Abbreviations and terms used in this publication

binary material
A chemical that can be mixed with other chemicals to make a lethal chemical agent.

Chemical Weapons Convention (CWC)
The international agreement, signed by over 180 nations and in effect since April 1997, that prohibits the development, production, acquisition, stockpiling, retention, transfer and use of chemical weapons.

DF
Methylphosphonicdiflouride, a non-lethal chemical that was produced at the Army's Pine Bluff Arsenal Integrated Binary Production Facility in the 1980s and 1990s. As one part of a binary munition, DF was intended to be mixed in a projectile while in flight to a target to form the lethal chemical, GB nerve agent, also known as sarin.

DF neutralent
Liquid that results from destroying the binary material DF using water. The neutralent is approximately 70% water and contains several hazardous byproducts (methylphosphonic acid and hydrofluoric acid) that need additional treatment before final disposal.

2-(diisopropylamino) ethanol (KB)
A chemical byproduct produced by neutralizing QL with water. KB is classified as a "schedule 2" compound under the Chemical Weapons Convention based on its being a component of other schedule compounds.

environmental assessment
Under NEPA, an environmental assessment is applied to activities that are not routine at federal facilities and require a greater level of evaluation, such as installing new equipment in an industrialized area or expanding an existing facility. The environmental assessment evaluates the potential impact of these activities and issues a finding. No environmental impacts lead to a "Finding of No Significant Impact" or FONSI; minor impacts can be addressed in this document. A finding of significant impact will lead to an environmental impact statement.

ethanol
A chemical compound commonly known as alcohol that is contained in beverages for human consumption. It is a byproduct produced by neutralizing QL with water.

GB
A liquid nerve agent, also known as sarin.

hydrofluoric acid (HF)
The chemical compound hydrogen fluoride. HF is a strong acid that is formed by the reaction of fluorine with water. HF is a byproduct produced by neutralizing DF with water.

methylphosphinic acid (MP)
A chemical byproduct produced by neutralizing QL with water. MP is classified as a "schedule 2" compound under the Chemical Weapons Convention based on its chemical structure containing a carbon-phosphorous bond. It is considered a precursor to forming other schedule compounds.

methylphosphonic acid (MPA)
A chemical byproduct produced by neutralizing DF with water. MPA is classified as a "schedule 2" compound under the Chemical Weapons Convention based on its chemical structure containing a carbon-phosphorous bond. It is considered a precursor to forming other schedule compounds.

National Environmental Policy Act (NEPA)
This act sets guidelines and requirements to ensure potential impacts to the environment are evaluated as part of the decision-making process for major activities at federal facilities.

non-schedule wastes
Non-schedule wastes are generated from the destruction of chemical warfare materiel that do not contain any compounds included in the Chemical Weapons Convention treaty list of compounds monitored by the Convention.

Non-Stockpile Chemical Materiel Project (Non-Stockpile Project)
Provides centralized management and direction to the U.S. Department of Defense for the safe disposal of non-stockpile chemical warfare materiel in a safe, environmentally sound and cost-effective method. The Non-Stockpile Project conducts research and develops treatment options and destruction plans that fully comply with all federal, state, and local regulations and laws. This effort includes developing, implementing, and monitoring a public outreach program to ensure the exchange of information between the Army and the public.

non-stockpile chemical warfare materiel
Chemical warfare materiel that is not part of the U.S. chemical weapons stockpile. The five categories of non-stockpile materiel include binary chemical weapons, former production facilities, miscellaneous chemical warfare materiel, recovered chemical warfare materiel and buried chemical warfare materiel.

QL
Diisopropylaminoethyl methylphosphonite, a chemical that was produced primarily at the Army's Newport Chemical Depot and stored at the Pine Bluff Arsenal. One part of a binary munition, QL was intended to be mixed in a projectile while in flight to a target to form the lethal nerve agent, VX.

QL neutralent
Liquid that results from destroying the binary material QL with water. The neutralent is approximately 82% water and contains several hazardous byproducts — methylphosphinic acid and 2-(diisopropylamino) ethanol — that need additional treatment before final disposal.

sarin
A liquid nerve agent, also known as GB.

schedule wastes
Schedule wastes are generated from the destruction of chemical warfare materiel that contain compounds included in the Chemical Weapons Convention treaty list of compounds monitored by the Convention at concentrations above 1,000 parts per million.

secondary wastes
Hazardous and non-hazardous waste generated during the destruction of chemical warfare materiel.

stockpile chemical warfare materiel
Includes the current U.S. stockpile of chemical weapons. These weapons are kept under strict conditions of accountability in Alabama, Kentucky, Utah, Maryland, Indiana, Arkansas, Colorado and Oregon.

