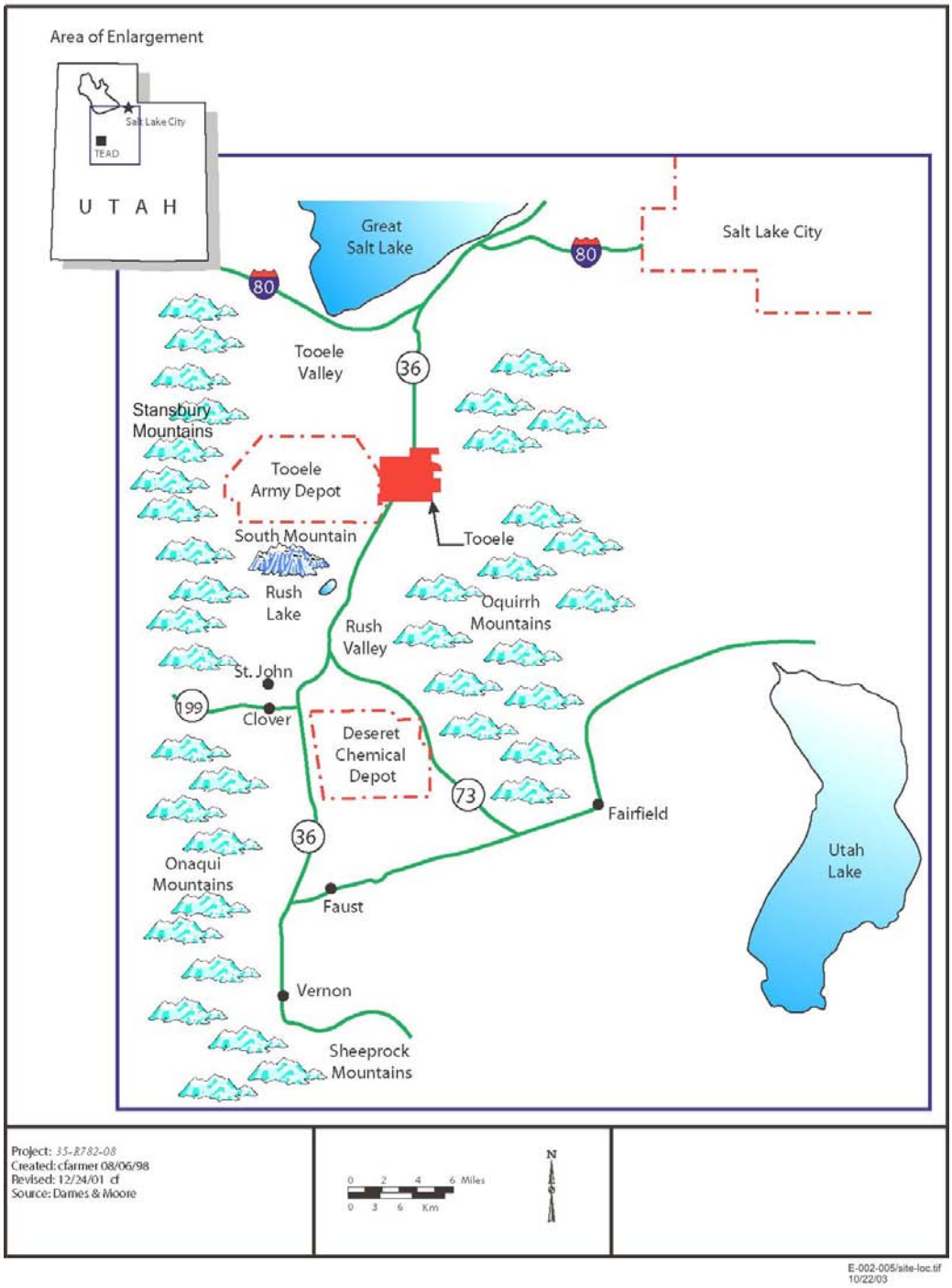

Figure 1. Location of the Deseret Chemical Depot in Utah.

Table 1. Characteristics of the chemical agents to be destroyed under this proposed action

Agent	Common Name	CAS [a] No.	Chemical Name	Chemical Formula	Vapor Pressure at 25°C (mm Hg)	Liquid Density at 25°C (g/cm3)	Freezing Point (°C)	Color	Mode of Action
GA	Tabun	77-81-6	ethyl N, N-dimethyl-phosphoramidocyanidate	$C_5H_{11}N_2O_2P$	0.07	1.07	–50	Colorless to brown	Nervous system poison
L	Lewisite	541-25-3	dichloro 2-chlorovinyl arsine	$C_2H_2AsCl_3$	0.58	1.89	–18	Amber to dark brown to black	Blistering of exposed tissue

[a] CAS = Chemical Abstracts Service

Table 2. Quantities and number of containers to be processed

Agent Fill/Designation	Number of Ton Containers	Estimated Total Quantity (tons)
GA	2	1.41
GA/UCON [a]	2	0.64
Lewisite (L)	10	12.96
Empty Lewisite [b]	10	(*b*)
Total	**24**	**approximately 15.0**

[a] UCON is a thickening agent thought to have been added to some GA ton containers in the 1950s and 1960s; however, subsequent testing has shown that UCON is not present in the Deseret Chemical Depot's inventory.

[b] Only residual traces of Lewisite remain inside these "empty" ton containers.

1.1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of this action is to provide for the safe and timely destruction of DCD's inventory of GA and Lewisite. This action is needed to meet current U.S. obligations and timetables under the Chemical Weapons Convention (CWC) and Congressional directives in Public Law 99-145 for destroying the entire chemical weapons stockpile being stored at DCD. In addition, the completion of the proposed action would eliminate the risk to the public from continued storage of these chemical agents and associated bulk storage containers.

The proposed action would allow for the timely and safe destruction of the DCD GA and Lewisite stockpile in parallel with ongoing TOCDF mustard disposal operations. The operational period for GA destruction is expected to be less than one month, and the operational period for destruction of the Lewisite is expected to be less than four months.

1.2 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This EA has been prepared by the CMA to evaluate the significance of the potential environmental impacts associated with the installation and operation of a hazardous waste treatment unit, consisting of a small-scale liquid incinerator system and auxiliary equipment, for the purpose of thermally treating the DCD stockpile of GA and Lewisite. This EA has

been prepared in compliance with Council on Environmental Quality regulations for implementing the procedural revisions of the National Environmental Policy Act (NEPA) of 1969 (see 40 CFR Parts 1500-1508) and Army Regulation 200-2 on *Environmental Analysis of Army Actions* (see 32 CFR Part 651).

The potential impacts associated with the destruction of the DCD chemical weapons stockpile at the TOCDF have been previously reviewed in an Environmental Impact Statement (U.S. Army 1989) and in three subsequent reviews of that document (PMCD 1996; Gant and Zimmerman 1999; Zimmerman et al. 2008). These four previous documents each concluded that TOCDF operations would not result in significant adverse environmental impacts; however, they did not specifically address potential impacts associated with the addition of an auxiliary hazardous waste treatment unit, as contemplated by the proposed action. The residues from GA and Lewisite treatment via the proposed action are similar to those evaluated in the previous documents. The potential environmental impacts of the proposed small-scale incinerator are evaluated in this EA, including those associated with infrastructure improvements, air quality, human health, ecological resources, and waste management.

To avoid redundancy and to comply with the intent of the Council on Environmental Quality's guidance at 40 CFR 1500.4 on reducing paperwork, this EA relies upon the findings of the Army's previous assessments, where appropriate, rather than presenting new analyses.

2. THE PROPOSED ACTION AND ITS ALTERNATIVES

This section describes the proposed action (installation and operation of a small-scale liquid incinerator to thermally destroy GA and Lewisite), as well as the alternatives considered. Section 2.1 describes the proposed action, Section 2.2 describes the no-action alternative (i.e, continued storage without destruction), and Section 2.3 discusses other alternatives considered.

2.1 THE PROPOSED ACTION: INSTALLATION AND OPERATION OF A SMALL-SCALE LIQUID INCINERATOR TO THERMALLY DESTROY GA AND LEWISITE

The proposed action consists of the installation and operation of an auxiliary, small-scale liquid incinerator system to thermally destroy the DCD stockpile of GA and Lewisite. The incinerator and its associated pollution abatement system (PAS) would be installed within the boundary of DCD's Area 10, the current storage location for the ton containers. The proposed liquid incinerator (LIC) would be approximately one-third the size of one of the existing TOCDF LICs. Originally, the GA and Lewisite were to be destroyed as part of the TOCDF operations. The environmental effects of operation of the existing TOCDF incinerators have already been studied and were found to result in no significant environmental impacts (U.S. Army 1989).

2.1.1 The Proposed Process and Its Associated Equipment

Proposed Process. The proposed process would consist of transporting the four GA and twenty Lewisite ton containers (see Table 2) from their current storage location in Area 10 to the proposed facility, which would also be located in Area 10. Transport of the ton containers would follow existing procedures and utilize existing equipment. The transportation risk associated with the GA and Lewisite ton containers would be even less than that incurred during normal TOCDF operations, due to the close proximity between the storage igloos and the proposed destruction unit.

Following receipt of the ton containers from storage, they would be placed one at a time inside a glovebox. Operators would then record the weight of each ton container and would collect a sample of the agent for analysis to confirm the agent composition.

