Appendix Q: Toxic Release Inventory for Calendar Year 2004

POLLUTION PREVENTION

The Toxic Release Inventory (TRI) provides information about toxic chemicals released into the environment or transferred off-site from a facility. The Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and the Pollution Prevention Act of 1990 required the U.S. Environmental Protection Agency (EPA) to develop and maintain a publicly accessible toxic chemical database. This TRI database, known as TRI Explorer, contains information on:

- Chemicals released into the local environment during the preceding year
- The quantity of each chemical released into the air, water, and land in that year
- How chemical wastes were treated at the reporting facility
- The quantity of chemicals transported away from the reporting facility for disposal, treatment, energy recovery, or recycling.

The primary purpose of TRI reporting is to establish an inventory of toxic chemical releases and inform the public about both routine and accidental releases of toxic chemicals into the environment. Citizens, businesses, and governments can then use this information to work together to be aware of toxic chemicals present in their communities and prepare for potential emergency releases. Although federal agencies are not regulated under EPCRA, Executive Order (E.O.) 13148, "Greening the Government through Leadership in Environmental Management," requires federal facilities to comply with TRI reporting requirements.

Although the reporting period for this Defense Environmental Programs Annual Report to Congress covers Fiscal Year 2005 (October 1, 2004, through September 30, 2005), the TRI reporting period covers Calendar Year (CY) 2004 (January 1 through December 31, 2004). The different time frame exists because 2005 TRI releases are not due to EPA until July 1, 2005.

EPA's original reportable TRI list included 300 toxic chemicals. EPA selected these chemicals based on the criterion that each chemical's toxicity caused serious chronic or acute human health risks and/or adverse environmental effects. EPA can add to the list of TRI-toxic chemicals and can remove, or delist, chemicals according to industry standards and best available scientific information. TRI chemicals are added and deleted through either EPA-initiated action or an independent petition process. EPA's TRI reporting program is constantly evolving through the addition and deletion of toxic chemicals, chemical categories, newly regulated facilities, and new data elements. The 2004 TRI toxic chemical list contained over 600 chemicals and 30 chemical categories.

TRI Reduction Requirements

The Department of Defense (DoD) works hard to comply with TRI reporting requirements and reduce releases of toxic chemicals. E.O. 13148 requires each agency to reduce its reported TRI releases and off-site transfers of toxic chemicals for treatment and disposal by 10 percent annually, or by 40 percent overall by December 31, 2006. The E.O. established 2001 as the baseline year for reduction goals. The 40 percent reduction is on top of the 50 percent reduction DoD already achieved between 1994 and 1999, under E.O 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements." A large portion of TRI-reported releases occur as a byproduct of critical DoD manufacturing and utilities processes. DoD cannot reduce these coincidentally manufactured chemicals, such as nitrate compounds from wastewater treatment and hydrochloric acid from coal-fired heating plants, without expensive, long-term infrastructure projects. Munitions lifecycle-related activities also contribute to TRI releases, particularly those used on ranges and during demilitarization, because these processes do not benefit from standard pollution prevention approaches. A longer-term initiative for reducing TRI releases from munitions involves substituting

chemicals in the munitions during the acquisition design phase. The impacts of such changes will take time to have a significant impact on range TRI release totals.

Reporting TRI Data

Facilities manufacturing, processing, or otherwise using TRI chemicals in excess of reporting thresholds must report releases and waste management activities on chemical inventory forms (Form Rs). Facilities must submit Form Rs to EPA and state authorities on or before July 1 of each year for activities that occurred during the previous calendar year. EPA checks these data submissions for reporting errors and compiles the information into a publicly accessible database.

TRI-reported releases may have been released evenly over the course of the calendar year, intermittently, or in a single event. A facility may revise its TRI-reported data if new information, better data, or more accurate measurement tools become available, even if this occurs after the reporting deadline has passed. Enabling facilities to revise historical data encourages review and recalculation of original data submissions to improve accuracy.

Major Changes to Reporting Requirements

TRI data reported by facilities has changed in the past five years. The most significant changes are described in detail below.

Munitions Demilitarization

In 2000, DoD began reporting releases and off-site transfers from munitions demilitarization activities. Although reporting releases associated with these activities was not a new requirement, DoD deferred reporting until it developed detailed guidance and tools to ensure consistent reporting. The Department maintains a large stockpile of munitions. As munitions reach the end of their useful life, it is necessary for DoD to demilitarize excess, obsolete, or unserviceable munitions. Demilitarization activities vary depending on mission requirements, mission activity levels, and the budget available for demilitarization actions.

Reporting Thresholds for Persistent Bioaccumulative Toxics

In 2000, EPA lowered the reporting threshold for persistent bioaccumulative toxic (PBT) chemicals and added other PBT chemicals to the TRI list of toxic chemicals. PBTs are of concern because they are toxic, remain in the environment for long periods of time, are not readily destroyed, and can accumulate in body tissue.

These lower thresholds require facilities, including DoD installations, to report the amount of PBT chemicals released into air, land, and water at much lower quantities than previously reported. EPA finalized two thresholds based on the chemicals' potential to persist and bioaccumulate in the environment. The two levels include setting manufacture, process, and otherwise use thresholds to 100 pounds for PBT chemicals and to 10 pounds for a subset of PBT chemicals that are highly persistent and highly bioaccumulative. One exception is the dioxin and dioxin-like compounds category that has a threshold of 0.1 grams.

In 2001, EPA published the TRI lead rule classifying lead and lead compounds as PBT chemicals and lowered their thresholds. Lead and lead compounds were on the original TRI toxic chemical list, but with this ruling, EPA reclassified lead and lead compounds as PBT chemicals due to their bioaccumulative properties. Facilities that manufacture, process, or otherwise use more than 100 pounds of lead or lead compounds must now report releases and off-site transfers. Previously, facilities were required to report lead and lead compound releases only if they manufactured or processed more than 25,000 pounds annually or otherwise used more than 10,000 pounds annually.

