



THE JOINT CHIEFS OF STAFF  
WASHINGTON, D. C. 20301

JCSM-28-68

16 JAN 1968

MEMORANDUM FOR THE SECRETARY OF DEFENSE

Subject: Use of COFRAM (U)

1. (U) It is requested that all holders of this document take extraordinary security precautions in its handling, limiting access to those who must know the contents in order to execute their official duties.

2. (S) COMUSMACV has stated that targets suitable for controlled fragmentation munitions (COFRAM) exist in South and North Vietnam. A significant number of the artillery targets in Vietnam are subject to observed fire. COMUSMACV has further stated that the employment of the air-delivered COFRAM will improve the effectiveness of air strikes against the extended battlefield lines of communication repair and defense forces. Also, he has stated that observed targets are frequently of a fleeting nature and must be attacked with rapid response and surprise with weapons capable of inflicting kills over a large area on the first attack.

3. (S) Recent intelligence indicates that the enemy buildup of forces in and near the DMZ, and in Laos, provides an impetus for immediate consideration of the use of COFRAM in Southeast Asia. The increasingly large enemy redeployments in and around the Khe Sahn area require that every effort be made to increase our defensive firepower so as to avert the major victory the enemy is seeking south of the DMZ.

4. (S) COFRAM submissiled munitions are particularly effective against personnel targets and can take much greater advantage of the element of surprise than can their conventional counterparts.

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TOP SECRET CONTROL
Copy No. <i>94-7-CD-32</i>
Case No. <i>94-75-04</i>
T.S. No. <i>31</i>
Document No. <i>31</i>

~~AUTHORITY FOR ACCESS TO COFRAM INFORMATION REQUIRED~~

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Declassified by Joint Staff  
Date *31 Oct 94*  
*701A 4025*

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a. Field tests indicate that ratios favorable to COFRAM ranging from about 3:1 to more than 25:1 are possible, depending upon the nature and location of the targets. For example, a personnel target 150 meters in radius in open terrain, with half of the troops standing and the other half prone, would require about 140 rounds of 8-inch artillery to kill or disable 30 percent of the enemy. The same results can be achieved with the expenditure of only five 8-inch COFRAM rounds.

b. The Joint Environmental Effects Program has established that COFRAM is significantly more effective than conventional munitions even in dense vegetation, such as in Vietnam.

c. COFRAM artillery and air-delivered munitions have the ability to produce larger areas of more uniform and lethal coverage than current conventional munitions. A volley from a battery of 155mm COFRAM artillery will have a lethal area of coverage 10 to 15 times greater than a similar volley of conventional munitions. In air-delivered COFRAM, the probability of kill ( $P_K$ ) for the CBU 1 and CBU 7 will be approximately two to three times greater than that of the currently used nonsensitive CBU 2 antipersonnel COFRAM under similar employment conditions in Southeast Asia.

5. (S) COMUSMACV has urgently requested that designated items of COFRAM be declassified in order to permit storage in South Vietnam and use against appropriate enemy targets. CINCPAC has concurred, noting that conditions have changed since the present COFRAM policy was established in 1965, and has advised the Joint Chiefs of Staff of his intent to authorize the use of COFRAM subsequent to reclassification.

6. (S) The intelligence community, through Project DOUBLE EAGLE, has observed that many items of munitions being produced abroad show that the fragmentation principle is well understood and that some foreign developments meet every criteria for being designated COFRAM. However, there is a lack of hard intelligence concerning development of COFRAM-like munitions in the USSR and the Chinese Peoples Republic (CPR). Accordingly, two assumptions concerning USSR and CPR development efforts in the fragmentation munition field were considered:

a. No effort has been made by either the USSR or the CPR to develop COFRAM-like munitions.

b. COFRAM-like munitions have been developed, stockpiled, and withheld for fear of compromise but would be made available to the North Vietnamese after the appearance of US COFRAM.

7. (S) The Joint Chiefs of Staff considered the views of CINCPAC and COMUSMACV and weighed the advantages of using COFRAM in Southeast Asia against the disadvantages of compromise and the possible risk of COFRAM-like weapons or other new weapons being used in retaliation by the enemy. The Joint Chiefs of Staff believe that the increased lethality, tactical effectiveness, and lessons to be learned for the guidance of future development of COFRAM outweigh the disadvantages of compromise and the risk of enemy retaliation. Further, the Joint Chiefs of Staff, less the Chief of Staff, US Army, believe that:

a. Certain specified first-generation COFRAM now can be employed advantageously against suitable targets in the following combat areas:

(1) North Vietnam and Laos, to include lines of communication in the extended battlefield.

(2) The Central Highlands.

(3) In and near the DMZ.

b. The initial 120-day period of employment will be designated as a combat evaluation phase and will permit a determination of COFRAM effectiveness in a combat environment. COFRAM artillery impacts in South Vietnam will be limited to observed fires and to counterfires against mortar, recoilless rifle, and rocket attacks but, in any case, only in specific areas known to be sparsely populated. Further, COFRAM will be used only when the benefit of additional effectiveness can be realized; they will not be used for harassing and interdiction fires by artillery. There will be no geographical restriction on the use of COFRAM hand grenades or 40mm cartridges.

c. The introduction of COFRAM does not present any unusual or difficult training problems.

8. (S) The Chief of Staff, US Army, concurs in the use of COFRAM air-delivered munitions in North Vietnam and Laos and in the unrestricted use of COFRAM hand grenades and 40mm cartridges. He does not concur in the use of COFRAM artillery munitions.

9. (S) COMUSMACV has proposed tentative required supply rates (RSRs) based on the use of COFRAM by US forces throughout the theater of operations. These rates cannot be supported on a continuing basis without drawing down on stockpiles in and earmarked for EUCCOM, and in Korea. Consequently, a lesser quantity will be authorized COMUSMACV on a monthly basis. This monthly quantity will support the initial 120-day combat evaluation plus consumption at the same rate for at least 20 months thereafter. Restricting the RSRs to these rates will, with the exception of 8-inch projectiles, protect the stocks in and earmarked for EUCCOM, and in Korea, and provide a pipeline to Southeast Asia, assuming timely decisions are made. A comparison of COMUSMACV's RSRs and the monthly allocations proposed by the Joint Chiefs of Staff is as follows:

	JCS MONTHLY ALLOCATION (THOUSANDS)	COMUSMACV PROPOSED MONTHLY RSRs (THOUSANDS)
105mm cart (M444, M444E1)*	32	43.6
155mm proj (M449)*	9.9	9.9
8-inch proj (M404)*	1.4	2.6
40mm cart (M386, M397, M441)	105	267.8
Hand grenade (M33)	56	56.7
Air-delivered systems:		
(1) CBU 1	0.83	.384
(2) CBU 7 (When Available)	0.5	.944

\* The Chief of Staff, US Army, does not agree with the release of any COFRAM artillery munitions.

Appendix C hereto contains detailed tables depicting the applicable stockpile and cost data. Cost during the evaluation phase is estimated at \$47.1 million (Table 2). Trade-off costs are not included in this amount as they are dependent on the substitution rates experienced; however, the potential monthly saving is shown (Table 3).

10. (S) Subsequent to the 120-day evaluation period, the submission of revised RSRs will be required. The use of COFRAM at the proposed allocation rate will cost an estimated additional \$125.1 million for hardware and facilities through FY 1969, which has not been programmed. This could be reduced to the extent that production substitution proves possible. Production decisions would be required for each munition as shown on Tables 4 to 10, Appendix C.