VX
A liquid nerve agent.

wet air oxidation (WAO)
A thermal process that uses heat and the oxygen in air to destroy organic matter in water. The process can convert organics to carbon dioxide, water and biodegradable organic acids

How the selection was made for a treatment, storage and disposal facility to host the Zimpro® wet air oxidation system

Evaluating the impact on the environment

All federal agencies, including the Army, must assess the impact of major actions–such as the installation of a wet air oxidation unit–on the environment by conducting an environmental study under the ***National Environmental Policy Act***. This act sets guidelines and requirements to ensure potential impacts to the environment are evaluated as part of the decision-making process.

The Non-Stockpile Project determined that an ***environmental assessment*** was the appropriate NEPA process for the installation and use of a wet air oxidation treatment system to treat binary neutralent because:

- Wet air oxidation has been demonstrated to treat binary neutralents safely and successfully.
- The commercial facility selected to treat, store and dispose of the waste also has demonstrated experience and ability to treat neutralent waste in a safe and environmentally sound manner.

What does an environmental assessment do?

An environmental assessment:

- describes the proposed installation process;
- evaluates potential impacts to environmental resources such as air, water, land use and wildlife;
- evaluates potential impacts to cultural, social and economic resources;
- describes waste management issues

Because the assessment was performed at three separate facilities in two states, the assessment did not evaluate transportation issues or the pre-treatment of the binary neutralents that will occur before they are transported to the commercial treatment facility.

What effect did the environmental assessment have on the project?

A "Finding of No Significant Impact" (FONSI) was determined after the environmental assessment was finished. This finding meant that there would be no significant impacts to the natural and human environments resulting from the use of the wet air oxidation treatment system at any of the three facilities investigated. Any minor impacts would have to be addressed before the FONSI was finalized.

If the environmental assessment had determined there were significant impacts with use of the system, the Non-Stockpile Project would have prepared an environmental impact statement to examine the system and alternatives to the system in greater detail.

What happens after a "Finding of No Significant Impact"?

The draft FONSI document was made available to the public during a 45-day public comment period that ended March 16, 2005. During this time, community members and interested parties, such as regulatory agencies, were invited to submit comments on the assessment. The Army collected and reviewed the comments received, and they did not result in any changes to the draft FONSI. The document was finalized in April 2005 and now is available on the Web site: www.nscmp-wao.com.

How was the commercial facility selected?

Before the environmental assessment was conducted, Shaw Environmental–Non-Stockpile's waste management contractor–requested several facilities known to handle similar types of waste to bid on hosting the wet air oxidation system. Shaw issued the request for proposal in the summer of 2004 and received bids by mid-December.

Following its own government-approved formal process to seek and evaluate proposals received from commercial facilities, the Shaw evaluation team prepared a report detailing its evaluation of all proposals and a recommendation for contract award. This recommendation was submitted to an independent Source Selection Board for review and approval. The contract was awarded to Texas Molecular Limited Partnership, located in Deer Park, Tex., in April 2005.

For more detail about the site selection process, see the fact sheet located on the Web site www.nscmp-wao.com.

Learn more about Texas Molecular Limited Partnership

At the top of this page is a description and finding of the environmental assessment and some of the activities that were conducted before Texas Molecular Limited Partnership, a commercial treatment, storage and disposal facility, was selected for the installation of the Zimpro® wet air oxidation unit. If you would like to learn more about this company that is hosting this technology for the Non-Stockpile Project, contact:

Frank Marine, Vice President of Environmental Sales and Marketing
Texas Molecular Limited Partnership
2525 Battleground Road
P.O. Box 1914
Deer Park, TX 77536
Phone: 281-930-2525
E-mail: fmarine@texasmolecular.com

You also may want to visit Texas Molecular's Web site at: www.txmolecular.com. Documents related to this task are located at www.nscmp-wao.com.