Reporting from Ranges

Beginning in 2001, DoD reported releases and off-site transfers associated with operational range activities, including training, live fire, and clearance activities. DoD developed and implemented the necessary tools, such as the TRI Data Delivery System, to identify and report releases from munitions activities on operational ranges because these methods were not previously available. The system uses emissions factors and munitions use information supplied by installations to calculate the amount of TRI-listed toxic chemicals released.

The requirement for reporting operational range training activities had widespread implications for DoD. Many installations that previously were not required to file Form Rs found themselves required to report TRI releases and waste management activities. Many National Guard bases and Reserve installations filed Form R reports for the first time in 2001. As a result, the number of DoD facilities reporting TRI releases and off-site transfers increased in 2001.

Specifically, 77 facilities reported in 2001 due to range-only activities. These facilities reported 6.7 million pounds of releases and off-site transfers.

Reporting Thresholds for Coincidental Manufacturing

In September 2001, DoD published a question-and-answer document that clarified the reporting of toxic chemicals coincidentally manufactured during other processes. Nitrate compounds, one of the most common chemicals reported at DoD installations from coincidental manufacture, are often produced during wastewater treatment. Other common chemicals reported from coincidental manufacture include coal combustion byproducts. Facilities that use coal, fuel oil, and other raw materials have the potential to coincidentally manufacture toxic chemicals such as sulfuric acid, hydrochloric acid, hydrogen fluoride, and metal compounds. For example, some DoD installations have coal-fired power plants to provide heating for the base facilities. The presence of chlorine in coal results in the coincidental manufacture of hydrochloric acid during the coal-burning process. Facilities must calculate the amount of TRI chemicals coincidentally manufactured and released as a byproduct and count it towards their TRI threshold.

Some DoD installations had sufficient information to implement this clarification with the 2001 reporting year even though they were not required to do so until the 2002 reporting year. Other facilities, however, were not able to begin reporting until the 2002 reporting period. In 2002, 26 facilities reported nitrate compounds, compared to 14 in 2001. Many of these facilities have since revised their data and submitted updates to EPA to include releases from coincidental manufacturing processes. In 2004, the Navy submitted updated Form Rs for nine facility releases in 2001 and four in 2002 for nitrate compounds and zinc, bringing the total number of facilities reporting nitrate compounds in 2001 to 22. These revisions are included in the following data report.

Deletion of Methyl Ethyl Ketone

In 2005, EPA published a final rule deleting methyl ethyl ketone (MEK) from the list of TRI toxic chemicals. Under EPCRA §313(e), any person may petition EPA to add or delete a chemical from the TRI toxic chemical list based on certain criteria. On May 10, 2005, the D.C. Circuit Court of Appeals ruled in favor of the American Chemistry Council, who petitioned the EPA to remove MEK from the list of toxic chemicals subject to the TRI reporting requirements. The D.C. Circuit Court of Appeals ruled that MEK does not meet the EPCRA toxicity criteria. As a result, facilities are no longer required under EPCRA §313 to report MEK releases and other waste management information beginning with those activities that occurred during the 2004 reporting year. This change is reflected in the 2004 data.

DoD's 2004 TRI Report

Calculating, reporting, and reducing TRI releases and off-site transfers is a priority at DoD facilities. By complying with TRI reporting requirements, DoD can identify:

- Processes that produce releases and off-site transfers of TRI toxic chemicals
- Procedures or processes that require the use of TRI toxic chemicals
- Pollution prevention opportunities.

This analysis helps DoD develop a strategy for reducing releases and off-site transfers of TRI-reportable chemicals. By reducing uses of toxic chemicals, DoD minimizes its impacts on the environment, DoD personnel, their families, and surrounding communities.

In 2004, DoD reported releases and off-site transfers of 15.3 million pounds, an increase of 1.7 percent from the 2001 TRI baseline total. The increase from 2001 through 2004 is primarily due to increased activities to support mission requirements, deployments, and training.

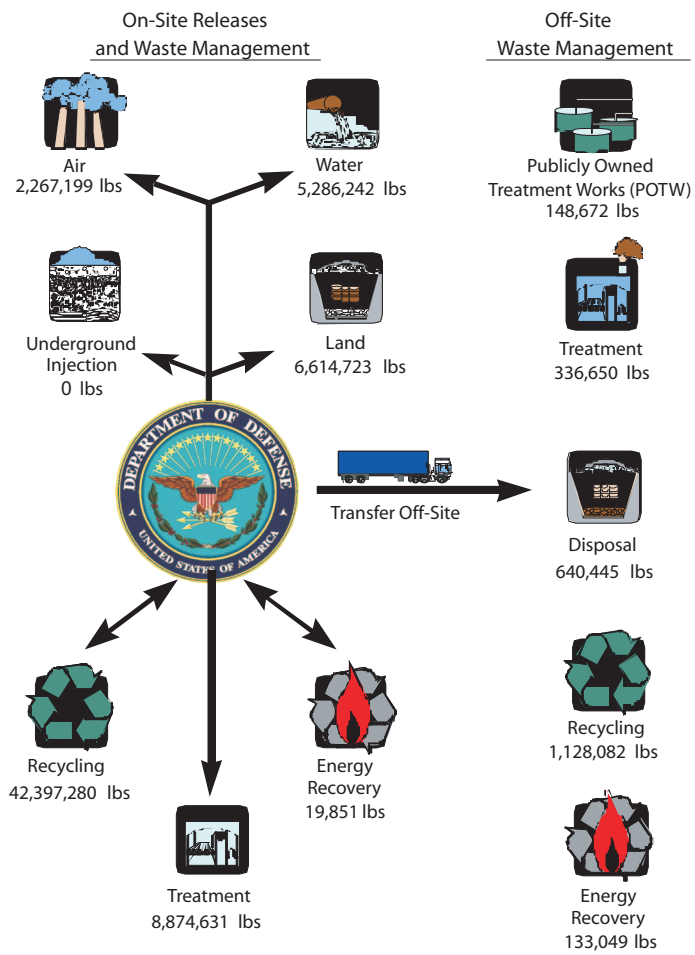
When subtracting the chemical amounts reported from operational range activities, DoD released and transferred off-site 9.7 million pounds of TRI chemicals in 2004. Compared to the 2001 non-range release totals of 10.6 million pounds, 2004 releases represent a decrease of 8.5 percent. Range installation releases accounted for approximately 37 percent of the total DoD reportable releases in 2004, with the Army having the highest percentage of their releases originating from range activities, as shown in Figure Q-1.

