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Fact Sheet for the Chairman, Subcommittee on Legislation and National Security, Committee on Government Operations, House of Representatives

May 1990

DEFENSE INVENTORY

Production, Distribution, and Storage of C-4 Explosive

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GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-238708

May 7, 1990

The Honorable John Conyers, Jr.
Chairman, Subcommittee on
Legislation and National Security
Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

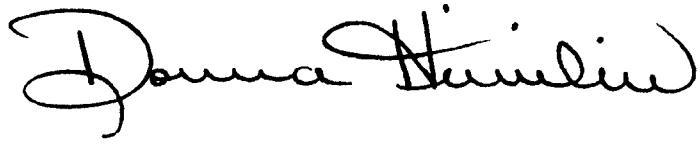
In response to your August 25, 1989, request, we are providing information on your specific questions regarding C-4 explosive (see app. I). You expressed particular concern about C-4 explosive due to its high demand by paramilitary groups and other illicit organizations. The object of this fact sheet is to describe the production, distribution, and storage of C-4 explosives. In a subsequent report, we will address your concerns about the military departments' inventory controls over such sensitive material and the extent of reforms undertaken to safeguard those inventories.

We obtained information about C-4 explosives at the U.S. Army Armament, Munitions, and Chemical Command headquarters. We also contacted key officials involved in the management of C-4 in the Navy, Air Force, and Defense Logistics Agency. We conducted our review from September 1989 to January 1990 in accordance with generally accepted government auditing standards.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this fact sheet until 30 days from its issue date. At that time, we will send copies to interested committees and other congressional members; the Secretaries of Defense, the Army, Navy, and Air Force; the Director, Defense Logistics Agency; and the Director, Office of Management and Budget. We will also make copies available to other parties upon request.

If you have any additional questions, please contact me on 275-8412. GAO staff members who made major contributions to this report are listed in appendix II.

Sincerely yours,



Donna M. Heivilin
Director, Logistics Issues

Answers to Questions Regarding C-4 Explosive

1. What is C-4?

Composition C-4 is a mixture containing Research Development Explosive (RDX)[1] (91 percent) and a non-explosive plasticizer (9 percent). It is dirty white to light brown in color. C-4 is a semiplastic, putty-like material. It can be molded over a wide range of temperatures (-70° F to 170° F) and produces a cutting action when detonated.

C-4's velocity of detonation, the rate at which an explosive changes to a gaseous form, is 26,400 feet per second. Detonation velocities for some other explosive are trinitrotolyene (TNT) (22,600 feet per second); nitroglycerin (25,200 feet per second); and pure RDX (27,400 feet per second). According to an Army field manual, C-4 is 1.34 times as effective as the same weight of TNT.

Table I.1 shows the following munitions items using C-4 as a component:

Table I.1: Munitions Items With C-4 as a Component

Items	Pounds of C-4 used in each item	
C-4 Bulk Composition, Class 2	60.00	(per box)
C-4 Bulk Composition, Class 3	60.00	(per box)
Projected Charge M157, Center Section	5.00	
Charge Assembly, Demolition MK135	20.00	
Charge Assembly, Demolition MK138	20.00	
Charge Assembly, Demolition M37	20.00	
Charge Assembly, Demolition M183	20.00	
Charge, Demolition Block M5A1	2.50	
Charge, Demolition Block C-4 M112	1.25	
Charge, Demolition MK20	2.00	
Charge, Demolition Flex Linear	1,750.00	
Demolition Line Charge M58 (MICLIC)	1,900.00	
Demolition Kit, Projected Charge M173	1,500.00	
Demolition Line Charge M59 (MICLIC)	1,900.00	
Mine, AP M18A1 (Claymore)	1.50	

Composition C-4 in bulk form is not considered an end item. Thus, the above list shows 13 items or components that use C-4 as a component.

[1]RDX (the chemical name is cyclotrimethylenetrinitramine) is a white solid manufactured by the nitration of hexamethylenetetramine. RDX was first prepared in 1899, but its explosive properties were not discovered until 1920. It was used extensively in World War II as an explosive filler in ammunition.

2. Who makes C-4 and is the United States the only producer?

The current producers of C-4 are Holston Army Ammunition Plant in Kingsport, Tennessee, and Expro Chemical Products Inc. of Canada. In addition, the U.S. Army Armament, Munitions, and Chemical Command (AMCCOM) identified the Lone Star, Newport, Sunflower, and Louisiana Army Ammunition Plants as C-4 producers for mobilization.