Non-Stockpile Project public involvement

Since its beginning in 1994, the Non-Stockpile Project has committed to involving the public at every step of its mission. This endeavor has included developing, implementing and monitoring a public outreach program to ensure the exchange of information between the Army and the public. The Non-Stockpile Project has responded to public environmental and health concerns by sharing information and open dialogue with many stakeholders that include members of the general public and public, private and government organizations, including environmental and community advocacy groups.

The Non-Stockpile Project uses many methods to actively inform and involve its stakeholders. These tools include more than 250 information repositories located nationwide, public meetings, fact sheets, targeted mailings, and a Web site. Independent advisory groups that have provided invaluable insight to public issues about the program include the Non-Stockpile Core Group and technical advisory panels.

The Non-Stockpile Project offers opportunities for public involvement, including small-group and other public meetings and workshops to share information with and receive feedback from local communities and interested parties. For more information about or to be added to a mailing list for the Non-Stockpile Chemical Materiel Project, contact Karen Drewen in our public outreach and information office toll-free at (800) 488-0648 or (410) 436-3445, or visit our Web site at www.cma.army.mil/nscmp.aspx.

Removing threats from yesterday's chemical weapons
Protecting our environment and health today

Ending Our Cold-War Legacy

The ***Chemical Weapons Convention*** (CWC) is an international treaty prohibiting the development, production, stockpiling and use of chemical weapons. The treaty came into force on April 29, 1997, 180 days after ratification by 65 countries. It is the product of decades of international deliberations and negotiations on the elimination of weapons of mass destruction.

The Organisation for the Prohibition of Chemical Weapons at The Hague, Netherlands, is responsible for overseeing the implementation of the CWC. Specifically, the CWC forbids each States Party to:

- develop, produce, acquire, retain or transfer chemical weapons;
- use chemical weapons;
- engage in any military preparations to use chemical weapons; and
- assist, encourage or induce in any way, anyone engaging in any activity prohibited under the CWC.

The treaty imposes international economic penalties and other actions for nations failing to ratify the treaty and for participants violating its provisions.

U.S. participation in the CWC

Countries signing the CWC treaty

As of October 16, 2005, 186 countries have signed the CWC, and 174 of them have ratified its terms and principles.

The United States became a States Party when it ratified the CWC on April 25, 1997. As a States Party, the U.S. government is striving to meet CWC destruction deadlines while ensuring public and environmental safety. The U.S. Army's Chemical Materials Agency is currently the international leader in chemical weapons destruction, destroying over 20 percent of its declared chemical weapons stockpile well ahead of the April 2002 treaty deadline. The U.S. has stated that it will destroy 45 percent of its declared inventory by the end of 2007.

Under the requirements of the treaty, the Chemical Materials Agency also is active in destroying ***non-stockpile*** chemical warfare materiel, such as recovered chemical weapons, former chemical weapons production facilities, binary chemical weapons and chemical samples.

The ***Non-Stockpile Chemical Materiel Project*** (Non-Stockpile Project), a part of the Chemical Materials Agency, completed the destruction of all M687 binary projectiles in July 1999 and destroyed 40 percent of former production facilities two years ahead of the 2002 treaty deadline. The U.S. is on track to destroy 100 percent of its former production facilities by April 2007.

Currently, the Non-Stockpile Project is destroying binary chemicals--which are not chemical weapons themselves but are components for producing chemical weapons--under a secondary waste disposal contract. This publication describes some of the activities associated with the Non-Stockpile Project's disposal of secondary waste.

The Non-Stockpile Chemical Materiel Project

The Non-Stockpile Project provides centralized management and direction to the U.S. Department of Defense for the disposal of ***non-stockpile chemical warfare materiel*** in a safe, environmentally sound and cost-effective manner.

A separate specialized branch of the Army is destroying the bulk of the U.S. chemical weapons stockpile at the eight sites where the material is stored. The Non-Stockpile Project is tasked to dispose of smaller quantities of chemical and chemical-related materials that also are subject to the Chemical Weapons Convention. The Non-Stockpile Project conducts research and develops treatment options and destruction plans for chemical warfare materiel that fully comply with all federal, state and local regulations and laws.
with the destruction and disposal of five types of chemical warfare materiel:

- Binary chemical weapons
- Former production facilities
- Buried chemical warfare materiel
- Miscellaneous chemical warfare materiel
- Recovered chemical warfare materiel

This materiel includes the individual components used to make chemical agents, structures and equipment from facilities once used for making chemical weapons such as empty storage tanks, as well as chemical sampling kits and filled and unfilled munitions. The Non-Stockpile Project has developed specialized equipment and processes to safely destroy the materiel for which it is responsible.