Figure Q-1
DoD Component Percentage of 2004 TRI Releases from Ranges

Component	Percentage
Army	47.07%
Navy	2.87%
Marine Corps	37.90%
Air Force	25.62%
Total	**36.82%**

Those TRI releases prior to 2000 were largely air releases from painting, depainting, and cleaning operations.

Figure Q-2
2004 TRI Release Data



Releases to land and water dominate the 2004 TRI data, as shown in Figure Q-2. Releases to land are primarily metals from munitions used on training ranges or treated during open burning and open detonation (OB/OD). Releases to water are mainly nitrate compounds released as a byproduct of wastewater treatment operations. These types of releases have not been the traditional focus of installation pollution prevention programs.

Figure Q-3 shows DoD's toxic chemical releases and off-site transfers since 2001, not including range facilities. This figure demonstrates an increase in the amount of chemicals released or transferred off-site in 2004. The largest increase is from on-site releases to water. Releases to water are mainly from nitrate compounds. More facilities began reporting nitrate compounds as coincidentally manufactured chemicals in 2002.

Figure Q-4 illustrates DoD's overall reportable quantities of toxic chemical releases and off-site transfers, including TRI data from operational range training. In 2001, 69 facilities reported due to range-only activities with 4.4 million pounds of releases and off-site transfers. By 2004, range releases and facilities had increased, with 71 facilities reporting 5.6 million pounds of releases and off-site transfers. This increase is primarily the result of increased activities associated with training and deployments.

Figure Q-3
DoD TRI Quantities (pounds), Not Including Range Releases

Category	2001	2002	2003	2004	2001 - 2004 % change
On-site to Water	4,440,131	5,001,387	4,795,961	5,286,088	19.05%
On-site to Air	2,995,428	2,784,618	2,897,006	2,198,820	-26.59%
On-site Underground Injection	0	0	0	0	-
On-site Land	1,563,549	1,893,674	1,411,830	1,054,000	-32.59%
Off-site to POTW	220,140	270,355	208,522	148,672	-32.47%
Off-site Treatment	474,080	580,222	479,707	336,650	-28.99%
Off-site Disposal	945,823	1,051,353	1,098,039	640,284	-32.30%
Calculated Baseline	**10,639,152**	**11,581,609**	**10,891,065**	**9,664,514**	**-9.16%**

Figure Q-4
DoD TRI Quantities (pounds), Including Range Releases

Category	2001	2002	2003	2004	2001 - 2004 % change
On-site to Water	4,440,158	5,002,923	4,796,003	5,286,242	19.06%
On-site to Air	3,022,163	2,825,150	3,107,041	2,267,199	-24.98%
On-site Underground Injection	0	0	0	0	-
On-site Land	5,897,764	7,624,589	7,879,300	6,614,723	12.16%
Off-site to POTW	220,140	270,355	208,522	148,672	-32.47%
Off-site Treatment	474,080	580,222	479,707	336,650	-28.99%
Off-site Disposal	988,849	1,051,985	1,098,065	640,445	-35.23%
Total	**15,043,155**	**17,355,224**	**17,568,637**	**15,293,931**	**1.67%**

Top Ten Chemicals Reported in 2004

Changes in TRI reporting requirements and the new DoD interpretation of TRI reporting requirements have vastly changed the makeup of the top ten list since the last baseline year for reductions in 1994. The top ten chemicals released in 2004, as shown in Figure Q-5, were similar to 2003's top ten list except for a few differences that include the omission of MEK and xylene, and the addition of toluene and ethylene glycol. All the chemicals on the 2004 top ten list reduced their releases from the previous year except nitrate compounds and toluene.

Figure Q-5
Top 10 CY2004 DoD Chemicals
(pounds released or transferred)

Chemical	
NITRATE COMPOUNDS	5,769,366
COPPER	3,392,679
LEAD COMPOUNDS	1,472,004
LEAD	1,019,091
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	453,569
ALUMINUM (FUME OR DUST)	325,005
DICHLOROMETHANE	322,197
ZINC (FUME OR DUST)	316,906
TOLUENE	203,654
ETHYLENE GLYCOL	201,904

In 2005, the U.S. EPA published in the *Federal Register* a final rule deleting MEK from the list of reportable TRI toxic chemicals. Facilities are no longer required to report MEK on their Form Rs and these releases will not be included in DoD's release analysis. Xylene releases decreased 15 percent in 2004 from 2003, dropping the chemical from the top ten list.

Releases of nitrate compounds and hydrochloric acid continue to remain high due to a DoD interpretation of "coincidental manufacture." While hydrochloric acid remains fifth on the top ten list, it had a 39 percent decrease in 2004 because the number of installations reporting toluene decreased and several installations reported smaller releases.

Reporting of heavy metals such as copper, lead, lead compounds, aluminum (fume or dust), and zinc (fume or dust) occur on operational ranges and during munitions demilitarization activities. DoD's reporting of releases from operational ranges remains high as a result of increased activities associated with training and deployment operations.

Dichloromethane is one of the main components released during aircraft and vehicle maintenance. Industry has not yet developed suitable alternatives to these chemicals, which are integral to operations.

Toluene releases increased 39 percent in 2004 from 2003, because the number of installations reporting toluene increased and several installations reported higher releases. Ethylene glycol appears on the top ten list not because of an increase in its releases (which actually decreased by five percent in 2004), but due to the delisting of MEK and a greater reduction of xylene releases.

Top Ten Installations Reported in 2004

The nature of DoD's 2004 top ten installations releases is similar to the 2001 baseline even though some of the installations have changed. In 2004, installations involved with the lifecycle of munitions (manufacturing, use, and demilitarization) were DoD's largest reporters of TRI releases and off-site transfers, as shown in Figure Q-6.