11. (S) It is possible that the rates proposed by the Joint Chiefs of Staff would not be expended fully due to the operational restrictions imposed. It is more likely, however, that the expected effectiveness of COFRAM will be validated and that greater rates will be recommended. Should COMUSMACV resubmit the tentative rates he has proposed, the estimated cost would be \$14.9 million for facilities and \$10.3 million monthly for nonair-delivered munitions, exclusive of potential saving through substitution. However, some drawdown of 105mm and 8-inch munitions earmarked for other theaters would result. This would not start being corrected until mid 1970, assuming early production decisions (see Appendix D hereto).

12. (S) Should even greater rates be required, the following maximum monthly rates can be supported by protecting stocks in Korea, and those in EUCOM except for 50 percent of the EUCOM stocks of 105mm, reducing the pipeline to the maximum, and including some airlift supply of 8-inch and 105mm:

<u>ITEM</u>	<u>MONTHLY RATE (in 1000s)</u>
105mm cart (M444, M444E1)	45 until May 1970, then 60
155mm proj (M449)	37 through 1969
8-inch proj (M404)	3 until May 1969, then 4
40mm cart (M386, M397, M441)	223 through Dec 1968, then 2
Hand Grenade (M33)	100 through Dec 1969

(These rates assume the same decisions and funding as in the other options; Appendix D amplified.)

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13. (S) The maximum monthly rates which can be supported and protect the EUCOM and Korea stocks of 15,300 are 830 CBU-1s and 500 CBU-7s. Because the CBU-1 will not be produced, only 15 months can be supported at the proposed CBU-1 consumption rate before infringement begins on the EUCOM and Korea stocks. If the total consumption of 1330 air-delivered COFRAM is to be met, CBU-7 production must continue at a higher rate (see Annexes I and J and Appendix C, Tables 9 and 10).

14. (S) The Joint Chiefs of Staff recommend that there be no public announcement of the use of COFRAM. However, since use may occasion public interest, it would be advantageous to have a prepared position to respond to any queries. The Joint Chiefs of Staff suggest that the Assistant Secretary of Defense (Public Affairs) be apprised of the decision to use COFRAM in Southeast Asia so that responses can be prepared.

15. (S) Therefore, the Joint Chiefs of Staff, less the Chief of Staff, US Army, recommend as a matter of urgency that you:

a. Approve the reclassification to "nonsensitive" and the declassification of the following COFRAM: the 105mm projectile (M444, M444E1); 155mm projectile (M449); 8-inch projectile (M404); 40mm cartridges (M386, M397, M441); hand grenade (M33); and the air-delivered systems (CBU 1, CBU 7, and CBU 10) in order to permit their movement into South Vietnam where classified storage space is not available, for employment as described in paragraph 7.

b. Notify the Department of State that COFRAM will be used in Southeast Asia. A proposed memorandum is contained in Appendix A hereto.

16. (S) The Chief of Staff, US Army, concurs in the recommendations above except as they pertain to the 105mm projectile (M444, M444E1), the 155mm projectile (M449), and the 8-inch projectile (M404), and the use of air-delivered COFRAM in South Vietnam. He does not concur in the declassification and subsequent employment of COFRAM artillery munitions and believes that use of air-delivered COFRAM should be limited to North Vietnam and Laos. The rationale supporting the view of the Chief of Staff, US Army, is contained in Appendix E hereto.

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17. (15) Subject to your approval of the recommendations in subparagraph 15a, above, the message in Appendix B hereto will be dispatched to CINCPAC to initiate the movement of COFRAM into Vietnam for use in Southeast Asia under the limitations outlined above.

For the Joint Chiefs of Staff:

~~SIGINT~~

**EARLE G. WHEELER**  
Chairman  
Joint Chiefs of Staff

Attachments

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APPENDIX A

DRAFT

MEMORANDUM FOR THE SECRETARY OF STATE

Subject: Use of COFRAM (U)

1. (U) It is requested that all holders of this paper  
take extraordinary security precautions in its handling,  
limiting access to those who must know the contents in order  
to execute their official duties.

2. (S) In June 1966, the Deputy Secretary of Defense  
replied to a letter by the Deputy Under Secretary of State  
concerning the use of fragmentation munitions in Asia. At  
that time, the tactical advantages to be gained by employing  
our controlled fragmentation munitions (COFRAM) were not  
sufficient to risk disclosure of our advanced technology in  
design and manufacture of these munitions.

3. (S) Since the last review of the policy for the use of  
COFRAM, we have increased greatly our commitment of troops  
in Vietnam and have, as a result, experienced a much greater  
share of combat casualties.

4. (S) The intelligence community has monitored the  
munitions development of other countries and has found  
independent developments of COFRAM-type munitions that are  
similar to those of our own manufacture. Several countries  
have approximated our early developments in infantry and air-  
delivered COFRAM and at least five countries are known to  
be engaged in research and development of artillery munitions.

5. (S) We feel that circumstances are such that we are  
denying our field commanders a tactical advantage by retaining  
the current degree of security to protect a questionable

GROUP 3  
DOWNGRADED AT 12 YEAR INTERVALS;  
NOT AUTOMATICALLY DECLASSIFIED.

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Appendix A

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technological lead. Additionally, future developments could 1  
be improved by lessons learned in the field. Accordingly, 2  
we have made the decision to declassify certain sensitive 3  
first generation COFRAM to permit their employment, under 4  
specified operational limitations, in Southeast Asia. The 5  
initial 120-day period of use will be designated as a combat 6  
evaluation phase. 7

6. (S) The Department of Defense considers a public announce- 8  
ment concerning the use of COFRAM undesirable. However, since 9  
the use of these munitions may occasion public interest, we are 10  
preparing a position to respond to any queries. 11

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APPENDIX B

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ROUTINE

Distribution

FROM: JCS  
 TO: CSA  
 CNO  
 CSAF  
 CMC  
 CINCPAC  
 USCINCEUR

092317Z  
 is  
 JCS IN 35086

CJCS  
 DJS  
 SJCS  
 J-3  
 J-4  
 J-5  
 DIA

INFO: COMUSMACV

SECRET COFRAM JCS JCS send.

Subj: Declassification of Munitions (U)

Ref: CINCPAC 092317Z Oct 67

1. (U) It is requested that all holders of this message  
 take extraordinary security precautions in its handling,  
 limiting access to those who must know the contents in  
 order to execute their official duties.

2. (C) Reference requested declassification of specific  
 items of munitions for movement into Southeast Asia, as  
 necessary.

3. (C) The following munitions are designated as specific  
 exceptions to the sensitive COFRAM category and may be  
 downgraded to UNCLASSIFIED as required for use in Southeast  
 Asia:

- a. 105mm projectile (M444, M444E1).
- b. 155mm projectile (M449).
- c. 8-inch projectile (M404).
- d. 40mm cartridges (M386, M397, M441).
- e. Hand grenade (M33).
- f. Air-delivered systems (CBU 1, CBU 7).

4. (C) It is recognized that there is a shortage of classi-  
 fied storage areas in Vietnam and that the munitions must be  
 distributed to tactical units. It is requested, however, that  
 all practicable measures be taken to avoid premature disclosure  
 or compromise.