These destruction processes generate solid and liquid wastes called ***secondary wastes*** that require disposal. The secondary wastes from the destruction of all five categories of chemical weapons materiel include non-hazardous and hazardous materials.

What's inside

Inside this publication is more detail about the Non-Stockpile Project's activities associated with the destruction and disposal of these non-hazardous and hazardous secondary wastes.

On the back page is information about contacts for getting answers to your questions, joining a mailing list or visiting a web site for more information.

Work In Progress – 11/1/05 – Printed Size: 25" x 22.75" – Confidential Work Product

Disposing of DF and QL neutralent

Types of Non-Stockpile chemical materiel

Non-Stockpile chemical materiel is not included in the chemical weapons stockpile inventory. The five categories of chemical materiel are:

Binary chemical weapons
DF and QL, called binary chemicals, were individual components that had to be mixed with a second chemical inside a munition during flight to a target to make a lethal chemical agent. These binary chemicals have been safely stored and monitored at Pine Bluff Arsenal since the mid-1980s. The United States never used binary chemical weapons.

Former production facilities
These facilities include government facilities that produced chemical agent, its precursors and components for chemical weapons or were locations where munitions were loaded and filled. Currently, the Integrated Binary Production Facility at Pine Bluff Arsenal, which includes several buildings, is being demolished. Several production facilities at other Army locations have already been destroyed.

Miscellaneous chemical warfare materiel
These include unfilled munitions, support equipment and devices designed for use directly in connection with the use of chemical weapons.

Recovered chemical warfare materiel
Recovered chemical warfare materiel include items recovered during range clearing operations, from chemical burial sites and from research and development testing. When suspect chemical warfare materiel is recovered, specially trained personnel are called to the site to assess the content and condition of the materiel and determine if it is safe for storage or transportation.

Buried chemical warfare materiel
This category includes any chemical warfare materiel currently buried. Land burial had been a means of disposing of hazardous materials for many years. U.S. Department of Defense records indicate that chemical warfare materiel was disposed of by land burial until the late 1950s. In most cases, the materiel has been treated (burned or chemically neutralized) before it was buried.

Source: Guide to Non-Stockpile Chemical Warfare Materiel, published by the Non-Stockpile Chemical Materiel Program Core Group, October 2003.

Managing secondary wastes for the Non-Stockpile Project

The destruction of chemical warfare materiel results in the creation of ***secondary wastes***. The Non-Stockpile Project has selected Shaw Environmental as its waste management support contractor to coordinate the safe disposal of these wastes at commercial treatment, storage and disposal facilities.

As the waste management support contractor, Shaw is responsible for: characterizing the waste streams generated; identifying qualified treatment facilities based on the characteristics of the waste; evaluating the identified treatment facilities and selecting one for the treatment and disposal of specific waste streams; and arranging for the safe transport of the waste.

Using alternative technologies

The Non-Stockpile Project has directed Shaw to use alternative technologies whenever that option is appropriate for a waste stream. To facilitate the use of alternative technologies, Shaw conducts or oversees treatability tests of non-incineration treatment technologies on specific Non-Stockpile secondary wastes as appropriate.

Another way that Shaw is promoting the use of alternative technologies for Non-Stockpile secondary wastes is by partnering with a commercial facility, Texas Molecular Limited Partnership in Deer Park, Texas, to install and operate a Zimpro® ***wet air oxidation*** unit to dispose of DF and QL neutralent waste. These wastes are generated from the destruction of binary chemicals and represent a significant amount of secondary waste that the Non-Stockpile Project will generate in completing its mission.