Figure Q-6
Top 10 CY2004 DoD Installations
(pounds released or transferred)

Installation	
RADFORD ARMY AMMUNITION PLANT	3,057,140
CAMP LEJEUNE	719,992
FORT SILL FIELD ARTILLERY RANGE	541,127
FORT BRAGG RANGE	429,653
ANNISTON ARMY DEPOT	365,832
AIR DEFENSE ARTILLERY CENTER & RANGES FORT BLISS	349,255
CAMP LEJEUNE RANGE	331,866
MCB CAMP PENDLETON	309,485
FORT DIX RANGE	294,245
PEARL HARBOR NAVAL COMPLEX	294,092

Radford Army Ammunition Plant remains the largest contributor to DoD's totals, with over 3 million pounds of TRI chemical releases reported. Pearl Harbor Naval Complex, Camp Lejeune Marine Corps Base, and Camp Pendleton also reported high levels of nitrate compounds. All three installations' releases are attributable to discharges from wastewater treatment plants.

Anniston Army Depot demilitarizes munitions. OB/OD is the most common method for disposing of munitions. Releases from munitions disposal include heavy metals similar to those from operational ranges.

Fort Bliss Air Defense Artillery Center and Ranges, Camp Lejeune Range, Fort Dix Range, Fort Bragg Range, and Fort Sill Field Artillery Range report releases and off-site transfers associated with operational range activities, including range training, live fire, and clearance activities. Range releases generally consist of copper, copper compounds, lead, and lead compounds.

Status of DoD Component Reduction Plans

To measure progress towards reducing TRI releases, DoD requires Components to report the status of reduction plans to meet the E.O. 13148 goal.

Army

While the Army does not anticipate meeting the DoD 40 percent TRI reduction goal mandated by E.O. 13148 by 2006 based on the 2001 baseline, in 2004, the Army's releases showed a significant decline. In 2004, the Army had a 21 percent reduction from 2003 in non-range releases measured against the DoD reduction goal. Approximately half of this reduction was due to the delisting of methyl ethyl ketone from the list of TRI chemicals. A significant decrease was also experienced in 2004 with 3.2 percent reduction in water-dissociable nitrate compounds from 2003. Water-dissociable nitrate compounds are primarily released from the Army's propellant manufacturing, an activity that has experienced a steady increase with the Global War on Terrorism. Other sources of water dissociable nitrate compounds include domestic wastewater treatment; however, future privatization efforts of on-site wastewater treatment plant facilities may eliminate this reporting. Another major decrease was seen in conventional and chemical weapons' demilitarization activities. Non-range activities decreased 70 percent from 2001 as a result of corresponding decreases in conventional weapons demilitarization (primarily OB/OD).

Navy

The Navy will have difficulty reducing its chemical releases to meet the E.O. 13148 reduction goal because of the significant resources needed to reduce or eliminate its current releases. In addition, the Navy already achieved significant reductions of 70 percent between 1994 to 1999, making the E.O. reduction goal even more challenging. In 2001, the Navy TRI baseline releases were 2.6 million pounds. For the Navy to meet the 40 percent reduction goal, the 2006 releases have to be 1.6 million pounds. This will be difficult to achieve without significant investment or the discontinuation of some activities. The 2004 Navy TRI releases remains close to the 2001 baseline at 2.28 million pounds.

The Navy's releases are driven by revised reporting guidance clarifications that include reporting of releases from Transient Refueling, and from Coincidental Manufacture. These releases made up 53 percent of the Navy's 2004 TRI totals. In 2005, wastewater treatment releases and steam plant releases were virtually unchanged from the previous year, while releases from transient refueling decreased from approximately 33,000 pounds to about 1,000 pounds this past year. Reducing coincidentally manufactured releases would require extensive investments in infrastructure. Unless these releases are significantly reduced or eliminated, the 2006 goal will be difficult to achieve. However, the Navy is working to reduce these releases. For example, the Navy is scheduled to replace the coal plant at NAB Little Creek in early 2006, which will reduce the Navy's TRI releases by 300,000 pounds. The implementation of other practices and technologies may help the Navy reach the 2006 E.O. 13148 reduction goal.

Marine Corps

The Marine Corps will have difficulty achieving the E.O. 13148 reduction goal because of its over 90 percent reduction in releases and off-site transfers during the previous reduction period (1994 through 2000) and because of the extensive investment in currently compliant processes that release coincidentally manufactured, reportable chemicals. Specifically, over 84 percent of the Marine Corps' 2001 baseline releases, and 93 percent of its 2004 TRI releases and off-site transfers, consist of coincidentally manufactured nitrate compounds created during water and wastewater treatment, and hydrochloric acid created as a byproduct of coal combustion. Reducing these types of releases would require extensive investments in infrastructure.

As these releases currently comply with water and air permit requirements, funding further reductions are difficult to justify given other environmental compliance priorities. The Marine Corps is executing one compliance-driven project, a new tertiary treatment plant at Marine Corps Base (MCB) Camp Pendleton, which will significantly reduce nitrate compounds in the wastewater effluent. The project, scheduled for completion in 2007, will significantly reduce the Marine Corps nitrate compound totals, as MCB Camp Pendleton's nitrate releases represent approximately 40 percent of the total 2004 Marine Corps nitrate compounds released. However, as noted above, it is unlikely that the Marine Corps will execute other denitrification projects for wastewater treatment systems in the foreseeable future because other systems are currently operating in compliance with National Pollutant Discharge Elimination System permits, the length of the military construction process, and the competition for funds.

Air Force

The Air Force is a key enabler of U.S. national security strategy, operating 77 major and 26 minor installations worldwide and managing approximately eight million acres. It employs 762,012 Active Duty, Civilian, Guard, and Reserve personnel while maintaining an industrial complex that sustains more than one hundred different weapon systems and components. While the Air Force sustains this significant industrial complex, the initial estimates of the Air Force TRI emissions represented only 0.02 percent of the total TRI releases in the United States.