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5. ~~(S)~~ CINCPAC is authorized to employ COFRAM of the types 1  
specified above against suitable targets in the following 2  
combat areas: 3

a. North Vietnam and Laos, to include lines of communica- 4  
tion in the extended battlefield. 5

b. The Central Highlands. 6

c. In and near the DMZ. 7

CINCPAC will report to the Joint Chiefs of Staff any additional 8  
COFRAM target areas he recommends. In South Vietnam, all use of 9  
COFRAM will be strictly controlled. COFRAM artillery impacts in 10  
South Vietnam will be limited to observed fires and to counter- 11  
fires against mortar, recoilless rifle, and rocket attacks but, 12  
in any case, only in areas known to be sparsely populated. These 13  
munitions will not be used for harassing and interdiction fires. 14  
Authority to expend artillery munitions may be authorized at 15  
the supported or supporting battalion level in the geographical 16  
areas listed above. However, no geographical restrictions are 17  
placed on the use of hand grenades and 40 mm cartridges. 18

6. ~~(S)~~ The first 120-day period of use is designated as an 19  
initial combat evaluation phase. The tentative required supply 20  
rates (RSR) proposed by COMUSMACV were based on the use of 21  
COFRAM by US forces throughout the theater of operations. 22  
These rates were in addition to the rates for conventional 23  
munitions. In view of logistic constraints, and the 24  
limitations imposed by paragraph 5, a specific quantity of 25  
COFRAM will be allocated for use during the evaluation phase. 26  
Sufficient COFRAM assets are available in PACOM and CONUS to 27  
support the initial 120-day combat evaluation plus consumption 28  
at the evaluation rate for an additional 20 months if 29  
required. Concurrently, with the exception of 8-inch 30

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projectiles, a stockpile can be maintained to protect 1  
stocks in and earmarked for EUCOM, and in Korea, and provide 2  
a pipeline to Southeast Asia when the evaluation of COFRAM 3  
is approved. Subsequent to this evaluation, revised RSRs 4  
will be submitted so that a further examination of the 5  
operational and logistic implications of COFRAM usage 6  
can be made and a determination reached as to its continued 7  
employment in Southeast Asia. Concurrent with submission of 8  
revised RSRs, recommended reductions in RSRs for conventional 9  
munitions, made possible by use of the more effective COFRAM, 10  
will be provided. 11

7. During the initial 120-day period of combat evalua- 12  
tion and for continued use until analysis of the initial evalua- 13  
tion phase permits determination of the best basis for further 14  
planning, COFRAM will be stocked and allocated on the same basis 15  
as conventional munitions (i.e., operating level, safety level, 16  
and in-transit pipeline). Thirty-day allocations, by type 17  
COFRAM, are listed below: 18

<u>ITEM</u>	<u>THOUSANDS</u>	
a. 105 mm cart (M444, M444E1)	32	20
b. 155 mm proj (M449)	9.9	21
c. 8-inch proj (M404)	1.4	22
d. 40 mm cart (M386, M397, M441)	105	23
e. grenade, hand (M33)	56	24
f. air-delivered systems:		25
(1) CBU 1	0.83	26
(2) CBU 7	0.5 (When available)	27

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8. ( ) USCINCEUR will continue to adhere to the special 1  
 access requirement for COFRAM pending notification of indivi- 2  
 dual weapon employment. The Joint Chiefs of Staff will 3  
 provide notification of weapon employment and guidance for 4  
 response to questions from representatives of countries 5  
 signatory to COFRAM Memorandum of Understanding. 6

9. (U) For CSA, CNO, CSAF, CMC: Request publications and 7  
 directives related to above be reviewed and reclassified 8  
 when requested by CINCPAC to permit effective use of 9  
 munitions. GP3 10

WRITER:  
 Colonel L. H. Cummings, USAF  
 General Operations Div., J-3  
 Extension 73776

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APPENDIX C

COST AND STOCKAGE IMPLICATIONS

1. (S) Table 1 depicts the current status of the COFRAM stockpile. It provides theater location of stocks, the production status, and the quantities required for the 120-day combat evaluation period.
2. (S) Table 2 provides a comparison of the unit cost of conventional munitions against the estimated unit cost of COFRAM munitions. These data will be updated subsequent to the 120-day evaluation period.
3. (S) Table 3 provides estimates of potential monthly costs or savings based on the substitution of non-air-delivered COFRAM munitions for their conventional counterparts for various substitution ratios. Air-delivered COFRAM are additive to nonsensitive COFRAM CBU's currently employed in SEA; therefore, a cost and saving comparison for these munitions is not depicted in Table 3.
4. (S) Tables 4 through 10 display stockpile assets as influenced by usage and production over a 24-month period and location and obligation of assets.
5. (S) Table 11 provides a summary of estimated additional funding requirements in FY 1968 and FY 1969 for the COFRAM involved.

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TABLE 1  
COFRAM STOCKPILE STATUS  
(in thousands)

ITEM	INVENTORY OBJECTIVE	TOTAL ON HAND	ACTUAL		REQUIRED TO SUPPORT MACV RSR FOR 120 DAYS	PRODUCTION STATUS	QUANTITY RECOMMENDED FOR EVALUATION <sup>2/</sup>
			EUCOM	PACOM AND CONUS			
<u>Cartridge, 105mm, HE, M-444</u>							
USA	1100	789	94	695 <sup>1/</sup>	96.5	None	<u>128/Total</u> 32/mo
USMC	530	226		226	<u>78.0</u> 174.5		
<u>Projectile, 155mm, HE, <sup>2/</sup>M-449</u>							
USA	1661	1396	553	843	29.4	Start Apr 68 to receive 140 @ 12/mo; 70 allocated to USMC	<u>39.6/Total</u> 9.9/mo
USMC	318	100		100	<u>10.1</u> 39.5		
<u>Projectile, 8" HE, M404</u>							
USA	218	67.5	44	23.5	8.9	20 due by Jul 68 of which 6.5 allocated to USMC	<u>5.6/Total</u> 1.4/mo
USMC	26	12.5		12.5	<u>1.7</u> 10.6		
<u>Cartridge, 40mm, HE, M-397</u>							
USA	3950	2610	695	1915	757.0	Start Feb 68 to receive 800 @ 60/mo; 125 allocated to USMC	<u>420/Total</u> 105/mo
USMC	238	231		231	<u>314.5</u> 1071.5		
<u>Hand Grenade, M-32</u>							
USA	1022	1183	517	666	100.8	Start Feb 68 to receive 400 @ 60/mo	<u>224/Total</u> 56/mo
USMC	412	289		289	<u>126.0</u> 226.8		
<u>CBU - 1 USAF <sup>5/</sup> USN</u>							
		28.7	9.6	18.9 <sup>2/</sup>	1.53	None	<u>3.3/Total</u> .83/mo
		5.0		5.0			
<u>CBU - 7 USAF</u>							
	21.4	1.6 <sup>1/</sup>		2.6 <sup>4/</sup>	3.77	Start Oct 67 @ 0.5/mo thru Dec 68	<u>2.0/Total</u> 0.5/mo (when available)
<u>CBU - 10 USN</u>							
	5.9	4.7	0.0	4.7	None	0.1/mo thru Jan 69	None

NOTES:

- 1/ US Army has experienced deterioration problems with 105mm steel cartridge cases in PACOM storage - several thousand have required replacement, others may require replacement in the future.
- 2/ There is requirement to begin production of 155mm (M483) which is a dual-purpose (antimaterial/personnel). These munitions are more advanced and are intended for EUCOM where the present stocks of M449 projectiles would have little value against troops in APCs.
- 3/ Quantity recommended does not draw down on EUCOM stocks, CONUS stocks earmarked for EUCOM, and stocks in Korea, and provides pipeline to SEA, should the evaluation be approved, except for 8-inch.
- 4/ Produced but not released to stockpile. Testing of sample lots not completed.
- 5/ CBU-1 is an authorized substitute for the CBU-7; total inventory objective reflected for CBU-7 includes the CBU-1.
- 6/ An additional 0.2 munitions are located in Puerto Rico.