Each ton container would be drained so that the agent could be fed to the small-scale incinerator for destruction. After each ton container has been drained, it would be rinsed to remove any residual material. The rinsate would either be fed to the small-scale incinerator or disposed of in compliance with hazardous waste regulatory requirements.

Each drained-and-rinsed ton container would be monitored to verify that it would be safe to remove the ton container from the glovebox. The drained-and-rinsed ton containers would be disposed of off-site as hazardous waste, in compliance with all regulatory requirements, either directly after removal from the glovebox, or after further on-site treatment.

Proposed Equipment. The proposed LIC would consist of a refractory-lined, two-chamber furnace. The primary chamber would destroy the GA and Lewisite through high-temperature incineration. The secondary chamber would provide additional incineration residence time to ensure complete agent destruction of the primary chamber exhaust gases. The proposed small-scale LIC would be approximately one-third the size/throughput of one of the existing two TOCDF LICs, which have repeatedly demonstrated the safe and efficient destruction of chemical agent. The ton container rinsate and spent decontamination solution would also be incinerated in the proposed small-scale LIC or shipped off site for hazardous waste disposal. Spent decontamination solution would be produced from routine operation and maintenance activities within the proposed facility.

The exhaust gases from the LIC would be scrubbed in a PAS to remove acid gases, particulates, arsenic, mercury, and other metal contaminants. Emissions would be monitored prior to being released to the atmosphere through a new exhaust stack. Characterization efforts completed in 2008 indicate that the GA contains very low or non-detectable levels of arsenic and mercury (less than 40 mg/kg and 4 mg/kg, respectively) (SAIC 2008). Characterization results for the Lewisite stored at DCD indicate that arsenic, which is a major constituent of Lewisite, is present at levels between 354,000 and 374,000 mg/kg. The Lewisite also contains trace amounts of mercury, as an impurity, at levels between 56 and 536 mg/kg.

The PAS would consist of a quench tower, packed bed scrubber train, high energy venturi scrubber, exhaust gas re-heater, carbon injection, particulate removal device, and carbon filter assembly. The carbon filter assembly would consist of a High Efficiency Particulate Air (HEPA) inlet filter, carbon filters, and a HEPA outlet filter. The PAS design would ensure compliance with the Resource Conservation and Recovery Act (RCRA) and the Clean Air Act, including regulatory standards for potential emissions of arsenic, mercury, and other regulated pollutants.

The proposed facility, including the glovebox, the ton container drain-and-rinse equipment, the small-scale LIC, and the PAS would be housed in a building enclosure which

would be maintained under negative pressure and ventilated through a carbon filter system (includes carbon filters, pre-filters and HEPA filters), in the same way as the existing TOCDF facility. A control room would be located adjacent to the proposed facility to allow operators to monitor and control the process. Laboratory facilities and other mechanical and electrical ancillary equipment would also be included to support the proposed facility. Additional process equipment may be installed to remove metals from the brines to facilitate disposal of the resulting wastewater.

2.1.2 Proposed Site, Layout, and Installation

The equipment that is part of this proposed action would be installed on previously-disturbed land in Area 10, comprising an area of land that would be less than one acre. Design, construction and completion of operations would be completed before the CWC treaty deadline in April 2012. The duration of the construction activities would be expected to be less than one year.

2.1.3 Waste Management

The principal types of solid and liquid wastes that would be generated under the proposed action would include: (1) expended carbon filters and HEPA filters used in the PAS, (2) expended carbon filters, HEPA filters, and prefilters used for the building enclosure ventilation, (3) spent scrubber liquid brines resulting from blow-down of the PAS, (4) residue from the PAS particulate removal device, (5) ton container rinsate and spent decontamination solution, (6) personnel protective equipment (PPE) including gloves, suits, aprons, booties, etc., (7) decontaminated ton containers, and (8) construction wastes from the installation of the proposed equipment. Each of these waste streams would be characterized and managed in accordance with its hazardous characteristics and in accordance with regulatory requirements. This practice is similar to what has been conducted for waste streams during existing TOCDF operations.

Mercury and arsenic emissions resulting from the incineration of GA and Lewisite would be captured and controlled by the PAS. The maximum anticipated emissions of arsenic and mercury over the operational lifetime of the small-scale LIC would be 0.07 pound and 0.03 pound, respectively, based on the regulatory emission limits (see Section 3.3.3).

Other wastes that may contain mercury and/or arsenic would include the expended PAS carbon filters, HEPA filters, spent scrubber liquid brines, and residue from the particulate removal device. At the end of GA and Lewisite operations, approximately

9,000 pounds of carbon filters and 800 pounds of HEPA filters from the PAS filter system would require disposal. The scrubber brine liquid blow-down from the PAS would contain salts, residual caustic, suspended particulate solids, and arsenic oxides. The brine may be treated on site, but as a bounding estimate, approximately 355,000 gallons of scrubber brine blow-down would be generated over the operational lifetime of the proposed action and would be characterized and shipped to an off-site hazardous waste disposal facility.

Approximately 3,600 pounds of residue from the PAS particulate removal device would be generated over the operational lifetime of the proposed action. This waste material would be characterized and shipped to an off-site hazardous waste disposal facility.

At the end of GA and Lewisite operations, solid wastes from the building enclosure ventilation carbon filters would consist of approximately 4,500 pounds of carbon filters, 100 pounds of prefilters, and 200 pounds of HEPA filters that would require off-site disposal.

Ton container rinsate and spent decontamination solution would be fed to the small-scale LIC for incineration during operations. As an alternative, either of these liquid wastes may be characterized and disposed of off-site at a permitted disposal facility. As a bounding estimate to assess the environmental impacts of the proposed action, it can be assumed that approximately 3,000 gallons would undergo off-site disposal over the lifetime of the proposed action.

PPE would be utilized by operators who operate or maintain any of the proposed equipment in areas of the proposed facility where agent contamination may be present. Prior to doffing the PPE, operators routinely would use decontamination solution to remove potential residual agent contamination. Up to approximately 10,000 pounds of PPE would be generated over the lifetime of the proposed action. The PPE would be monitored for the presence of any residual agent and shipped off-site for disposal, either directly or after further on-site treatment.

After the ton containers of GA and Lewisite have been drained and rinsed, they would be monitored for residual agent. The ton containers would be shipped off-site directly, or after on-site treatment, to a hazardous waste disposal facility. A total of 24 decontaminated ton containers would be shipped to off-site disposal during the GA and Lewisite campaigns.

Construction wastes would be generated during the installation of the proposed equipment. Up to 200,000 pounds of wastes could be associated with the equipment installation. These construction wastes would be initially placed into “roll-off” containers and then transferred to an off-site waste management vendor.

2.1.4 Resource Requirements

The proposed action would increase the use of electricity, natural gas, and water over its operational lifetime, which would be expected to be less than one year. Electrical supply for the proposed incinerator and supporting equipment would be provided by expanding the existing electric power infrastructure within DCD. As a bounding estimate in order to assess the worst-case environmental impacts, it can be assumed that an additional electrical switchyard would be installed near the proposed facility, with a capacity of approximately 2.5 MW. This would be comparable in size to the existing TOCDF facility electrical switchyard which provides approximately 3.3 MW for existing TOCDF operations. The estimated land area needed for the proposed electrical switchyard would be less than one acre. The electrical infrastructure at DCD has the capacity to supply the electrical needs of the proposed action, especially considering the recent closure of other electrical power users at DCD.

Natural gas usage is estimated at 2,500 decatherm/month (this estimate is based on one-third the size of the existing TOCDF LIC and the actual, average natural gas use of the TOCDF's two LICs for January through April 2008). This represents a relatively small increase (approximately 7%) in natural gas usage when compared to total TOCDF usage of 35,000 decatherm/month (January through April 2008) for all four of the TOCDF's existing incinerators and furnaces. The incinerator would be fired with natural gas from an existing natural gas pipeline in Area 10, which has a capacity of 6,500 ft^3/hr or approximately 2 times greater than needed.

Water for the PAS would be supplied by the existing water infrastructure at DCD, which uses pumped groundwater as the source. Worst-case water usage assumes 7.4 gallons per minute, based on experience with the existing TOCDF LICs. This would represent an increase of up to 11,000 gallons per day or approximately 4 million gallons per year in the existing water use of about 80 million gallons per year at the DCD (Zimmerman et al. 2008), which would be an increase in water usage of about 5% at the DCD.

Sewer use would remain approximately the same as during the recently completed mustard ton container sampling program in Area 10. Process wastes generated by the proposed action would be segregated and not introduced into the sewer system.

It is not expected that the construction or operation of the proposed small-scale LIC system and auxiliary equipment would create long-term employment opportunities in the area. Approximately 30 trained and qualified operators would operate and maintain the proposed facility. Construction would be performed by up to 25 contractors who would temporarily be on-site during installation of the proposed equipment.

2.1.5 Approvals, Permits, and Conditions

The TOCDF currently operates under the conditions established by a RCRA permit issued by the State of Utah, Division of Solid and Hazardous Waste (UDSHW). A Class 3 modification to the existing TOCDF permit would be required to support installation and operation of the equipment in Area 10 associated with the proposed action. The Army would not be allowed to proceed with the proposed action without receiving approval in the form of a revised RCRA permit from the UDSHW. The RCRA permitting process would also include the development and implementation of a small-scale LIC performance test. A surrogate test would also be conducted to satisfy both RCRA and Clean Air Act requirements for performance testing for a new incinerator.