The Air Force sustains, restores, and modernizes its natural infrastructure to ensure operational capability, while maximizing the military value and optimizing the economical, ecological, and community value. Through targeted pollution prevention, weapon system recapitalization, and technology investment, the Air Force achieved almost a 54 percent reduction in TRI chemical releases from 1994 through 2001. Since 2001, in spite of new reporting requirements such as fuel-related chemicals and range emissions being added to TRI reporting, the Air Force has further reduced TRI emissions by 29 percent. These reductions are attributable to proactive management practices, such as the on-site reuse of off-specification jet fuel and off-site transfer of fuel for recycling.
As of 2004, almost 73 percent of the Air Force releases are in two categories, fuels (61 percent) and metals/metal compounds (12 percent), the latter being primarily from range and munitions release activities. The remaining releases are from industrial operations like painting and maintenance operations. Additional reductions in these categories will be challenging due to their mission-critical nature and the current absence of suitable, safer substitutes. In maximizing military value and optimizing the economical, ecological, and community value of its assets, the Air Force will continue to invest in areas that work to reduce TRI releases while ensuring combat capability.

Defense Logistic Agency

The Ozone-Depleting Substances (ODS) Reserve recycling center at Defense Supply Center Richmond (DSCR), Virginia, is the Defense Logistics Agency's (DLA's) only remaining contributor of TRI releases. The ODS Reserve receives, reclaims, repackages, and issues Class 1 chlorofluorocarbons and halons. TRI levels remains fairly steady at DSCR and are based on the quantity of recycled products that were produced. In 2001, the TRI data reported was unusually low because production was halted when the ODS Reserve moved to a more modern facility.

Future Directions

Given the changes in reporting requirements and the great reductions DoD has already achieved, the challenges of meeting further reduction goals are evident. In many cases, pollution prevention solutions are not applicable because of the makeup of current TRI releases—chemicals released in wastewater treatment processes, burning coal activities, refueling operations, and the lifecycle of munitions. Further reduction of TRI releases, especially during wartime, remains a complex challenge.

DoD TABLES

DoD TRI Reportable Quantities
(pounds released or transferred)

Category	2001	2002	2003	2004	2001 - 2004 % change
On-site to Water	4,440,158	5,002,923	4,796,003	5,286,242	19.06%
On-site to Air	3,022,163	2,825,150	3,107,041	2,267,199	-24.98%
On-site Underground Injection	0	0	0	0	-
On-site Land	5,897,764	7,624,589	7,879,300	6,614,723	12.16%
Off-site to POTW	220,140	270,355	208,522	148,672	-32.47%
Off-site Treatment	474,080	580,222	479,707	336,650	-28.99%
Off-site Disposal	988,849	1,051,985	1,098,065	640,445	-35.23%
Calculated Baseline					**1.67%**

Change in Top 10 DoD Chemicals Released and Transferred based on 2001 baseline
(pounds released or transferred)

Chemical	2001	2002	2003	2004	2001 - 2004 % change
NITRATE COMPOUNDS	5,010,112	5,845,229	5,378,439	5,769,366	15.15%
COPPER	2,864,607	3,275,746	4,154,942	3,392,679	18.43%
LEAD COMPOUNDS	1,011,077	1,449,669	1,562,890	1,472,004	45.59%
LEAD	976,690	1,143,543	1,340,277	1,019,091	4.34%
ALUMINUM (FUME OR DUST)	948,188	633,764	438,460	325,005	-65.72%
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS")	854,013	648,271	738,877	453,569	-46.89%
METHYL ETHYL KETONE	469,204	530,798	418,684	Delisted	-
ZINC (FUME OR DUST)	426,034	367,983	521,658	316,906	-25.61%
DICHLOROMETHANE	386,483	391,782	437,515	322,197	-16.63%
COPPER COMPOUNDS	207,014	627,995	224,494	166,867	-19.39%
TOTAL	**13,153,422**	**14,914,780**	**15,216,236**	**13,237,684**	**0.64%**

Change in Top 10 DoD Installations' Releases and Transfers based on 2001 baseline
(pounds released or transferred)

Installation	2001	2002	2003	2004	2001 - 2004 % change
RADFORD ARMY AMMUNITION PLANT	3,162,293	3,047,324	3,078,765	3,057,140	-3.33%
TINKER AFB	479,956	293,605	314,686	110,287	-77.02%
PUGET SOUND NAVAL SHIPYARD	479,773	139,465	158,307	278,741	-41.90%
SIERRA ARMY DEPOT	441,409	859	509	3,477	-99.21%
FORT WAINWRIGHT	440,103	166,503	168,547	148,814	-66.19%
NAB LITTLE CREEK	365,135	271,569	278,476	269,395	-26.22%
PEARL HARBOR NAVAL COMPLEX	359,220	460,229	371,644	294,092	-18.13%
SCHOFIELD BARRACKS/ WHEELER ARMY AIRFIELD	326,667	420,317	312,930	115,489	-64.65%
NELLIS AFB TRAINING RANGE	309,581	422,261	374,558	168,529	-45.56%
TWENTYNINE PALMS RANGE	293,501	261,452	48,813	97,089	-66.92%
TOTAL	**6,657,638**	**5,483,584**	**5,107,235**	**4,543,053**	**-31.76%**

Top 10 CY2004 DoD Chemicals
(pounds released or transferred)

Chemical	
NITRATE COMPOUNDS	5,769,366
COPPER	3,392,679
LEAD COMPOUNDS	1,472,004
LEAD	1,019,091
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	453,569
ALUMINUM (FUME OR DUST)	325,005
DICHLOROMETHANE	322,197
ZINC (FUNE OR DUST)	316,906
TOLUENE	23,654
ETHYLENE GLYCOL	201,904

Top 10 CY2004 DoD Installations
(pounds released or transferred)