TABLE 2  
PRODUCTION COSTS

ITEM	CONVENTIONAL		UNIT COST <sup>1/</sup>	COPRAK		QUANTITY AND REPLACEMENT COST OF STOCKPILE ITEMS EXPENDED-120 DAY USAGE (in 1000s)
	UNIT COST	PROD. RATE/MONTH		PROD. RATE/MONTH	PROD. RATE/MONTH	
Cartridge, 105mm	\$50.00 <sup>2/</sup>	1,700,000	\$135.00 <sup>4/</sup>	60,000	128.0 x \$ 135.00 = \$17,280,000	
Projectile, 155mm <sup>3/</sup>	\$58.00 <sup>2/</sup>	300,000	\$174.00	90,000	39.6 x \$ 174.00 = \$ 6,890,400	
Projectile, 8" HE <sup>3/</sup>	\$95.00 <sup>2/</sup>	62,000	\$297.00	20,000	5.6 x \$ 297.00 = \$ 1,663,200	
Cartridge, 40mm HE	\$ 3.40	1,000,000	\$ 4.85	100,000	420.0 x \$ 4.85 = \$ 2,037,000	
Hand Grenade	\$ 2.50	460,000	\$ 5.35 <sup>5/</sup> (2.35)	175,000	224.0 x \$ 5.35 = \$ 1,198,000	
CBU-1	N/A	N/A	\$3116.00	None <sup>6/</sup>	3.3 x \$3116.00 = \$10,282,800	
CBU-7 <sup>7/</sup>	N/A	N/A	\$3840.00	500	2.0 x \$3840.00 = \$ 7,680,000	
CBU-10	N/A	N/A	\$4050.00	100	Not Applicable	
TOTAL:					\$47,032,600	

- 1/ Prices do not include facilities costs which would vary with any tradeoff between ground conventional ammo production and with total production of all selected items since some components are shared.
- 2/ Approximate cost of a complete round is based on approved percentage of fuze mix.
- 3/ The prices shown do not include propellant or primer.
- 4/ New production in 105mm cartridges should be the M444E1 because it contains 28 submissiles and is significantly superior to the M444.
- 5/ Price shown is for grenade with M217 fuze. Price of \$2.35 would be for grenade with M215 fuze.
- 6/ Would not be replaced.
- 7/ When available.

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Annex B to Appendix C

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TABLE 3

COST COMPARISONS

<u>ITEM*</u>	<u>UNIT COST</u>	<u>MONTHLY EVALUATION FIRE RATE</u>	<u>SUBSTITUTION RATIO (COFRAM/CONVENTIONAL)</u>	<u>COST (-) or SAVINGS (+) PER MONTH**</u>
105mm M444 (M1)	\$135.00 50.00)	32,000	1:1 = 1:2 = 1:3 = 1:10 =	-\$ 2,720,000 -\$ 1,120,000 +\$ 480,000 +\$11,680,000
155mm M449 (M107)	\$174.00 58.00)	9,900	1:1 = 1:2 = 1:3 = 1:10 =	-\$ 1,148,400 -\$ 574,200 0\$ 000,000 +\$ 4,019,400
8- inch M404 (M106)	\$297.00 95.00)	1,400	1:1 = 1:2 = 1:4 = 1:10 =	-\$ 282,800 -\$ 149,800 +\$ 116,200 +\$ 914,200
Hand Grenade M33 w/M217 Fuze w/M215 Fuze (M26 w/M204 Fuze)	\$ 5.35 2.35 2.50)	56,000	1:1 = (5.35:2.50) 1:1 = (2.35:2.50)	-\$ 159,000 +\$ 8,400
40mm M397 (M406)	\$ 4.85 3.40)	105,000	1:1 =	-\$ 152,250

\* Items in parenthesis are conventional

\*\* Facility costs not included

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Annex C to  
Appendix C

941103-536

TABLE 4

**105 MM, M444/M444E1 STOCKPILE DRAWDOWN PLUS PRODUCTION**

(MUNITIONS FIGURES IN THOUSANDS)

TOTAL INV. OBJ.

1,630

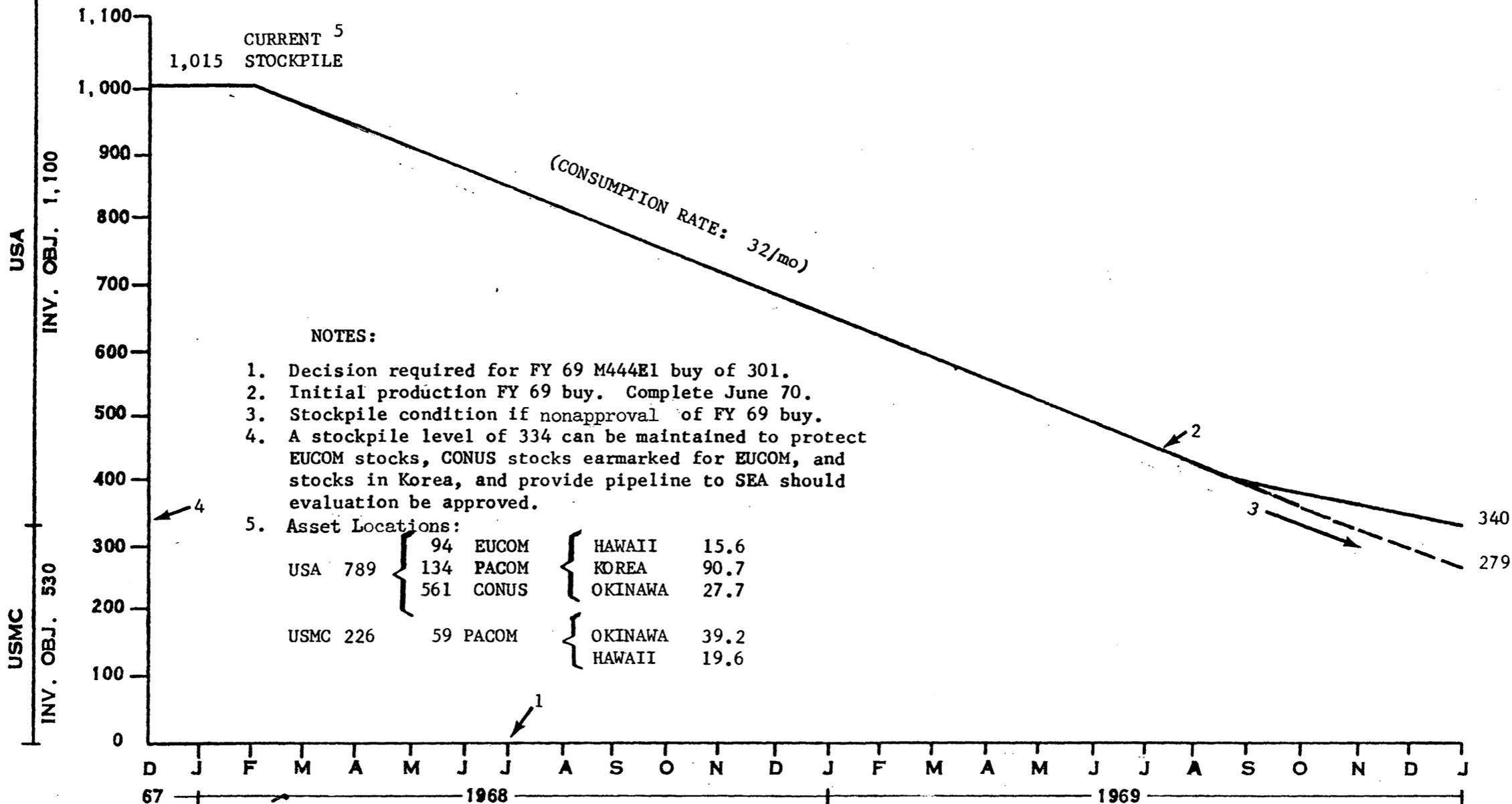
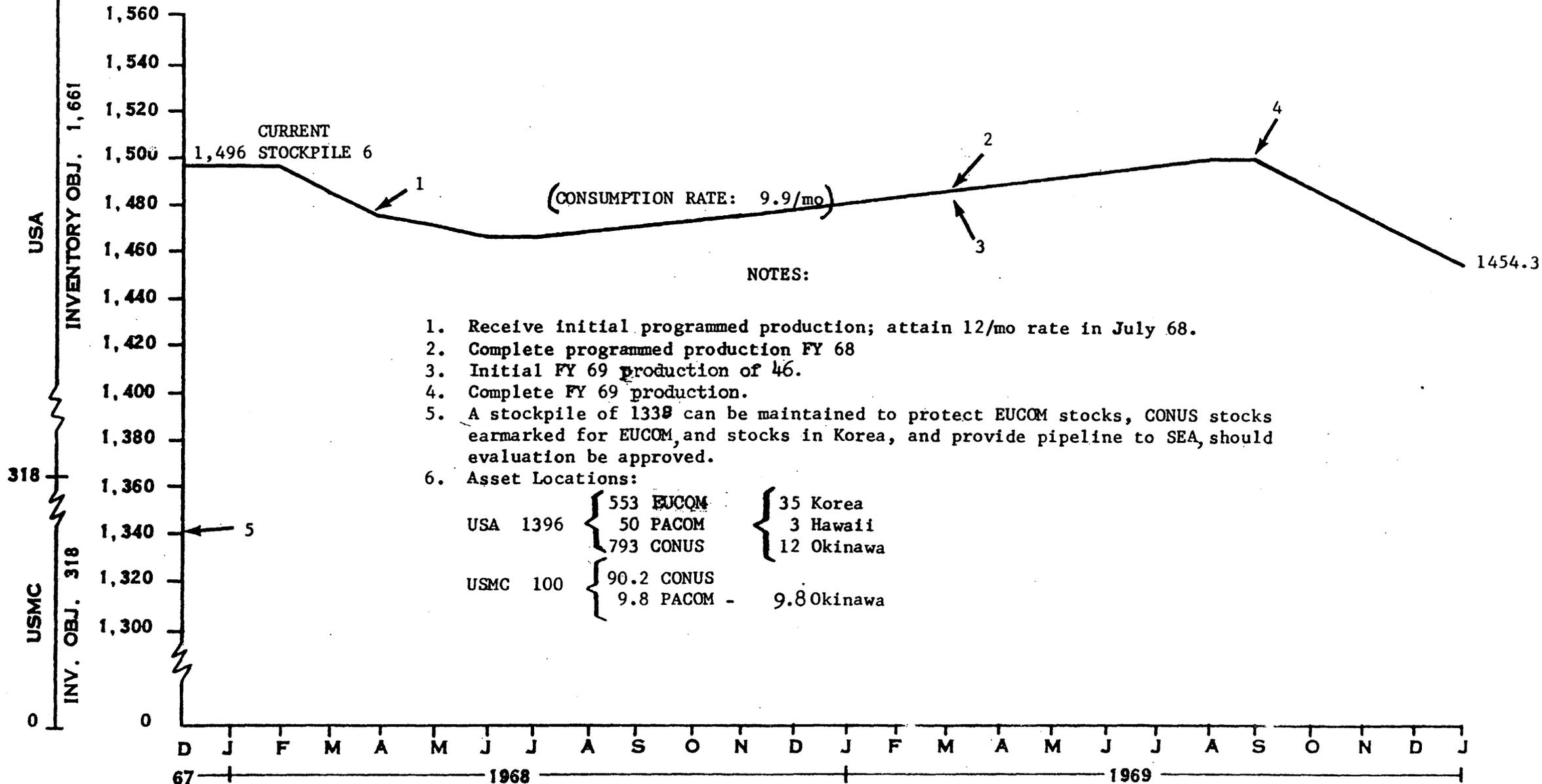