3. Does C-4 have a legitimate civilian use?

Civilians may use C-4 as an initiator for other explosives or in underwater seismic charges. RDX, the explosive component of C-4, is also used in blasting caps and in other commercial explosives.

4. Is C-4 legally available to civilians?

C-4 is not available for purchase from the Holston Army Ammunition Plant by non-military users. The Defense Reutilization Marketing Office sells C-4 determined to be unusable by the military to non-military users. The Reutilization Marketing Office allows only those persons who have valid end-use permits and are licensed by the Bureau of Alcohol, Tobacco and Firearms to bid on surplus explosives. These sales are conducted through competitive bids. Table I.2 shows the bidders the Reutilization Marketing Office sold C-4 to from February 1986 through September 1987.[2]

Table I.2 Non-Military Purchasers of C-4

Buyer	Pounds of composition C-4 sold
Demex International Ltd.	12,013
Hi Tech Inc.	4,286
Thunderbird Cartridge Co.	1,472
Total	**17,771**

The U.S. Forest Service, the U. S. Department of State, and the U.S. Bureau of Mines have ordered C-4 in the past.

5. Who may legitimately purchase C-4 and under what kinds of restrictions?

[2]According to the Defense Logistics Agency, its Reutilization Marketing Office did not sell any C-4 in fiscal years 1988 and 1989.

The Defense Reutilization Marketing Office allows only those persons who have valid end-use permits and are licensed by the Bureau of Alcohol, Tobacco and Firearms to bid on surplus explosives.

6. What U.S. agencies control the (a) production, (b) storage, (c) distribution, (d) use, and (e) disposal of C-4?

The AMCCOM directorates and Army organizations that have these responsibilities with respect to C-4 and ammunition items that use C-4 at the wholesale[3] level are shown in table I.3.

Table I.3: Organizations With Responsibility for C-4

Production	AMCCOM Production Directorate
Distribution	AMCCOM Defense Ammunition Directorate and AMCCOM Transportation Directorate
Storage	AMCCOM Defense Ammunition Directorate and Depot Systems Command
Use	Various end users control use at the retail level. Specifically, the Army major commands control use for the Army. The other services control their own use.
Disposition	AMCCOM Production Directorate, AMCCOM Defense Ammunition Directorate, and the Defense Reutilization Marketing Office are responsible for disposing unserviceable C-4.

7. What is the shelf life of C-4?

According to AMCCOM officials, if C-4 is properly stored and kept from extreme heat, its shelf life is considered to be indefinite.

8. What parts of the control cycle seem most vulnerable?

According to AMCCOM officials, C-4 explosive and other sensitive materials are most vulnerable to pilferage or loss at the retail level where it is used for training. Maintaining inventory controls at the retail level is difficult. At the user level, C-4 is broken down into smaller quantities (such as individual demolition blocks), thus making it easier to steal. According to the Director of the Defense Ammunition Directorate, there is much better control over inventories at the wholesale level. To further substantiate their position, the Ammunition Directorate officials certified in writing that they have made no inventory adjustments involving

[3]The wholesale system is comprised of the inventory control points, which determine inventory requirements and procure the items; the distribution depots, which receive, store, and issue stock to retail activities; and factories. The retail system is comprised of numerous supply support activities at bases and installations throughout the world.

items containing C-4 over the past 2 years at any wholesale location storing this material.

9. Can C-4 be homemade?

According to AMCCOM officials, C-4 would be hard to make at home because RDX (the explosive component) is difficult to obtain. Production of RDX is difficult, expensive, and requires advanced production techniques.

10. Is the production process dangerous?

AMCCOM officials do not consider the production process to be particularly dangerous. In over 40 years of operation, the Holston Army Ammunition Plant (the manufacturer of C-4) has had only one fatality. C-4 does not require special handling beyond that needed in explosives manufacturing or military use of explosives.

According to an AMCCOM document, C-4 is manufactured by putting wet RDX into a stainless steel mixing kettle and then adding the plastic binder. The mixture is blended by tumbling the kettle until a homogenous mixture is obtained. The resulting dough is then dried with hot air for about 16 hours. The bulk C-4 is then shipped in 60-pound cardboard boxes to ammunition plants or users.