Schedule and non-schedule wastes

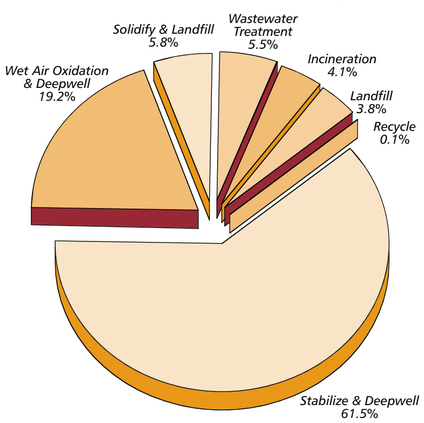
The chemical warfare materiel secondary wastes fall into two broad categories: ***non-schedule wastes*** and ***schedule wastes***. The non-schedule wastes include neutralents and remaining compounds that, although a byproduct of destroying chemical weapons, are free of compounds controlled by the Chemical Weapons Convention.

An estimated 80% (by weight) of the Non-Stockpile Project secondary wastes will be non-schedule wastes. The handling and disposal of these wastes will be consistent with methods used for disposal of typical hazardous and non-hazardous wastes. Federal and state agencies administer regulations for the safe handling and disposal of these wastes. The section across the bottom of this page shows where non-schedule secondary waste comes from.

The schedule wastes refer to materials containing schedule compounds identified in and controlled by the Chemical Weapons Convention treaty. Specifically, binary neutralents—generated from the destruction of the chemicals DF and QL—contain compounds that according to treaty requirements require special handling for destroying chemical weapons.

Proposed waste treatment methods 2004-2007

The Non-Stockpile Project is committed to seeking alternatives for disposing of its waste. This chart shows the anticipated type of disposal method to be used for most of its secondary waste.



Pine Bluff Arsenal

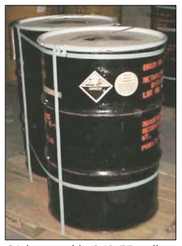
Pine Bluff Arsenal is located in Arkansas, 35 miles southeast of Little Rock and eight miles northwest of the city of Pine Bluff.

Pine Bluff Arsenal currently specializes in the manufacture, testing and repair of chemical and biological defense items (masks, filters and personnel decontamination kits). It is also a storage site for ***stockpile chemical warfare materiel*** and has an associated incinerator for destroying those weapons. Pine Bluff Arsenal produced and stored ***binary chemicals*** and is the site for the Binary Chemical Destruction Facility where these chemicals will be neutralized and destroyed with water. The Arsenal also stores recovered chemical warfare materiel.

This is the Binary Chemical Destruction Facility at Pine Bluff Arsenal where the DF and QL will be neutralized and destroyed with water.

Destroying DF and QL

DF is stored in 56,820 liter-sized canisters and seven 55-gallon drums at Pine Bluff Arsenal.



QL is stored in 249 55-gallon drums.

The reactor housed at the Pine Bluff Binary Chemical Destruction Facility is where the DF or QL will be mixed with water to create a chemical reaction that destroys the DF and QL chemicals. The resulting wastewater from the reaction process–while free of DF and QL–still will contain hazardous byproducts that need additional treatment before final disposal.

The DF and QL will be destroyed in two separate operations. The reactor will be flushed and cleaned between the DF destruction and QL destruction.

DF and ***QL*** are chemicals that could be used to make chemical agent.

DF is a clear liquid that is not flammable and has a strong acid-like odor. The compound can be combined with a second component to form the nerve agent known as ***sarin*** or ***GB***.

QL in its original form is a thick, colorless liquid with a strong fishy smell. QL can be combined with a second compound to make the nerve agent ***VX***.

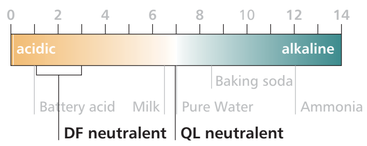
DF and QL neutralent are wastes that result from mixing DF or QL with water. Mixing the DF or QL with water creates a chemical reaction that destroys the DF and QL. The wastewater that comes from this reaction process–while now free of DF or QL–will contain hazardous byproducts that need additional treatment before final disposal.

Since the DF and QL are binary chemicals and are not themselves nerve agent, the resulting neutralent waste will present no risk associated with chemical agent exposure. The DF neutralent is a corrosive acid, however. Like the acids used in car batteries and some industrial applications, this wastewater is capable of causing serious burns to the skin if not properly handled. QL neutralent does not pose any significant safety concerns.

