Final Environmental Impact Statement

Design, Construction and Operation of One or More Pilot Test Facilities for Assembled Chemical Weapons Destruction Technologies at One or More Sites

April 2002

Program Manager
Assembled Chemical
Weapons Assessment

Anniston Army Depot, Alabama
Pine Bluff Arsenal, Arkansas
Blue Grass Army Depot, Kentucky
Pueblo Chemical Depot, Colorado

ASSEMBLED CHEMICAL WEAPONS ASSESSMENT

APPROVAL AUTHORITY: U.S. Department of Defense, Program Manager Assembled Chemical Weapons Assessment

DOCUMENT DESIGNATION: Final Environmental Impact Statement (FEIS)

AFFECTED JURISDICTIONS: State of Alabama, State of Arkansas, State of Colorado, and Commonwealth of Kentucky.

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COVER SHEET

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COOPERATING AGENCIES: None

TITLE OF PROPOSED ACTION: Design, Construction and Operation of One or More Pilot Test Facilities for Assembled Chemical Weapons Destruction Technologies at One or More Sites

POINT OF CONTACT: Information concerning this environmental impact statement can be obtained by calling 1-888-482-4312 or by writing to PMACWA, Attn: AMSSB-PM-ACWA, 5183 Blackhawk Rd., Aberdeen Proving Ground, MD 21010-5424.

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ABSTRACT: The U.S. Congress established the ACWA Program as part of the *Omnibus Consolidated Appropriations Act* of 1997 (Public Law [P.L.] 104-208). This authorizing legislation instructed DOD to "demonstrate not less than two alternatives to the baseline incineration process for the demilitarization of assembled chemical munitions." The primary purpose of ACWA is to pilot test alternative systems for destroying assembled chemical weapons (ACWs). The actual destruction of chemical munitions is not the primary function of the ACWA Program. The Program Manager for Chemical Demilitarization (PMCD), as mandated under P.L. 99-145, is charged with the systematic construction and operation of facilities or processes to reduce the chemical weapons stockpile.

This EIS analyzes the potential environmental impacts of a proposed action to pilot test one or more alternative systems for the destruction of ACWs at one or more alternative Army installations that are storing ACWs. The four installations included in this EIS are Anniston Army Depot (ANAD) in Anniston, Alabama; Pine Bluff Arsenal (PBA) in Pine Bluff, Arkansas; Pueblo Chemical Depot (PCD) in Pueblo, Colorado; and Blue Grass Army Depot (BGAD) in Richmond, Kentucky. The four destruction systems that are assessed in the document are those that successfully completed the initial demonstration testing. The systems are (1) neutralization followed by biological treatment (Neut/Bio), (2) neutralization followed by supercritical water oxidation (Neut/SCWO), (3) neutralization followed by gas-phase chemical reduction and transpiring wall supercritical water oxidation (Neut/GPCR/TW-SCWO), and (4) electrochemical oxidation (Elchem Ox). The no action alternative is also assessed. The preferred alternative is to pilot test ACWA technologies at one or more locations. The substantive impact areas that are considered include the following broad categories: land use, infrastructure, waste management, air quality, noise, human health and safety, visual resources, water use and quality, soils, biological resources, cultural resources, socioeconomics, environmental justice, accidents, agriculture, and cumulative effects. In addition to facility construction and operation, decommissioning and closure are also addressed.

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NOTATION

ACRONYMS AND ABBREVIATIONS

1X, 3X, 5X	U.S. Army system for material safety hazard classification (X, XXX, and XXXXX, respectively)
AADT	annual average daily traffic
ACA	*Arkansas Code Annotated*
ACW	assembled chemical weapon
ACWA	Assembled Chemical Weapons Assessment
ADECA	Alabama Department of Economics and Community Affairs
ADEM	Alabama Department of Environmental Management
ADEQ	Arkansas Department of Environmental Quality
agl	above ground level
AHPA	*Archaeological and Historic Preservation Act*
AIRFA	*American Indian Religious Freedom Act*
AMC	Army Material Command
ANAD	Anniston Army Depot
ANCA	Anniston Chemical Activity
ANSI	American National Standards Institute
APEN	air pollutant emission notice
AQCR	Air Quality Control Region
AR	Army Regulation
ASA	Ammunition Storage Area
ATSDR	Agency for Toxic Substances and Disease Registry
AWS	Ammunition Workshop
BACT	best available control technology
BGAD	Blue Grass Army Depot
BGCA	Blue Grass Chemical Activity
Bio	biological treatment or biotreatment as used in Neut/Bio
BLM	Bureau of Land Management
BLS	U.S. Bureau of Labor Statistics
BR	business route
BRAC	Base Realignment and Closure
CAA	*Clean Air Act*
CAAA	*Clean Air Act Amendments*
Cabinet	Kentucky Natural Resources and Environmental Protection Cabinet
CAIRA	Chemical Accident or Incident Response and Assistance
CatOx	catalytic oxidation unit
CBDCOM	Chemical and Biological Defense Command
CCR	*Code of Colorado Regulations*
CDC	Centers for Disease Control and Prevention

