

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

2



AD-A162 242

THE NATIONAL DEFENSE STOCKPILE:
 AN ORGANIZATIONAL PERSPECTIVE

THESIS

Robert A. Batchelor, B.S. James E. Kirby, Jr., B.S.
 Captain, USAF Captain, USAF

AFIT/GSM/LSP/85M-1

DTIC FILE COPY

DISTRIBUTION STATEMENT A
 Approved for public release
 Distribution Unlimited

DTIC ELECTE
 DEC 16 1985
 S B D

DEPARTMENT OF THE AIR FORCE
 AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

85 12 16 186

AFIT/GSM/LSP/85M - /

THE NATIONAL DEFENSE STOCKPILE:
AN ORGANIZATIONAL PERSPECTIVE

THESIS

Robert A. Batchelor, B.S. James E. Kirby, Jr., B.S.
Captain, USAF Captain, USAF

AFIT/GSM/LSP/85M-1

DTIC
ELECTE
DEC 16 1985

B

Approved for public release; distribution unlimited

The contents of the document are technically accurate, and no sensitive items, detrimental ideas, or deleterious information are contained therein. Furthermore, the views expressed in the document are those of the author(s) and do not necessarily reflect the views of the School of Systems and Logistics, the Air University, the United States Air Force, or the Department of Defense.

Approved for	<input checked="" type="checkbox"/>

A-1



AFIT/GSM/LSP/85M-1

THE NATIONAL DEFENSE STOCKPILE:
AN ORGANIZATIONAL PERSPECTIVE

THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Systems Management

Robert A. Batchelor, B.S.
Captain, USAF

James E. Kirby, Jr., B.S.
Captain, USAF

March 1985

Approved for public release; distribution unlimited

ACKNOWLEDGEMENTS

The authors are indebted to our advisor, Dr. William C. Pursch, for his support, interest and helpful directions for this study. The authors are also thankful to those individuals of the numerous Government agencies and other organizations who generously provided their time and expertise in completing this thesis:

Bureau of Mines

Library of Congress

General Accounting Office

Congressional Staff Members

General Services Administration

Federal Emergency Management Agency

Council on Economics and National Security

Table of Contents

	Page
Acknowledgments	ii
List of Figures	vi
List of Tables	vi
Abstract	vii
I. Introduction	1
General Issue	2
Statement of the Problem	2
Definitions	3
Background	4
Methodology	6
Investigative Questions	6
Scope and Limits of the Research	6
Particular Method	7
Justification of Method	9
Overview	9
II. Background	10
Historical Perspective	10
World War I	10
World War II	10
Korean War	11
Vietnam War	12
Post-Vietnam War Era	12
Present Status of the National Defense Stockpile	13
How Stockpile Goals are Established	15
The Annual Materials Plan	16
A Look at the World Mineral Dependency	17
The Need for an Effective National Nonfuel Minerals Policy	21
Conclusion	22
III. Executive Branch Agencies Affecting the National Defense Stockpile	23
Introduction	23
The Executive Office of the President	24
The President	24
Commentary	26
Office of Science and Technology Policy (OSTP)	27
National Security Council (NSC)	31
The Office of Management and Budget (OMB)	32
Commentary	32

Executive Branch Departments.	34
Department of the Interior.	34
Department of Defense (DoD)	36
Commentary.	37
Department of Commerce (DoC)	38
Department of State.	41
Department of Agriculture (DoA).	41
The Department of Energy and Treasury Department	42
Independent Establishments (Executive Agencies)	42
Central Intelligence Agency (CIA).	42
General Services Agency (GSA).	43
Commentary.	46
Federal Emergency Management Agency (FEMA).	48
The Annual Materials Plan (AMP).	49
Commentary.	51
Summary.	52
 IV. Agencies of the Legislative Branch Affecting NDS Policy.	 53
Introduction.	53
General Accounting Office (GAO)	53
Library of Congress.	54
Congressional Budget Office (CBO)	55
Congressional Committees Affecting the Stockpile	56
Senate Committees and Subcommittees.	57
House of Representative Committees and Subcommittees.	61
Summary of Legislation Affecting the National Defense Stockpile.	65
The Strategic Materials Act of 1939 (P.L. 76-117).	65
The Strategic and Critical Materials Stock Piling Act of 1946 (P.L. 79-520).	66
Defense Production Act of 1950 (P.L. 81-774)	66
The Mining and Minerals Policy Act of 1970 (P.L. 91-631).	68
The Strategic and Critical Minerals Policy Revision Act of 1979 (P.L. 96-41).	68
The National Materials and Minerals Policy, Research, and Development Act of 1980 (P.L. 96-479)	69
The Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35).	71
Arctic Research and Policy Act of 1984-National Critical Materials Act of 1984 (P.L. 98-373)	72
Executive Orders Affecting the National Defense Stockpile.	73
Commentary	76
Summary.	77
 V. Organizations Outside the Government Affecting the NDS	 78
Introduction.	78

Organizations Representing the Major Users of Strategic and Critical Materials.	78
The Aerospace Industries Association of America (AIA).	78
American Mining Congress (AMC)	80
Federation of Materials Societies (FMS)	81
National Association of Manufacturers (NAM).	81
Nonprofit Organizations Affecting the Stockpile.	82
National Academy of Sciences (NAS)	82
Council on Economics and National Security (CENS)	83
International Economic Policy Association (IEPA).	83
Resources For the Future (RFF).	84
World Affairs Council of Pittsburgh.	85
Commentary.	85
Summary.	86
VI. Summary, Conclusions, and Recommendations.	87
Summary.	87
Conclusions.	89
Introduction.	89
Cost.	89
Deterrent Value	90
Organizational Aspects.	91
General Recommendations.	92
Comparison of Alternatives.	93
Alternative No. 1. Transfer Stockpile Management to the Secretary of Defense.	94
Pros.	94
Cons	95
Alternative No. 2. Transfer the NDS Management to an Independent Body.	96
Pros.	96
Cons	97
Specific Recommendation for Stockpile Management	98
Recommendations for Future Research.	99
Appendix A: The National Defense Stockpile (NDS) Inventory	100
Appendix B: Major Defense Uses of Selected Stockpile Materials	112
Appendix C: Studies Calling for a More Coherent National Materials Policy.	115
Appendix D: Mineral and Country Risk Assessments.	116
Bibliography.	120
Vitas	125

List of Figures

Figure	Page
2-1. Percent of Stockpile Goal Filled	14
3-1. Major Organizations in the Government of the United States . . .	23
3-2. The Executive Office of the President	24
3-3. Organization of the Materials Councils and Committees	28
3-4. Abbreviated Organization of the DoI With Respect to the NDS . .	34
3-5. Abbreviated Organization of the DoD With Respect to the NDS. .	36
3-6. Abbreviated Organization of the DoC With Respect to the NDS. .	38
3-7. Organizational Hierarchy in the DoA With Respect to Barter . . .	41
3-8. GSA Organization With Respect to the NDS.	43
3-9. Abbreviated Organizational Chart of the FEMA	48
3-10. National Defense Stockpile Material Flows.	49
3-11. The Annual Materials Planning Process.	50
4-1. Organizations in the Legislative Branch Affecting Stockpile Policy.	53
4-2. Senate Committees and Subcommittees Affecting NDS Policy . . .	57
4-3. House Committees and Subcommittees Affecting NDS Policy. . . .	61

List of Tables

Table	Page
2-1. Net Import Dependence, 1977-1980 Average	18
3-1. History of Authorization and Appropriation Requests (\$ millions). .	33
3-2. National Defense Stockpile Storage Data for FY 1983.	44

Abstract

The United States is dependent on foreign sources for many strategic and critical materials vital to its survival and national security. To counter the affects of a disruption in the supply of these materials, the US maintains a National Defense Stockpile (NDS) made up of over a hundred separate depots located in various parts of the country. The management and policy formulation of various aspects of the NDS are distributed across a wide spectrum of agencies in the Executive and Legislative Branches. These organizations along with associated legislation are examined for their impact on the policy-formulation process. This study also reviews organizations outside the government that affect stockpile policy. General and specific recommendations on proposed management alternatives are presented at the end of the study.

THE NATIONAL DEFENSE STOCKPILE: AN ORGANIZATIONAL PERSPECTIVE

I. Introduction

The practice of stockpiling supplies is as old as civilization itself. Perhaps the earliest such account is found in Genesis 41 when the Egyptians stockpiled grain and subsequently survived seven years of famine. The purpose, of course, is to have needed resources available in the event of an interruption in supply or sudden increase in demand. Either of these situations could result from many conditions (war, natural disasters, and economic sanctions, to mention a few), and could occur at any time. Today, the defense industries in the United States demand large quantities of materials obtained from Communist or other potentially unstable sources to produce the Nation's modern weapons systems. Therefore, the possible loss of these critical materials represents a potential threat to the ability to protect national interests and security. To prevent this loss, the United States must stockpile strategic and critical materials and must ensure that the policy required to manage and coordinate its uses are as efficient and effective as possible.

This chapter is divided into two sections. In the first section is a discussion about the general issue and a definition of the problem concerning the lack of focus in the Nation's overall stockpiling effort and the resulting slow progress in reaching inventory goals. Next, several frequently used terms will be defined, followed by a brief background on the current status of the National Defense Stockpile. In the second section is a description of the methodology used to explore this problem, the scope and limitations, as well as the particular method of investigation used. The second section concludes with a justification for using the methodology.

General Issue

The National Defense Stockpile (NDS) was established during World War II because of shortages experienced in imported and domestic strategic and critical materials used in manufacturing weapons. The Korean and Vietnam wars again highlighted the shortages the United States may face in a protracted conventional war and the strain it places on the domestic economy. Presently, the US imports more than one-fourth of all raw materials consumed and relies on these imports for more than one-half the supply of 25 different strategic and critical materials (5:1). In contrast, the Soviet Union imports only five minerals to a significant (20% or more) degree and is 50 percent or more reliant on imports for only two of these (See Table 2-1). Many of these materials vital for the construction of modern weapons come from two politically unreliable areas: the Soviet Union and southern Africa.

The purpose, then, of the NDS is to preclude a dangerous and costly dependence on foreign sources of strategic and critical materials during a national emergency. Present law requires a three-year supply of 93 designated materials in the stockpile.

Statement of the Problem

Since its establishment, the NDS has experienced many changes in its scope (types and grades of materials, required quantities, purchase specifications, and management responsibility). Presently, the Federal Emergency Management Agency (FEMA) is ". . . responsible for formulating stockpile [operating] policy, for determining the quantity and quality of materials to be held in the stockpile and for reporting to Congress. . ." (57:2). Also, the General Services Administration (GSA) is in charge of ". . . the property management function and the acquisition and disposal operations. . ." (57:3).

Although these two independent agencies have the ultimate authority (as delegated by the President) for the mentioned areas, many of the actual mechanics for executing stockpile policy are distributed to numerous other agencies. For example, one report by President Reagan in 1982 estimated there are approximately twenty governmental bodies involved in the various aspects of strategic and critical material issues (43:3). Thus, those groups responsible for formulating the overall NDS policy are widely diffused organizationally.

These groups must also consider many different issues in formulating overall policy. Some of the issues confronting these policy makers are foreign relations and international trade; domestic tax and environmental laws, especially those applying to the mining and mineral processing industries; and the determination of which minerals to include in the stockpile, what quantities to procure, and the purchase priority given to each material within funding constraints set by Congress.

Effective policy formulation requires coordination throughout all levels of the government to assure that these different agencies and groups are not working at cross-purposes. The problem, according to studies in the last thirty years, is that the high-level coordination is not present and the stockpile inventory continues to fall short of its goals.

Definitions

The following terms are used frequently in the remaining text and are important enough to require clarification of their meaning.

National (Defense) Emergency

A general declaration of emergency with respect to the national defense made by either the President or Congress as stated in the 1979 Stockpiling Act (70:Sec.12).

Strategic and Critical Materials

Also defined in the 1979 Stockpiling Act, these are the materials that would supply the military, industrial, and essential civilian needs of the US during a national emergency, and are not presently found in sufficient domestic quantity to satisfy such needs (70:Sec.12).

Stockpiling Policy of the United States

The US policy is ". . . to promote an adequate and stable supply of materials necessary to maintain national security, economic well-being and industrial production with appropriate attention to a long-term balance between resource production, energy use, a healthy environment, natural resources conservation, and social needs" (68:Sec.3).

Overall Stockpile Policy

Here the reference is to the Government's overall policy as opposed to the stockpile's operating policy that is set by the Federal Emergency Management Agency. This involves the inputs and coordination between all agencies responsible for the separate areas of the NDS Policy. One example of an area of NDS policy is the allocation of government funds, with the President (through OMB) and Congress responsible for this area.

Background

The need to stockpile materials considered vital to US military capability is not a new concept, but is receiving increased emphasis because of the increasingly questionable reliability of the sources we obtain them from. Also, US reliance on these imported supplies has increased during the past two decades as domestic deposits have been depleted, environmental restrictions implemented, and industrial usage accelerated to meet growing demand (5:7). The following paragraphs give a brief description of the purpose and composition of the NDS.

The National Defense Stockpile was originally created in 1939 by the Strategic Materials Act. This Act has been amended or revised several times over the years, thus changing the scope of the stockpile. The most recent change was the Strategic and Critical Materials Stockpiling Act of 1979 (hereafter called the 1979 Act). The purpose of the NDS, according to this 1979 Act, is to

. . . provide for the acquisition and retention of stocks of certain strategic and critical materials and to encourage the conservation and development of sources of such materials within the US and thereby to decrease and to preclude, when possible, a dangerous and costly dependence by the US upon foreign sources of such materials in time of national emergency (70:Sec.2b).

This legislation also set a three-year military contingency similar to WW II as the criterion for establishing stockpile goals, and consolidated material inventories collected under all previous stockpiling legislation into one national stockpile. Three separate stockpiles had been authorized under the Strategic Materials Act of 1946, the Commodity Credit Corporation Act of 1949 and the Trade Development Act of 1954 (5:9).

Currently, the NDS consists of 61 family groups of minerals and nonfood agricultural materials (a family group being all forms or stages of processing of a material). These family groups contain 93 commodities with 80 of mineral origin and the remainder agricultural products. Stockpile goals have been set for 64 of the 80 mineral commodities, representing 34 different minerals (5:7-8). The total current stockpile inventory is valued at \$10.9 billion, including an excess inventory not held for goals valued at \$3.8 billion (15:9). These materials are stored at 112 separate locations such as private firms, leased sites, and government owned reservations around the country. Appendix A lists the inventory of the NDS as of March 31, 1984, according to the most recent Stockpile Report to Congress

(15:22-26). This appendix is a collection of tables and figures extracted from the report to Congress that describes the inventory and recent acquisitions and disposals.

Methodology

Investigative Questions

A 1984 GAO report and many other studies critical of the NDS assert there are over 20 different government agencies and 80 laws that directly affect policy formulation (18:2). However, no study has examined the agencies and other groups that affect overall policy formulation or the means they use. Therefore, to examine this subject the following investigative questions were researched:

1) Who are the organizations that directly or indirectly exert significant influence on overall stockpile policy? These organizations may be inside the government or they may be outside, such as special interest groups.