TABLE 5

**155 MM. M449 STOCKPILE DRAWDOWN PLUS PRODUCTION**

(MUNITIONS FIGURES IN THOUSANDS)

TOTAL INV. OBJ. 1,979



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Annex E to Appendix C 41103-538

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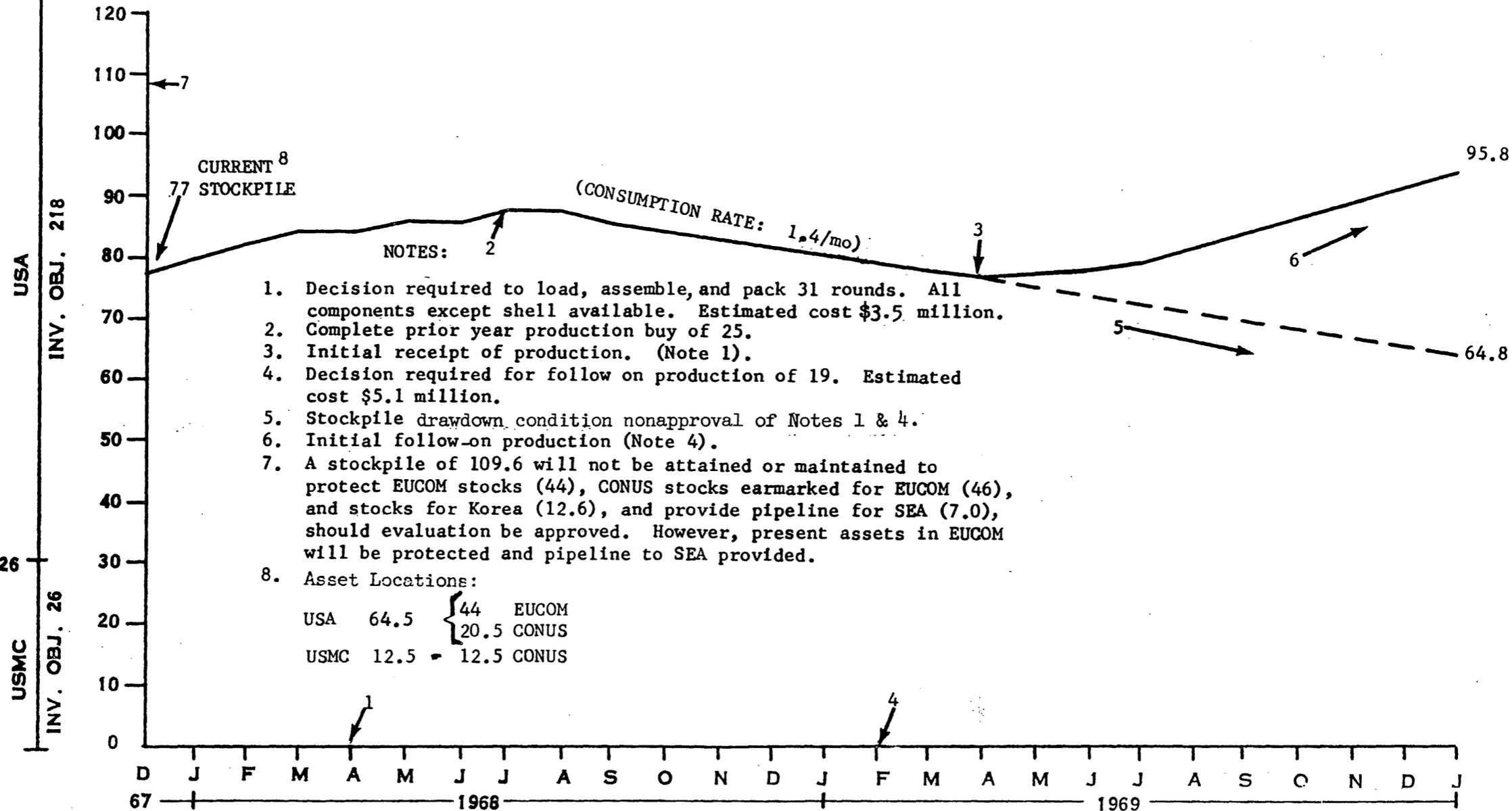
TABLE 6