In the State of Utah, prior to commencement of the construction of a facility that would potentially emit regulated pollutants, the facility owner must receive an Approval Order in accordance with the air quality regulations. The application for this permit is a Notice of Intent, which would be submitted to the Utah Division of Air Quality. The DCD has an existing, depot-wide Clean Air Act Title V operating permit (UDEQ 2008). A modification to the DCD Title V operating permit would be necessary prior to commencement of operation of the proposed small-scale LIC system.

The U.S. Environmental Protection Agency (EPA) has promulgated the National Emission Standards for Hazardous Air Pollutants (see 40 CFR 63.1219). This rule stipulates emission standards based on the performance of Maximum Achievable Control Technology (MACT). This rule and the emission standards contained therein are commonly referred to as the MACT rule and MACT standards, respectively. Under the MACT rule, mercury emissions from new incinerators are currently limited to 8.1 µg/dscm corrected to 7% oxygen [see 40 CFR 63.1219(b)(2)] which would be applicable to mercury emissions from the proposed small-scale LIC. Also under the MACT rule, arsenic (plus beryllium and chromium) emissions from new incinerators are currently limited to 23 µg/dscm corrected to 7% oxygen [see 40 CFR 63.1219(b)(4)] which would be applicable to arsenic emissions from the proposed small-scale LIC. As part of the MACT requirements, a Comprehensive Performance Test would be necessary. The current approach also includes a surrogate trial burn to satisfy both MACT and RCRA requirements, prior to processing the GA and Lewisite agents in the proposed equipment.

2.2 THE NO-ACTION ALTERNATIVE: CONTINUED STORAGE WITHOUT DESTRUCTION

Under the no-action alternative, the small-scale liquid incinerator would not be installed or operated at the DCD. The GA and Lewisite presently stored at DCD would remain in storage indefinitely.

The no-action alternative is addressed in this EA as required by Army regulations, even though its implementation is precluded by the CWC and by Public Law 99-145. It should be noted that for the purpose of the analyses presented in this EA the no-action alternative is limited to activities related solely to the continued storage of the agent GA and Lewisite inventory at DCD. As such, the no-action alternative is open ended in that the eventual fate of the DCD inventory is not included in this definition of no action. The analyses of continued storage do not include the continued aging of the ton containers, nor do the analyses include the risks or potential impacts of whatever disposal process(es) may eventually be implemented to dispose of the DCD inventory of agent GA and Lewisite.

It is assumed, for the purpose of comparing the impacts of the no-action alternative with those of the proposed action, that existing Army storage procedures would be followed during the period of continued storage, including surveillance and inspection activities. The stockpile is currently stored in compliance with Army regulations (i.e., the chemical agents must be stored in a manner that protects human health and the environment). These requirements would continue to be met under the no-action alternative.

As long as the GA and Lewisite ton containers remain in storage, they would continue to be monitored for leaks and other signs of deterioration. If leaks were detected, the leaking ton container would be repackaged to contain the leak. These continued surveillance, monitoring, and maintenance activities would consume financial and manpower resources for as long as the agent-filled ton containers remained in storage at DCD. The continued presence of the GA and Lewisite in storage at DCD would continue to pose a threat to the public and the environment.

2.3 ALTERNATIVES TO THE PROPOSED ACTION

This section describes potential alternatives to the proposed installation and operation of a small-scale LIC and auxiliary equipment for the treatment and disposal of the DCD stockpile of agents GA and Lewisite. The advantages and disadvantages of the potential alternatives are discussed to provide information on why these alternatives are not being further considered in favor of the proposed action.

2.3.1 Use of the Existing TOCDF Incinerators

The existing incinerators at TOCDF have repeatedly demonstrated they can safely and efficiently destroy chemical agents. Based on the demonstrated metals removal efficiency of the pollution abatement systems, it is expected that GA and Lewisite ton containers could be processed at TOCDF. However, several factors complicate the use of the TOCDF for GA and Lewisite destruction. First, the GA and Lewisite agent campaigns would have to be sequenced to follow completion of the current mustard campaign. Between each campaign there would be an agent changeover period where comprehensive decontamination would be conducted, and the plant would then be prepared for the initiation of the new agent campaign. Adding the two campaigns to the current TOCDF schedule would put in jeopardy the ability of the TOCDF to meet the CWC treaty deadline for 100% destruction of all chemical agents. Second, the use of the TOCDF would require operating and maintaining a significantly larger infrastructure for the period of time required for the two additional agent campaigns. As such, use of the TOCDF facility for GA and Lewisite destruction would be a second choice to the addition of a new, smaller facility.

2.3.2 Neutralization

Neutralization was used to destroy mustard and VX agent at U.S. Army sites in Aberdeen, Maryland, and Newport, Indiana, respectively. In both cases, the neutralization processes resulted in a volume of liquid effluent that had to undergo further treatment (wastewater treatment and incineration, respectively) in order to complete the destruction process. Neutralization is also planned for agent destruction at the Blue Grass, Kentucky, and Pueblo, Colorado, U.S. Army sites.

As described in the 1995 EA (U.S. Army 1995), neutralization was once considered as a viable alternative for destruction of the DCD Lewisite stockpile at the CAMDS facility. However, the neutralization equipment and CAMDS facility are unavailable and the CAMDS facility is currently undergoing permanent closure. A new neutralization facility would need to be designed, constructed, and systemized in order to implement Lewisite neutralization. Incineration of GA has been the preferred alternative in each of the previous environmental studies (U.S. Army 1989 and U.S. Army 1995).

Compliance with the U.S. obligations under the CWC Treaty for the timely and complete destruction of the chemical agent stockpile was an important consideration in the selection of the current proposed action to incinerate both GA and Lewisite. Neutralization is not being pursued further as a disposal option for the DCD GA and Lewisite stockpile. The additional burden to implement a neutralization process solely for Lewisite destruction

would work against the effort to meet the CWC Treaty milestone. A method to dispose of GA would still be required. Since incineration of other chemical agents has been successfully demonstrated by TOCDF for over 12 years, exporting the significant knowledge base of the existing TOCDF workforce to the proposed incineration of GA and Lewisite offers the best opportunity for CMA to meet the objectives of the CWC treaty. The proposed action to install an additional incineration process to supplement the current TOCDF chemical agent destruction capacity would allow destruction of both GA and Lewisite in parallel with the ongoing mustard agent destruction campaign.

3. THE AFFECTED ENVIRONMENT AND POTENTIAL ENVIRONMENTAL CONSEQUENCES

This EA addresses the proposed installation and operation of a small-scale incinerator at the DCD to thermally destroy that depot's inventory of agents GA and Lewisite. The destruction of chemical warfare agents at the DCD, including the operation of and emissions from the nearby existing TOCDF incineration facility, has been examined in four previous environmental reviews (see Section 1.2). In comparison to the impacts previously assessed, the proposed action would create negligible or no new environmental impacts upon the following categories of environmental resources. These categories of environmental resources are not discussed further in this EA for the reasons given below.

- **Land use.** The proposed equipment would be installed within the footprint of the existing Area 10 at the DCD and would therefore not affect current uses of land.
- **Air quality impacts from construction activities.** There would be minimal disturbance of soils and negligible generation of dust from construction and/or equipment-installation activities. The emissions from construction vehicles would be incidental, short-term, and small.
- **Surface water resources.** The nearest surface waters (i.e., the ephemeral Ophir Creek) are located more than two miles from the location of the proposed action. No surface water would be consumed, diverted or affected by the proposed action.
- **Groundwater resources.** Water usage at the DCD is currently supplied by groundwater resources, and groundwater use at the DCD was examined in detail in Zimmerman et al. (2008). As discussed in Section 2.1.4, the use of water at the DCD would increase by only about 5% under the proposed action. The small increase in water usage under this proposed action would not be expected to result in any significant or adverse impacts.
- **Wetlands.** The nearest wetlands (i.e., Clover Pond) are located more than two miles from the location of the proposed action and would not be disturbed or affected by the proposed activities.
- **Threatened and endangered species.** No threatened or endangered species are known to occur within the DCD installation boundaries. Impacts from the TOCDF's emissions upon wildlife have been explicitly evaluated in a Screening-Level Ecological Risk Assessment (SLERA; see Tetra Tech 2005) and were found not to be of concern; hence, potential impacts to threatened and endangered species are not discussed further in this EA.

- **Socioeconomic resources.** There would be no significant influx of new workers, nor would the proposed action have any effects upon existing infrastructures such as roads and traffic, upon the availability or supply of utilities, or upon other socioeconomic resources in the vicinity of the DCD.
- **Cultural (i.e., archaeological and historic) resources.** Because all of the proposed activities would occur within the footprint of the previously disturbed Area 10, no potential exists for the proposed action to disturb or affect cultural resources.
- **Environmental justice populations.** The nearest private residence is located more than two miles from the DCD (U.S. Army 1989). The proposed action would not create any significant impacts to populations near the depot (see Section 4). In the absence of such impacts, there would be no disproportionately high and adverse impacts to low-income or minority populations.
- **Safety and risks.** The hazards of installing the proposed equipment would be similar to those of any small-scale industrial construction project and would not be significant or unique. The hazards of the agent GA and Lewisite have been well documented in previous NEPA reviews (see, for example, U.S. Army 1989), and the Army has developed and implemented engineering controls (such as filtered ventilation systems and protective clothing), procedures, and administrative controls to deal appropriately with these hazards.