2) What laws created these agencies and govern National Defense Stockpile policy?

3) What are the interactions between laws and organizations, and are there any built in structural problems?

4) Where is there room for improvement (i.e. are there any omissions, repetitions of effort)?

Scope and Limits of the Research

This report examines the issue of policy formulation of those groups that deal with strategic and critical materials only. Intentionally excluded are the fuel minerals (oil, coal) and food materials as well as those government agencies whose only responsibility is for their management. Also, only unclassified information was collected and presented. Because of the exploratory nature of this effort, time constraints made it impossible to contact each organization

identified in this research. But those considered the most important were contacted for additional information and comments.

An analysis of the specific strategic and critical materials and their uses is not covered in this report but the reader, depending on his or her background of the subject, may want to examine Appendix B to obtain a general knowledge.

Particular Method

In order to examine the Government's overall policy on stockpiling an examination of the agencies in the Executive and Legislative Branches was conducted. In addition, an examination of the laws creating and governing these various agencies responsible was made. An effort was made to identify the key laws, agencies, and their interaction affecting stockpile policy the most. The two major investigative techniques used were the literature search and experience survey (interviews). The general steps in the literature search and interviews for answering the investigative questions are listed below.

Literature Survey of Published Information

- 1) Information searches from Defense Technical Information Center (DTIC), National Technical Information Service (NTIS), and Defense Logistics Studies Information Exchange (DLSIE).
- 2) Already-published bibliographies from Air University (AU), and the National Defense University (NDU).
- 3) A legislative history of the NDS from the Federal Legal Information Through Electronics (FLITE) system. This included all applicable Congressional hearings, reports, and Executive Orders.
- 4) Several of the other data bases on the Dialog® Information Services Network such as Books in Print, Magazine Index™, Government Printing Office's Publication Reference File, Congressional Information Service, and others.
- 5) Information obtained from the following US Government Agencies:

Federal Emergency Management Agency (FEMA), General Services Administration Bureau of Mines, Government Printing Office, Department of Defense, General Accounting Office (GAO), Department of Commerce, and Congressional Research Service.

Experience Survey

Personal interviews, to the extent possible, were conducted of those individuals knowledgeable on stockpiling. The primary purpose of these interviews was to gain an insight into the organizational problems not readily obvious from the literature, and to obtain informed opinions on how to improve the policy formulation process. The individuals interviewed included representatives of the FEMA, Bureau of Mines, Congressional staff members, GAO personnel, and individuals representing nonprofit organizations. Different questions were asked each individual, but several general questions are listed below:

- 1) What has been done in the past to coordinate policy and why has it not been effective?
- 2) How have stockpile management philosophies changed over time?
- 3) Who are the most powerful contributors to formulating policy and what roles do they play?
- 4) How are the various advisory groups affecting policy formulation?
- 5) Which legislation helps or hinders policy formulation the most?
- 6) Are there any built in structural problems and, if so, where is there room for improvement?
- 7) What are the strengths and weaknesses of the current management structure; are there any better alternatives?
- 8) What are the pros and cons of these alternatives?

Justification of Method

This method is justified for several reasons. First, this is an exploratory study, for no other similar study of the stockpile policy-making structure has been attempted. Also, understanding policy formulation requires a general understanding of the bureaucratic structure and its members interactions. Finally, this organizational perspective will answer the investigative questions in the most comprehensive, understandable form.

Overview

The next chapter examines the background of the NDS in greater detail. Chapter three focuses on the organizations in the Executive Branch of the Government that have a significant impact on the National Defense Stockpile, while Chapter four examines the Legislative Branch. Chapter five briefly describes organizations outside the Government that impact policy. The sixth and final chapter contains the summary, conclusions, and recommendation.

The appendices contain very useful information for anyone interested in the National Defense Stockpile. Appendix A consists of 2 tables and 10 figures from the latest Stockpile Report to Congress. Appendix B lists the important uses of most of the minerals in the stockpile's inventory. Appendix C list several studies since 1979 calling for a more coherent national minerals and materials policy. Appendix D lists some of the factors considered when computing the total strategic rating of various minerals in the stockpile. Another table in this Appendix lists the types of factors considered in determining a country's risk as a source of supply.

II. Background

Historical Perspective

World War I

The concept of stockpiling materials in the United States was first examined in 1920. The factors responsible for this initial concern were the disadvantages revealed in relying on foreign suppliers and the difficulties experienced in maintaining a smooth flow of materials required during the first world war (12:225). Examples of US dependence on foreign suppliers for war materials are the following: of the 4,400 artillery pieces used by the American Expeditionary Forces (AEF), only 500 came from US production lines; of the 6,000 planes and 290 tanks employed by the AEF, only 1,200 planes and 40 tanks were made in America (56:7). One major cause of this dependence was the lengthy lead times required to obtain the necessary materials to be used in weapons production.

Congress, responding to these lessons learned, enacted the National Defense Act of 1920. This Act led to the establishment of an industrial planning organization within the Office of the Assistant Secretary of War, responsible for planning the acquisition of war material and for the mobilization of industrial resources. These Industrial Mobilization Plans (IMPs) were prepared every three years between 1930 and 1939, and proved to be an important factor in preparing for the industrial expansion required by World War II (56:7).

World War II

The increasing probability of US involvement in WW II renewed interest in stockpiling, and on June 7, 1939, the first national materials stockpile was established by the Strategic and Critical Materials Stock Piling Act of 1939. This Act required the Treasury Department to accumulate supplies of chromite, quartz crystals, rubber, and tin, and charged the Army and Navy Munitions Board to

determine policy for the use of these materials (24:iii). Further anticipating US involvement in the WW II, the Reconstruction Finance Corporation in 1940 was assigned additional material acquisition responsibilities (12:225).

Although the need for this program was widely acknowledged and supported, it quickly became apparent that the stockpile never achieved its objectives and it was virtually eliminated in the early stages of the war (29:7). Following World War II, these shortages again focused attention on the need for an adequate supply of raw materials, and, in 1946 Congress passed the Strategic and Critical Materials Stock Piling Act. This Act established the National Stockpile and brought the Strategic Stockpile up to \$1.6 billion worth of materials by 1950 (12:225). These two stockpiles subsequently were combined in the National Defense Stockpile which exists today.

Korean War

The Korean War and the threat of its possible escalation again sparked Congressional interest in the Nation's ability to support another world war. As a result, the Defense Production Act (DPA) of 1950 was passed. This Act authorized the Government to purchase the output of the expanding metals and minerals producing industries. Government purchase of the surplus, where necessary, was an incentive for defense-essential expansion of production capacity and actual output of these industries (24:iii). This authorization, then referred to as the Defense Priorities System, specifically permitted

. . . the President to accelerate the production of critical defense items by causing the manufacturer to place these items at the front of the production line; guaranteed loans to expedite deliveries of vital national defense systems; and direct Government loans to industry to expand plants and facilities in order to develop or produce essential material (56:8).

As a result, considerable inventories were collected under the DPA.

Vietnam War

Few additions were made to the stockpile after the mid-1950's, but still the Vietnam War saw the industrial base of the United States respond smoothly to the increased requirement of materials and supplies. However, because the US largely controlled the level of military involvement in Southeast Asia, the capability of the US industrial base to accelerate to a full-scale war capability was essentially untested (56:9).

During this period, the Government released large quantities of NDS materials, the principle minerals being copper and nickel. Because of rising prices due to war demands, copper was released to defense contractors both to reduce the rate of price escalation and to supply the needed material for the war effort. Additionally, nickel was released because of a strike in Canada, the major producer. The threat of further stockpile releases was used in the 1960's and again in the early 1970's to discourage domestic metal producers from raising their prices (5:66). The supply of copper or nickel was not replenished, bringing allegations of misuse of the stockpile for non-defense purposes (12:226).

Post-Vietnam War Era

The selling of stockpile materials again continued after the Vietnam War due to the continuing widespread shortages of minerals. These shortages were the result of a weakening dollar and the reduction in US mining production. The prevalent attitude in the United States at this time was that, except for short-term dislocations, long-term scarcity of materials was no longer the vital issue it had been in the late 1940's and 1950's. This complacent attitude continued even through the 1972-1974 commodity crunch, which resulted in severe shortages of raw materials (51:32). Although numerous studies before and after this crunch have recommended increased levels of materials in the stockpile, no actual purchases were made in the 20 years prior to the Reagan Administration.

Present Status of the National Defense Stockpile

In 1979, the Congress passed the Strategic and Critical Materials Act. The major purpose of this Act was to update and revise the stockpile program, particularly by confirming the 1976 decision to use a three-year military contingency as the criterion for establishing stockpile goals. During the previous 20 years, this goal had changed from five to three (1958) and finally to a one-year contingency (1973). In addition, this legislation specified that the stockpile was to be managed for defense purposes only and not to control or influence commodity prices (5:9).

On March 13, 1981, President Reagan ordered the first major stockpile acquisition in twenty years. This purchase represented \$100 million in materials and was appropriated by the Congress for FY '81 (43:15). Subsequently, through FY '84 funding for stockpile acquisitions has totaled \$301.2 million (see Figure 4 of Appendix A) (15:1).

The current stockpile inventory is valued at \$10.9 billion, of which \$7.1 billion is held against stockpile goals. The other \$3.8 billion consists of materials considered surplus. To meet existing goals, an additional \$10.2 billion in materials would be required. Table 2 of Appendix A gives the NDS inventory of strategic and critical materials, and the goal for each item (15:22-26).

Figure 2-1 on the following page illustrates the relationship between inventories on hand and the goals for these as broken into family groups. As can be seen, the 61 family groups can be divided into two categories: (1) 24 groups and individual materials with inventory equal to or greater than goals, and (2) 37 groups and individual materials with inventory less than goals. Of the latter group (below set goals) only 14 materials are over 50 percent filled (12:231).

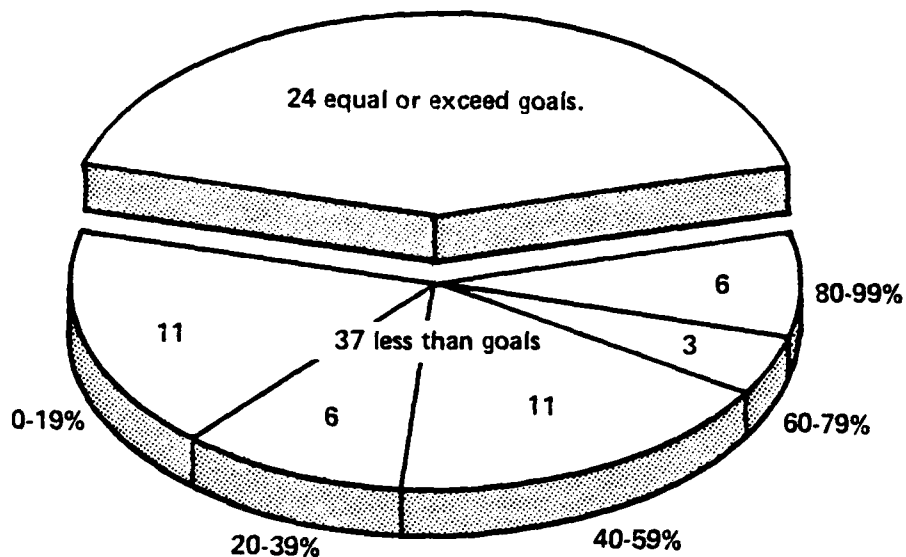


Figure 2-1. Percent of Goal Filled

The importance of these inventory shortages becomes apparent by the fact that the United States is a net importer of 64 of these materials. The scope of this problem is further expanded, as we are more than 50 percent dependent on foreign sources for over half of the approximately 40 minerals considered essential to our economy. A 1980 report by the Committee on Armed Services to Congress found that

. . . a shortage of critical materials, combined with a resulting dependence on uncertain foreign sources for these materials, is eroding the foundation of U.S. defense capabilities. These shortages are a monumental challenge to the Congress, the Department of Defense, the defense industry and the civilian economy (56:24).

In addition to concern about inventory levels, several questions have also been raised about the appropriate form and the quality of some of the stock-piled materials. For example, there is presently a large inventory of chromite and manganese ore in the stockpile as opposed to their upgraded ferroalloy forms that are used in steelmaking. The question of appropriate form arises

because accompanying this increase in stockpiled ore is a decrease in domestic processing capability to convert ore to ferroalloys. However, in November of 1982, the President directed GSA to upgrade stockpile chromite and manganese ores to high-carbon ferrochromium and high-carbon ferromanganese. During Fiscal Year 1984, two contracts were awarded for this purpose representing an estimated cost of \$34 million (15:18).

In the case of quality, questions have arisen about the possible deterioration of the stockpile materials—most of which were purchased over twenty years ago. According to a 1983 Department of Commerce report on the steel industry, more information needs to be known about the compatibility between the current state of stockpiled materials and existing industry processes (12:232,234). The basic issue, then, is in a national emergency will the form and technical quality of materials be sufficiently up-to-date, so that it can be processed into critically needed goods as quickly and as inexpensively as possible?

How Stockpile Goals are Established

As mentioned earlier, the Strategic and Critical Materials Act of 1979 specifically stated that the stockpile should be sufficient for at least three years in a national emergency. The President, through Executive Order 12155 issued in 1979 and amended by Executive Order 12417 in 1983, gave the planning and general direction of stockpile operations to the Director of the Federal Emergency Management Agency (FEMA) (12:227). Presently, the FEMA establishes stockpile goals through an elaborate interagency process and econometric modeling that involves simulating Gross National Product values and wartime requirements of those materials to be used specifically in the defense sector. Also simulated are domestic primary and secondary production under conditions

of national mobilization (5:11). Domestic primary production refers to those civilian expenditures directly related to the war effort and secondary production refers to the remaining expenditures that support the general industrial base.

The formulation of total stockpile inventory goals is very complex and is greatly aided by the use of computer models. This modeling technique offers significant advantages over traditional estimating procedures (such as simple extrapolation of current data) in that the estimates are internally consistent, that is, the estimates are based on the same set of initial data. Another advantage is that these models permit using different contingencies to generate a range of estimated material requirements (12:228). Many different scenarios are postulated, but because of their sensitive nature to national security and foreign policy, a large portion of this model is classified. The major vehicle used to translate these goals into specific yearly requirements is the Annual Materials Plan, discussed below.

The Annual Materials Plan

Each year an Annual Materials Plan (AMP), representing a major effort by several agencies, is formulated under the direction of the FEMA. In this Plan, national security requirements are balanced against market constraints and funding availability to develop a list of materials for stockpile acquisition and disposal covering a five year period (43:15).

This planning process begins when the FEMA gives a list of goals, deficits, excesses, and priorities to the GSA. These materials are ranked according to national security priorities, and the GSA determines those quantities that could be bought or sold without undue disruption of the normal market. Added to the GSA's market constraints are the revenue and cost projections of the Annual Materials Plan proposal. This draft plan is submitted to the National

Security Council (NSC) and the President's Office of Management and Budget (OMB). Any further revisions to this plan are made by the NSC, the OMB, and the FEMA (20:3). Chapter three discusses this process in greater detail.