11. How much C-4 was produced in the U.S. during the past 5 fiscal years?

Table I.4: C-4 Produced for Fiscal Years 1985-1989

Pounds

Fiscal Year				
1985	**1986**	**1987**	**1988**	**1989**
4,592,501	5,828,430	5,293,529	3,971,841	8,670,574

Source: AMCCOM, Rock Island, Illinois

12. What is the military requirement for C-4?

Table I.5: Amount of C-4 Used by the Services

Pounds in thousands

	Requirements by service[a]				
	Fiscal year				
Service	**1985**	**1986**	**1987**	**1988**	**1989**
Army	2,000	3,500	5,000	3,900	7,900
Navy	800	0	300	0	700
Marine Corps	2,800	600	0	100	0
Air Force	200	300	0	0	0
Totals	**5,800**	**4,400**	**5,300**	**4,000**	**8,600**

[a]Figures are the total amounts required by the services to produce the items that use C-4.
Source: AMCCOM, Rock Island, Illinois

13. How is C-4 packaged and in what quantities?

C-4 is used as a military explosive for demolitions and as a burster charge in ammunition. Specific uses and packaging for items that use C-4 are as follows:

C-4 Bulk Composition

Bulk C-4 is sent to ammunition plants for use in end items. The C-4 is packaged in 60-pound cardboard boxes. The cost per pound in fiscal year 1989 was $1.81.

Projected Charge M157

The M157 projected charge demolition kit, an antitank mine clearing device, consists of 79 sections, 64 of which contain explosives (the center loading assembly and the impact fuse assembly). The explosive is a linear-shaped charge containing 45 pounds of composition B and 5 pounds of C-4. The kit, when assembled, is about 12 inches wide, 7 inches high, and about 400 feet long. It is pushed into the minefield by a tank and, when detonated, is designed to clear a path approximately 4 to 5 meters wide and 100 meters long. The unit cost for one section of the center loading assembly in fiscal year 1972 was $140. The unit cost for one section of the impact fuse assembly in fiscal year 1972 was $240.

Charge Assembly, Demolition MK135 and MK138	The MK135 and MK138 demolition charge assemblies each consist of 10 2-pound blocks of C-4 in a canvas bag. The Navy uses these items primarily for underwater demolitions but uses them for other purposes as well. The unit cost for these items in fiscal year 1989 was $113.54.
Charge Assembly, Demolition M37	The M37 demolition charge assembly consists of eight M5A1 demolition charge blocks and two priming assemblies for a total explosive weight of 20 pounds. According to an Army field manual, the M37 was used primarily in breaching obstacles or demolishing structures where large demolition charges are required. It has been superseded by the M183 demolition charge assembly. The unit cost for this item in fiscal year 1989 was $30.30.
Charge Assembly, Demolition M183	The M183 demolition charge assembly (satchel charge) consists of 16 M112 demolition blocks and 4 priming assemblies for a total explosive weight of 20 pounds. The complete assembly weighs 57 pounds. According to an Army field manual, the M183 is used primarily in breaching obstacles or for demolition of structures where large demolition charges are required. The unit cost for this item in fiscal year 1989 was $90.06.
Charge, Demolition Block M5A1	The M5A1 demolition block charge consists of 2.5 pounds of C-4 packed in a white plastic container with a threaded blasting cap well in each end. It has been superseded by the M112 block. According to an Army field manual, the M5A1 block was used for cutting and breaching in all types of demolition work. The unit cost for this item in fiscal year 1989 was $9.05.
Charge, Demolition Block C-4 M112	The M112 demolition block charge consists of 1.25 pounds of C-4 packaged in a Mylar-film container with a pressure-sensitive adhesive tape on one surface. According to an Army field manual, it is used for cutting and breaching in all types of demolition work. The unit cost for this item in fiscal year 1990 is $4.33.
Charge, Demolition MK20	The MK20 demolition charge, formerly used by the Navy, consists of 2 pounds of C-4 in a canvas bag. The unit cost for this item in fiscal year 1985 was $4.50. The Navy discontinued the item in June 1989.