# 8 IN. M404, STOCKPILE DRAWDOWN PLUS PRODUCTION

(MUNITIONS FIGURES IN THOUSANDS)

TOTAL INV. OBJ

244



13

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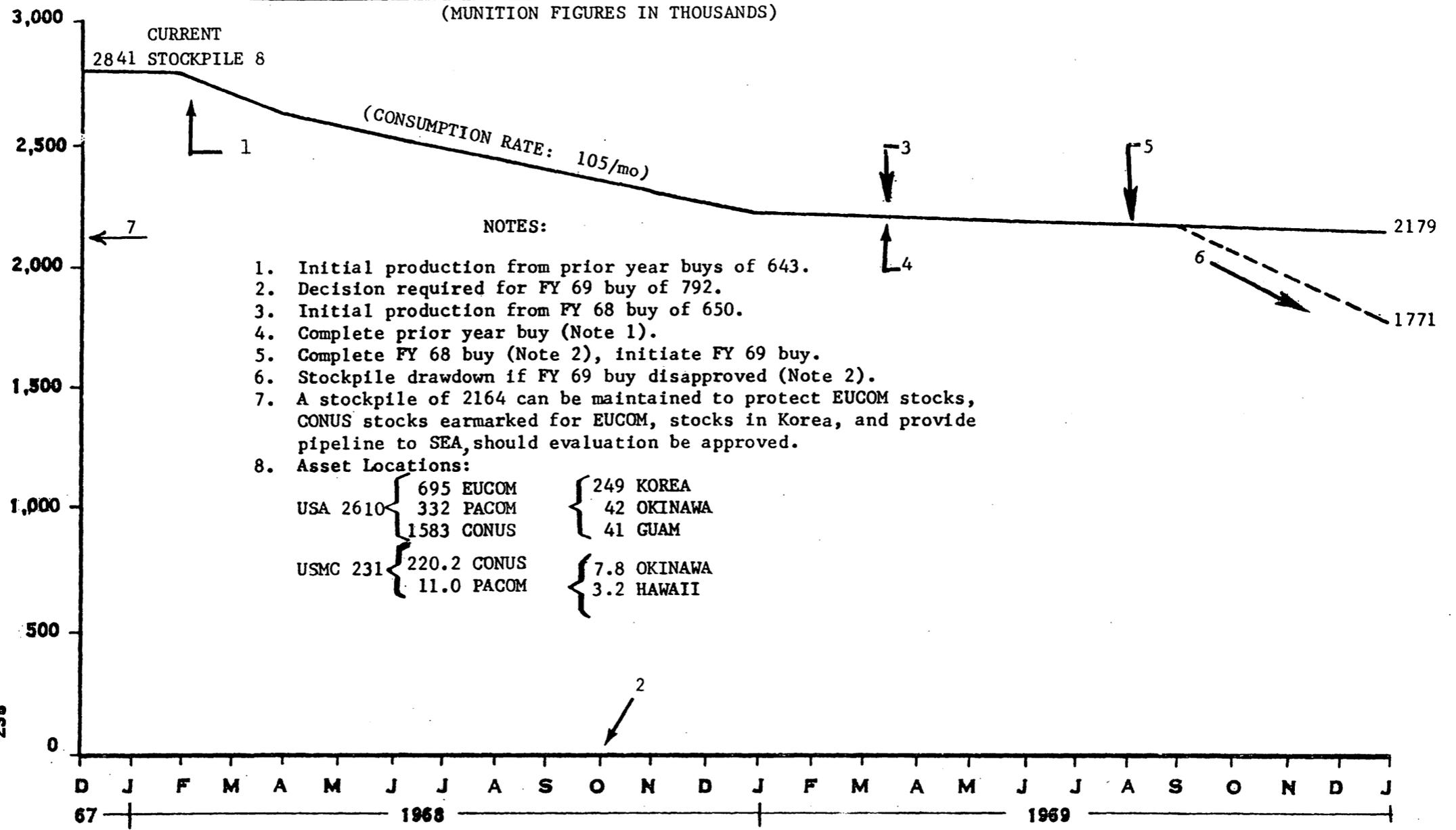
TABLE 7

### 40 MM M386/M397 STOCKPILE DRAWDOWN PLUS PRODUCTION

(MUNITION FIGURES IN THOUSANDS)

TOT. INV. OBJ 4,188

USA INVENTORY OBJ. 3,950  
USMC INV OBJ 238



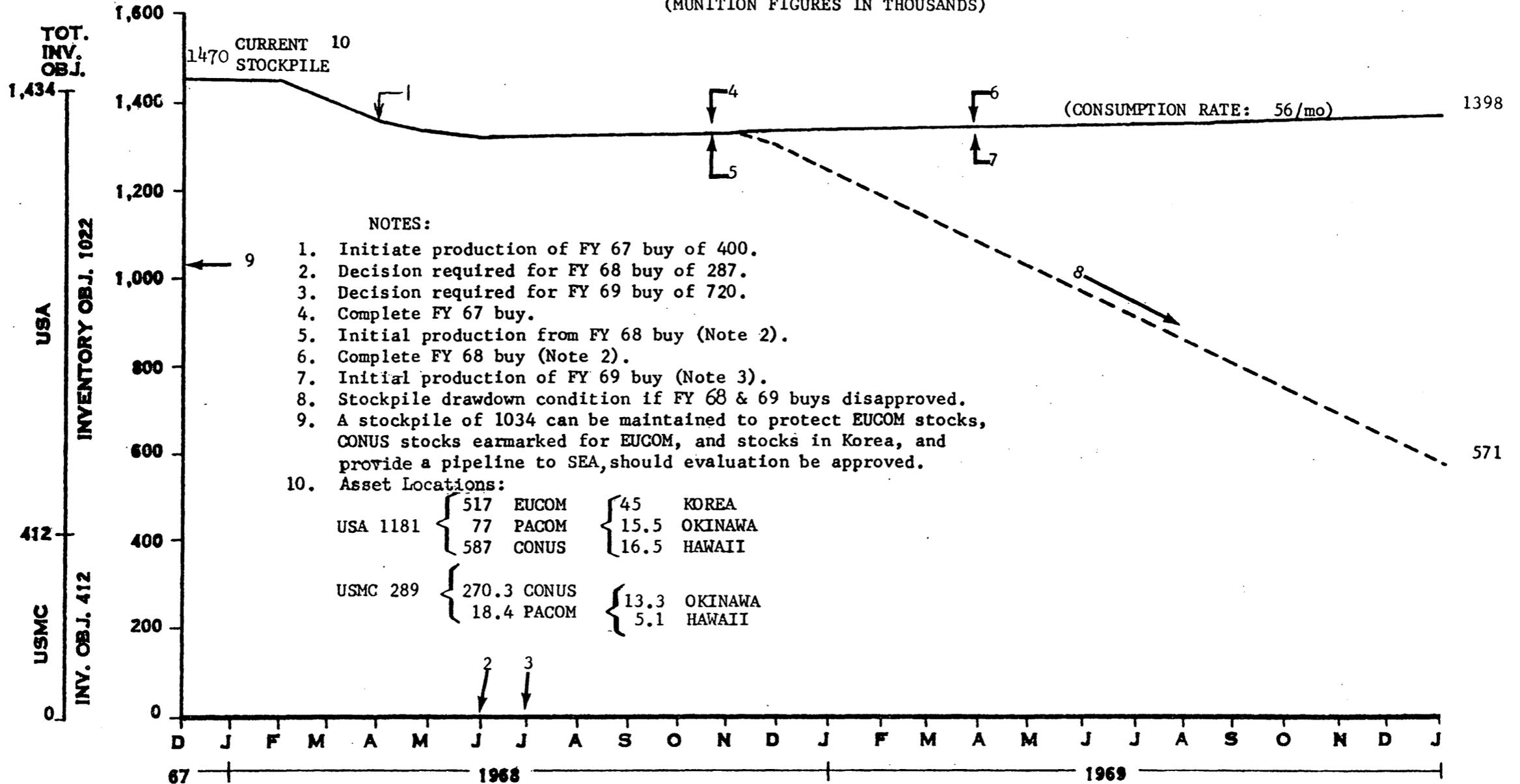
Annex G to Appendix C 041103-546

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TABLE 8

# GRENADE, M33 STOCKPILE DRAWDOWN PLUS PRODUCTION

(MUNITION FIGURES IN THOUSANDS)