A Look at the World Mineral Dependency

"The US and its allies are on a collision course with the Soviet Union over access to strategic materials" (56:43). This statement was published in a 1980 article in *Fortune Magazine* and is a representative viewpoint by proponents of the resource war school of thought. But why do they feel this way and what are the possible implications for the United States?

Until recently, Soviet policy was to be self-sufficient in minerals at any cost. However, exports of various commodities from the USSR have declined sharply, and the Soviets as well as the Eastern European Countries (EEC) have begun to import a number of materials (31:4). This fact is significant because the Soviets are the largest single producer of minerals in the world. Immediately following the Soviet Union in mineral production are the nations of southern Africa, which currently have (42:6):

- 95% of the world's Chrome
- 86% of the world's Platinum
- 64% of the world's Vanadium
- 53% of the world's Manganese
- 52% of the world's Cobalt

The concern to foreign policy analysts in the US is both the political instability of much of this region where the materials are located and the increasing dependence of the major economic centers on these materials. This dependence is illustrated in Table 2-1 on the next page (33:52,42:8). It should be noted that the Defense Department's usage verses total US consumption is difficult to determine because of the vast number of Defense Contractors and the wide spectrum of direct and indirect defense uses of these materials. With the

exception of the four values listed under the "DoD Share" column, the Defense Department's proportion of usage is considered relatively small.

Some of the major states in southern Africa like Zambia, Zaire and Zimbabwe are landlocked, with no access to exporting seaports except across territory now in Marxist hands. The Soviet Union is establishing an increasing military presence in this region, and some US observers believe a crisis point is approaching (47:20). Proponents of the theory of a resource war hold that the Soviets intend to impede US access to strategic minerals in southern Africa for one of two reasons: 1) either because they (the Soviets) need these minerals for themselves, or 2) because they intend to prevent these African governments from supplying minerals to the West (25:17). But what would the impact be on the United States if the flow of minerals from Africa were suddenly reduced or eliminated?

Table 2-1. Net Import Dependence, 1977-1980 Average

	<u>United States</u>	<u>Europe (EEC)</u>	<u>Japan</u>	<u>Warsaw Pact</u>	<u>DoD Share</u>
Chromium	91%	90%	98%	2%	9-16%
Platinum	87%	-	-	Exporters	
Vanadium	26%	-	-	Exporters	
Manganese	97%	100%	99%	3%	
Cobalt	97%	100%	100%	68%	25-33%
Bauxite	91%	97%	100%	28%	
Asbestos	85%	90%	98%	1%	
Nickel	70%	100%	100%	13%	
Zinc	57%	91%	100%	9%	
Iron Ore	48%	82%	100%	10%	
Silver	36%	93%	71%	10%	
Copper	13%	100%	97%	4%	
Lead	13%	76%	78%	3%	
Mica	100%	-	-	12%	
Tin	80%	-	-	20%	
Tungsten	60%	-	-	12%	
Antimony	60%	-	-	20%	
Barium	40%	-	-	60%	
Titanium	100%	-	-	0%	25-50%
Tantalum	90%	-	-	-	20-25%

One author estimates that the USSR, by expanding its influence over just a few key southern African nations, could control the distribution of more than 80 percent (including their own) of the world's strategic and critical mineral production. For example, an interruption in supply to the West of the nations of Zaire, Zambia, Zimbabwe, or South Africa could shift control of over 99% of the world's platinum reserves, 98% of the world's manganese, and 96% of its chromium to the Soviets (52:15-16). Others contend that even reduced production by these nations for more than a few years would have a significant impact on the US and its allies and could exhaust current stockpiles. Also, since Western Europe and Japan maintain small or unofficial stockpiles, there would be severe pressure on the United States to share its stored resources--further complicating the situation (27:643).

The bottom line is that without minerals there would be no modern agriculture, no energy production, no transportation systems or communications network, and no weaponry for national defense (48:24). As the former Commander of the Air Force Logistics Command, General James P. Mullins stated, "Modern technology makes us dependent on these materials for our future survival; yet, geographical and political realities make their certain availability rather uncertain indeed" (36:5).

There are, however, those who disagree with this concept of a resource war. Some experts argue that if the Soviets were prepared to confront the West so openly, they would find the Middle East an easier and, with its oil, a more attractive target. For example, in 1980 the total value of imports of the top five materials for which the US is 100 percent dependent was \$155 million. This fact contributes to the strong visual impression of dependency, but in comparison, this annual amount is only roughly equivalent to what the United States paid for 14 hours of oil imports in the same year (4:63-64).

In contrast, some experts see no threatening motive to recent Soviet initiatives, but see these actions as a logical result of economic changes in the Soviet domestic resource posture similar to those changes occurring in the rest of the industrialized world. Today, the USSR ranks as the world's second largest industrial economy preceded only by the United States in demand for minerals and materials. The Soviets, to meet their increasing demand, are currently expanding their domestic minerals capability. Experts feel that the current level of imports by the Soviets will decrease in the mid 1980's when Siberian mines begin production. Rather than a "resource war" of a military nature, these experts view the situation as a "resource confrontation" of an economic nature (8:170). In the words of one author representing Resources For the Future, "The ups and downs in Soviet production and trade combined with the uncertainty surrounding statistical information leave a wide-open field for speculation about motivations of policy, but the resource war interpretation seems based on thin premises" (4:63).

According to a 1981 GAO report on this subject, the current US import reliance is not synonymous with vulnerability and does not necessarily present a high risk to the United States. They feel that political, military, and economic ties between the mineral producing countries and the industrialized nations substantially reduces the probability of long-term supply disruptions or sharp price increases. The GAO goes on to explain that any short-term contingencies caused by civil or military conflicts, demand surges, and natural disasters could last for several years, but fall within the bounds of normal business risks and do not require Federal attention (23:3-4).

Although many opinions exist both for and against the construct of a resources war and the resulting vulnerability of the United States, there is currently no clear-cut consensus on the subject. The position taken in this paper

is that there is a competition for resources in the world today that potentially threatens the security of the US and its' allies. As such, it is being conducted in a calculated, subdued manner by the Soviets and is motivated by both strategic and economic considerations.

The Need for an Effective National Nonfuel Minerals Policy

Raw materials stockpiling as a hedge against a "Resource War" is only a partial solution to national security preparedness. To ensure survival, Senator Barry Goldwater stated that the US must focus responsibility for developing and implementing a national nonfuel minerals policy (26:520). But, what disturbs Congress most is that for years the US has had no coherent set of interrelated policies, institutional structures, or programs concerning the NDS (47:21).

This need for a workable policy has been addressed in more than 30 studies over the past 30 years, with perhaps the most famous being the 1952 Paley Commission Report (See Appendix C). [One of the recommendations of this Commission was the need for a specific mechanism to look at the materials policy verses domestic and foreign policy problem as a whole, for keeping track of changing situations, and to coordinate the interrelation of the Government's policies and programs (45:170)]. According to the GAO, in August of 1979, the President's Domestic Policy Review of Non-Fuel Minerals found that the existing nonfuel minerals policymaking process was generally ad hoc and often conducted without adequate coordination among all applicable policymakers (18:2).

Therefore, in 1980 the National Materials and Minerals Policy, Research and Development Act was passed in an attempt to alleviate these problems. This Act assigned the leadership role of the NDS within and under the responsibility of the Executive Office of the President. But, again this legislative attempt has allegedly failed, as suggested by the findings of recent reports echoing that the

same condition of poor coordination still exists and the resulting slow progress the stockpile is making towards its goals (18:3,7).

Judgments on what role Government policy might play in reducing the probability of materiel shortages and their potential adverse consequences differ greatly, and it is no surprise that this subject has been the focus of lively debate for years. Resources For the Future argues that while certain government actions can enhance security of supply with little or no cost, most such actions have been taken. Consequently, greater national security will have to be bought, in the sense that the additional security can be obtained only at a cost (4:68-69). However, considering the tremendous Federal Budget deficits the US is currently facing, there are many objections to incurring this required cost.

Conclusion

An adequate National Defense Stockpile is generally accepted as necessary to maintaining our national defense in times of an emergency. However, the inefficiencies that exist in managing the stockpile is a subject widely debated, little understood, and generally blamed for much of the concern over its present status.

As the Paley Commission stated in 1952, ". . .there can be no purely domestic materials problems but only aspects of world problems" (45:170). An attempt to explore these causes for the lack of coordination in the Government's overall policy towards stockpiling and its resulting problems are examined in the following chapters by looking at the complex bureaucratic structure involved.

III. Executive Branch Agencies Affecting The National Defense Stockpile

Introduction

This chapter begins the description of the organizations in the federal government that exert significant control over the various aspects of the National Defense Stockpile (NDS). Discussions in this chapter centers on agencies of the Executive Branch, which includes the Executive Office of the President, Cabinet-level departments, and independent establishments (independent executive agencies). The Congress, and organizations outside the government (such as special interest groups) are discussed in chapters four and five, respectively. Figure 3-1 below is a diagram of the more important government agencies in terms of overall responsibility; a triangle points to those organizations having an impact on the NDS (40:816).

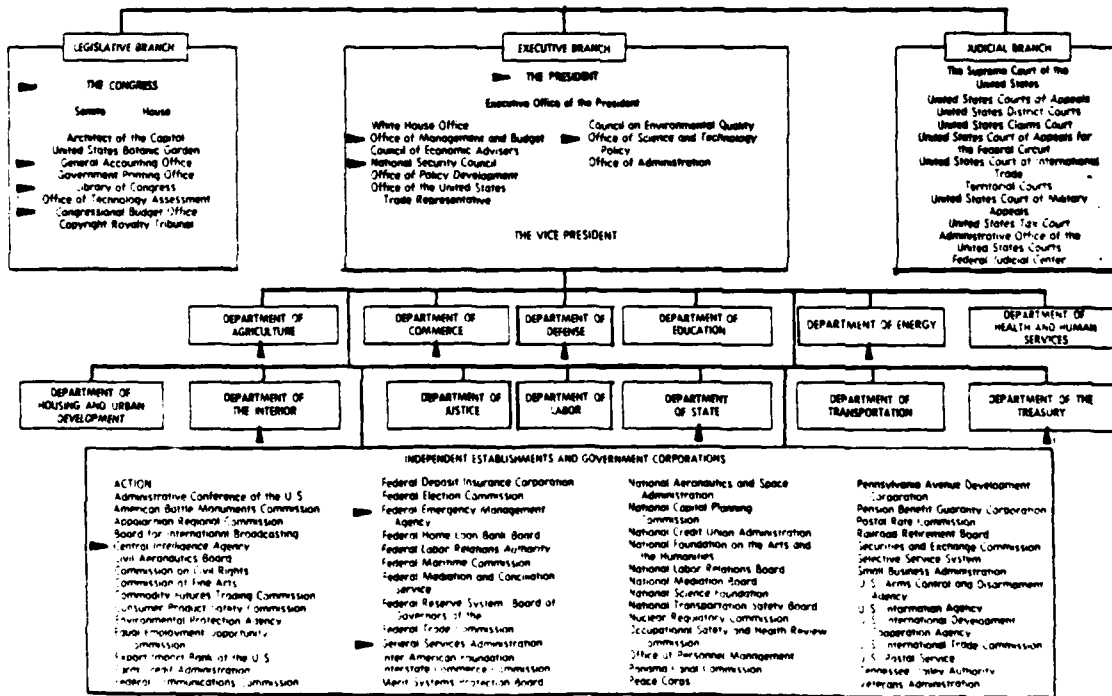


Figure 3-1. Major Organizations in the Government of the United States

The Executive Office of the President

The Executive Office of the President consists of several agencies whose purpose is to aid the President in the performance of his duties. According to the US Government Manual, the Office was originally assembled in 1939; since then ". . . Presidents have used Executive orders, reorganization plans, and legislative initiatives to reorganize the Executive Office to make its composition compatible with the goals of their administrations" (40:77). Figure 3-2 below depicts the Executive Office of the President (39:822). A double border surrounds those agencies that have an impact on the NDS; these agencies are discussed further in this section.

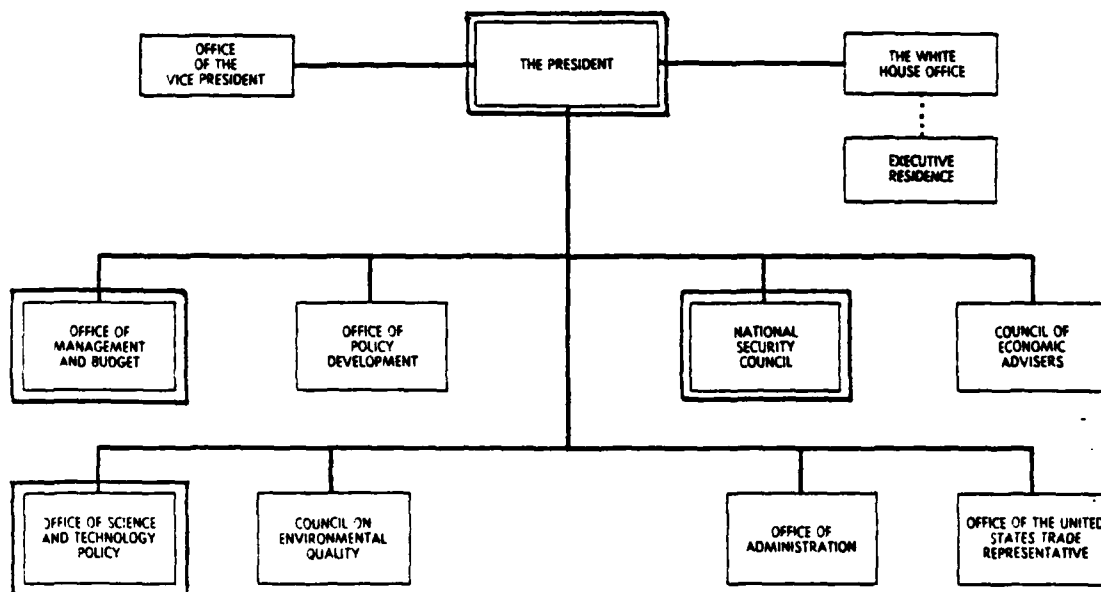


Figure 3-2. The Executive Office of the President

The President

According to Congressional reports, from 1952 to 1979 there were between 25 and 35 studies on the need for a national policy on strategic and critical materials (Appendix C lists several additional studies since 1979) (69:4875,4887).