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FORT SILL FIELD ARTILLERY RANGE	541,127
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ANNISTON ARMY DEPOT	365,832
AIR DEFENSE ARTILLERY CENTER & RANGES FORT BLISS	349,255
CAMP LEJEUNE RANGE	331,866
MCB CAMP PENDLETON	309,485
FORT DIX RANGE	294,245
PEARL HARBOR NAVAL COMPLEX	294,092

ARMY TABLES

Army TRI Reportable Quantities
(pounds released or transferred)

Category	2001	2002	2003	2004	2001-2004 % change
On-site to Water	3,133,507	3,324,496	3,056,004	2,947,735	-5.93%
On-site to Air	1,334,187	1,359,027	1,549,231	983,529	-26.28%
On-site Underground Injection	0	0	0	0	-
On-site Land	3,787,162	5,039,861	5,891,132	4,730,451	24.91%
Off-site to POTW	7,420	67,026	25,971	22,636	205.06%
Off-site Treatment	185,566	267,714	238,883	176,043	-5.13%
Off-site Disposal	438,124	746,166	718,296	261,622	-40.29%
Calculated Baseline					**2.66%**

Change in Top 10 Army Chemicals Released and Transferred based on 2001 baseline
(pounds released or transferred)

Chemical	2001	2002	2003	2004	2001 - 2004 % change
NITRATE COMPOUNDS	3,497,464	3,852,789	3,424,208	3,313,677	-5.25%
COPPER	1,722,224	2,018,669	3,366,557	2,569,937	49.22%
LEAD	679,642	974,454	1,145,886	848,093	24.79%
ALUMINUM (FUME OR DUST)	665,824	633,764	161,087	97,170	-85.41%
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	634,263	426,860	490,432	226,661	-64.26%
LEAD COMPOUNDS	577,222	826,077	1,001,005	993,573	72.13%
METHYL ETHYL KETONE	176,424	255,037	146,146	Delisted	-
COPPER COMPOUNDS	156,650	577,085	155,658	87,985	-43.83%
NITROGLYCERIN	156,305	155,969	193,003	116,551	-25.43%
DICHLOROMETHANE	122,015	152,265	178,612	94,668	-22.41%

Change in Top 10 Army Installations' Releases and Transfers based on 2001 baseline
(pounds released or transferred)

Installation	2001	2002	2003	2004	2001 - 2004 % change
RADFORD ARMY AMMUNITION PLANT	3,162,293	3,047,324	3,078,765	3,057,140	-3.33%
SIERRA ARMY DEPOT	441,409	859	509	3,477	-99.21%
FORT WAINWRIGHT	440,103	166,503	168,547	148,814	-66.19%
SCHOFIELD BARRACKS/WHEELER ARMY AIRFIELD	326,667	420,285	312,930	115,489	-64.65%
ANNISTON ARMY DEPOT	283,462	719,241	557,770	365,832	29.06%
FORT HOOD RANGE	263,902	263,902	522,621	97,163	-63.18%
FORT BENNING RANGE	251,363	157,270	303,210	77,256	-69.27%
FORT BRAGG RANGE	245,215	403,638	385,454	429,653	75.21%
HOLSTON AAP	235,302	269,214	254,538	107,588	-54.28%
RED RIVER ARMY DEPOT	216,679	147,981	95,730	88,870	-58.99%

Top 10 CY2004 Army Chemicals
(pounds released or transferred)

Chemical	
NITRATE COMPOUNDS	3,313,677
COPPER	2,569,937
LEAD COMPOUNDS	993,573
LEAD	848,093
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	226,661
METHYL ISOBUTYL KETONE	121,097
NITROGLYCERIN	116551
ALUMINUM (FUME OR DUST)	97,170
DICHLOROMETHANE	94,668
COPPER COMPOUNDS	87,985

Top 10 CY2004 Army Installations
(pounds released or transferred)

Installation	
RADFORD ARMY AMMUNITION PLANT	3,057,140
FORT SILL FIELD ARTILLERY RANGE	541,127
FORT BRAGG RANGE	429,653
ANNISTON ARMY DEPOT	365,832
AIR DEFENSE ARTILLERY CENTER & RANGES FORT BLISS	349,255
FORT DIX RANGE	294,245
FORT LEONARD WOOD MANEUVER SUPPORT CENTER RANGE	281,372
FORT IRWIN NATIONAL TRAINING CENTER	251,336
MCALESTER AAP	242,897
FORT CARSON RANGE	242,890

NAVY TABLES

Navy TRI Reportable Quantities
(pounds released or transferred)

Category	2001	2002	2003	2004	2001 - 2004 % change
On-site to Water	891,271	882,194	899,992	966,038	8.39%
On-site to Air	695,862	687,568	711,667	619,995	-10.90%
On-site Underground Injection	0	0	0	0	-
On-site Land	363,280	270,468	527,574	384,370	5.81%
Off-site to POTW	950	1,316	837	17,949	1789.16%
Off-site Treatment	184,477	133,229	63,775	88,949	-51.78%
Off-site Disposal	379,994	166,035	245,211	260,942	-31.33%
Calculated Baseline					**-7.06%**

Top 10 CY2004 Navy Chemicals
(pounds released or transferred)

Chemical	
NITRATE COMPOUNDS	1,037,643
ZINC (FUME OR DUST)	269,286
ALUMINUM (FUME OR DUST)	215,500
COPPER	140,137
N-BUTYL ALCOHOL	110,750
COPPER COMPOUNDS	78,882
ETHYLENE GLYCOL	75,723
XYLENE (MIXED ISOMERS)	64,416
AMMONIA	55,300
N-HEXANE	54,237

Change in Top 10 Navy Chemicals Released and Transferred based on 2001 baseline
(pounds released or transferred)

Chemical	2001	2002	2003	2004	2001 - 2004 % change
NITRATE COMPOUNDS	924,292	1,035,877	935,734	1,037,643	12.26%
COPPER	415,190	146,113	227,078	140,137	-66.25%
ZINC (FUME OR DUST)	365,135	271,451	278,363	269,286	-26.25%
LEAD	126,425	25,690	59,711	44,031	-65.17%
N-BUTYL ALCOHOL	111,743	169,139	127,093	110,750	-0.89%
ETHYLENE GLYCOL	67,452	27,550	17,594	75,723	12.26%
XYLENE (MIXED ISOMERS)	66,959	92,514	83,824	64,416	-3.80%
AMMONIA	55,300	59,799	0	55,300	0.00%
N-METHYL-2-PYRROLIDONE	51,660	21,200	4,133	9,254	-82.09%
COPPER COMPOUNDS	50,364	50,910	68,836	78,882	56.62%