It will take approximately two months to destroy the DF which will generate an estimated 155,000 gallons of DF neutralent. The DF neutralent represents one of the largest amounts of ***secondary waste*** the U.S. Army's ***Non-Stockpile Project*** will produce. It will take approximately two weeks to destroy the QL, which will generate a little more than 87,000 gallons of QL neutralent.

Qualities of the neutralent waste

pH is a measure of how acidic or alkaline a compound is. DF neutralent is very acidic, while QL neutralent is neutral.



What compounds are in DF and QL neutralents?

- DF neutralent will contain about 70% water, about 21% ***methylphosphonic acid***, almost 9% ***hydrogen fluoride*** and trace amounts of ***sodium fluoride***.
- QL neutralent will contain about 82% water, about 10% ***2-(diisopropylamino) ethanol***, slightly more than 5% ***methylphosphinic acid***, about 3% ***ethanol*** and trace amounts of ***sodium hydroxide***.

Using Zimpro® wet air oxidation technology to break down the neutralents

Shaw Environmental proposed using Zimpro® wet air oxidation technology for this additional treatment step on the neutralent because of its proven ability to destroy the hazardous byproducts, including compounds banned by the Chemical Weapons Convention.

Wet air oxidation is an established technology with more than 50 years of commercial history. Originally developed in the 1930s as a process to produce artificial vanilla, it was patented as a waste treatment process in 1950. Since then, it has been used to treat wastewater from refineries and acidic material from industrial plants, as well as for pre-treating sewage sludge.

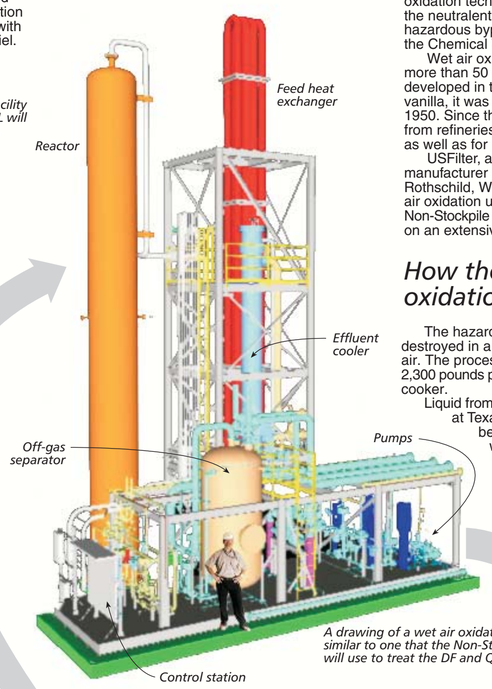
USFilter, a Siemans Water Technologies company and manufacturer of wastewater treatment systems in Rothschild, Wisconsin, is building a modular Zimpro® wet air oxidation unit specifically designed for processing the Non-Stockpile Project neutralent. The unit's design is based on an extensive testing program conducted since 2001.

How the Zimpro® wet air oxidation system works

The hazardous byproducts in the neutralent will be destroyed in a closed vessel using heat and the oxygen in air. The process operates at 572 degrees Fahrenheit and 2,300 pounds per-square-inch pressure, similar to a pressure cooker.

Liquid from this treatment process will be treated further at Texas Molecular (as described in the section below: "What is done with the neutralent wastewater"). The minimal gas resulting from the process will be treated with a thermal oxidation process. The unit will be capable of processing the total volume of Non-Stockpile's neutralent over a nine-month period.

Following the processing of the neutralent, the wet air oxidation unit will be cleaned and dismantled or may be sold to the commercial treatment facility for use on other wastes.



A drawing of a wet air oxidation system similar to one that the Non-Stockpile Project will use to treat the DF and QL neutralent.

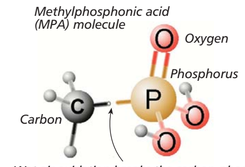
Testing Zimpro® wet air oxidation technology for neutralent breakdown

The Non-Stockpile Project is committed to identifying and evaluating alternative technologies for treatment and disposal of its wastes. The Non-Stockpile Project has evaluated more than 100 technologies and tested nine technologies using similar wastes and actual Non-Stockpile neutralent wastes.

The testing demonstrated that wet air oxidation can achieve greater than 99.9% destruction of the organic or hazardous content of the wastes tested.