Action finally came when Congress explicitly assigned responsibility for policy formulation to the President through the Strategic and Critical Materials Stockpiling Act of 1979 (the 1979 Act) and the National Materials and Minerals Policy, Research and Development Act of 1980 (the 1980 Act). Congress declared in section 3 of the 1980 Act that the President (through his Executive Office) is responsible for the coordination of all agencies and departments in the executive branch in order to:

- (1) identify materials needs and assist in the pursuit of measures that would assure the availability of materials critical to commerce, the economy, and national security;
- (2) establish a mechanism for the coordination and evaluation of Federal materials programs, including those involving research and development so as to complement related efforts by the private sector as well as other domestic and international agencies and organizations;
- (3) establish a long-range assessment capability concerning materials demands, supply and needs, and provide for the policies and programs necessary to meet those needs;
- (4) promote a vigorous, comprehensive, and coordinated program of materials research and development consistent with the policies and priorities set forth in the National Science and Technology Policy, Organization, and Priorities Act of 1976 (42 U.S.C. 6601 et seq.);
- (5) promote cooperative research and development programs with other nations for the equitable and frugal use of materials and energy;
- (6) promote and encourage private enterprise in the development of economically sound and stable domestic materials industries; and
- (7) encourage Federal agencies to facilitate availability and development of domestic resources to meet critical materials needs (68:Sec.3).

The 1980 Act also listed 15 actions the President would take to implement the 7 measures listed above and required the President to submit a Program Plan and Report to Congress.

The President's Program Plan and Report to Congress (Program Plan)

The Program Plan was required by section 5 of the 1980 Act with a due date of October 21, 1981. In February of 1981, President Reagan formed the

Cabinet Council on Natural Resources and Environment (Cabinet Council). The Cabinet Council in-turn formed the interagency Minerals Task Force which formulated his Program Plan to explain how the President would implement the 1980 Act. Because the Congress directed the President to address a number of issues concerning the stockpile, the Program Plan addressed the following areas in very broad terms: land availability, minerals data, research and development, regulatory reform, stockpile policy, and cabinet-level coordination. This Program Plan was submitted to Congress on April 5, 1982 (43).

Commentary

In 1982 after the President sent his Program Plan to Congress, the General Accounting Office (GAO) released two reports critical of the Administration's Program Plan and the general management of the stockpile. As a result, the Seapower and Strategic Materials Subcommittee held hearings on House of Representatives (H.R.) bill number 33 (a bill to transfer the entire NDS away from the President back to the Secretary of Defense). Representatives from Defense stated their opposition to the transfer during those same hearings.

The first GAO report in June of 1982 (to the Secretary of the Interior) criticized the Program Plan for the following reasons:

[Because it] does not adequately address the fundamental, rudimentary issues of (1) what constitutes a strategic and critical mineral or material, (2) what is the magnitude of potential U.S. vulnerability in a given nonfuel mineral or material market, and (3) what is the proper Federal role, including the benefits and costs associated with various mitigating alternatives (22:1).

The second report was issued in July to the Senate Armed Services Committee's Subcommittee on Preparedness. This report ". . . found no apparent attempt within the [Reagan] administration to correlate the budget with either the President's March 13, 1981, statement [where he emphasized the Nation's vulnerability

to foreign suppliers] or the April 5, 1982, program plan" (20:2). The GAO contended that the Annual Materials Plan was adjusted to reflect the President's budget instead of national defense needs. The revenues from sales of excess materials were greatly increased while the Administration decreased purchase funds significantly.

Although the President maintains responsibility for the NDS, through the Program Plan and Executive orders, he has delegated authority to his Executive Office and other agencies for fulfilling the requirements of the 1979 and 1980 Acts. These agencies are discussed in the remaining subsections of this chapter.

Office of Science and Technology Policy (OSTP)

The OSTP was established in 1976 to provide advice and analysis of a scientific, engineering, or technological nature on government plans, policies, or programs. It assists the President, other members of the Executive Office, and other Federal agencies throughout the budget development process. By its chartering legislation, ". . . the Office shall advise the President of scientific and technological considerations involved in areas of national concern; . . . evaluate the scale, quality, and effectiveness of the Federal effort in science and technology; . . . and assist the President . . ." (40:91).

The 1980 Act along with the National Science and Technology Policy, Organization, and Priorities Act of 1976 (42 U.S.C. 6601 et seq.) directs the OSTP to:

- (1) . . . coordinate Federal materials research and development and related activities . . .
- (2) place special emphasis on the long-range assessment of national materials needs related to scientific and technological concerns and . . . prepare an assessment of national materials needs related to scientific and technological changes... (68:Sec.5b).

The director of the OSTP is also the President's science advisor.

In his Program Plan, the President also directed the OSTP to work with each ". . . department and agency with a significant materials research and development program, [and] direct senior officials to maintain or create effective mechanisms for constructive coordination of minerals and materials research and development" (43:8). The OSTP accomplishes much of its work through the various organizations discussed below. A diagram of the relationship of the OSTP to the various councils and committees is depicted below in Figure 3-3. It should be noted that the Cabinet on Natural Resources and Environment is not a part of OSTP but resolves policy disputes among government agencies concerning materials research and development.

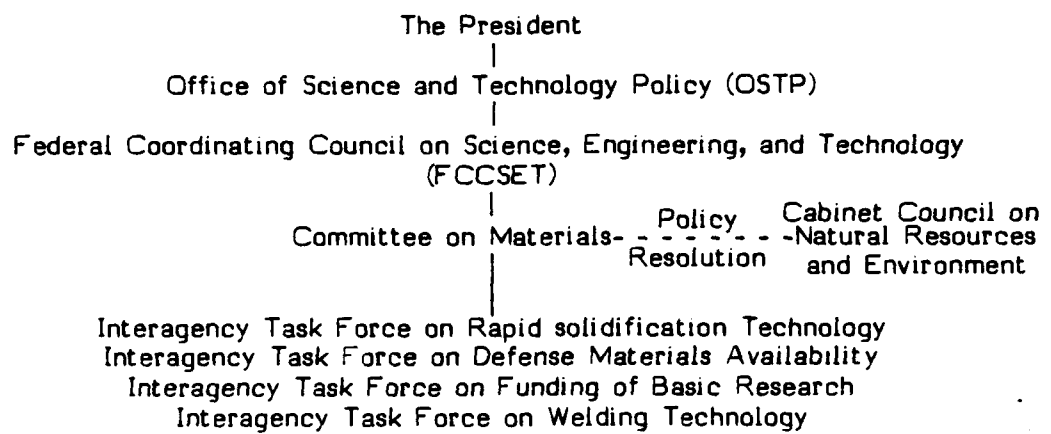


Figure 3-3. Organization of the Materials Councils and Committees

Federal Coordinating Council on Science, Engineering, and Technology

In addition to being the President's science advisor, the director of the OSTP serves as the chairman of the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET). The FCCSET has members from 13 Federal agencies and was established under the same 1976 law as OSTP. According to OSTP's *Inventory of Federal Materials Research & Technology* the

FCCSET ". . . considers problems and developments in the fields of science, engineering, and technology (SE&T) and related activities affecting more than one Federal agency . . ." (41:4). The FCCSET recommends policies and other courses of action designed to

- [1] Provide more effective planning and administration of Federal SE&T programs.
- [2] Identify research needs including areas requiring additional emphasis.
- [3] Achieve more effective utilization of the SE&T resources and facilities by Federal agencies including the elimination of unwarranted duplication.
- [4] Further international cooperation in SE&T (41:4).

The COMAT is under the direction of the FCCSET and is discussed next.

Committee on Materials (COMAT)

The President's Program Plan placed the COMAT ". . . under the direction of the Federal Coordinating Council on Science, Engineering, and Technology for the coordination of Federal materials and minerals research and development activities . . ." (43:8). The Assistant Director for Energy and Natural Resources of the OSTP is the chairperson of the COMAT. According to COMAT's charter, their purpose is the ". . . coordination of Federal minerals and materials research . . ., identify[ing] key points of interest, as well as problems, related to national minerals and materials technology and availability needs and coordinate the development of long-range plans for an effective R&D program" (41:App.A). The COMAT has members from all Cabinet-level departments and many of the independent establishments of the Executive branch, such as NASA and EPA.

In addition to the formation and updating of an inventory data base of all Federal materials research and development, the COMAT has formed four other interagency task forces listed in Figure 3-3. These task forces maintain contact with industry representatives through workshops. One of the main objectives of

all these task forces is to reduce the Nation's vulnerability to shortages in imported strategic and critical materials.

The President's Program Plan directs the COMAT to go through the Cabinet Council on Natural Resources and Environment for "Policy resolution of materials research and development questions . . ." (43:8). The Cabinet Council is independent of the Executive Office of the President (OSTP) and is discussed in the following section.

Cabinet Council on Natural Resources and Environment

The Cabinet Council was formed on February 26, 1981, by Presidential letter to resolve major interdepartmental policy disputes at the Secretarial level. The President stated in his Program Plan that

During the course of the Cabinet review, approximately twenty governmental bodies were involved in various aspects of the [National Defense Stockpile] issue. . . . the involvement of numerous Federal agencies in the materials issue reflects both the breadth of the issue, not only in the government but in the economy, as well as the existence throughout government of statutorily assigned missions and responsibilities which relate to materials policy (43:3).

The President then directed that national materials policy be coordinated through the Cabinet Council.

The Cabinet Council is chaired by the Secretary of the Interior and its members include the Attorney General, plus the Secretaries of Agriculture, Commerce, Transportation, Housing & Urban Development, and Energy. Ex-officio members include the Vice president, Chief of Staff, and Counselor to the President. It meets and chooses its subjects for discussion by dividing into subgroups or task forces. In 1983 the Cabinet Council established a Minerals and Materials Industry Advisory Committee in order to bring more industry expertise into consideration for materials policy. Some recent activity centered on stockpile policy, coal slurry pipeline, and the 200 mile Exclusive Economic Zone (41:766).

National Security Council (NSC)

The NSC was formed in 1947 and placed in the Executive Office of the President in 1949. According to the US Government Manual, "The statutory function of the Council is to advise the President with respect to the integration of domestic, foreign, and military policies relating to national security" (40:85).

The Council, chaired by the President, includes the Vice President and Secretaries of State and Defense. Advisors include the Director of the Central Intelligence Agency (CIA), Chairman of the Joint Chiefs of Staff, and the Special Assistant to the President for National Security Affairs.

The NSC provides presidentially-approved policy guidance on the wartime scenario and general priorities to be used in the Annual Materials Plan (AMP) planning process. The NSC is a member of the AMP Steering Committee and ultimately reviews (along with OMB) the quantity goals set by the FEMA.

Emergency Mobilization Preparedness Board (EMPB)

The Chairman of the EMPB is the Assistant to the President for National Security Affairs, who also is a statutory advisor to the National Security Council. The Board was created on December 17, 1981, with the purpose of coordinating "The people, government, and economy of the nation . . . to meet national needs in the event of major peacetime and wartime emergencies" (43:1). The EMPB consists of 23 government agencies whose representatives are at the Deputy or Under Secretary level. The Board is responsible for determining overall policy concerning the Nation's preparedness and monitoring how Government agencies carry it out.

The work of the Board is supported by 13 interdepartmental working groups. "These Working Groups provide a mechanism for interdepartmental coordination of emergency mobilization; policies and plans; and advise the Board concerning national policy and a plan of action to improve emergency mobilization

preparedness" (14:2). For example, a working group on barter was established in January of 1984 in response to congressional interest. This interest was demonstrated by the fact that 20 bills were introduced in the 98th Congress to facilitate bartering surplus agricultural commodities for stockpile materials (7:2).

The Office of Management and Budget (OMB)

The OMB assists the President in the performance of all his domestic responsibilities including examining the organizational structure and management procedures of the Executive Branch. The OMB is tasked with developing effective coordinating mechanisms to implement government activities. One of its major duties is preparation and administration of the budget. It also coordinates departmental advice on proposed legislation and assists in preparation of proposed executive orders. Finally, it keeps the President informed of the progress of activities by Government agencies (40:83).

OMB's function of coordinating the Federal budget is the most significant means by which it affects stockpile policy. By determining how much agencies like the Federal Emergency Management Agency (FEMA), General Services Administration (GSA) or any other Executive Branch agency spend on stockpile related activities, the OMB ultimately affects policy. The OMB also reviews and approves all of the prepared statements of Executive Branch representatives before they testify at Congressional hearings.

Commentary

Currently the NSC is reviewing the methodology that the FEMA uses in setting the final inventory goal for each material in the NDS. The required 3-year supply of materials is mandated in the 1979 Act. However, the NSC could change the way FEMA calculates the total inventory goals (by altering the wartime scenario for example) in order to reduce the amount of material and funds required to purchase them. Suggestions have arisen that many materials in

the stockpile should not even have a goal, and thus be excluded from the stockpile. One such example is the goal for natural insulating fibers (duck down).

It was suggested by the officials interviewed in Washington D.C. that the NSC's review of stockpile goals was initiated at the request of OMB in order to reduce the demands on the budget. Retired Admiral William Mott, former Executive Officer of the Council of Economics and National Security (CENS), stated in Congressional hearings that ". . . the man who is actually the choreographer of the management of the stockpile . . . is the Director of the Office of Management and Budget. . . . He is the one that decides what is going to be sold from, and usually how much can be bought for, the stockpile" (62:4,5). Table 3-1 below lists the proposed funding by GSA to the OMB and what the OMB approval was; this approved amount is the value in the President's Budget. Note that the OMB has usually reduced funding to a significant degree.

Table 3-1. History of Authorization and Appropriation Requests (\$ millions)

<u>Fiscal Year</u>	<u>GSA Proposal</u>	<u>Administration Request</u>	<u>Authorization Committees</u>	<u>Congress</u>	<u>Appropriation</u>
1978	109.8	70.5	(FY 78 & 79 requests were combined into a FY 79 Supplemental request)		
1979	198.7	174.1			
1979 Sup.	308.5	244.6	579.0	.0	.0
1980	346.4	177.0	237.0	237.0	.0
1981	298.5	169.9	535.0	535.0	100.0
1982	908.9	120.0	†	†	57.6
1983	862.4	120.0	(Congressional Authorization No		120.0
1984	120.0	120.0	Longer Required)		120.0
1985	120.0	120.0			185.0
<u>Total</u>	<u>2,964.7</u>	<u>1,071.5</u>			<u>582.6</u>

† In FY 1982 no authorization was approved due to the fact that \$772.0 (\$237.0 + \$535.0 million) had previously been authorized and only \$100.0 million had actually been appropriated from the authorization; thus no further authorization was necessary. Source: Office of Stockpile Management, GSA

It should be noted that starting in FY 1983 the "Appropriation" column of Table 3-1 reflects the obligational authority approved by OMB. This is due to a

change in the authorization and appropriation requirements of the Transaction Fund. Receipts from disposals of excess materials are used for new purchases only, therefore making the Transaction Fund a rotating fund. For this reason only obligational authority is required for approval by OMB.

During the 1983 hearings on the stockpile the OMB was repeatedly charged with using funds for the NDS to reduce the Federal budget deficit. For example, OMB shows huge receipts (about \$2.5 billion in sales over a 3 year period for excess silver, tin, diamonds, and tungsten) and small annual outlays of \$100-120 million for purchases (53:2,7,16). The materials markets could never absorb sales of that magnitude, thus the \$2.5 billion could never be realized.

Executive Branch Departments

Department of the Interior

The Department of the Interior (DoI) is the Nation's primary conservation agency with ". . . responsibility for most of our nationally-owned public lands and natural resources. . . . The Department assesses our mineral resources and works to assure that their development is in the best interests of all our people" (40:307). An abbreviated diagram of the DoI is shown below in Figure 3-4.