The analysis conducted for this EA has determined that a more detailed examination of the potential environmental impacts is necessary in four additional categories: **infrastructure improvements** (see Section 3.1) related to the utilities needed at the site of the proposed action, **air quality impacts** (see Section 3.2), impacts to **human health and to ecological resources** due to potential arsenic and mercury emissions (see Section 3.3), and **waste management** (see Section 3.4).

3.1 INFRASTRUCTURE IMPROVEMENTS

The proposed action includes the provision of electricity, water, natural gas, and sewer connections to the proposed facility; however, utility connections already exist in Area 10 for natural gas and sewer. New water and electrical connections would be made with the existing infrastructure for these same utilities which support the TOCDF. Routes would be constructed in alignment with existing routes for existing utilities at the DCD. The land around Area 10 is previously disturbed; therefore, any trenching operations for the water

pipeline or any overhead powerline construction would not be expected to create any significant impacts.

As described in Sections 2.1.1 and 2.1.2, the proposed facility (including the building enclosure, as well as the control room, laboratory facilities, and other mechanical and electrical equipment) would be installed in a previously disturbed area within Area 10 at the DCD. Less than one acre would be disturbed for the proposed facility. In the event that a new electrical switchyard is required, less than one acre would be disturbed by the footprint of this new switchyard. The impacts of constructing the proposed incineration facility, including the possible new electrical switchyard, would be similar to any small-scale industrial construction activity and would be expected to be minimal.

None of the aforementioned utilities or commodities are in short supply at the DCD, and none would be significantly impacted by the proposed action, as follows. The quantities of natural gas and water to be consumed during the proposed action are given in Section 2.1.4. The proposed consumption of natural gas would represent about a 7% increase over the amount of natural gas consumed at the TOCDF. The need for additional utilities would be temporary due to the short operational lifetime of the proposed action.

3.2 AIR QUALITY

The emissions from the TOCDF's incinerators and furnaces have been evaluated in detail in three previous environmental reviews (U.S. Army 1989, Gant and Zimmerman 1999, Zimmerman et al. 2008). This section uses the previous findings for the TOCDF to compare the potential air quality impacts from the emissions of the proposed small-scale LIC.

3.2.1 Ambient Air Monitoring Data

The EPA considers air quality in Tooele County to be in attainment with the National Ambient Air Quality Standards (NAAQS) for the "criteria pollutants" nitrogen dioxide (NO_2), carbon monoxide (CO), ozone, elemental lead, particulate matter less than or equal to 10 µm in aerodynamic diameter (PM_{10}), and particulate matter less than or equal to 2.5 µm in aerodynamic diameter ($PM_{2.5}$); however, part of Tooele County is designated as being in nonattainment for sulfur dioxide (SO_2) (see 40 CFR 81.345). In 1978, EPA designated the entire county as a nonattainment area for SO_2, based on ambient data collected at nearby air monitoring locations. In 1981, EPA removed the nonattainment status

for all of Tooele County except that portion in the Oquirrh Mountains north of Middle Canyon and above an elevation of 5,600 feet above mean sea level.

An examination of the most recent ambient air quality monitoring data available on EPA's AirData website (see http://www.epa.gov/air/data/reports.html) indicates that only a limited amount of monitoring data exists for criteria pollutants in Tooele County. No data have been recorded in Tooele County for SO_2, NO_2, PM_{10}, CO, or elemental lead during the most recent five-year period (i.e., from 2003 through 2007). The data recorded in the cities of Tooele[2] and Grantsville[3] for ozone and $PM_{2.5}$ are discussed in the following paragraphs.

Ozone. From a regulatory perspective, NAAQS compliance for ozone is determined from the ambient 8-hour ozone concentrations. The standard is met when the three-year average of the annual fourth-highest daily maximum 8-hour ozone concentration is less than or equal to 0.08 ppm.

Monitoring data for ozone were collected in the city of Tooele for 2005, 2006, and 2007, but no data are available for 2003 or 2004. Tooele County is an ozone attainment area, but since 1997, the adjacent Salt Lake County has been an ozone maintenance area (i.e., an area that previously was a nonattainment area, which is striving to maintain attainment and comply with the state implementation plan). In 2005, the fourth-highest daily maximum 8-hour ozone concentration at Tooele was 0.080 ppm, which is equal to the NAAQS value of 0.08 ppm. This monitoring value was 0.079 ppm in 2006 and 0.076 ppm in 2007. The trend is for decreasing ambient ozone concentrations in Tooele over the past three years. Thus, the measured ambient concentrations of ozone in Tooele are in compliance with the NAAQS.

While ozone is not emitted directly from combustion sources, it is formed from combustion products during subsequent photochemical reactions involving emitted volatile organic compounds (VOCs) and oxides of nitrogen (NO_x). Because the photochemical reactions can take hours to complete, ozone can form far from the sources of its precursors (the VOCs and NO_x that initiate its formation). Therefore, the contribution of an individual source to ozone concentrations at any particular location cannot be readily quantified.

$PM_{2.5}$. Standards for $PM_{2.5}$ were added to the NAAQS in 1997 (62 FR 38652-762; July 18, 1997) but were revised in 2006 (71 FR 61144-61233; October 17, 2006). The <u>24-hour standard</u> for $PM_{2.5}$ is attained when the 98th percentile value of the monitoring data, averaged over three years, is less than or equal to 35 $\mu g/m^3$. The <u>annual standard</u> for $PM_{2.5}$ is

[2] The air monitoring station in the city of Tooele is located about 16 miles almost due north of the TOCDF. The two predominant wind directions in the vicinity of the TOCDF are from the north-northwest and from the south-southeast.

[3] The air monitoring station in Grantsville is located about 21 miles north-northwest of the TOCDF.

met when the annual concentration of monitoring data is less than or equal to 15 µg/m^3, when averaged over three years.

Monitoring data for $PM_{2.5}$ have been collected in Tooele County at both Tooele and Grantsville. During the most recent five-year period (i.e., from 2003 through 2007), the highest recorded 98th percentile 24-hour value was 45.5 µg/m^3 (during 2005 at Tooele). The most recent three-year average of $PM_{2.5}$ monitoring data is 30.5 µg/m^3, which is below the 35 µg/m^3 NAAQS value. During the period from 2003 through 2007, the maximum annual recorded $PM_{2.5}$ concentration was 9.0 µg/m^3 (during 2005 at Tooele), which is 60% of the NAAQS value of 15 µg/m^3. Thus, the measured ambient concentrations of $PM_{2.5}$ in Tooele County are in compliance with the NAAQS.

3.2.2 Modeled Emissions

To address potential impacts to air quality, three previous reviews (U.S. Army 1989, Gant and Zimmerman 1999, Zimmerman et al. 2008) of the emissions from the TOCDF have estimated the projected emission rates and maximum ground-level concentrations of four criteria pollutants: SO_2, NO_2, CO, and PM_{10}. These previous reviews also included an examination of the TOCDF's emissions in light of actual data obtained from trial burns.

The previous emissions modeling demonstrated that even if the criteria pollutant concentrations from the TOCDF were multiplied by a factor of ten, no exceedances of the NAAQS would be expected to occur. That is, the ambient concentrations of each of the modeled criteria pollutants were found to be less than 10% of their respective NAAQS value. These findings for criteria pollutants were also determined to be valid under EPA's latest standards for ozone and $PM_{2.5}$, with a "worst case" calculation for $PM_{2.5}$ indicating that the ambient concentration would be less than 15% of the NAAQS limit (see Zimmerman et al. 2008). Therefore, each of the previous reviews for the TOCDF (U.S. Army 1989, Gant and Zimmerman 1999, Zimmerman et al. 2008) concluded that the TOCDF's emissions would not be expected to produce significant air quality impacts.

Because the proposed small-scale LIC would be about one-third the size of one of the TOCDF's two LICs, and because the TOCDF's modeled emissions are estimated to result in ambient concentrations of criteria pollutants that are less than 10 to 15% of the respective NAAQS limits, the modeled emissions from the small-scale LIC would not be expected to indicate any significant impacts to air quality near the DCD.

3.2.3 Cumulative Air Quality Impacts

One measure of the potential for the proposed small-incinerator to adversely affect air quality is a comparison between the total quantity of each criteria pollutant emitted and the combined quantities of that same pollutant emitted by other sources in the region. The following paragraphs present such a comparison.

During its review of proposed modifications and revisions to the TOCDF's air quality permit, the State of Utah prepared calculations to determine the total quantities of criteria pollutants that would be emitted by the TOCDF if it were to operate at the emission rates allowed by the DCD-wide air permit (UDEQ 2008). These "potential-to-emit" values are presented in Table 3. In its calculations, the State of Utah assumed that the TOCDF's two LICs and its deactivation furnace system (DFS) would be operated for 6,000 hours annually, and its metal parts furnace (MPF) for 8,424 hours annually. Other sources of emission (i.e., from CAMDS and from other operations at the DCD) were also included in the calculation in order to obtain values applicable to the DCD as a whole (UDEQ 2007).