Two independent technology evaluation panels identified wet air oxidation technology as an effective treatment process for Non-Stockpile neutralents. The panels consisted of technical experts as well as citizen members familiar with, and active in, the chemical demilitarization weapons destruction programs.

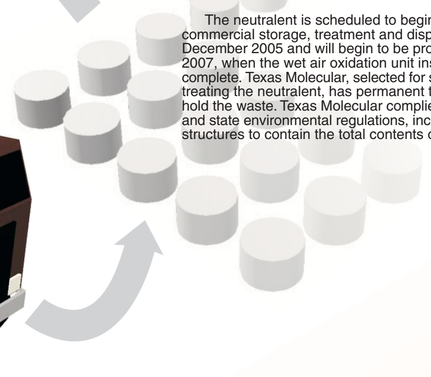
Breaking the carbon-phosphorus bond



Wet air oxidation breaks the carbon-phosphorus bond in the neutralent waste

Two of the byproducts produced when the DF and QL are destroyed are methylphosphonic acid, also known as MPA, and methylphosphinic acid, MP. These acids contain a molecular structure, called a carbon-phosphorus bond, that is of concern to the Chemical Weapons Convention. These compounds can be used as precursor chemicals to producing a chemical weapon. The wet air oxidation process breaks this chemical bond, producing carbon dioxide, a phosphate and water.

Storing the neutralent waste



About 50 tanker-truck loads of neutralent will be shipped to a commercial facility over a six-month period.

The neutralent is scheduled to begin arriving at the commercial storage, treatment and disposal facility in December 2005 and will begin to be processed in March 2007, when the wet air oxidation unit installation is complete. Texas Molecular, selected for storing and finally treating the neutralent, has permanent tanks on site to hold the waste. Texas Molecular complies with all federal and state environmental regulations, including secondary structures to contain the total contents of any spills.

Transporting the waste

The neutralent waste will fill about 50 tanker trucks over a six-month period beginning December 2005, which includes time to change over the equipment in Pine Bluff from DF destruction to QL destruction. It is expected that the destruction process at Pine Bluff Arsenal will produce about 30 tanker truck loads of DF neutralent wastewater and fewer than 20 tanker truck loads of QL neutralent.

Truck tankers lined with corrosive-resistant material will hold the neutralent wastes. The tankers will be hauled by a licensed commercial hazardous waste transporter experienced with safely transporting similar types of wastes daily. All trucks will be placarded according to U.S. Department of Transportation regulations, which is DOT Class 8 for the DF neutralent. Transport of the QL neutralent will require no placarding as it will be classified as a non-hazardous waste.

Tanker trucks will depart every one-to-two days as the chemicals are destroyed at Pine Bluff Arsenal. Travel time from Arkansas to Texas Molecular in Deer Park averages 10 hours, allowing the wastewater to be delivered within 24 hours of shipment. Actual delivery time will depend upon departure times and federal requirements for driver rest periods.

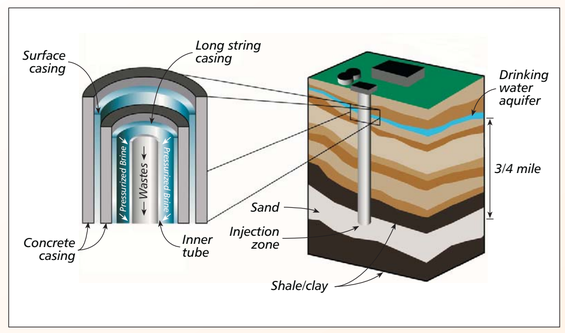
The preferred route to be used travels north-south through eastern Texas and includes U.S. Highway 59 along with two additional routes. These additional routes may be used based on traffic or road conditions at any given time.

From Pine Bluff the preferred route runs southwest on I-30 to Texarkana and includes U.S. Highway 59 south, diverting to Beltway 8 to bypass greater Houston traffic. A second route also is under consideration--a variation of the first proposed route that runs almost completely along US 59 in eastern Texas and diverts to State Route 146 in Polk County, Texas. Finally, an all-interstate route also has been proposed.

What is done with the wastewater

The wastewater from the wet air oxidation process will be disposed at Texas Molecular by deep-well injection, which is described below.