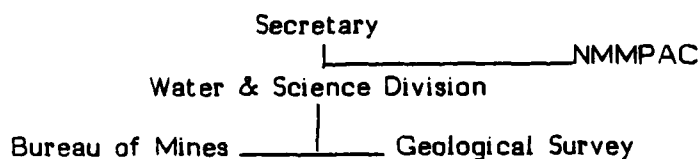


Figure 3-4. Abbreviated Organization of the DoI With Respect to the NDS

The Water and Science Division's responsibilities includes, among others, fostering and encouraging the private sector in the production of domestic fuel and nonfuel minerals through programs supporting the development and implementation of national mineral policy; effective mineral data collection and analysis;

and topographic, geologic, and mineral resource investigations (40:308). The Bureau of Mines is the primary organization in the Water and Science Division that affects stockpile policy. The Assistant Secretary for Water and Science is the administrator of the National Strategic Materials and Minerals Program Advisory Committee (NMMPAC) for the Interior Department.

NMMPAC

The Secretary of the Interior formed the NMMPAC in April of 1984. The NMMPAC is a 25 member task force headed by Retired Admiral Mott. According to NMMPAC's charter, they are to examine a wide variety of issues surrounding mining and mineral processing industries of the United States. So far, it has examined the management structure of the NDS and recommended that the NDS ". . . program be administered by a Government corporation having no other responsibilities than to secure and maintain an adequate supply of strategic and critical materials . . ." (38:1). Presumably this corporation will be a quasi-governmental, similar to COMSAT (Communication Satellite Corporation of America). It would be quasi-governmental because it would still be under the review of Congress and have reporting requirements in the Federal Register (This alternative to management is discussed further in chapter six).

Bureau of Mines

The Bureau of Mines is mainly a research and fact-finding organization. Its main objective is to ensure that the United States has an adequate supply of minerals for its security and economic needs. The Bureau performs a wide array of important services needed for stockpile policy formulation, such as data collection and analyses or research on all aspects of mining. Because the majority of materials in the stockpile are of mineral origin (80 of 93), ". . . there is virtually day-to-day contact between the FEMA and the Bureau of Mines, which is the [Interior] Department's primary contact with the FEMA [NDS] operation"

(55:70). The Bureau, aided by the U.S. Geological Survey, supplies all agencies of the government and the public with supply and demand data for all strategic and critical materials. The Bureau supplies information on world-wide reserves of minerals and ". . . also collects, compiles, analyzes, and publishes statistical and economic information on all phases of mineral resource development, including exploration, production, shipments, demand, stocks, prices, imports, and exports" (40:318-319).

Department of Defense (DoD)

A significant amount (approximately one-third) of strategic and critical materials from the National Defense Stockpile would be used by the Defense Department in the production of weapons should a national emergency develop. Consequently, the Defense Department is very interested in NDS policy. A diagram of the main organizational elements in the DoD responsible for formulating advice on strategic and critical materials policy is shown below in Figure 3-5.

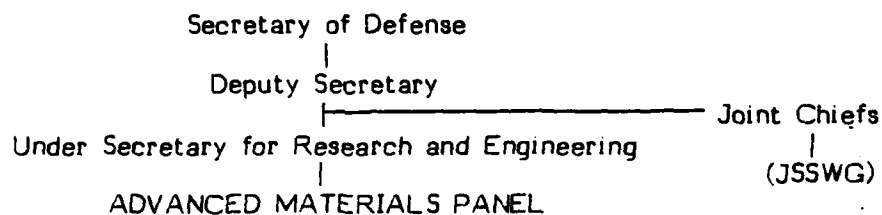


Figure 3-5. Abbreviated Organization of the DoD With Respect to the NDS

The Under Secretary for Research and Engineering is the primary advisor to the Secretary of Defense concerning defense-related scientific or technical matters. This responsibility includes ". . . basic and applied research, environmental services, and the development and acquisition of weapons systems" (40:166). As the complexity of weapons has increased, so have the requirements for exotic and/or high temperature alloys. Accordingly, the concern about strategic and

critical materials, especially for substitutes, have increased in the DoD.

The Joint Strategic Stockpile Working Group (JSSWG) recommends policies concerning the NDS to the Joint Chiefs of Staffs who in-turn make recommendations to the Secretary of Defense (SECDEF). Based on the JSSWG's suggestions the Joint Chiefs stated in a December 1983 memorandum to the SECDEF that no changes be made to FEMA or GSA management of the Stockpile, among their many other recommendations (9:19).

In 1983 the DoD formed the Advanced Materials Panel to accomplish a tri-service (Army, Navy, Air Force) study on critical materials. The objectives of the Panel are listed below (57:64).

- 1.) Evaluation of the impact of critical materials, and shortages thereof, on future DoD systems;
- 2.) Exploration and definition of needs for coordinated or inter-dependent tri-service research and development programs;
- 3.) Proposals for strategies to help against future shortages of critical materials; and
- 4.) Identification of roadblocks to success, including the potential problems of technology gaps, shortages of personnel, and funding deficiencies.

Commentary

It was suggested by the interviewees in Washington that the military was a poor leader or contributor to the NDS policy-making process for two main reasons. First, no person in uniform stays in one position long enough to gain the expertise needed to understand the issues surrounding the stockpile. Secondly, DoD military and civilian personnel do not know the current material requirements or are able to forecast what materials may be in future weapon systems and therefore may be needed in the stockpile (if designated strategic or critical). A 1981 Institute for Defense Analyses (IDA) study found that the current "DoD material requirements are not readily determinable [because] the data are widely dispersed and not in easily useable form" (30:5-4). This data is dispersed among

the thousands of prime and subcontractors—so much so that it may be impossible to collect. Even though DoD is technically not in charge of the stockpile, these officials believe DoD should show more leadership, as they did in the past under the Army and Navy Munitions Board.

One rebuttal against the second charge is that technology is changing so fast compared to even the previous decade that the material forecasting risks are too great. Another rebuttal is that the DoD has studied future materials through various funded studies by defense contractors and other groups. For example, the memorandum mentioned above listed several materials such as high purity silicon, germanium, quartz, and carbon fibers that should be examined for inclusion into the stockpile (germanium was added to the NDS in June of 1984). One group that is analyzing current materials requirements is the Joint Aeronautical Materials Analysis Center. So far they have examined the bills of materials for Air Force jet engines and determined the amounts of strategic and critical materials used.

Department of Commerce (DoC)

Figure 3-6 below is an abbreviated organizational chart of the DoC with respect to the stockpile.

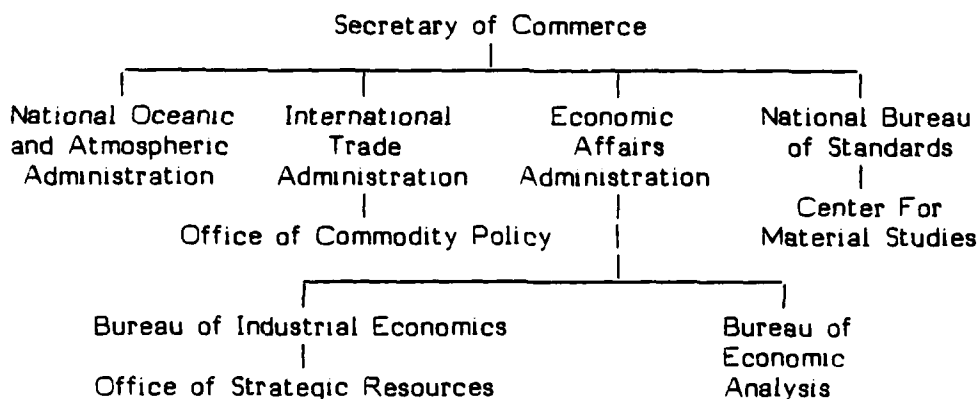


Figure 3-6. Abbreviated Organization of the DoC With Respect to the NDS

The 1980 Act required the Secretary of Commerce to submit to Congress case studies that identify a specific industry's needs that relate to national security. The case report would also make recommendations on programs to meet these needs. In the 1980 Act, the Congress also ordered the DoC to ". . . continually thereafter identify and assess additional cases, as necessary, to ensure an adequate and stable supply of materials to meet national security, economic well-being and industrial production needs" (68:2308).

The first report from the DoC was on the **Critical Material Requirements of the Aerospace Industry** (10). The second was on the steel industry, and the next is planned to be on the requirements of the defense industries (12). These reports are prepared by the Department's Mineral and Materials Task Force, which is chaired by the Office of Strategic Resources. Other members include the Bureau of Industrial Economics, International Trade Administration, National Bureau of Standards, the National Oceanic and Atmospheric Administration, and others. All of the activities of these agencies of the Department are coordinated by the Office of Strategic Resources (OSR) which was formed in May of 1982. According to the director of the OSR, the Office will

. . . coordinate studies of that are heavy users of strategic materials; identify current and innovative practices in the materials industries such as conservation, substitution, recycling, reclamation, and processing; and coordinate studies of government stockpiles. The office also will develop a business consultation program to ensure that the viewpoints of users of materials and minerals will be considered in the development of resource policies (58:35).

The DoC also administers the Defense Priorities and Allocation System (DPAS). This system replaced the Defense Materials System and Defense Priorities System in August of 1984. The DPAS is essentially a body of Government regulations and a priority rating system of materials orders under the authority

of the Defense Production Act of 1950 designed to accomplish two objectives. As expanded upon in the July 30, 1984 issue of the **Federal Register** "The DPAS . . . [1] helps to keep current national defense programs on schedule and [2] provides an operating system that can be rapidly expanded in a national emergency" (39: Sec.350.1b). Defense programs (weapon systems for example) are kept on schedule because suppliers of materials must give preferential treatment (fill first) to defense-rated orders. Among the defense-rated orders there is a priority ranking as well. The rationale for keeping a peacetime operating system that can be used during national emergency was brought about by the experiences in WW II and the Korean War. It took a year and a half in WW II and a year in Korea to develop a system of industrial controls to support mobilization for the war effort (13:4). The DPAS is designed to reduce this time required for mobilization to a minimum. The Office of Industrial Resource Administration and International Trade Administration manage the DPAS. "Commerce has delegated authority to place priority rankings on contracts or material orders necessary or appropriate to promote the national defense to the other government agencies that issue such contracts or orders" (39:Sec.350.2c).

Other parts of the DoC handle a wide variety of strategic material studies. For example, the Bureau of Industrial Economics performs market trend analyses and forecasts, the most recent being on aluminum, cobalt, copper, lead, titanium, and zinc (11). The National Bureau of Standards and its Center for Material Studies is studying rapid solidification technology, composites, and graphites. The Office of Commodity Policy examines international issues in ". . . securing adequate supplies of cobalt and chromium" (8:404). Thus, the general thrust of the Commerce Department is to reduce the vulnerability of American business to disruptions in the supply and price of materials.

Department of State

With regards to strategic materials, the Department of State is responsible ". . . for coordinating with other Government agencies and foreign governments to insure that the strategic stockpile acquisition and disposal program is consistent with our . . . overall foreign policy objectives" (55:74). The Office of International Commodities is the primary office with this responsibility. The Department is a member of a variety of committees that formulate stockpile policies. For example, the State Department chairs the National Security Council's (NSC) Nonfuel Mineral Working Group which in turn reports to the NSC's Steering Group. The former group reviews policy options on selected minerals. The Department is also a member of the COMAT and the Mineral Information Coordinating Committee (63:59).

Department of Agriculture (DoA)

The Department of Agriculture's primary effect on strategic materials policy is with regards to using barter to acquire NDS materials. Figure 3-7 below is an abbreviated organizational chart of the Agriculture Department illustrating the main organizations responsible for barter.

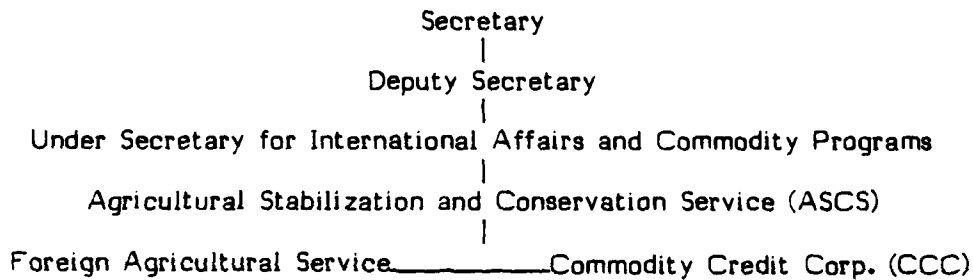


Figure 3-7. Organizational Hierarchy in the DoA With Respect to Barter

In general, "The purpose of the CCC is to stabilize and protect farm income and prices, to assist in maintaining balanced and adequate supplies of agricultural

commodities and their products, and to facilitate the orderly distribution of commodities" (40:113). Regarding the NDS the Commodity Credit Corporation is authorized by Public Laws 80-806, 83-480, and 98-284 to barter surplus agricultural products, such as grains and dairy products, for strategic materials produced in foreign countries. Section 6 of the 1979 Act states that "The President shall encourage the use of barter in the acquisition of strategic and critical materials . . ." (70:Sec.6(c)1).

The CCC uses the staff and facilities of the ASCS along with the Foreign Agricultural Service when dealing in certain foreign trade operations. The CCC obtains its agricultural materials during its effort to stabilize domestic commodity prices—that is, it purchases the surpluses to reduce supply and maintain the price.

The Department of Energy and Treasury Department

Both of these Departments are members of the AMP Steering Committee and various other councils. Although no fuel minerals or foodstuffs are in the NDS (oil is in the Strategic Petroleum Reserve), the Energy Security Act of 1980 amended the Defense Production Act [DPA] of 1950 to ". . . specifically designate 'energy' [fuel minerals] as a 'strategic and critical material' for the purposes of the DPA" (69:Sec.101).

Independent Establishments (Executive Agencies)

The two independent executive branch establishments that significantly affect stockpile policy are the Federal Emergency Management Agency and the General Services Administration, although the Central Intelligence Agency also plays a relatively minor role, and it will be discussed first.

The Central Intelligence Agency (CIA)

The CIA is a member of the Strategic Implications Subcommittee of the

AMP Steering Committee. One of its main responsibilities is to analyze the political reliability of supply sources. Table 2 of Appendix D lists political reliability and other risk factors for various sources of supply. This Table shows some of the types of criteria considered in determining mineral-source reliability.

The General Services Administration (GSA)

The GSA manages the Government's ". . . property and records, including construction of and operation of buildings, procurement and distribution of supplies, utilization and disposal of property, transportation, traffic, and . . . stockpiling of strategic materials. . ." (40:533). The GSA manages the the Stockpile Transaction Fund and the stockpiled materials themselves through the Federal Property Resources Service and the Public Buildings Service. An abbreviated diagram of the GSA as it relates to the National Defense Stockpile is shown below in Figure 3-8.