Top 10 CY2004 Navy Installations
(pounds released or transferred)

Installation	
PEARL HARBOR NAVAL COMPLEX	294,092
PUGET SOUND NAVAL SHIPYARD	278,741
NAB LITTLE CREEK	269,395
NSWC CRANE DIV	224,092
NAS CORPUS CHRISTI	219,093
NAS JACKSONVILLE	204,528
NAVAL STATION MAYPORT	160,012
NORFOLK NAVAL SHIPYARD	119,916
COMNAVMARIANAS GUAM	83,376
NAS FALLON, BRAVO 17	78,146

Change in Top 10 Navy Installations' Releases and Transfers based on 2001 baseline
(pounds released or transferred)

Installation	2001	2002	2003	2004	2001 - 2004 % change
PUGET SOUND NAVAL SHIPYARD	479,773	139,465	158,307	278,741	-41.90%
NAB LITTLE CREEK	365,135	271,569	278,476	269,395	-26.22%
PEARL HARBOR NAVAL COMPLEX	359,220	460,229	371,644	294,092	-18.13%
NSWC CRANE DIV	264,937	156,409	366,710	224,092	-15.42%
NAS JACKSONVILLE	152,795	188,561	248,753	204,528	33.86%
NAS CORPUS CHRISTI	151,660	115,496	116,238	219,093	44.46%
NORFOLK NAVAL SHIPYARD	139,901	209,134	122,837	119,916	-14.29%
COMNAVMARIANAS GUAM	125,000	124,731	71,635	83,376	-33.30%
NAVAL STATION MAYPORT	114,457	123,788	202,212	160,012	39.80%
NAWS CHINA LAKE	89,018	60,480	63,203	67,725	-23.92%

MARINE CORPS TABLES

Marine Corps TRI Reportable Quantities
(pounds released or transferred)

Category	2001	2002	2003	2004	2001 - 2004 % change
On-site to Water	338,784	652,454	740,369	1,222,170	260.75%
On-site to Air	132,920	133,359	181,456	144,964	9.06%
On-site Underground Injection	0	0	0	0	-
On-site Land	885,236	1,244,632	708,330	846,123	-4.42%
Off-site to POTW	48	0	0	0	-100.00%
Off-site Treatment	7,291	7,416	30,914	0	-100.00%
Off-site Disposal	46,376	9,273	11,011	1,046	-97.74%
Calculated Baseline					**56.97%**

Change in Top 10 Marine Corps Chemicals Released and Transferred based on 2001 baseline
(pounds released or transferred)

Chemical	2001	2002	2003	2004	2001 - 2004 % change
COPPER	452,758	826,495	314,313	433,950	-4.15%
LEAD COMPOUNDS	370,284	348,540	337,341	363,985	-1.70%
NITRATE COMPOUNDS	338,793	654,266	742,095	1,230,239	263.12%
LEAD	111,662	62,266	68,924	42,982	-61.51%
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS")	65,740	62,406	103,819	55,390	-15.74%
METHYL ETHYL KETONE	28,087	27,770	30,444	Delisted	-
DICHLOROMETHANE	19,741	20,395	14,370	20,018	1.40%
TOLUENE	11,901	12,763	11,878	40,972	244.27%
ETHYLENE GLYCOL	7,506	6,772	30,292	71	-99.05%
XYLENE (MIXED ISOMERS)	3,792	2,819	1,000	3,940	3.90%

Change in Top 10 Marine Corps Installations' Releases and Transfers based on 2001 baseline
(pounds released or transferred)

Installation	2001	2002	2003	2004	2001 - 2004 % change
TWENTYNINE PALMS RANGE	293,501	261,452	48,813	97,089	-66.92%
CAMP PENDLETON RANGE	237,607	188,052	138,740	150,165	-36.80%
CAMP LEJEUNE	212,219	225,179	230,068	719,992	239.27%
CAMP PENDLETON	203,810	254,585	344,959	309,485	51.85%
QUANTICO RANGE COMPLEX	108,000	116,919	118,256	94,941	-12.09%
CAMP LEJEUNE RANGE	84,398	175,760	195,382	331,866	293.22%
PARRIS ISLAND RANGE	67,402	72,575	77,511	78,556	16.55%
MCAS CHERRY POINT	49,787	107,223	169,042	89,537	79.84%
PUULOA TRAINING FACILITY	48,200	6,200	10,673	10,480	-78.26%
CAMP BILLY MACHEN GUNNERY RANGE	46,270	0	47,627	0	-100.00%

Top 10 CY2004 Marine Corps Chemicals
(pounds released or transferred)

Chemical	
NITRATE COMPOUNDS	1,230,239
COPPER	433,950
LEAD COMPOUNDS	363,985
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	55,390
LEAD	42,982
TOLUENE	40,972
DICHLOROMETHANE	20,018
N-METHYL-2-PYRROLIDONE	14,478
METHYL TERT-BUTYL ETHER	6,415
XYLENE (MIXED ISOMERS)	3,940

Top 10 CY2004 Marine Corps Installations
(pounds released or transferred)

Installation	
CAMP LEJEUNE	719,992
CAMP LEJEUNE RANGE	331,866
MCB CAMP PENDLETON	309,485
MCB QUANTICO	189,149
MCB CAMP PENDLETON RANGE COMPLEX	150,165
TWENTYNINE PALMS RANGE	97,089
MCB QUANTICO RANGE COMPLEX	94,941
MCAS CHERRY POINT	89,537
RECRUIT DEPOT PARRIS ISLAND - TRAINING RANGES	78,556
MCB HAWAII	47,996