Table 3. Quantities of criteria pollutants emitted in the vicinity of the proposed action

	Total quantity emitted (tons/year)		
Criteria pollutant	DCD-wide "Potential-to-emit" from Title V air permit [a]	From the DCD's Annual Emissions Inventory [b]	From Utah's Annual Emissions Inventory for Tooele County [c]
PM_{10}	28.32	1.4	5,184
$PM_{2.5}$	N/A	1.3	1,935
SO_2	91.06	2.8	267
CO	68.77	6.0	43,568
VOCs	10.12	3.6	44,550
NO_x	222.26	30.0	5,492

N/A indicates no data are available in the specified source document.

[a] Obtained from calculations presented in State of Utah, *Approval Order Number DAQE-AN113390044-07*, Department of Environmental Quality, Division of Air Quality, Salt Lake City, Utah, March 19, 2007.

[b] Obtained from data in EG&G Defense Materials, Inc., *Deseret Chemical Depot (DCD) and Tooele Chemical Agent Disposal Facility (TOCDF), Emissions Inventory Report 2006*, Stockton, Utah, March 2007.

[c] Data are from 2002 and were obtained from State of Utah, *Division of Air Quality Annual Report 2007*, Department of Environmental Quality, Salt Lake City, Utah, February 2008; data also available on-line at http://www.airquality.utah.gov/Public-Interest/annual-report/2007_AnnualReportFinal.pdf

The data for the DCD-wide actual emissions (which include the emissions from the TOCDF) are shown in the center column of Table 3 (EG&G 2007). These data represent the best available measurements of the DCD's emissions during 2006. Table 3 also presents the State of Utah's data from its triennial inventory of various air pollutants released by all emission sources in the state (UDEQ 2006). The rightmost column in Table 3 shows the State's inventory data for only Tooele County.

Inspection of the data presented in Table 3 reveals two findings. First, the measured quantities of criteria pollutants emitted from the DCD are very small in comparison to their respective "potential-to-emit" values. Secondly, both the "potential-to-emit" values and the measured values are insignificant in comparison with the values from the emissions inventory for Tooele County. That is, the emissions from the DCD represent a negligible contribution to the overall quantities of criteria pollutants emitted annually in Tooele County.

While the proposed small-scale LIC would create a temporary, short-term increase in the quantity of criteria pollutants emitted in Tooele County, the unit would only be about one-third the size of one of the TOCDF's two LICs; hence, the increased quantities of criteria pollutants would not be significant in comparison to either the emissions from the TOCDF's four incinerators, or DCD-wide emissions, or the overall emissions in Tooele County.

3.2.4 Conclusions about Air Quality

Based upon three lines of evidence, the operation of the proposed small-scale LIC would not be expected to result in any significant impacts to air quality:

- Because all of the EPA criteria pollutants are in attainment with the NAAQS in Tooele County in the areas surrounding the DCD, it can be concluded that the existing DCD and TOCDF operations have not contributed to any exceedances of the NAAQS. In comparison to the DCD-wide emissions, the incrementally small amounts of criteria pollutants to be emitted from the proposed small-scale LIC would not be expected to alter the air quality attainment status of Tooele County.
- The emissions from the TOCDF have previously been modeled, and ambient concentrations of criteria pollutants have been predicted to be less than 10% of the NAAQS limits. Because the proposed small-scale LIC would be about one-third the size of one of the TOCDF's two LICs, the emissions from the proposed incinerator would not be expected to increase the ambient concentrations of criteria pollutants above the NAAQS limits.
- The "potential-to-emit" for the proposed incinerator, in conjunction with existing DCD-wide emissions, would be negligible compared to the quantities of criteria pollutants presently emitted in all of Tooele County. Therefore, the emissions from

the proposed small-scale LIC, in conjunction with other emission sources in Tooele County, would not contribute significantly to the quantities of existing county-wide emissions of criteria pollutants.

3.3 HUMAN HEALTH AND ECOLOGICAL RESOURCES

The chemical warfare agents GA and Lewisite are hazardous to human health; however, these hazards are well understood and have been previously documented (see, for example, U.S. Army 1989). The operation of the proposed small-scale LIC would destroy these hazardous chemicals. This section discusses the potential impacts to human health and ecological resources from the emissions of the proposed LIC. These emissions would be similar to those that have previously been evaluated for the TOCDF. This section provides a summary of previous human health and ecological risk assessments for emissions from the TOCDF. It then uses that information to draw conclusions about the emissions from the proposed small-scale LIC.

3.3.1 The Human Health Risk Assessment for the TOCDF

A human health risk assessment (HHRA), which included a multi-chemical, multi-pathway exposure analysis, was completed for the TOCDF in 2003 (UDEQ 2003). The objectives of the 2003 HHRA were to calculate the cumulative risks (cancer effects) and hazards (non-cancer effects) for each exposure scenario specific to each source of emissions at the DCD—including both the TOCDF and the nearby CAMDS—and specific to each chemical warfare agent destruction campaign.

The 2003 HHRA evaluated six emission sources at the TOCDF and four sources at CAMDS. For the TOCDF's sources, actual trial burn emission rate data (e.g., GB trial burn data) were used when available; otherwise, values were extrapolated from data available from the Army's Johnston Atoll Chemical Agent Disposal System (JACADS) and CAMDS.

A total of 393 Chemicals of Potential Concern (COPCs) were identified for evaluation in the HHRA. The 2003 HHRA used a multi-pathway (e.g., inhalation, food consumption, water consumption) assessment to evaluate the COPCs with exposure scenarios for (1) a subsistence rancher adult and child, (2) a resident adult and child, (3) an on-site worker, (4) a water skier adult and child for the SunTen lake, (5) a recreationist adult and child at Rush Lake, and (6) a fisher adult and child for Rainbow Reservoir. The HHRA estimated potential daily intake rates for each COPC to evaluate the following exposure pathways: (1) acute and chronic inhalation; (2) incidental ingestion of soil; (3) consumption

of drinking water from surface water sources; (4) incidental ingestion of surface water during recreational use (such as water skiing); (5) consumption of homegrown produce, beef, mutton, pork, poultry and eggs; (6) consumption of cow's milk and goat's milk; (7) consumption of fish from Rush Lake and Rainbow Reservoir; and (8) ingestion of dioxins and PCBs in breast milk by an infant.

Potential adverse health effects were evaluated separately and cumulatively for each source and for each COPC to provide a basis for evaluating the protectiveness of the operating conditions in the RCRA hazardous waste permits. The health risks were first evaluated with very conservative assumptions to enable the analysts to eliminate many ultra-low risk scenario/chemical combinations. The scenarios remaining were then examined more closely to reduce the uncertainty in the estimates.

The findings of the 2003 HHRA stated that, with the exception of five chemicals (as identified below), the potential exposures to emissions from the TOCDF and CAMDS are considered safe and need no additional investigation or evaluation. The five chemicals of concern included (1) ethyl methanesulfonate, (2) di-n-octylphthalate (DNOP), (3 & 4) two polyaromatic hydrocarbons, namely dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene, and (5) mercury. Of these five chemicals, only DNOP and mercury have been detected in stack emissions at the TOCDF, CAMDS, or JACADS. The DNOP was detected in a single test at CAMDS. The majority of risk from DNOP in the HHRA was attributable to the consumption of contaminated homegrown foods; however, the Centers for Disease Control and Prevention reports that DNOP is not expected to be a concern in terrestrial food pathways because it is metabolized (ATSDR 1997). Arsenic was not found to be a significant contributor to risk in the 2003 HHRA.

Based on the lack of detection of the other problematic COPCs in stack emissions, and on the overestimation of exposure inherent in the EPA's risk assessment methodologies, only mercury was identified as warranting additional evaluation in the HHRA. The majority of risk from mercury in the 2003 HHRA is attributable to the consumption of fish contaminated with methyl mercury. Upon further evaluation, the HHRA concluded that mercury emissions from the TOCDF are considered safe because (1) the risk assessment methodology overestimates the risks from mercury emissions, (2) hypothetically exposed individuals were assumed to eat fish taken from Rush Lake and Rainbow Reservoir for 30 years; however, Rush Lake does not support a fishery and Rainbow Reservoir is not always open, and (3) mercury levels in soil and fish have been periodically monitored during the environmental update studies over the course of the TOCDF operations, and will continue to be monitored to confirm that mercury is not being released from stack emissions at unsafe levels.

3.3.2 The Screening-Level Ecological Risk Assessment for the TOCDF

In 2005, a SLERA was completed as a follow-on to the HHRA (Tetra Tech 2005) . The objective of the 2005 SLERA was to determine, for each emissions source at TOCDF and CAMDS, cumulative hazards across agent campaigns for COPCs based on ecological screening quotients (ESQ) for ecological receptors (communities and guilds) in the assessment region. The same six emission sources for the TOCDF and CAMDS as were used in the HHRA were used in the SLERA. The list of COPCs for the SLERA was based on the set of COPCs used in the HHRA.

Three types of ecosystems were included in the 2005 SLERA: (1) the dominant sage grass and salt shrub habitat (i.e., shrub-scrub habitat) found on the valley floor near the DCD, (2) the sage brush and grassy mountainous benchland (i.e., montane) areas east and west of the DCD at elevations over 5,400 feet above mean sea level, and (3) four freshwater areas: Rush Lake, Clover Pond, Atherly Reservoir, and Rainbow Reservoir.