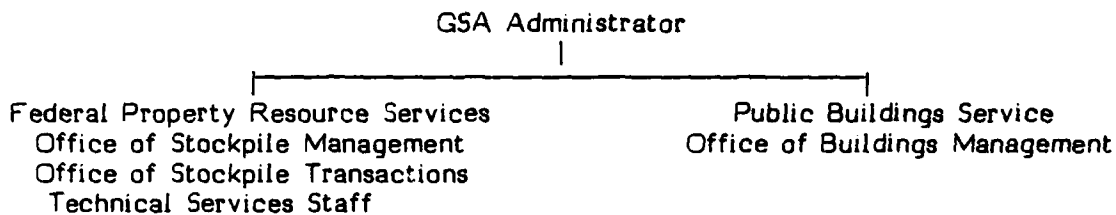


Figure 3-8. GSA Organization With Respect to the NDS

Federal Property Resources Service (FPRS)

The FPRS is made up of two basic programs: the real-property program and the National Defense Stockpile program. The real-property program office ". . . provides for the efficient and economical utilization of Federal real property and the disposal of any real property surplus to Federal requirements" (40:546). This excess property may be traded for strategic and critical materials as authorized by the Federal Property and Administrative Services Act of 1949.

The second basic program concerns the NDS and is discussed below.

Office of Stockpile Management

"The Office of Stockpile Management is responsible for the materials inventory of the NDS including storage, security, quality assurance, transportation and handling" (41:33). Table 3-2 below lists the type and number of stockpile depot locations they manage (7:6).

Table 3-2. National Defense Stockpile Storage Data for FY 1983

<u>Controlling Organization</u>	<u>Number of Depots</u>	<u>Annual Storage Costs</u>
GSA	31	8,324,000
DoD	34	2,048,566
Army	22	1,538,259
Navy	6	491,662
USAF	2	44,007
DLA*	4	172,767
Other Government	9	3,400
<u>Non Government</u>	<u>38</u>	<u>87,295</u>
<u>TOTAL</u>	<u>112</u>	<u>\$10,463,261</u>

*Defense Logistics Agency

The materials in these depots are in two basic categories: bulk ore piles and block formation. Bulk ore piles are huge mounds containing millions of pounds that are inspected visually. To prevent wind and rain erosion, or potential pollution problems, vegetation is being planted on some of the piles. Materials stored in block formation are in wooden/metal crates and drums, or as ingots. Narcotics are stored in special dry-vaults of the Bureau of Narcotics.

FPRS rules require that all NDS materials be inspected every six months. The purpose of these inspections are to ". . . detect deterioration, infestation, inventory inaccuracies, or theft" (21:5). The results of these inspections are forwarded to FPRS headquarters for review by stockpile specialists. These official inventory records are used by the GSA and the FEMA to prepare the semi-annual Stockpile Report to the Congress.

Office of Stockpile Transactions and Stockpile Transaction Fund

"The Office of Stockpile Transactions acquires and disposes of materials in the National Defense Stockpile based on policy guidance from FEMA, including long-term planning, recurring Congressional authorization and appropriation for acquisition and disposal, market research and planning, contract development and execution, and barter" (41:33).

The money for acquisition currently comes from the Stockpile Transaction Fund. The revenues from sales of surplus stockpile materials is put into the fund along with any additional moneys appropriated by Congress. The Transaction Fund is therefore a rotating fund but there are not sufficient surplus materials to fund the entire inventory deficit (See Fig. 6 of Appendix A). The Fund was created by section 9 of the Strategic and Critical Materials Stockpiling Act of 1979 which also stated that moneys in the Fund ". . . shall be available only for the acquisition of replacement materials" (70:Sec.9c). Congress also provided for a cap or limit to be placed on the Transaction Fund. This provision states that no disposal of materials from the stockpile may occur if the balance in the Fund exceeds the cap. The purpose of this provision is to force the Administration to purchase replacement materials to balance out the disposals. The original cap was a billion dollars but has been reduced several times and is currently \$250 million. The 1985 DoD Authorization Act reduces the cap to \$100 million effective October 1, 1986. With the cap on the fund and the fact that materials acquired or disposed of must both be approved, Congress has a degree of control over the balance in the Fund and the material composition of the stockpile.

Technical Services Staff

The Technical Services Staff operates the William Langer Jewel Plant at Rolla, North Dakota. According to the US Government Manual "The William Langer Plant is the only Government-owned, contractor-operated plant in GSA,

and it is the only plant of its kind in North America" (40:545). The funding for the plant and the jewel bearings going to the NDS comes from a separate GSA program appropriation.

Public Building Service (PBS)

Storage facilities, such as warehouses, are also inspected every six months. The type of storage facilities utilized varies according to the properties of materials stored. Protection from theft and deterioration are the primary factors determining how a material is stored. PBS is responsible for the maintenance of storage facilities and physical security as well.

Commentary

A 1982 study by the GAO found "Many storage facilities are in need of repair" (21:2). However, little damage has been caused because the materials themselves were moved out of harms way. For example, materials exposed to rain leaking through holes in warehouse roofs were moved to dry locations. PBS replied to the GAO investigators that they were doing as many repairs as possible with their limited resources. Physical security has also been reduced at some storage locations in order to augment security at Federal office buildings.

A general criticism of the NDS is the fact that the stockpile Transaction Fund, which is essentially a program of a defense nature, has to compete with the other non-defense programs of GSA for budget ranking priorities before it is sent to OMB. During 1983 hearings, the commissioner of the FPRS was asked what priority the Transaction Fund was in GSA as a whole. Although it was his first personal priority, surprisingly, he did not know what the overall priority was. It was surprising because the Transaction Fund has been 20 to 40 percent of the entire FPRS budget (53:114). According to the GSA budget ranking sheet (to OMB) the stockpile's management account, transaction account, and transaction fund account were ranked 40, 41, and 42 respectively (out of 92). The stockpile

accounts were ranked lower than the National Archives Gift Fund (ranked 35th with budget outlays of \$213,000).

A former commissioner of the FPRS related the following account in 1983 hearings. In fiscal year 1981 GSA was directed to reduce their budget by \$26.4 million. This was accomplished by reducing the Transaction Fund from 169.9 to 148.8 million dollars. The difference of \$21.0 million was almost 80 percent of the total GSA budget cut. The Appropriations Committee further increased the total GSA budget reduction to \$54 million of which almost 90 percent or \$49 million was taken out of the transaction fund (53:16).

In a sense of fairness, however, the Administrator of the GSA has few choices. Just as DoD's budget is the most controllable part of the entire federal budget, the stockpile Transaction Fund is the most controllable part of GSA's budget and therefore the most tempting candidate for a single-year budget reduction. The former commissioner of FPRS continued to explain that

The GSA's Administrator's choices are extremely limited. Considering the costs of a Reduction In Force (RIF) and the time it takes to reduce staffs beyond attrition, there are few choices available. The stockpile acquisition budget was in the wrong place [instead of DoD] and was competing with appropriated dollars for jobs and salaries, even though the funds for acquisition come from sales receipts through the Transaction Fund (53:16,17).

Another institutional handicap of having the Transaction Fund in the GSA is that it must be justified with the rest of GSA's budget in front of the Treasury, Postal Service, and General Government Subcommittee instead of a more sympathetic committee such as Armed Services. The Grace Commission did ". . . not believe the stockpile is a priority issue to either GSA or the Treasury, Postal Service, and General Government Committees to the extent that it would be to FEMA." The Commission recommended that ". . . FEMA be given control of the Stockpile Transaction Fund . . ." (44:27).

Federal Emergency Management Agency (FEMA)

The FEMA ". . . was created to provide a single point of accountability for all Federal emergency preparedness, mitigation, and response activities . . . in preparing for and responding to the full range of emergencies—natural, manmade, and nuclear. . ." (40:502). Figure 3-9 below is an abbreviated organizational chart of the FEMA with respect to the national defense stockpile.

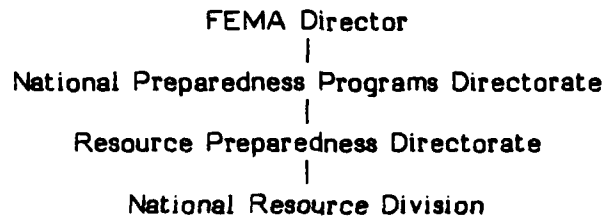


Figure 3-9. Abbreviated Organizational Chart of the FEMA

The three organizational subunits above ". . . are the real stockpile people. . ." (53:55). The National Preparedness Programs Directorate ". . . identifies shortfalls of natural, industrial, or economic resources that could constitute a threat to national security, and develops plans to mitigate the impact of resource shortages" (40:503). It covers the entire range of local, state, and Federal governments to assure mobilization for war, among its other responsibilities.

The Resource Preparedness Directorate ". . . is responsible within that larger framework for all actions, policies and plans to make sure we [the United States] are ready with respect to resources" (53:56). The director is responsible for the national defense stockpile and is chairman of the Annual Materials Plan Steering Committee. This committee has two subcommittees on the following that assists the full committee.

The Natural Resources Division is ". . . directly in charge of establishing policy, goals, and procedures for the national defense stockpile" (53:56).

The Annual Materials Plan (AMP)

A general description of how stockpile goals are determined and the annual plans to reach those goals in the long run was presented in chapter two. The AMP is required by the 1979 Act to be sent with the President's annual budget along with tentative AMPs for the next four fiscal years. In fiscal year 1984 some 27 materials valued at \$30 million were sold and 5 materials valued at \$53 million were purchased for the NDS (43:1,2). The AMPs are a means of restructuring the NDS to reflect current needs and technologies. A graphic illustration of overall stockpile operations in peacetime and national emergency is depicted below in Figure 3-10 (arrows indicate material flows).

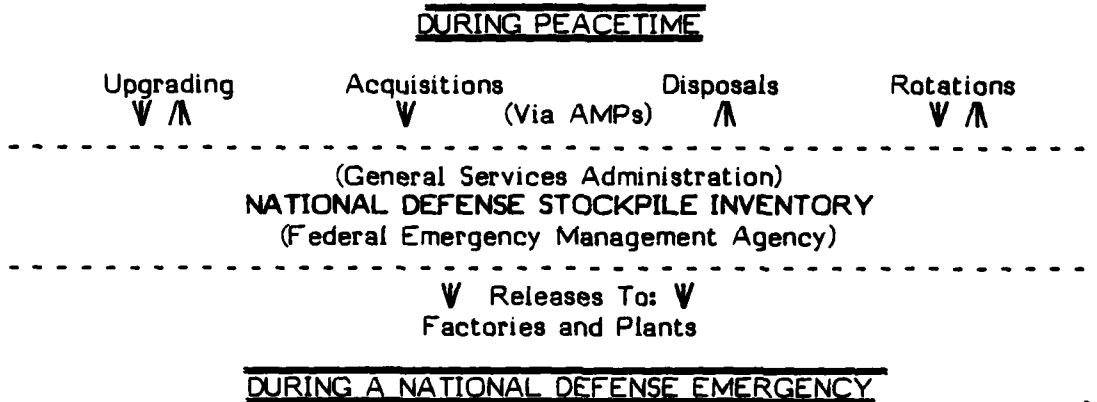


Figure 3-10. National Defense Stockpile Material Flows

Releases to factories and plants are initiated by a recommendation from the FEMA director to the President. The President then informs the Armed Services Committees of Congress. A Congressional Research Service (CRS) report states that "Since 1939, there have been 28 releases authorized by the President:"

- 6 during WW II
- 12 during the Korean War
- 6 during the Vietnam War
- 4 peacetime releases (1956, 1959, 1973, and 1979)
- 28 Total Releases

The CRS report also states that the latest release (1979) was a form of asbestos used as an insulation blanket in missiles. The justification for the release was that the Canadian mine was exhausted and the Zimbabwe mines were either embargoed or not active (23:28).

Figure 3-11 below is a graphical summary of the AMP planning process.

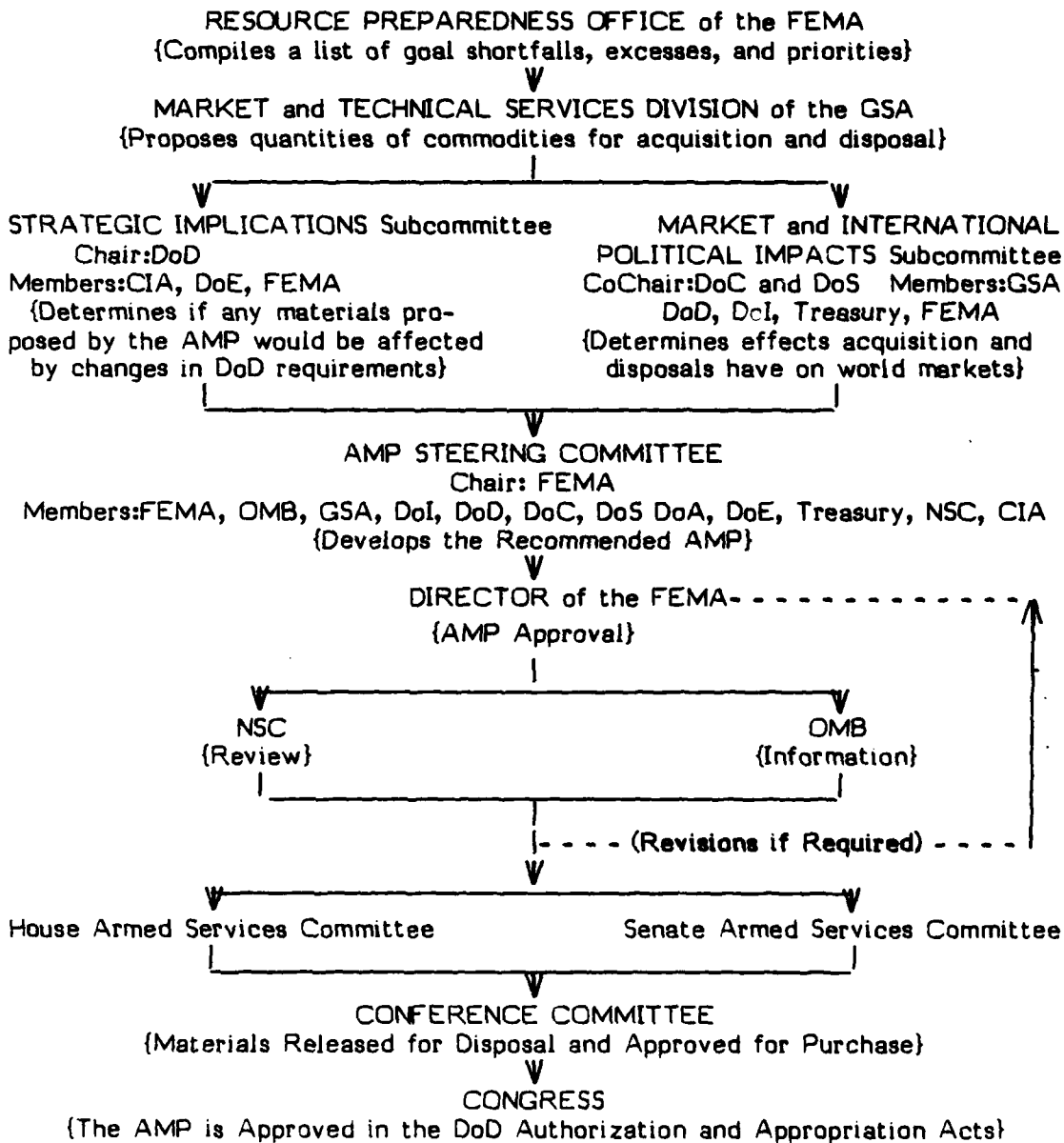


Figure 3-11. The Annual Materials Planning Process

Commentary

From discussions with government officials in Washington, a list of criticisms of the FEMA was formulated. The underlying criticism was lack of active management. It should be made clear that no one has specifically charged the FEMA with culpable mismanagement of the NDS. Three additional criticisms are (1) FEMA failed to explore alternatives for reaching goals such as recycling scrap and using barter transactions; (2) FEMA failed to perform a rigorous review of goals and consult with industry to the proper degree; (3) that FEMA failed to initiate legislative ideas.