Disposing of the wastewater from the Zimpro® wet air oxidation unit



The drawing on the left shows a typical Class I hazardous injection well, like the two at Texas Molecular, which are operated under current U.S. Environmental Protection Agency regulations. The inner pipe that carries the hazardous waste stream is surrounded by an annulus filled with a pressurized fluid--typically brine--surrounded by a long-string casing. This redundant tubing is surrounded by a concrete casing, surface casing and a final layer of concrete until the tubing is well below any underground source of drinking water.

The right side of the graphic shows the underground formation beneath Texas Molecular, which is ideal for certain types of hazardous wastes. Due to the nature of the geology, the sandstone injection zone is over a mile below the ground surface and isolated from migration by impermeable shale formations above and below. The injection zone also is located thousands of feet below the deepest drinking water. Aqueous wastes, such as the treated DF and QL neutralents that contain little solid or organic content, are typical of millions of gallons of wastes managed by Texas Molecular each year using this technology .

For more information about deep wells see the EPA document, "Underground Injection Wells and Your Drinking Water" EPA 814-F-94-001.

Where non-schedule secondary waste comes from

Shaw Environmental, the waste management contractor for the Non-Stockpile Project through 2007, will dispose of a variety of secondary wastes from several sources. These sources include:

Explosive Destruction System EDS

The Explosive Destruction System (EDS) safely destroys explosive munitions that contain a variety of military chemicals using an environmentally protective process. The system is transportable and enables the U.S. Army to destroy munitions on site that are considered unsafe to transport.

Secondary waste is produced from detonating and destroying a weapon within the EDS. Shaw determines where to dispose of this waste based upon the type of waste produced and the locations of the nearest appropriate treatment and disposal facilities.

The EDS containment vessel is resistant to corrosion, allowing it to treat a wide variety of munitions.

The Explosive Destruction System can be transported to sites where materiel may not be safe to store or transport.

Rapid Response System RRS

The Rapid Response System (RRS) is a state-of-the-art, mobile chemical neutralization system that safely processes the contents of chemical agent identification sets (CAIS).

The RRS consists of an operations trailer and various support trailers. The operations trailer, where chemical neutralization takes place, houses a three-station glove box where operators unpack, sort and neutralize recovered items under negative pressure conditions to prevent accidental vapor releases. Additional trailers provide needed services such as reliable power supply and mobile laboratory support.

The RRS glove box station allows operators to safely unpack, sort and neutralize CAIS items and to handle and package contaminated solid waste associated with CAIS.

The RRS operations trailer vents air through carbon filters, protecting against an accidental vapor release.

Ton Container Decontamination Facility

The Pine Bluff Ton Container Decontamination Facility decontaminates empty steel ton containers stored at Pine Bluff Arsenal, Ark., enabling recycling of their high-grade steel. Since the 1930s, ton containers have been used to store bulk liquids including chemical agent. Equivalent in length and diameter to two stacked 55-gallon drums, a ton container weighs about 1,600 pounds and measures about seven feet in length.

Ton containers are triple-cleaned in an environmentally secure building.

There are about 4,400 empty ton containers on Pine Bluff Arsenal awaiting decontamination and recycling. The facility should complete its mission by 2006.

The ton containers at Pine Bluff Arsenal are believed to be empty, but every one will be handled with a three-step process to ensure complete decontamination of the ton container inventory and so that worker health and the environment are protected should residual liquid or vapor be present. When operations are complete, about 3,500 tons of steel will be available for recycling.

The largest amount of secondary wastewater is produced from this process and is sent to a permitted disposal facility.

Integrated Binary Production Facility Demolition IBPF

Demolition of former chemical weapons production facilities is mandated by the Chemical Weapons Convention, the international treaty requiring the elimination of most chemical materiel and chemical weapons production facilities throughout the world.

Shaw Environmental also is responsible for disposing of the waste produced from the demolition of the buildings that are a part of the Integrated Binary Production Facilities (IBPF) at Pine Bluff Arsenal. This waste will be shipped to and disposed at permitted commercial facilities that are capable of handling the types of hazardous and non-hazardous waste produced from the demolition activities.

IBPF construction was halted before completion as a result of disarmament agreements with the then-USSR.

IBPF facilities processed chemicals that would have combined in flight to a target to form chemical agent.

For more information about the EDS, RRS and SCANS, refer to the information papers and brochures on the Chemical Material Agency's web site: www.cma.army.mil/nscmp.aspx.