The 2005 SLERA evaluated receptor interactions (e.g., predator–prey) to build food webs that are used to estimate indirect exposure to a COPC by a receptor. Plants and animals were categorized according to their habitats and feeding niches, following the example food webs presented in EPA (1999). Each food web contained four trophic levels, each with its own appropriate feeding guilds and assessment endpoint/receptors (for example, ranging from algae to fish to birds to mammals).

In the 2005 SLERA, risk is characterized by calculating numerical ESQs and then describing the main exposure pathways for any receptors with an ESQ value above the target value (i.e., above a numerical ESQ value of 1.0). ESQ values exceeding the target level were noted for receptors in the shrub-scrub habitat, in Clover Pond, and in Rush Lake; these risks are presented and discussed below. ESQ values for receptors in the montane habitat, Atherly Reservoir, and Rainbow Reservoir were all less than 1.0, and are not discussed further in this summary. These low-level risks include hypothetical scenarios that involve exposure to mercury and arsenic. In fact, arsenic was not found to be a significant contributor to risk in any of the exposure scenarios.

For the shrub-scrub habitat, source-specific methyl mercury ESQs exceeding the target level were calculated for omnivorous birds assuming that terrestrial invertebrates compose 100% of their diet. The ESQ values decreased to less than 1.0 when it was assumed that the omnivorous bird diet was 50% invertebrates and 50% plant matter. The ESQ values decreased to 0.01 when it was assumed that the diet was entirely plant matter. The differences in the magnitudes of the ESQs are a function of the propensity for mercury to accumulate, in terrestrial ecosystems, in animal matter rather than in plant matter.

For the endpoint receptors in Clover Pond, the 2005 SLERA found that the methyl mercury ESQs for omnivorous aquatic birds (modeled as the mallard), carnivorous birds

(modeled as the red-tailed hawk and the golden eagle), and fish-eating birds (modeled as the blue heron and the osprey) exceeded an ESQ of 1.0. Exposure through algae ingestion was responsible for the magnitude of the omnivorous aquatic bird ESQs. The omnivorous aquatic bird "equal-diet" ESQs, which are based on the ingestion of equal parts algae, benthic invertebrates, and rooted aquatic plants, were about one-third of the algae ESQs. The difference between the ESQs indicates that mercury dissolved in surface water, rather than that deposited in sediment, and its subsequent bioconcentration by algae, is the primary biotic transport pathway of concern for aquatic birds. The source-specific ESQ values for carnivorous birds and fish-eating birds are based on the ingestion of carnivorous fish. The concentration of methyl mercury in carnivorous fish depends on the concentration in surface water and its bioaccumulation by fish. These results also point to the relative importance of surface water-based exposure pathways for birds.

Evaluation of the air dispersion modeling information indicates that soil COPC concentrations decrease as a function of distance from any particular source at the TOCDF and CAMDS. To characterize methyl mercury risks as a function of distance from TOCDF and CAMDS, the 2005 SLERA created ESQ isopleths utilizing air concentrations and depositions modeled for each receptor node. These isopleths indicate that methyl mercury in soil is, as expected, greatest near the facilities and the concentration declines with increasing distance from the facilities. The isopleths indicate that mercury in stack gases emitted from the TOCDF deposits relatively close to the source, while mercury in stack gases from CAMDS is dispersed more widely; however, CAMDS is now closed and will not operate in the future. The differences between the ESQ patterns are believed to stem from different source characteristics—mainly building downwash and, to a lesser extent, stack gas exit velocities. Emission rates and other source characteristics are similar.

Uncertainties associated with the risk estimates include those for the three main parts of the risk assessment: (1) estimates of emission rates, (2) exposure assessment, and (3) toxicity assessment. Emissions of mercury in stack gases from some sources resulted in ESQ values for receptors in the shrub-scrub and aquatic environments that exceed the target level of 1.0; however, the 2005 SLERA states that the weighted-average mercury emission rates used in the analysis overestimate actual mercury emissions, thus indicating the elevated ESQs for methyl mercury overestimate potential ecological risks.

The 2005 SLERA evaluated the fate and transport of methyl mercury using EPA-recommended procedures (EPA 1999). The risk assessment evaluates potential exposures to mercuric chloride and methyl mercury but the analyses of stack emissions is limited to total mercury. In accordance with the EPA procedures, the defined percentages of the mercury released from the stack were modeled as elemental mercury and mercuric chloride. Once the mercury leaves the stack, the fate and transport of these two types of mercury are modeled separately with a portion converting via biological processes to a third

type: methyl mercury. Methyl mercury is the most toxic form of the three types of mercury, and the resulting exposures have a considerable amount of uncertainty. According to the 2005 SLERA, environmental monitoring data suggests that the modeling methods overestimate the amount of mercury deposited in the environment around the DCD; that is, no mercury has been detected in fish sampled from Rainbow Reservoir, and recent soil sampling results show no accumulation of mercury (Tetra Tech 2005; CMA 2006).

Also, elevated methyl mercury ESQs for omnivorous birds foraging on aquatic plants and benthic invertebrates in Clover Pond, west of the DCD, do not accurately represent the potential risks to these populations because Clover Pond periodically dries down, severely reducing available forage. The inherent assumption of continuous foraging activity, therefore, overestimates the potential risks to omnivorous birds in Clover Pond.

As a result of the multiple uncertainties associated with many components of the 2005 SLERA—including emission rates, exposure and toxicity assumptions, and fate and transport parameters for methyl mercury—the SLERA concludes that it potentially overestimates risks to ecological receptors in the assessment area. Based on the potential significant overestimation of risk results indicated by the uncertainty analysis in the 2005 SLERA, the UDSHW has concluded that potential ecological impacts from mercury emissions of the TOCDF are negligible (Tetra Tech 2005); therefore, no additional risk characterization was deemed to be necessary for baseline operation of the TOCDF.

3.3.3 Impacts of Destroying Mercury-Contaminated and Arsenic-Contaminated Agents GA and Lewisite

The emissions generated by any mercury and/or arsenic in the agents GA and Lewisite were not explicitly included in the 2003 HHRA or 2005 SLERA. Nevertheless, a comparison between the basis for the findings from those previous risk assessments and the levels of emissions from the proposed action can be used to draw conclusions about the risks of the proposed action. This section provides such a comparison.

Mercury. In 2007, an EA was prepared to investigate the potential consequences of destroying the mercury-contaminated mustard agents and munitions stored at the DCD (CMA 2007). The destruction process involved the installation of new equipment (i.e., sulfur-impregnated carbon filters) at the TOCDF to control emissions of mercury. For the purpose of analysis in the 2007 EA, a bounding calculation was used to illustrate the effects of the proposed action on human health.

The 2007 EA presents tabular data to show that the quantity of mercury emitted from the TOCDF into the environment—as assumed in the 2003 HHRA—is approximately 1,000 pounds over the lifetime of the TOCDF (including the mercury emissions from the

now-closed CAMDS). The estimates of mercury emissions in the 2003 HHRA were developed as the sum of four parts: emissions from the TOCDF during the GB, VX, and mustard campaigns and emissions from CAMDS. The 2003 HHRA concluded that such emission levels would not result in any significant impacts to human health. The 1,000-pound quantity therefore establishes the "threshold" at which any additional mercury introduced in the environment around the TOCDF would warrant further, detailed evaluation.

The amount of mercury to be emitted under this proposed action of installing and operating a small-scale LIC can be calculated from the maximum anticipated regulatory emission rate and the anticipated duration of the GA and Lewisite destruction campaigns. For mercury, the MACT emission rate of 8.1 µg/dscm over the operational lifetime of the proposed small-scale LIC would emit a maximum quantity of 0.03 pounds of mercury (Saupe 2008). This is a negligible amount in comparison to the numerical values discussed above, and is also well below the threshold of concern for mercury as determined from the 2003 HHRA.

No significant human health impacts would therefore be expected from the very small quantities of mercury that would be emitted from the proposed small-scale LIC. Based on the findings of the 2005 SLERA, a similar conclusion can be reached in regard to the expectation of insignificant impacts to ecological resources from the mercury emissions of the proposed action.

Arsenic. A similar calculation can be made for arsenic emissions as evaluated in the 2003 HHRA. Table 4 shows the quantity of arsenic emitted to the environment as assumed in the HHRA. That is, the emission of approximately 337 pounds of arsenic over the lifetime of the TOCDF (including the arsenic emissions from CAMDS) would result in the types of non-significant impacts to human health as described in Section 3.3.1. This quantity therefore establishes the "threshold" at which any additional arsenic introduced in the environment around the TOCDF would warrant further, detailed evaluation.

The amount of arsenic to be emitted under this proposed action of installing and operating a small-scale LIC can be calculated from the maximun anticipated regulatory emission rate and the anticipated duration of the GA and Lewisite destruction campaigns. For arsenic, the MACT emission rate of 23 µg/dscm over the operational lifetime of the proposed small-scale LIC would emit a maximum quantity of 0.07 pounds of arsenic (Saupe 2008). This is a negligible amount in comparison to the 337-pound threshold of concern for arsenic as determined from Table 4 and the 2003 HHRA.

Table 4. Hypothetical arsenic emissions from the Deseret Chemical Depot (in Utah) as calculated from the Human Health Risk Assessment (HHRA) and the Screening-Level Ecological Risk Assessment (SLERA) for the TOCDF.