FEMA, however, has been in existence only since 1979 whereas the stockpile has existed since 1939. Therefore it is not fair to blame FEMA for activities of the past four decades. FEMA suffers the same institutional handicaps as GSA: its final budget is set by the administration and congress currently in power. Although the Transaction Fund is technically in the GSA budget FEMA aids its formulation through the AMP process. One can see by examining Table 3-1 that of the \$2.965 billion proposed, only \$582.6 million has been appropriated by Congress or obligated by OMB in the past.

On a more positive note the FEMA has accomplished a great deal on many problem aspects of the stockpile. The FEMA has commissioned studies on the form and quality of materials stored and the director has stated ". . . substantial additions of cobalt, bauxite, iridium, quinidine sulfate, and tantalum have been added to the stockpile inventory" (See Figure 4 of Appendix A) (306:122). The current semiannual **Stockpile Report to the Congress** list several other initiatives as well. Whether these were self initiated by FEMA or brought about by critics is unknown to the authors.

Summary

One can see from the previous discussion that several Executive Branch agencies have a significant input into formulating the Government's overall policy on the National Defense Stockpile. One reason for this is because stockpile management requires many diverse fields of expertise in the Federal Government. For example, because it is a program of a defense nature it affects the DoD, since some materials are purchased from foreign sources the State Department is involved. The Commerce Department take part because materials are also purchase domestically. Stockpile management is basically a compromise between using enough expertise in the government as a whole and having the efficiency of single-agency management. This matrix-type management has led to a few built in structural problems. For instance, the NDS is about the only government program where one agency determines the budget requirement (FEMA through the Annual Materials Plan) and another agency (GSA) has to obtain the funds. Another problem is that even after an elaborate interagency process take place to develop the Annual Materials Plan, it is still subject to rigorous review by the OMB. This problem will be examined in the next chapter on the Legislative Branch.

The authors of the Paley Commission report in 1951 summed up the problem of managing the National Defense Stockpile as follows:

In general, building a national stockpile is an uncertain business. Nobody knows exactly what demands will be made on a stockpile until the emergency comes, yet the materials have to be assembled in advance. Its administration calls for judgement and imagination of the highest order" (45:163).

With all of the various Executive Branch agencies affecting stockpile policy it is easy for one to understand how even the highest order of judgement and imagination may be diluted.

IV. Agencies of the Legislative Branch Affecting NDS Policy

Introduction

This chapter describes those agencies in the Legislative Branch that affect policy matters relating to the National Defense Stockpile (NDS). These agencies are diagrammed below in Figure 4-1. First, the various organizations that provide background information on NDS matters to the Congress are discussed. Next, a description of those committees and subcommittees of Congress that are important in determining the fate of legislative proposals relating to the NDS follow. Finally, a history of the most significant legislation of the stockpile, including Executive Orders is presented.

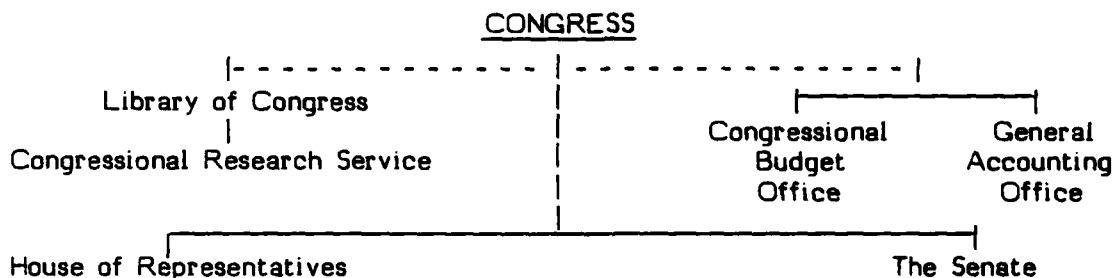


Figure 4-1. Organizations in the Legislative Branch Affecting Stockpile Policy

General Accounting Office (GAO)

The GAO, established in 1921, is an agency independent of the executive departments of the government whose basic purpose is to perform unbiased audits of other Government agencies. To accomplish this, the GAO is specifically charged

... to assist the Congress, its committees, and its Members in carrying out their legislative and oversight responsibilities, consistent with its role as an independent nonpolitical agency in the legislative branch . . . and to make recommendations designed to provide for more efficient and effective Government operations (40:41).

Their assistance is provided when requested by these different congressional organizations and has been used extensively on matters concerning the stockpile since 1978. Currently, the GAO is examining the area of recycling strategic and critical scrap materials that are generated as by-products in the production of weapons systems. For example, the F-100 engine (used in the F-15 and F-16 aircraft) contains 160 pounds of cobalt, but another 750 pounds are machined away as scrap in the production process (30:5-11). These raw materials are originally furnished by the Government, but the resulting superalloy scrap materials are sold by the civilian contractor (usually to foreign buyers) with the revenue obtained applied against the contract price. The effectiveness of this practice is being evaluated in light of current stockpile shortages of these materials; as an alternative, the processing and placing of these scraps into the stockpile is being examined.

Library of Congress

One department located within the Library of Congress that indirectly affects the stockpile is the Congressional Research Service (CRS). According to the preface located in each CRS report, they (the CRS) ". . . work exclusively for the Congress, conducting research, analyzing legislation, and providing information at the request of committees, Members, and their staffs. The Service makes such research available, without partisan bias"

The major contribution to stockpile policy by the CRS is provided through the publication of studies, reports, compilations, digests, and background briefs on this subject. An example of one such study is *A Congressional Handbook on U.S. Material Import Dependency/Vulnerability*. It was specifically prepared in 1981 to ". . . summarize past actions and activities relative to this subject [the NDS]; and to provide a basis for Congressional consideration of legislative

approaches to the problem" (8:III). The CRS also publishes regularly updated Issue Briefs which are condensed summaries on various aspects concerning the stockpile. As examples, three Issue Briefs are listed below:

- Barter of Surplus Agricultural Commodities for Strategic and Critical Materials**, updated December 6, 1984.
- National Defense Stockpile**, updated December 5, 1984.
- Strategic and Critical Materials Policy: Research and Development**, updated December 5, 1984.

These briefs and many other reports published by the CRS are prepared by two internal organizations, the Environment and Natural Resources Policy Division and the Science Policy Research Division.

Congressional Budget Office (CBO)

One of the functions assigned to the CBO is the area of special studies. These studies are produced in the form of background papers, CBO studies, and budget issue papers. As required by law, this service is provided in the following order of priority to: House and Senate Budget Committees; House and Senate Appropriations Committees; Senate Finance and the House Ways and Means Committee; all other congressional committees (40:56).

A 1983 study, **Strategic and Critical Nonfuel Minerals; Problems and Policy Alternatives**, was prepared at the request of the Senate Committee on Commerce, Science, and Transportation. According to the preface to this particular report, the mandate of the CBO is to provide objective analysis, and not to make recommendations (5:iii). Several divisions within the CBO such as the Natural Resources and Commerce Division, and the National Security and International Affairs Division, have both published reports concerning the present status of the stockpile and their perceived possible solutions.

Congressional Committees Affecting the Stockpile

The work of preparing and considering legislation is done largely by the committees of both Houses of Congress. The standing committees, i.e. those with permanently authorized staff and broad legislative mandates, are at the center of the legislative process. Currently, there are six standing committees in the Senate and six standing committees in the House of Representatives significantly affecting stockpile policy.

When a bill relating to stockpile matters is introduced, it is referred to the appropriate committee(s) by the Senate or House parliamentarian. Custom and rule generally govern this referral process, and the jurisdiction of the existing standing committees are specified in **Senate Rule 25** and **House Rule 10**. A bill may be considered by the full committee in the first instance, but more often the committee chairman assigns it to a subcommittee for study and initial hearings (34:40).

Within the committee system, subcommittees provide the ultimate division of labor that allows the members of Congress to develop expertise in specialized fields. Some have well-defined jurisdictions and function with great autonomy, whereas others are criticized as slowing down the authorization and appropriation process. These subcommittees usually invite testimony from government officials, outside experts or scholars, and special interest groups when performing their duties (34:41). When the subcommittee finishes its action on the bill (approving, rejecting, amending, or substituting a new version), it is returned to the full committee. The full committee may then repeat the subcommittee actions, but as is commonly the case, it simply ratifies the action of the subcommittee (34:42). Of the 12 committees affecting stockpile policy, 12 different subcommittees scattered throughout Congress perform the actual mechanics as described above.

The following sections on the Senate and House of Representatives, describe those standing committees and their subcommittees of Congress that are tasked as one of their duties to examine conditions and recommend legislation on matters affecting the stockpile. Also, beneath some of these subcommittees is a list of recent legislation relating to the NDS it has considered. Though current, it should be noted that the names of these committees and subcommittees, their membership, and jurisdiction are all subject to change with each new session of Congress.

Senate Committees and Subcommittees

This section describes those committees and subcommittees in Congress who significantly affect matters relating to the National Defense Stockpile. Figure 4-2 lists these various committees and subcommittees.

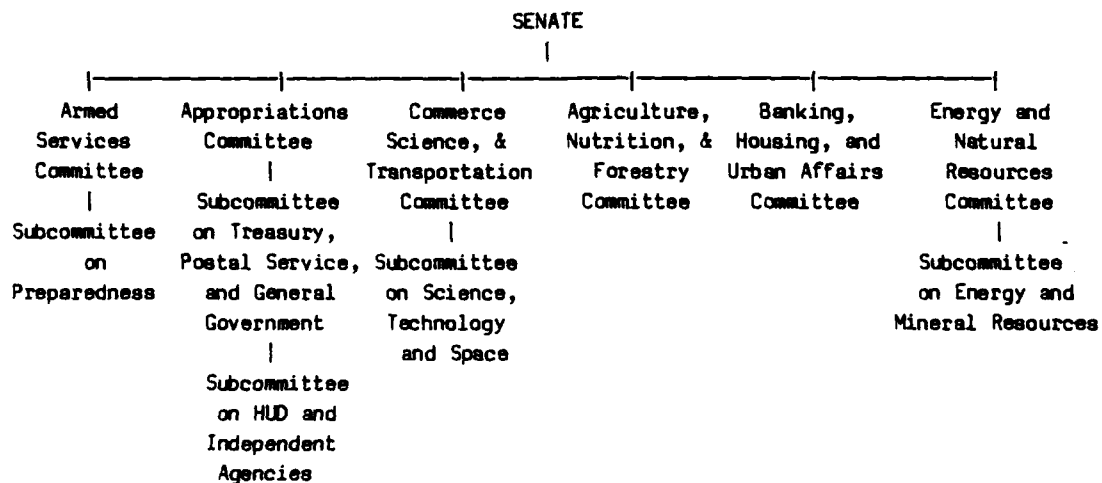


Figure 4-2. Senate Committees and Subcommittees Affecting NDS Policy

Agriculture, Nutrition, and Forestry Committee (est. 1825)

This Committee's general jurisdiction is over matters relating to agriculture and forestry measures. Their input to stockpile matters lies in their specific

oversight of agricultural commodities which may be bartered to acquire strategic and critical materials. This responsibility stems from the Committee's jurisdiction over the Commodity Credit Corporation (CCC) (60:334). (The duties of the CCC were discussed under the Department of Agriculture in Ch. 3).

Appropriations Committee (est. 1867)

The overall responsibility of this Committee lies in the appropriation of revenue for executive agencies and Federal programs and activities (60:335). To accomplish this, subcommittees are created and delegated specific jurisdiction with which to hold hearings, receive evidence, and report to the Committee on all matters referred to them (59:17). Currently there are 13 separate subcommittees within this Committee, but the two most prominent are those that control the funding of the various aspects of the stockpile discussed below.

HUD-Independent Agencies Subcommittee

Established by the Majority Caucus of the Appropriations Committee, this Subcommittee is responsible for the appropriation of funds for the budget of the Federal Emergency Management Agency (3:III-9).

Treasury, Postal Service , and General Government Subcommittee

This Subcommittee was also established by the Majority Caucus, with one of its delegated responsibilities being the appropriation funding of the General Services Agency (GSA). Within GSA's budget are the areas of stockpile management, transactions management, and the transaction fund (53:120-121).

Armed Services Committee (est. 1816)

This Committee is generally responsible for the common defense of the United States including procurement practices, weapon systems, manpower, military intelligence, and naval petroleum reserves. Also, it has the specific jurisdiction over matters relating to "Strategic and critical materials necessary for the common defense" (64:26). Public Law 96-41, the Strategic and Critical

Materials Stock Piling Act of 1979, also requires that this Committee be notified in writing at least 30 days prior to any revision in stockpile quantity requirements, or the acquisition or disposal of materials except during a national emergency.

Preparedness Subcommittee

This Subcommittee has the designated jurisdiction of providing ". . . to the full Committee general oversight of readiness and sustainability operations and maintenance issues", which includes the area of stockpiling (3:III-113). This Subcommittee held hearings on:

- S. 1982, a bill to establish an independent Strategic Stockpile Commission.
- S. 2429, directing the Administrator of the GSA to acquire copper for the stockpile from domestic producers (97th Congress, 1st Session).

Banking, Housing, and Urban Affairs Committee (est. 1913)

This Committee is referred all proposed legislation and matters relating to, among other areas, ". . . control of prices of commodities; economic stabilization and defense production; and money and credit, including currency and coinage (64:26). This Committee has held hearings on:

- the use of provisions in the Defense Production Act to stimulate the domestic production of cobalt (97th Congress, 1st Session).
- S. 269, to provide for the disposal of silver from the stockpile through the issuance of silver coins (98th Congress, 1st Session).
- S. 1852, to further extend the Defense Production Act of 1950 (98th Congress, 1st Session).

Commerce, Science, and Transportation Committee (est. 1958)

Among its many specific areas of responsibility, this Committee is referred all proposed legislation and other matters referring to "Science,

engineering, and technology research and development and policy" (64:28). It has one subcommittee affecting the stockpile, discussed below.