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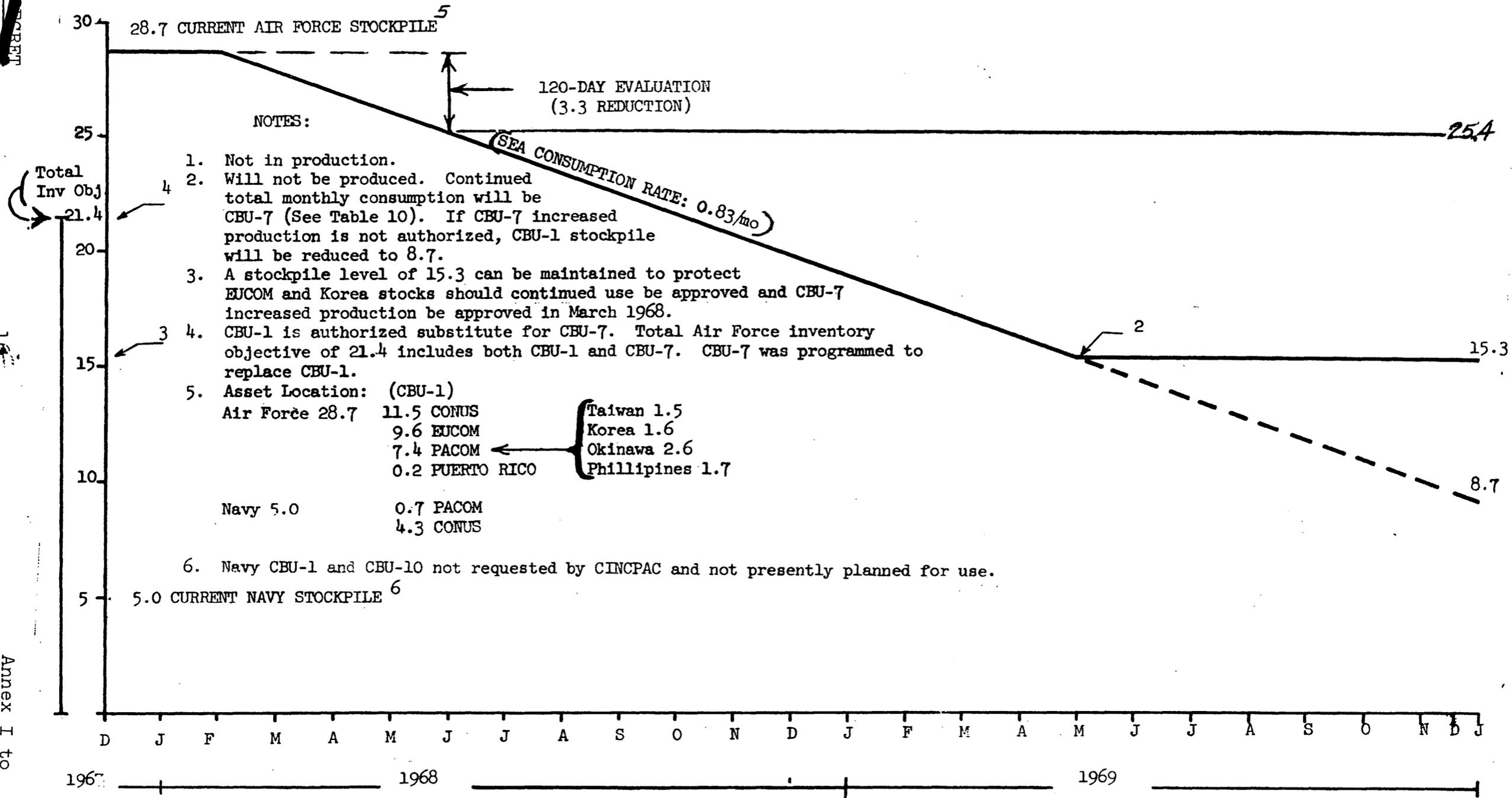
Annex H to  
 Appendix C  
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TABLE 9

CBU-1 STOCKPILE DRAWDOWN PLUS PRODUCTION

(MUNITIONS FIGURES IN THOUSANDS)

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NOTES:

1. Not in production.
2. Will not be produced. Continued total monthly consumption will be CBU-7 (See Table 10). If CBU-7 increased production is not authorized, CBU-1 stockpile will be reduced to 8.7.
3. A stockpile level of 15.3 can be maintained to protect EUCOM and Korea stocks should continued use be approved and CBU-7 increased production be approved in March 1968.
4. CBU-1 is authorized substitute for CBU-7. Total Air Force inventory objective of 21.4 includes both CBU-1 and CBU-7. CBU-7 was programmed to replace CBU-1.
5. Asset Location: (CBU-1)
 

Air Force 28.7	11.5 CONUS	}	Taiwan 1.5
	9.6 EUCOM		Korea 1.6
	7.4 PACOM		Okinawa 2.6
	0.2 PUERTO RICO		Phillipines 1.7
Navy 5.0	0.7 PACOM		
	4.3 CONUS		
6. Navy CBU-1 and CBU-10 not requested by CINCPAC and not presently planned for use.

5.0 CURRENT NAVY STOCKPILE <sup>6</sup>

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TABLE 10

CBU-7 ASSETS AND PRODUCTION 1

(MUNITIONS FIGURES IN THOUSANDS)

NOTES:

1. Current production authorized is total of 7.8 at 0.5/mo. To prevent CBU-1 drawdown below 15.3, production must be increased to 1.33/mo by 1 May 1969.
2. Decision required by 1 March 1968 to fund \$55.9 million for item cost (no additional facilities required) for continued production at increased rate to protect 15.3 level of EUCCOM and Korea CBU-1 stocks.
3. Consumption rate same as production rate so balance on hand remains constant until end CY 68, or until new production commences, if Note 2 is approved.
4. Consumption rate same as production rate if decision in Note 2 is approved.
5. CBU-1 is authorized substitute for CBU-7. Total USAF inventory objective of 21.4 includes both CBU-1 and CBU-7. CBU-7 was programmed to replace the CBU-1.
6. Not released to stockpile. Testing of sample lots not completed on total quantity.
7. Increased production begins.