Charge, Demolition Flex Linear	The demolition line charge is a U.S. Marine Corps mine clearing line charge containing 1,750 pounds of C-4. The unit cost for this item was not available because it is no longer an active item in the Marine Corps' inventory.
Demolition Line Charge M58, Series Mine Clearing Line Charge	The mine clearing line charge, an antitank/antivehicle device designed to be towed and positioned approximately 50 meters from the leading edge of a minefield, consists of 1,900 pounds of C-4. A rocket projects the linear demolition charge across the minefield, and the charge is then detonated to clear a path approximately 5 meters wide and 100 meters long. The unit cost for this item in fiscal year 1990 is $10,538.58.
Demolition Kit, Projected Charge M173	The M173 projected charge demolition kit, an antitank minefield-clearing device designed to be towed by a vehicle to the edge of a minefield, consists of 1,500 pounds of C-4. A rocket projects the linear demolition charge across the minefield, and the subsequent detonation clears a path in the minefield approximately 4 meters wide and 70 meters long. It has been superseded by the M58 series. According to an Army official, this item will be taken out of the Army's inventory within the next 2 years. The unit cost for this item in fiscal year 1983 was $13,385.
Demolition Line Charge, M59 Mine Clearing Line Charge	The Marine Corps uses the M59 line charge to clear beaches of mines and obstacles. This item consists of three modified M58A1 demolition charges and contains 1,900 pounds of C-4. The unit cost for this item in fiscal year 1989 was $11,602.
Mine, AP M18A1 (Claymore)	The M18A1 anti-personnel mine is a directional mine consisting of 1.5 pounds of C-4. When the mine is detonated, fragments fan outward in a 60 degree arc above the ground. The unit cost for this item in fiscal year 1989 was $77.86.

14. Where is C-4 stockpiled?

Table I.6 shows the locations under AMCCOM's control at the wholesale level where C-4 and munitions items are stored.

Table I.6: Army Storage Facilities for C-4

Army depots
Anniston — Anniston, Alabama
Fort Wingate — Gallup, New Mexico
Letterkenny — Chambersburg, Pennsylvania
Lexington — Lexington, Kentucky
Navajo — Flagstaff, Arizona
Pueblo — Pueblo, Colorado
Red River — Texarkana, Texas
Savanna — Savanna, Illinois
Seneca — Romulus, New York
Sierra — Herlong, California
Toole — Toole, Utah
Umatilla — Hermiston, Oregon
Army ammunition plants
Hawthorne — Hawthorne, Nevada
Holston — Kingsport, Tennessee
Louisiana — Shreveport, Louisiana
McAlester — McAlester, Oklahoma
Milan — Milan, Tennessee
Ravenna — Ravenna, Ohio

Table I.7 shows the locations for the Marine Corps where C-4 and ammunition items are stored.

Table I.7: Marine Corps Storage Facilities for C-4

29 Palms — 29 Palms, California
Augusta Bay — Augusta Bay, Sicily
Cartagena — Rota, Spain
Charleston — Charleston, South Carolina
Cherry Point — Cherry Point, North Carolina
Concord — Concord, California
Crane — Crane, Indiana
Earle — Colts Neck, New Jersey
Fallbrook — Fallbrook, California
Garcia — Diego Garcia
Glen Douglas — Glen Douglas, Scotland
Guantanamo — Guantanamo Bay, Cuba
Hawthorne — Hawthorne, Nevada
Lejeune — Camp Lejeune, North Carolina
Lualualei — Lualualei, Hawaii
Okinawa — Okinawa, Japan
Palermo — Isola Della Femmine, Sicily
Parris Island — Parris Island, South Carolina
Pendelton — Camp Pendelton, California
Quantico — Quantico, Virginia
Rota — Rota, Spain
Sasebo — Sasebo, Japan
Souda Bay — Souda Bay, Crete
Subic Bay — Subic Bay, Philippines
Yorktown — Yorktown, Virginia

15. Has the Department of Defense Office of Inspector General issued any reports on C-4 controls?

Table I.8 shows the reports issued by the Department of Defense Office of Inspector General during fiscal years 1985 through 1989 on internal controls and physical security over arms, ammunition, explosives and other sensitive items.

Table I.8: Department of Defense Inspector General Reports

Number	Title
85-046	Quick-Reaction Report on the Sustainability for U.S. Forces in the Republic of Korea - Munitions Storage
86-006	Sustainability for U.S. Forces in the Republic of Korea - Munitions Storage
88-017	Survey of Conventional Ammunition Asset Reporting

16. Are there any other similar explosives produced in this country?

AMCCOM officials defined other similar explosives as those which include all other explosives that use RDX. The percentage of RDX used in each explosive varies from 60 percent to 98 percent. Holston Army Ammunition Plant manufactures these materials, as shown in Table I.9.