		Arsenic Emissions			
	Agent Destruction Campaign	**IRAP-h Emission Rate [a] (g/s)**	**Data Source in Final HHRA or SLERA**	**Campaign Duration (years)**	**Total Arsenic (pounds)**
TOCDF Sources:					
LIC1	GB	3.81E-06	HHRA Table C-1	7.67	**2.0**
	VX	1.93E-05	HHRA Table C-1	2.47	***3.3***
	HD	5.37E-05	HHRA Table C-1	2.86	***10.7***
				Subtotal for LIC1	***16.0***
LIC2	GB	3.81E-06	HHRA Table C-2	7.67	**2.0**
	VX	1.93E-05	HHRA Table C-2	2.47	***3.3***
	HD	5.37E-05	HHRA Table C-2	2.86	***10.7***
				Subtotal for LIC2	***16.0***
MPF	GB	8.96E-07	HHRA Table C-3	7.67	***0.5***
	VX	9.37E-07	HHRA Table C-3	2.47	***0.2***
	HD	2.79E-06	HHRA Table C-3	2.86	***0.6***
				Subtotal for MPF	***1.2***
DFS	GB	6.30E-06	HHRA Table C-4	7.67	***3.4***
	VX	2.41E-06	HHRA Table C-4	2.47	***0.4***
	HD	1.17E-06	HHRA Table C-4	2.86	***0.2***
				Subtotal for DFS	***4.0***
BRA	IRAP rate	1.20E-05	SLERA Table B-7	13.0	***10.8***
				Subtotals for the TOCDF by campaign:	
				GB	***7.9***
				VX	***7.2***
				HD	***22.1***
				BRA	***10.8***
				All Campaigns	***48.0***

Table 4. (continued)

CAMDS Sources:					
MPF	GB	2.18E-04	HHRA Table D-1	10.0	***151.6***
	VX	3.27E-06	HHRA Table D-1	10.0	***2.3***
	HD	2.76E-06	HHRA Table D-1	10.0	***1.9***
				Subtotal for MPF	***155.8***
DFS	GB	1.34E-05	HHRA Table D-2	10.0	***9.3***
	VX	1.42E-06	HHRA Table D-2	10.0	***1.0***
	HD-1	1.77E-04	HHRA Table D-2	10.0	***123.1***
	HD-2	4.95E-06	HHRA Table D-2	10.0	***3.4***
				Subtotal for DFS	***133.4***
				Subtotals for CAMDS by campaign:	
				GB	***160.9***
				VX	***3.3***
				HD	***125.0***
				All Agents	***289.1***
				GRAND TOTAL (Both Facilities with the BRA):	
					337.2

Acronyms: BRA = brine reduction area (which is no longer in operation at the TOCDF); DFS = deactivation furnace system; GB = nerve agent GB (sarin); HD = sulfur mustard agent; HHRA = human health risk assessment (see UDEQ 2003 in the list of references in Section 6); LIC1 and LIC2 = the two liquid agent incinerators at the TOCDF; MPF = metal parts furnace; SLERA = screening-level ecological risk assessment (see Tetra Tech 2005 in the list of references in Section 6); VX = nerve agent VX.

[a] The HHRA and the SLERA used the Industrial Risk Assessment Program–Health (IRAP-h) computer code to generate numerical risk values. The values in the table above are listed in the respective HHRA and SLERA documents as the numerical inputs to the IRAP-h calculations.

No significant human health impacts would therefore be expected from the very small quantities of arsenic that would be emitted from the proposed small-scale LIC. Based on the findings of the 2005 SLERA, a similar conclusion can be reached in regard to the expectation of insignificant impacts to ecological resources from the arsenic emissions of the proposed action.

3.4 WASTE MANAGEMENT

The proposed action would generate solid and liquid, hazardous and non-hazardous wastes during its operational lifetime. The types of wastes to be generated by the proposed action are discussed in detail in Section 2.1.3, and the anticipated quantities are summarized in Table 5. All wastes generated by the proposed action would be disposed of in compliance with applicable federal, state, and local regulations. All wastes to be shipped off-site would be characterized and packaged in accordance with applicable U.S. Department of Transportation specifications. These wastes would then be transported to licensed and permitted commercial waste management facilities for final treatment and disposal in compliance with the waste acceptance criteria established for those respective facilities.

This section examines the quantities of wastes to be generated under the proposed action and compares them to the quantities of other DCD wastes. The potential for the combined quantities of such wastes to impact regional waste management capabilities is evaluated. For the purposes of analysis, all of the wastes to be generated by the proposed action will be assumed to be hazardous. The disposition of non-hazardous wastes would result in lesser impacts than those discussed below.

3.4.1 Regulatory Requirements

In Utah, residues from the treatment of chemical agent, such as GA and Lewisite, are a state-listed hazardous waste, and carry the waste code "F999." Some of the wastes to be generated by the proposed action may contain mercury[4] or arsenic[5]. Federal and state hazardous waste regulations provide requirements for management of waste containing a number of toxic materials, including mercury and arsenic. Hazardous waste containing mercury or arsenic above specific concentrations would carry the federal waste codes D009 or D004, respectively, and may require additional treatment to remove the component or

[4] From the ton container sampling data presented in Section 2.1.1 in combination with the agent tonnage data in Table 2, the total estimated quantity of mercury in the GA and Lewisite inventory can be calculated. These numbers yield approximately 0.02 pounds of mercury in the GA and about 14 pounds (upper bound) of mercury in the Lewisite. For the purposes of analysis in this EA, the total quantity of mercury in the DCD inventory of GA and Lewisite is therefore assumed to be about 14 pounds.

[5] From the ton container sampling data presented in Section 2.1.1 in combination with the agent tonnage data in Table 2, the total estimated quantity of arsenic in the GA and Lewisite inventory can be calculated. These numbers yield approximately 0.2 pounds of arsenic in the GA and about 9,700 pounds (upper bound) of arsenic in the Lewisite. For the purposes of analysis in this EA, the total quantity of arsenic in the DCD inventory of GA and Lewisite is therefore assumed to be about 9,700 pounds.

stabilize the waste in a form that prevents release of the component to the environment. Non-hazardous wastes from the proposed action would not create any unique or significant disposal concerns, nor would they be expected to create any significant environmental impacts.

Table 5. Estimates of waste quantities to be generated by the proposed action

Type of waste	Quantity (in tons)
Solid wastes	
Carbon filters from PAS	4.5
HEPA filters from PAS	0.4
Particulate residue from PAS	1.8
Carbon filters from building enclosure	2.3
Prefilters from building enclosure	0.1
HEPA filters from building enclosure	0.1
Personnel protective equipment	5.0
Decontaminated ton containers [a]	16.8
Construction wastes	100.0
Subtotal solid wastes	***131.0***
Liquid wastes	
PAS scrubber brines [b]	1,571.0
Ton container rinsate and spent decontamination solutions	12.5
Subtotal liquid wastes	***1,583.5***

PAS = Pollution abatement system
[a] Based on an empty ton container weight of 1,400 pounds; 24 ton containers total.
[b] Based on 355,000 gallons of brine.

Solid wastes that contain mercury at a concentration equal to or greater than 260 mg/kg (equivalent to 260 ppm by mass) must be treated by roasting or retorting in a thermal processing unit that is capable of volatilizing the mercury and subsequently condensing it for recovery (40 CFR Part 268). The EPA regulations require that residues from retorting processes have a mercury concentration less than 260 ppm, and that they have a leach rate no higher than 0.20 mg/L, measured using the Toxicity Characteristic Leaching Procedure (TCLP). All other mercury-contaminated solid wastes must have a leach rate that does not exceed 0.025 mg/L using the TCLP. This second limit applies to solid wastes generated by the proposed action. Solid wastes containing arsenic have similar EPA regulatory requirements (40 CFR 268.40) with the limit being 5.0 mg/L using the TCLP.

For liquid wastes, EPA regulations require that wastewater have a mercury concentration less than 0.15 mg/L and an arsenic concentration less than 1.4 mg/L (40 CFR Part 268). Solid or liquid wastes exceeding regulatory limits would require further treatment or stabilization prior to disposal.

3.4.2 Waste Quantities

The anticipated quantities of waste in Table 5 can be compared to the quantities of wastes associated with the continued operation of the TOCDF. The left-most columns of Table 6 show such a comparison.

The data in Table 6 can be used to determine the percentage increase in the quantity of waste generated at the DCD over the anticipated operational lifetime of the proposed action, which is expected to be less than one year. The increased amount of solid waste would equate to about 3% more than existing annual waste quantities already being generated and adequately managed. The amounts of liquid wastes to be generated under the proposed action would be about 7% higher than existing annual waste quantities. Because these percentages are small, the quantities of wastes to be generated by the proposed action would not be expected to create any significant impacts in regard to the management of the overall quantities of wastes to be generated at the DCD. The potential impacts of disposing of these wastes is discussed in the next subsection.

3.4.3 Cumulative Waste Management Impacts

From a worst-case perspective, the analysis of potential impacts to existing regional waste management systems and capabilities must focus upon the potential cumulative impacts of disposing of the wastes from the proposed action in conjunction with other wastes associated with TOCDF operations and other wastes generated in the region.