Total  
Inv Obj

21.4

5

5

4

3

2

1

(CONSUMPTION RATE 0.5/mo)

1.6 CURRENT CONUS ASSETS 6

3

2

4

(CONSUMPTION RATE 1.33/mo)

7

D J F M A M J J A S O N D J F M A M J J A S O N D J  
1967 1968 1969

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Appendix C

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TABLE 11  
SUMMARY

ESTIMATED ADDITIONAL FUNDING REQUIREMENTS  
(Millions of Dollars)

	FY 68		FY 69	
	Hardware	Facilities	Hardware	Facilities
<u>Ground Munitions:</u>				
105mm M444	0	0	40.6	11.0
155mm M449	0	0	0	0
8" M404	1.0	2.5	5.1	0
40mm M397	0	0	3.8	0
Grenade M33	1.5	0	3.7	0
	<hr/>	<hr/>	<hr/>	<hr/>
TOTAL	2.5	2.5	53.2	11.0
<u>Air-Delivered:</u>				
CBU-7	12.1		43.8	

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Appendix C  
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APPENDIX D

IMPACT OF HIGHER RSRs FOR COFRAM USE

1. (TS) COMUSMACV RSR

1

a. Cost

2

<u>WEAPON</u>	<u>ROUNDS/ MO</u>	<u>MONTHLY COST (in millions)</u>	<u>FACILITIES (in millions)</u>	
105mm cart (M444, M444E1)	43,625	5.9	11.0	5
155mm proj (M449)	9,900	1.9	0	6
8-inch (M404)	2,650	.9	3.5	7
40mm cart (M386, M397, M441)	267,875	1.3	.4	8
Hand Grenade (M33)	56,700	.3	0	10
		<u>10.3</u>	<u>14.9</u>	11

These do not include potential savings if substitution proves possible.

b. Risks. Starting in June 1969, reserve stocks (404,000) of 105mm COFRAM for EUCOM (94,000), Korea (90,000), and the pipeline (220,000) would be drawn down to a low of 167,000 in May 1970 when production would start exceeding consumption. The stockpile objective for the 8-inch projectile has not been reached, and this RSR would require use of CONUS stocks earmarked for EUCOM, Korea or the pipeline in January 1969. Assuming a 1 April 1968 decision, these stocks would start being replaced in June 1969. The RSR for all other nonair-delivered munitions can be supported without significant problems, though early production decisions need to be made.

2. (TS) Maximum Rates That Can Be Supported. Assuming similar production decisions and facilities funding as for other options, maximum drawdowns on other stocks except those in EUCOM (50% only of 105mm protected), for Korea, and curtailed pipeline, the following are the maximum monthly rates that can be supported:

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- a. 105mm. Protecting Korean stocks (91,000) only 1  
50,000 for EUCOM, and drawing down all other stocks, a 2  
rate of 45,000 a month can be supported until May 1970 3  
when production will support a rate of 60,000 a month. 4  
Some expedited supply will be required mid 1969. 5
- b. 155mm. Protecting EUCOM (553,000) and Korean 6  
(35,000) stocks, and drawing down all others, a rate 7  
slightly in excess of 37,000 can be supported through 8  
September 1970 under current funding. An additional 9  
production decision will be required to continue after 10  
this date. 11
- c. 8-inch. Protecting EUCOM (44,000) and Korean 12  
(12,000) stocks, and drawing down all others, a 3,000 a 13  
month rate can be supported until May 1969 and 4,000 a 14  
month thereafter. Some expedited delivery will be 15  
required early 1969 and additional production decisions 16  
will be required to continue the rate after 31,000 are 17  
produced. 18
- d. M79 Grenade. Protecting EUCOM (695,000) and Korean 19  
(249,000) stocks, and drawing down all others, a rate of 20  
223,000 through December 1968 and 263,000 thereafter can 21  
be supported. 22
- e. Hand Grenade. Protecting EUCOM (517,000) and Korean 23  
(45,000) stocks, and drawing down all others, a rate of 24  
approximately 100,000 a month through December 1969 can be 25  
supported. An additional production decision will be 26  
required to continue after this date. 27

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APPENDIX E

STATEMENT OF ARMY RATIONALE

- 1. (TS) The Chief of Staff, US Army, concurs with the 1  
declassification and use of COFRAM munitions as follows: 2
  - a. Air delivered CBU 1, CBU 7, and CBU 10 in North 3  
Vietnam and Laos. 4
  - b. 40mm cartridges, M386, M397, M441 as provided for 5  
in this document with no geographic limitation. 6
  - c. Hand grenades, M33, as provided for in this 7  
document with no geographic limitation. 8
- 2. (TS) The Chief of Staff, US Army, does not concur with 9  
declassification or use of artillery-delivered COFRAM 10  
munitions at this time for the following reasons: 11
  - a. Target Acquisition. To achieve improved effectiveness, 12  
COFRAM must be employed against exposed troops. Any preven- 13  
tive defense measures that can be taken by troops in the tar- 14  
get area reduce substantially the probability of improved 15  
effectiveness as a consequence of COFRAM employment. More- 16  
over, any natural obstacles such as temperate forests, jungle 17  
tangle, and rain forests reduce, progressively, COFRAM 18  
effectiveness until, in the case of rain forests, COFRAM 19  
effectiveness in the case of the 105mm shell is less than the 20  
effectiveness of the conventional 105mm shell. Maximum 21  
effectiveness of COFRAM munitions must assume a target 22  
acquisition to munitions-on-target sequence that permits 23  
no action by the enemy to avoid the consequences of 24  
COFRAM employment. Normal troop reaction in the presence 25  
of identified artillery spotter aircraft or following the 26  
first registration round or volley is to take some action 27  
to protect themselves. Thus, the advantage of surprise 28

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is very quickly lost except in those isolated cases where  
relatively large troop formations have no cover of any  
kind available. The sequence of actions covering target  
acquisition to munitions-on-target is simply not sophisti-  
cated enough to assure any significant change in artillery  
munitions effectiveness resulting from COFRAM employment.

b. Comparative Effectiveness. Effectiveness varies by  
type of munition, i.e., 105mm, 155mm, and 8", in relation to  
the type of cover prevalent in the areas, i.e., temperate  
forest, jungle tangle, rain forest. It is recognized  
that the variety of terrain in South Vietnam does permit  
the possibility of effective employment in parts of the  
areas considered for employment. However, the practicality  
of exercising a reasonable control of expenditures in the face  
of the pressures of combat is questionable. Moreover, a sub-  
stantial percentage of the major engagements resulting in  
comparatively high US casualties has occurred in encounters  
with the enemy occupying fortified or partially fortified  
positions. In these circumstances the first generation COFRAM  
proposed for use is less effective than conventional munitions.

c. The release of COFRAM munitions for controlled  
expenditure in limited geographic areas will create  
immediate pressures to extend the area in which they might  
be employed and expand the quantities authorized. The  
proposed allocation is limited. The capability to support  
any marked increase in allocation is limited. The time  
for production decisions to support substantial increases  
in allocation within the time frames in which pressures for  
increased employment can be expected has passed. For  
example, the capability to support the 105mm round while  
protecting Korean and European stocks would change from  
20 months to five months if the allocation were increased  
from one to four rounds per tube per day.

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d. There have been a number of US casualties resulting 1  
from erroneous troop locations reported or erroneous firing 2  
data; the number of civilian casualties resulting from 3  
inadvertent delivery of artillery fires is not known. An 4  
increase in these casualties which might result from use 5  
of more lethal munitions could well result in increased 6  
criticism unless public announcements are handled carefully. 7

e. Current plans do not provide for issuing COFRAM to 8  
forces other than US now fighting in Vietnam. Pressures 9  
for issue to other nations will be irresistible and will 10  
further complicate the problems set forth above. 11

3. (S) The Chief of Staff, US Army, is cognizant of the 12  
allegations that could be made that US forces are being 13  
denied an improved munition. He believes that disadvantages 14  
of employment, difficult as they will be to explain, out- 15  
weigh the advantages of declassification and release of 16  
artillery ammunition at this time. 17

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