Table I.9: Explosives Similar to C-4

Composition A-3
Composition A-4
Composition A-5
Composition B
Composition C-3
Composition CH-6
CXM-3, CXM-6, CXM-7, CXM-8
Cyclotol
HMX
LX
Octol
PBX
PBXN

Composition A-3

Composition A-3 consists of RDX (91 percent) and desensitizing wax (9 percent). It is used as a high explosive projectile filler in 25 ammunition items.

Composition A-4

Composition A-4 consists of RDX (97 percent) and desensitizing wax (3 percent). It is used as a booster in 11 items.

Composition A-5	Composition A-5 consists of RDX (98 percent) and stearic acid (2 percent). It is used as a high explosive filler in 27 items.
Composition B	Composition B is RDX (60 percent) and TNT (40 percent). It is used as an explosive filler in 41 items.
Composition C-3	Composition C-3 is RDX (77 percent) and an explosive plasticizer (23 percent). Composition C-3 absorbs moisture, is volatile at high temperatures, and hardens at -20 degrees Fahrenheit. It has been replaced by Composition C-4.
Composition Ch-6	Composition CH-6 is RDX (98 percent), calcium stearate (1 percent), graphite (0.5 percent), and polyisobutylene (0.5 percent). It is used as a booster in 28 items.
CXM-3, CXM-6, CXM-7, CXM-8	These explosives consist of RDX and a liquid binder. CXM-3 is RDX with dioctylmaleade. CXM-6 is RDX with nitroplasticizer. CXM-7 is RDX with diocllyladepate. CXM-8 is RDX with isodecatpelarginate. They are used as explosive fills in various ammunition items.
Cyclotol	Cyclotol is RDX (75 to 60 percent) and TNT (25 to 40 percent). It is used as an explosive fill in three items.
HMX	HMX (the chemical name is cyclotetramethylene tetranitramine) is an explosive material similar to RDX. It is used as an explosive fill in 19 items. It is also used in various other compositions.
LX	LX is HMX (95 percent) and estane (5 percent). It is used as an explosive fill in two items.
Octol	Octol is HMX (70 or 75 percent) and TNT (30 or 25 percent). It is used as an oil well formation explosive and as an explosive fill in five items.

PBX 0280

PBX (Plastic Bonded Explosive) 0280 is RDX (95 percent) and polyethylene (5 percent). It is used in five items.

PBXN-5

PBXN-5 is HMX (95 percent) and copolymer of vinylidene fluoride (5 percent). It is used as an explosive fill in 27 items.

Table I.10: Production Quantities of Similar Explosives in the U.S. (Fiscal Years 1989 and 1990)

Pounds in thousands

	Military requirements for similar explosives	
	Fiscal year	
	Actual production 1989	Planned production 1990
Composition A-3	0	0
Composition A-4	47	20
Composition A-5	5,159	3,129
Composition B	1,478	6,464
Composition C-3	0	0
Composition CH-6	0	2,000
CXM-3	0	0
CXM-6	0	0
CXM-7	0	0
CXM-8	0	0
Cyclotol	3,895	2,358
HMX	0	0
LX	0	0
Octol	0	0
PBX	0	0
PBXN	0	0

Source. AMCCOM, Rock Island, Illinois

17. How much of the C-4 produced in the past 5 years can be accounted for, by category (e.g., used up by military, distributed to foreign governments, and stored in current inventory)?

The amount of C-4 produced during the past 5 fiscal years and the military requirement for C-4 are listed in tables I.4 and I.5. Accounting for all of the C-4 produced during the past 5 years is difficult because bulk C-4 is sent to the various ammunition plants to produce the end items which contain C-4. AMCCOM officials said that sometimes production results in unserviceable as well as serviceable items which do not become part of the inventory. Also, inventories of end items at the retail level may reflect items produced in previous years.

For the Army and Marine Corps, we obtained the following information: (1) the serviceable inventories of C-4 items for the past 5 fiscal years, (2) the annual consumption of C-4 items for the past 5 fiscal years, and (3) the authorized acquisition objectives for C-4 items for the past 5 fiscal years.[4] We have similar information from the Air Force and the Navy, which can be made available to authorized personnel. We also obtained from AMCCOM information on the countries that purchased C-4 items during fiscal years 1985 to 1989.