Table 6. Disposal of hazardous waste from baseline TOCDF operations plus disposal of wastes to be generated by the proposed action

Type of waste	Anticipated TOCDF wastes [a] (tons per year)	Wastes to be generated by the proposed action [b] (tons per year)	Total quantity of waste (tons per year)	Wastes managed in Utah and six nearby states [c]: Waste quantities managed in 2005 (tons per year)	Wastes managed in Utah and six nearby states [c]: Incremental increase as a percentage of 2005 quantities
POTENTIAL WASTES MANAGED BY LANDFILL/SURFACE IMPOUNDMENT:					
Solid wastes	4,173	131.0	4,304	402,114	1.1%
Liquid wastes to be stabilized	23,601	1,583.5	25,185	N/A [d]	N/A [d]

[a] Data obtained from U.S. Army 2008, *Environmental Assessment for Proposed Installation and Operation of an Autoclave System to Expand Secondary Waste Treatment Capability*, U.S. Army Chemical Materials Agency, Aberdeen Proving Ground, Md., April 2008.

[b] See Table 5.

[c] Idaho, Nevada, Wyoming, Colorado, New Mexico, and Arizona. Numerical entries for 2005 represent the sum of state-specific data obtained from U.S. Environmental Protection Agency, *State Detail Analysis; The National Biennial RCRA Hazardous Waste Report (Based on 2005 Data)*, EPA-530-R-06-007, Office of Solid Waste and Emergency Response, Washington, D.C., December 2006; available on-line at http://www.epa.gov/epaoswer/hazwaste/data/br05/index.htm. The EPA's waste management source data provide only a single numerical entry for the combined categories of "landfill" and "surface impoundment." Hence, no further breakdown is available for use in this analysis.

[d] Water in liquid wastes to be stabilized would beneficially offset the usage requirement for other sources of water during the stabilization process for other wastes at the landfill; hence, no additional landfill capacity would be required for such stabilized wastes from the TOCDF and the proposed action.

Table 6 shows the best available data from the EPA for the types of hazardous waste management facilities in Utah and the six surrounding states (i.e., Arizona, Colorado, Idaho, Nevada, New Mexico and Wyoming) (EPA 2006). The following analysis compares the anticipated annual waste quantities with the quantities of similar wastes already managed within this seven-state region.

Table 6 shows the quantities of hazardous wastes generated by the TOCDF under baseline operations that are disposed of by landfill, as well as the incremental quantities of wastes that will require management under the proposed action. If the quantities of wastes to be generated by the proposed action are assumed to all be classified as hazardous, and if they are combined with the wastes generated by existing processing operations at the TOCDF, about 4,304 tons/yr of solid wastes would need to be disposed of in landfills. Table 6 shows that this quantity is only about 1.1% of the total amount of hazardous waste already disposed of by regional landfills or surface impoundments[6]. The addition of such a small fraction of waste to what is already managed by regional hazardous waste landfills would not produce any significant cumulative impacts to those landfills.

Table 6 also shows the combined quantities of TOCDF liquid process and the anticipated quantities of liquid wastes from the proposed action. According to the table, only 1583.5 tons of liquid waste would be generated over the anticipated one-year operational lifetime of the proposed action. As is currently the practice for the TOCDF, the liquid wastes from the proposed action would beneficially offset the usage requirement for other sources of water during the stabilization process for other wastes at the landfill; hence, no additional landfill capacity would be required. Disposal of both the anticipated liquid process effluents from the TOCDF and the liquid wastes from the proposed small-scale incinerator would not be expected to create any cumulative effects that would adversely impact the management of such wastes in the region.

3.4.4 Off-Site Shipments of Hazardous Waste

One other issue is relevant to the potential environmental impacts of off-site shipment of wastes from the DCD: the potential human health and environmental impacts in the event of a spill or release during such a transportation accident. This section discusses such impacts.

[6] The EPA's waste management source data (EPA 2006) provide only a single numerical entry for the combined categories of "landfill" and "surface impoundment." Therefore, no further breakdown is available for use in this analysis, even though some types of wastes which would be appropriate for landfill disposal might not be appropriate for disposal by surface impoundment.

In the event of an accident involving liquid brines, the brines could spill and escape into the environment. The trucks to be used for transporting these liquid wastes would each hold about 4,000 gallons. With an estimated total of 355,000 gallons of scrubber brines generated over the operational period of the proposed action, and if all of the mercury and arsenic were well-mixed within the shipped brine, each 4,000-gallon truckload of brine would contain a worst-case of only 1.5 pounds of mercury and 125 pounds of arsenic. The principal environmental impacts from spills would be contamination of local surface soils and/or to liquid run-off that might reach surface waters or groundwater.

Nationwide, there are millions of highway shipments of hazardous materials each year, and some of these shipments involve chemicals (such as sulfuric acid) that present far more toxic hazards than the wastes to be shipped from the DCD. The containers and vehicles used for hazardous waste transport from the DCD would be appropriately placarded and labeled prior to leaving the facility. Furthermore, wastes shipped off-site would be accompanied by either a hazardous waste manifest or bill of lading. All shipping papers would conform to applicable federal, state, and local regulations in order to provide first responders with the necessary information in the event of an accidental spill or release. In such instances, emergency responders are trained to establish isolation and protective action distances for accidents involving hazardous material and to take appropriate actions to limit the impact of such accidents.

Under the provisions of DOT regulations at 49 CFR Part 172, licensed carriers and shippers are required to provide information to emergency responders about the hazardous nature of their shipments. Specifically, Subpart G of these regulations relates to *Emergency Response Information* that is to be carried by each transporter, and Subpart H relates to *Training* for hazardous waste transport personnel.

In the unlikely event of an accidental spill during the transport of the PAS brines, the first response effort would be to contain and capture the free liquids. Any liquids not captured would likely move into exposed soils. Those soils would be removed and transferred to a appropriate disposal or treatment site immediately after all of the free liquid is contained. The potential impacts to groundwater from such a spill would be expected to be minimal due to the relatively small volumes that would be transported in each truck and that would be available for release in an accidental spill. Between the liquid and soil removed, virtually all of the spilled brines could be removed and properly disposed of.

If other drummed or containerized hazardous wastes from the DCD were to be involved in a transportation accident, then they would have less potential for contaminating surface soils and/or water resources than would the liquid brines. Appropriate emergency response actions would be expected to result in the rapid and complete containment of such hazardous materials.

3.5 IMPACTS OF THE NO-ACTION ALTERNATIVE

Under the no-action alternative (see Section 2.2), the proposed small-scale incinerator and its auxiliary systems would not be installed or operated at the DCD. The GA and Lewisite presently stored at DCD would remain in storage indefinitely. This alternative would prevent the United States from complying with CWC obligations to destroy the entire stockpile and would also require continued monitoring and surveillance of stored chemical agents and munitions for the indefinite future. The risks of accidental releases of these chemical warfare agents during storage activities would continue until such time as the agents and munitions were eventually destroyed.

Under the no-action alternative, there would be no changes in land use at the DCD. Nor would there be any adverse effects from modifications to or disturbances of existing surface water bodies, terrestrial and/or aquatic communities, wetlands, or threatened and endangered species habitat areas. There would be no new water consumption requirements for the no-action alternative; hence, there would be no impacts to water resources. No additional workers would be required under the no-action alternative, and no socioeconomic impacts would be anticipated. No disproportionate impacts to minority or low-income populations would be expected during continued storage of the agents GA and Lewisite.

The only wastes generated under the no-action alternative would be those associated with continued monitoring and storage of the GA and Lewisite ton containers. No additional solid or liquid wastes—beyond those currently generated during normal inspection and maintenance operations—would be produced under the no-action alternative. Thus, there would be no need for additional treatment or disposal of any new wastes.

4. CONCLUSIONS

The information and analyses presented in this EA indicate that the proposed action of installing a small-scale incinerator and auxiliary systems at the DCD and operating this unit to destroy the DCD's stockpile of agents GA and Lewisite would have no significant environmental impacts.

Operation of a small-scale incinerator for destruction of GA and Lewisite would be short-term, due to the small quantities of GA and Lewisite in the DCD stockpile. Installation and operation of a new PAS would ensure the emissions from the proposed small-scale incinerator would be in compliance with applicable regulatory limits. Based upon an examination of the findings of previous human health and ecological risk assessments conducted on the emissions from the existing TOCDF, the emissions from the small-scale incinerator with the PAS in operation would not result in significant impacts to human health or to ecological resources. Consumption of additional resources, such as water, to support the proposed action would involve incremental quantities that are mere fractions of the consumption requirements for the existing TOCDF. The additional waste streams to be created by the proposed action are likewise only small, incremental amounts of the wastes normally generated by baseline operation of the TOCDF.

An evaluation of the no-action alternative (i.e., continued storage of the agents inside ton containers) indicates that no significant impacts would occur; however, the no-action alternative could jeopardize the ability of the United States to comply with chemical warfare agent destruction deadlines established under the CWC and Congressional directives in Public Law 99-145. Furthermore, choosing the no-action alternative would require the continued commitment of resources for stockpile monitoring, surveillance, and maintenance for as long as the agents GA and Lewisite remained in storage.

Based on the above considerations and the lack of significant adverse environmental effects, it is concluded that the most desirable course of action is to proceed with the installation and operation of a small-scale incinerator to destroy the DCD stockpile of agents GA and Lewisite.

This proposed action would create no significant impacts. A finding indicating this conclusion will be prepared and published for public comment.

5. PERSONS CONTACTED AND CONSULTED

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