AIR FORCE TABLES

Air Force TRI Reportable Quantities
(pounds released or transferred)

Category	2001	2002	2003	2004	2001 - 2004 % change
On-site to Water	76,596	143,779	99,607	150,299	96.22%
On-site to Air	903,420	640,405	659,105	514,921	-43.00%
On-site Underground Injection	0	0	0	0	-
On-site Land	862,788	1,917,706	752,263	653,780	-24.22%
Off-site to POTW	211,722	220,171	181,712	108,087	-48.95%
Off-site Treatment	96,746	54,221	146,125	71,658	-25.93%
Off-site Disposal	124,355	277,749	123,548	116,835	-6.05%
Calculated Baseline					**-29.01%**

Change in Top 10 Air Force Chemicals Released and Transferred based on 2001 baseline
(pounds released or transferred)

Chemical	2001	2002	2003	2004	2001 - 2004 % change
COPPER	274,435	309,513	246,994	248,655	-9.39%
ALUMINUM (FUME OR DUST)	271,464	0	0	12,335	-95.46%
NITRATE COMPOUNDS	249,563	302,297	276,402	187,807	-24.75%
METHYL ETHYL KETONE	221,491	211,474	196,010	Delisted	-
DICHLOROMETHANE	208,825	208,745	207,093	181,578	-13.05%
BARIUM	197,364	137,000	115,000	122,000	-38.19%
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS")	154,010	159,005	144,626	171,518	11.37%
GLYCOL ETHERS	114,250	18,215	15,139	15,641	-86.31%
ETHYLENE GLYCOL	108,586	88,166	117,303	104,454	-3.81%
PHENOL	95,780	48,131	53,312	35,123	-63.33%

Change in Top 10 Air Force Installations' Releases and Transfers based on 2001 baseline
(pounds released or transferred)

Installation	2001	2002	2003	2004	2001 - 2004 % change
TINKER AFB	479,956	193,605	314,686	110,287	-77.02%
NELLIS AFB TRAINING RANGE	309,581	422,261	374,558	168,529	-45.56%
HILL AFB (OGDEN ALC)	260,588	336,373	332,612	272,605	4.61%
EIELSON AFB	226,152	213,902	155,080	164,612	-27.21%
ROBINS AFB	220,351	176,146	140,921	105,403	-52.17%
BARRY M. GOLDWATER RANGE LUKE AFB	171,312	20,372	20,832	21,080	-87.69%
AIR FORCE PLANT NO. 4	145,868	166,998	177,836	124,877	-14.39%
EGLIN AFB RANGE	129,333	80,761	17,386	120,131	-7.12%
WRIGHT-PATTERSON AFB	95,623	87,015	92,639	120,058	25.55%
AIR FORCE PLANT NO. 6	65,481	47,360	50,977	56,119	-14.30%

Top 10 CY2004 Air Force Chemicals
(pounds released or transferred)

Chemical	
COPPER	248,655
NITRATE COMPOUNDS	187,807
DICHLOROMETHANE	181,578
HYDROCHLORIC ACID (1995 AND AFTER "ACID AEROSOLS" ONLY)	171,518
BARIUM	122,000
ETHYLENE GLYCOL	104,454
LEAD COMPOUNDS	105,951
LEAD	83,985
XYLENE (MIXED ISOMERS)	72,722
TOLUENE	66,516

Top 10 CY2004 Air Force Installations
(pounds released or transferred)

Installation	
HILL AFB (OGDEN ALC)	272,605
NELLIS AFB TRAINING RANGE	168,529
EIELSON AFB	164,612
AIR FORCE PLANT NO. 4	124,877
EGLIN AFB RANGE	120,131
WRIGHT-PATTERSON AFB	120,058
TINKER AFB	110,287
ROBINS AFB	105,403
ARNOLD AFB	84,446
AIR FORCE PLANT NO. 6	56,119

DEFENSE LOGISTIC AGENCY TABLES

DLA TRI Reportable Quantities
(pounds released or transferred)

Category	2001	2002	2003	2004	2001 - 2004 % change
On-site to Water	0	0	0	0	-
On-site to Air	869	4,791	5,084	3,790	336.13%
On-site Underground Injection	0	0	0	0	-
On-site Land	0	0	0	0	-
Off-site to POTW	0	0	0	0	-
Off-site Treatment	0	0	0	0	-
Off-site Disposal	0	0	0	0	-
Calculated Baseline					**336.14%**

Change in Top 10 DLA Chemicals Released and Transferred based on 2001 baseline
(pounds released or transferred)

Chemical	2001	2002	2003	2004	2001 - 2004% change
BROMOTRIFLUOROMETHANE	471	1,867	3,156	691	46.71%
DICHLORODIFLUOROMETHANE (CFC-12)	220	1,562	726	613	178.64%
BROMOCHLORODIFLUOROMETHANE	80	0	0	1,362	1602.50%
DICHLOROTETRAFLUOROETHANE	55	1,362	1,202	991	1701.82%
TRICHLOROFLUOROMETHANE	43	0	0	133	209.30%

Change in Top 10 DLA Installations' Releases and Transfers based on 2001 baseline
(pounds released or transferred)

Installation	2001	2002	2003	2004	2001 - 2004 % change
DEFENSE SUPPLY CENTER RICHMOND	869	4,791	5,084	3,790	336.14%

Top 10 CY2004 DLA Chemicals
(pounds released or transferred)

Chemical	
BROMOCHLORODIFLUOROMETHANE	1,362
DICHLOROTETRAFLUOROETHANE	991
BROMOTRIFLUOROMETHANE	691
DICHLORODIFLUOROMETHANE (CFC-12)	613
TRICHLOROFLUOROMETHANE	133
POLYCYCLIC AROMATIC COMPOUNDS	0.016
BENZO(G,H,I)PERYLENE	0.002

Top 10 CY2004 DLA Installations
(pounds released or transferred)

Installation	
DEFENSE SUPPLY CENTER RICHMOND	3,790
DEFENSE DISTRIBUTION DEPOT OF SUSQUEHANNA	0.018