Table I.11: Army Consumption of C-4

number of items

	Fiscal year				
	1985	**1986**	**1987**	**1988**	**1989**
Serviceable inventories[a]					
M18A1 mines	938,500	834,500	650,400	606,200	665,200
M58 MICLIC	0	6	447	2,254	221
M173 projected charge	2	0	0	0	0
M183/M37 demo. chg. ass'y	134,200	125,500	126,000	123,000	122,200
M112/M5A1 demo. blocks	2,703,000	2,864,300	3,306,600	2,167,500	2,068,700
Annual consumption[b]					
M18A1 mines	32,300	22,500	20,100	35,300	25,700
M58 MICLIC	0	0	0	2	0
M173 projected charge	0	0	0	0	0
M183/M37 demo. chg. ass'y	900	3,700	600	1,100	1,800
M112/M5A1 demo. blocks	117,700	118,800	111,000	224,400	185,200
Authorized acquisition objective[c]					
M18A1 mines	287,000	287,000	483,000	1,474,000	1,474,000
M58 MICLIC	46,864	46,816	48,312	42,070	42,070
M173 projected charge	0	0	0	0	0
M183/M37 demo. chg. ass'y	79,000	79,000	105,000	136,000	136,000
M112/M5A1 demo. blocks	1,452,000	1,451,000	1,540,000	2,945,000	2,945,000

[a]Refers to serviceable inventories of these items at the Army wholesale and retail levels.

[b]Refers to the number of items used for training requirements at the Army's retail level. Includes a minimal number of items used for testing and demilitarization at the Army wholesale level.

[c]Refers to the quantity of an item approved for acquisition to equip and sustain forces in peacetime and wartime.

[4]AMCCOM and the Marine Corps provided the data by number of items rather than the pounds of C-4 used in each item because the retail level does not use bulk C-4.

Table I.12: Marine Corps Consumption of C-4

number of items

	Marine Corps				
	Fiscal year				
	1985	**1986**	**1987**	**1988**	**1989**
Serviceable inventories[a]					
M18A1 Mines	45,294	49,457	48,468	43,378	15,910
M58 MICLIC	635	852	852	765	2,078
M59 MICLIC	0	5	0	0	2,524
M183 demolition chg ass'y	151,200	138,683	134,335	120,770	121,769
M112 demolition blocks	27,019	23,592	23,867	23,823	19,641
Annual consumption[b]					
M18A1 Mines	1,151	455	754	1,878	1,037
M58 MICLIC	0	0	51	157	30
M59 MICLIC	0	3	0	15	0
M183 demolition chg. ass'y	1,615	2,133	1,377	2,967	3,978
M112 demolition blocks	0	7,161	5,117	2,805	1,444
Authorized acquisition objective[c]					
M18A1 mines	25,730	27,765	26,543	35,080	38,205
M58 MICLIC	3,361	3,269	3,010	3,928	3,928
M59 MICLIC	2,743	2,729	2,395	2,395	2,395
M183 demolition chg. ass'y	60,136	66,022	59,344	60,763	69,450
M112 demolition blocks	3,348	455	2,841	4,547	4,547

[a]Refers to serviceable inventories of these items at the Marine Corps wholesale and retail levels

[b]Refers to the number of items used for training requirements at the Marine Corps retail level.

[c]Refers to the quantity of an item approved for acquisition to equip and sustain forces in peacetime and wartime.

Table I.13: C-4 Purchased by Foreign Countries (Fiscal Years 1985 to 1989)

Number of M18A1 mines

	Fiscal year				
Country	**1985**	**1986**	**1987**	**1988**	**1989**
Colombia					498
Denmark		402			
Ecuador			648		
El Salvador	16,206	2,394	2,604	3,522	3,024
Indonesia		102			
Morocco		102			
New Zealand				852	
Thailand				4,998	
Turkey		96			
United Kingdom					12
Total	**16,206**	**3,096**	**3,252**	**9,372**	**3,534**

Number of M112 demolition blocks

	Fiscal year				
Country	**1985**	**1986**	**1987**	**1988**	**1989**
Antigua/Barbados			60		
Barbados			60		
Belize					108
Dominica			540		
Ecuador		1,020			
El Salvador	2,700	5,340	4,020	4,650	2,970
Grenada	300		60		
Honduras				12,000	1,140
Jordan			50,010		
St. Christopher - Nevis (UK)			30		
St. Lucia			60		
St. Vincent and Grenadines			30		
Thailand		9,984			
United Kingdom					90
Total	**3,000**	**16,344**	**54,870**	**16,650**	**4,308**

18. Does the quantity of C-4 being produced seem reasonably related to military requirements?

Our analysis shows that over the past 5 fiscal years, average yearly quantities of C-4 produced exceeded the military requirement by less than 1 percent.

Major Contributors to This Report

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