CD EIS	chemical demilitarization environmental impact statement
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act*
CFR	*Code of Federal Regulations*
CHB	Container Handling Building
CIC	Central Incinerator Complex
CLA	Chemical Limited Area
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
COE	U.S. Army Corps of Engineers
CR	county road
CSEPP	Chemical Stockpile Emergency Preparedness Program
CWA	*Clean Water Act*
CWC	Chemical Weapons Convention *(Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons)*
DAB	Defense Acquisition Board
DAE	Defense Acquisition Executive
DAPC	Division of Air Pollution Control
DCE	dichloroethylene
DDT	dichlorodiphenyltrichloroethane
DEIS	draft environmental impact statement
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
DRMO	Defense Reutilization and Marketing Office
EIS	environmental impact statement
Elchem	electrochemical as used in Elchem Ox
EMIS	Emergency Management Information System
EOC	emergency operations center
EPA	U.S. Environmental Protection Agency
EPCRA	*Emergency Planning and Community Right-to-Know Act*
EVAWS	enhanced visual/audio warning system
FDA	U.S. Food and Drug Administration
FEC	Foothill Engineering Consultants, Inc.
FEIS	final environmental impact statement
FEMA	Federal Emergency Management Agency
FR	*Federal Register*
FRRA	Front Range Research Associates, Inc.
FTE	full-time-equivalent
FY	fiscal year

GB	sarin, a nerve agent
GPCR	gas-phase chemical reduction
H	mustard, a blister agent
H_2S	hydrogen sulfide
HAP	hazardous air pollutant
HC	hydrocarbon
HD	mustard, a blister agent
HEPA	high-efficiency particulate air
HF	hydrogen fluoride
HQ	hazard quotient
HSWA	*Hazardous Solid Waste Amendments of 1984*
HT	mustard, a blister agent
HVAC	heating, ventilation, and air conditioning
I	interstate
ICAGRS	interim corrective action groundwater remediation system
ICB	immobilized cell bioreactor
IIPT	Integrating Integrated Product Team
IMPA	isopropyl methylphosphonic acid
IOC	Industrial Operations Command
IPT	Integrated Product Team
ISCST3	Industrial Source Complex Short-Term 3 (model)
IWTP	Industrial Waste Treatment Plant
JACADS	Johnston Atoll Chemical Agent Disposal System
KAR	*Kentucky Administrative Regulation*
KDEP	Kentucky Department of Environmental Protection
KPDES	Kentucky Pollutant Discharge Elimination System
KRS	*Kentucky Revised Statute*
KSNPC	Kentucky State Nature Preserves Commission
KYNHP	Kentucky Natural Heritage Program
LEPC	Local Emergency Planning Committee
LOAEL	lowest observed adverse effect level
LP	load platform
MCE	maximum credible event
MCL	maximum contaminant level
MDB	Munitions Demilitarization Building
MOA	memorandum of agreement
MOU	memorandum of understanding
MPA	methylphosphonic acid
MPT	metal parts treater

MSA	Metropolitan Statistical Area
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NAGPRA	*Native American Grave Protection and Repatriation Act*
NCTR	National Center for Toxicological Research
NEPA	*National Environmental Policy Act*
NESHAP	National Emission Standards for Hazardous Air Pollutants
Neut	neutralization as used in Neut/Bio, Neut/SCWO, and Neut/GPCR/TW-SCWO
NHPA	*National Historic Preservation Act*
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOAEL	no observed adverse effects level
NOI	Notice of Intent
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRHP	*National Register of Historic Places*
NSPS	New Source Performance Standards
O_3	ozone
OB/OD	open burning/open detonation
OIPT	Overarching Integrated Product Team
OMB	Office of Management and Budget
ONC	on-site container
OSC	Operations Support Command
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit
Ox	oxidation as used in Elchem Ox
PA	programmatic agreement
PAD	Pueblo Army Depot
PAH	polycyclic aromatic hydrocarbon
PAPR	powered air-purifying respirator
PAR	protective action recommendation
PAZ	protective action zone
Pb	lead
PBA	Pine Bluff Arsenal
PBCDF	Pine Bluff Chemical Demilitarization Facility
PCB	polychlorinated biphenyl
PCD	Pueblo Chemical Depot
PCP	pentrachlorophenyl
PDA	Pueblo Depot Activity
PDADA	Pueblo Depot Activity Development Authority

PEPS	plasma energy pyrolysis system
P.L.	Public Law
PM	particulate matter
PM_{10}	coarse, inhalable PM with a mean aerodynamic diameter of 10 µm or less
$PM_{2.5}$	fine, inhalable PM with a mean aerodynamic diameter of 2.5 µm or less
PMACWA	Program Manager Assembled Chemical Weapons Assessment
PMCD	Program Manager for Chemical Demilitarization
POD	Pueblo Ordnance Depot
POM	polycyclic organic matter
PPE	personal protective equipment
PSD	Prevention of Significant Deterioration (of air quality)
PTFMC	Power Train Flexibility Maintenance Center
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
R&D	research and development
RBC	running buffalo clover
RCRA	*Resource Conservation and Recovery Act*
RD&D	research, development, and demonstration
RDF	rotary deactivation furnace
RDX	an explosive
RFP	request for proposal
RI	remedial investigation
RMP	risk management plan
ROD	Record of Decision
ROI	region of influence
SAAQS	State Ambient Air Quality Standards
SAFE	Serving Alabama's Future Environment
SAIC	Science Applications International Corporation
SARA	*Superfund Amendments and Reauthorization Act*
SBCCOM	Soldier and Biological Chemical Command
SCWO	supercritical water oxidation
SDWA	*Safe Drinking Water Act*
SET	solvated electron technology
SHPO	State Historic Preservation Officer
SIA	Southeast Industrial Area
SIC	Standard Industrial Classification
SIP	state implementation plan
SO_2	sulfur dioxide
SR	state route
SVOC	semivolatile organic compound
SWMU	solid waste management unit

TACOM	Tank Automotive Command
TAF	time after functioning
TCE	trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TDG	thiodiglycol, a mustard degradation product
TEAD	Tooele Army Depot
TNT	trinitrotoluene
TOCDF	Tooele Chemical Agent Disposal Facility
TRBP	thermal reduction batch processor
TRI	Toxics Release Inventory
TSCA	*Toxic Substances Control Act*
TSDF	treatment, storage, and disposal facility
TTC	Transportation Technology Center
TW	transpiring wall as used in Neut/GPCR/TW-SCWO
US	U.S. highway
USAEHA	U.S. Army Environmental Hygiene Agency
USC	*United States Code*
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
VRM	Visual Resources Management
VX	a nerve agent
Western	Western Area Power Administration
WIPT	Working Integrated Product Team
WVRU	waste volume reduction unit
WWTP	wastewater treatment plant

UNITS OF MEASURE

^{o}C	degree(s) Celsius
cm	centimeter(s)
d	day(s)
dB	decibel(s)
^{o}F	degree(s) Fahrenheit
ft	foot (feet)
ft^3	cubic foot (feet)
g	gram(s)
G	gravity
gal	gallon(s)

GWh	gigawatt-hour(s)
h	hour(s)
ha	hectare(s)
in.	inch(es)
K	kelvin
kg	kilogram(s)
km	kilometer(s)
km^2	square kilometer(s)
kV	kilovolt(s)
L	liter(s)
lb	pound(s)
m	meter(s)
m^2	square meter(s)
m^3	cubic meter(s)
mg	milligram(s)
MHz	megahertz
mi	mile(s)
mi^2	square mile(s)
min	minute(s)
mm	millimeter(s)
mo	month(s)
mph	mile(s) per hour
MWh	megawatt-hour(s)
ng	nanogram(s)
Nm^3	normal cubic meter(s)
ppm	part(s) per million
psi	pound(s) per square inch
psia	pounds per square inch absolute
s	second(s)
tonne(s)	metric ton(s)
wk	week(s)
yd^3	cubic yard(s)
yr	year(s)
µg	microgram(s)
µm	micrometer(s)
µS	microsievert(s)