Science, Technology, and Space Subcommittee

As stipulated in the Washington Monitor's *Congressional Yellow Book*, the jurisdiction of this Subcommittee is designated by its title (3:III-20). This Subcommittee has held hearings on:

- critical minerals and materials in general (97th Congress, 1st Session).
- the oversight of national materials and minerals policy (97th Congress, 1st Session).

Energy and Natural Resources Committee (est. 1816)

As its name implies, this committee is generally concerned with the areas of energy and natural resources. Their tasking in this second area, natural resources, contains several applications to stockpile matters as alluded to in the President's Program Plan (64:28-29):

1. Extraction of minerals from oceans and Outer Continental Shelf lands.
2. Mining education and research.
3. Mining, mineral lands, mining claims, and mineral conservation.
4. Public lands and forests, including farming and grazing thereon, and mineral extraction therefrom.

In addition, this Committee is to study, review and report to the full Congress from time to time on matters relating to resources development (64:21).

Energy and Mineral Resources Subcommittee

This Subcommittee is tasked to perform several of the responsibilities of the Committee, particularly in the areas of nonfuel mineral resources, mining policy, and mineral conservation (3:III-22). This Subcommittee has held hearings on:

- the strategic minerals and materials policy of the United States (97th Congress, 1st Session).

-the President's National Materials and Minerals Program and report to Congress (97th Congress, 2nd Session).

House of Representative Committees and Subcommittees

This section describes those committees and subcommittees of the House of Representatives who significantly affect matters concerning the National Defense Stockpile. Figure 4-3 lists these various committees and subcommittees.

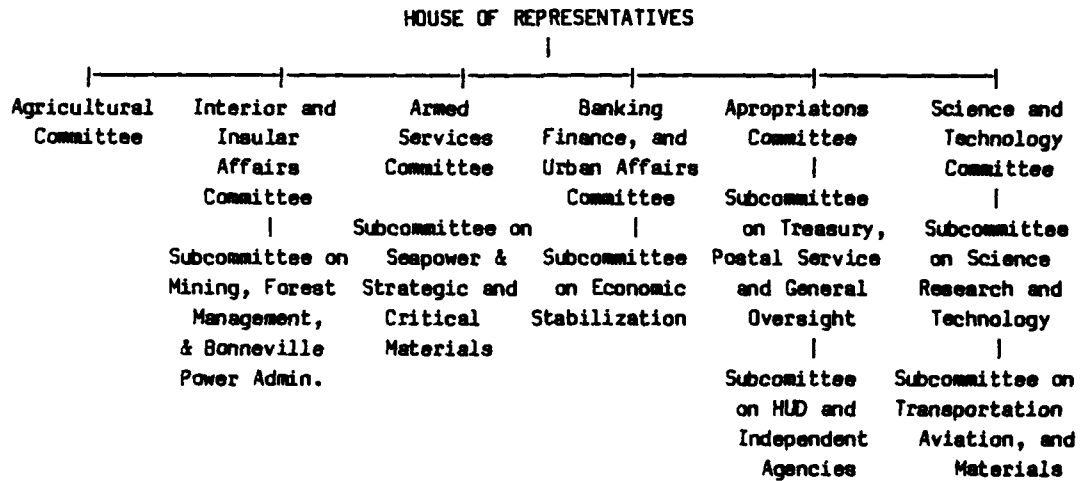


Figure 4-3. House Committees and Subcommittees Affecting NDS Policy

Agricultural Committee (est. 1820)

The duties of this Committee are essentially the same as that of the Senate Agriculture, Nutrition, and Forestry Committee.

Appropriations Committee (est. 1865)

The duties of this Committee and its Subcommittees listed below are essentially the same as their counterparts in the Senate.

Treasury, Postal Service, and General Government Subcommittee

HUD-Independent Agencies Subcommittee

Armed Services Committee (est. 1822).

The duties of this Committee are essentially the same as those of the Senate Armed Services Committee. However, its applicable subcommittee is not the same and is discussed below.

Seapower and Strategic and Critical Material Subcommittee

Also a standing subcommittee, with one of its delegated responsibilities being ". . . strategic and critical materials necessary for the national defense; and related oversight" (59:27). This subcommittee has held the majority of recent hearings on the National Defense Stockpile such as:

-H.R. 2154, which eventually became the Strategic and Critical Materials Act of 1979 (96th Congress, 1st Session).

-H.R. 4281, the Critical Materials Act of 1981, to establish a critical materials council in the Executive Office of the President (97th Congress, 2nd Session).

-H.R. 33, to transfer management of the stockpile to the Secretary of Defense (98th Congress, 1st Session).

-H.R. 3544 to facilitate the use of barter for NDS materials, and H.R. 626, the National Strategic Materials and Minerals Assessment of 1983 (98th Congress, 1st Session).

-H.R. 5167, the Defense Department Authorization and Oversight which became the 1985 Department of Defense Authorization Act (98th Congress, 2nd Session).

Banking, Finance, and Urban Affairs Committee (est. 1865)

This Committee's general responsibilities include banking and currency legislation, international financial organizations, and public and private housing. Specific jurisdiction relating to the stockpile is ". . . gold and silver, including the coinage thereof; . . . Economic stabilization, defense production,

renegotiation, and control of the price of commodities" (60:339). The Committee's work on stockpiling has been done by the Subcommittee discussed below.

Economic Stabilization Subcommittee

This is one of eight standing subcommittees within this committee, with jurisdiction over matters relating to economic stabilization and ". . . all defense production matters as contained in the Defense Production Act of 1959, as amended, . . ." (59:54). This Subcommittee requested the Congressional Research Service to produce the 1981 Congressional Handbook on US Materials Import Dependency/Vulnerability ". . . in connection with its continuing investigation of activities and decisions that might affect the problem of revitalization within the U.S. economy" (8:III).

Interior and Insular Affairs Committee (est. 1805)

This Committee is responsible for a wide variety of domestic issues including public lands, National parks, irrigation reclamation, and mining (60:357). Of particular interest to stockpile matters are those responsibilities delegated to the Mining, Forest Management, and Bonneville Power Administration Subcommittee.

Mining, Forest Management, and Bonneville Power Administration Subcommittee

This subcommittee is one of six standing subcommittees within this committee with a portion of its jurisdiction relating to stockpile matters in (3:43):

- a) Mining interests generally;
- b) Mineral resources of the public lands;
- c) Mineral land laws, and claims and entries thereunder;
- d) Geological survey;
- e) Mining schools and experimental stations;
- f) Proposed long-range domestic minerals programs, including availability of domestic minerals to fulfill all domestic requirements;

This Subcommittee has held hearings on H.R. 3364, the National Minerals Security Act of 1981 (97th Congress, 1st Session) which was designed to establish a Council on Minerals and Materials.

Science and Technology Committee (est. 1958)

This Committee has as the basis of its jurisdiction, research and development in astronautics, energy, and science (60:370). Their participation in stockpile matters, as delegated to its subcommittees, has been in oversight hearings particularly in the area of materials and minerals research and development as called for in the 1980 National Materials and Minerals Policy, Research and Development Act. Its most prominent subcommittees affecting stockpile matters are discussed below.

Science, Research and Technology Subcommittee.

This designated standing subcommittee has jurisdiction over legislation, general and special oversight and all other matters relating to ". . . the Office of Science and Technology Policy [in the Executive Branch]; the Office of Technology Assessment [in the Legislative Branch]; scientific research and development and applications;" (59:217). This subcommittee has held joint oversight hearings (with the Transportation, Aviation, and Materials Subcommittee) on the National Materials and Minerals Policy, Research and Development Act of 1980 and on H.R. 4281, the Critical Materials Act of 1981 (97th Congress, 2nd Session).

Transportation, Aviation, and Materials Subcommittee

This standing subcommittee has responsibility for legislation, general and special oversight and all other matters relating to ". . . materials R&D and national materials policies, both domestic and international . . ." (59:217). This Subcommittee has held hearings:

-on materials R&D policy (98th Congress, 1st Session).

-with the Science, Research and Technology Subcommittee as described above (97th Congress, 2nd Session).

Commentary

This commentary section focuses mainly on the funding aspects of the GSA and FEMA, as dictated by the Appropriations Committees. To begin, the fact that FEMA sets policy for the stockpile while GSA formulates the budget proposal for its respective areas of the stockpile is an unusual practice for agencies within the government. The Executive Deputy Director of FEMA, in 1982 testimony before the Preparedness Subcommittee of the Senate Armed Services Committee, stated that this could create a problem and that FEMA would like to see this policy changed. The Executive Director, General Lewis, further relates that FEMA was not invited by the Appropriations Committee and did not attend GSA budget hearings for fiscal years 1982 and 1983. According to General Lewis, "In that FEMA is responsible for the overall policy I believe the Appropriations Committee would like to hear from FEMA. It seems that they might want that information FEMA could provide as they render their decision" (61:65). This practice represents a built-in structural problem of the National Defense Stockpile.

Summary of Legislation Affecting the National Defense Stockpile

This section describes those legislative Acts that have had the greatest impact on the existing stockpile. The reader is referred to the **Congressional Handbook on US Materials Import Dependency/Vulnerability**, for a more detailed discussion of stockpile legislation through 1980.

The Strategic Materials Act of 1939 (P.L. 76-117)

As U.S. involvement in World War II became more certain, stockpiling became an urgent issue and in 1938 the first stockpiling legislation was passed.

This legislation, the Strategic Materials Act of 1939, authorized the Secretaries of War and Navy, acting jointly with the Secretary of the Interior to determine which materials were to be considered strategic and critical, and to determine the quality and quantities of such materials to be purchased. The organization created to satisfy these purposes was the Army-Navy Munitions Board. They subsequently formulated a list of 39 materials then considered to be strategic or critical (8:57). By the summer of 1940, however, this Act had become virtually inoperative as it was superseded by broader, more urgent mobilization plans. Very little material was actually accumulated in the stockpile during this one year of operation (49:9).

The Strategic and Critical Materials Stock Piling Act of 1946 (P.L.79-520)

The delays, confusion, and exorbitant costs encountered in obtaining materials were further highlighted in WW II, and in response the Strategic and Critical Materials Stock Piling Act was passed. This 1946 Act amended the Strategic Materials Act of 1939, but the focus remained the same: to provide the necessary materials required in defense production (6:2). However, this objective was now to be accomplished by:

- 1) developing domestic sources of supply when possible, and
- 2) by creating stockpiles of materials which were not present in sufficient quantities in the United States, or which could not be supplied in sufficient quantities during an emergency period (8:58).

As a result, the strategic stockpile was brought up to \$1.6 billion worth (then year dollars) of materials by 1950 (8:225).

Defense Production Act of 1950 (P.L. 81-774)

The Korean War led to another period of materials shortages and again focused attention on this vulnerable posture of the United States. In response, Congress in 1950 enacted the Defense Production Act (DPA) which established a

broad spectrum of authority to expand the U.S. productive base (8:225). As a preparedness measure, the DPA has proved to be a powerful tool for enlarging supplies to meet sharply increased military and industrial needs. Originally the law contained numerous sections, providing for (32:27):

1. Certification for rapid (five-year) amortization [for plant and equipment].
2. Guaranteed markets at guaranteed prices by contract.
3. Direct loans, guaranteed loans, and advances against production when private financing was unavailable.
4. Grants for research and development.
5. Priorities and allocations of scarce materials.
6. Construction of access roads to sources of strategic materials.

Although the Act was originally intended to terminate in 1952, it has been renewed, modified, and is currently due to expire on September 30, 1986 (66:Sec. 2). As such, three sections of the original law currently remain: Title I - Priorities and Allocations; Title III - Supply Expansion (items 1-3 above); and Title VII - Voluntary Agreements. The main components of these provisions are explained below (30:8):

Title I: Priorities and Allocations

-authorizes a priority system that provides preferential treatment of defense orders and special allocation of four materials—aluminum, copper, steel, and nickel.

Title III: Expansion of Production Capacity

-authorizes the President to stimulate production of materials through loans, loan guarantees, loss-sharing agreements, and commitments to purchase output at specific support prices.

Title VII: Voluntary Agreements

-has two main provisions: it allows individuals and companies to enter into voluntary agreements to meet defense needs without fear of violating anti-trust laws. Also, it provides for the National Defense Executive Reserve, an organization aimed at training a special pool of executive and professional talent for government service in the event of a national emergency involving at least the threat of armed conflict.

Historically, Title III of this Act has proved to be the most useful in supporting the needs of the defense establishment during the Korean and Vietnam

wars. In the 1983 Grace Commission's report to the President, using Title III provisions to increase domestic production was given as an alternative to stockpiling materials. The rationale behind this provision is that every unit of existing domestic capacity decreases the stockpile goals by three units, and may be a more cost-effective method of supplying critical defense needs in some cases. But, as the report states, the provisions of this Act have never been used to reduce the need for the practice of stockpiling (44:24).

The Mining and Minerals Policy Act of 1970 (P.L. 91-631)

Following the Korean War, an increased concern over the lack of an explicit national minerals policy grew. Many factors (depletion of higher grade resources, increasing costs of production, increased mineral competition, and a lack of long-range objectives in the domestic mining and minerals industry) were considered likely to increase the pressure on future demands of the minerals market (8:66).

Therefore, in 1970, Congress passed the Mining and Minerals Policy Act to establish, for the first time, a ". . . broad, overall national minerals policy with particular emphasis on the need for an economically sound and stable mining and minerals industry" (62:87). While these mining and minerals activities were left solely within the private sector, Congress did however establish under this act the Federal Government's responsibility for fostering and encouraging these activities. The Secretary of the Interior was given this specific responsibility for the advancement of this national minerals policy, and he was to report annually on the state of the domestic mining and minerals industry and to make the necessary legislative recommendations to carry out overall policy objectives (8:67).

The Strategic and Critical Minerals Policy
Revision Act of 1979 (P.L. 96-41)

The present stockpiling program is conducted under the authority of the

Strategic and Critical Materials Stock Piling Act of 1946, as revised by the Strategic and Critical Materials Stock Piling Revision Act of 1979. Through the late 1970s, no significant additions to the stockpile had been made since 1959 and no releases of excess stockpile material had been authorized since 1973. The House Committee on Armed Services, investigating the subject, found a substantial need for updating and revising the stockpile program as the existing modifications and provisions were confusing and conflicting (8:68-9).

Therefore, the major purpose of this Act was to update and revise the defense stockpile program, particularly by setting a three-year military contingency as the criterion for establishing stockpile goals. (Over the previous twenty years, the period for determining stockpile goals had been reduced by various Presidents from five to three and finally to a one year's demand associated with a military contingency). This Act also specified that the National Defense Stockpile was to be managed for defense purposes only and not to control or influence commodity prices (5:9).

Another significant portion of this Act was the creation of the National Defense Stockpile Transaction Fund, which holds all money received from the sale of excess stockpile material. Until this time, these funds were returned to the Treasury as miscellaneous receipts and were effectively lost from the stockpile program. Under this legislation, these funds are now to remain available only for the appropriation of strategic and critical materials (23:27).

The National Materials and Minerals Policy, Research,
and Development Act of 1980 (P.L. 96-479)

The 1980 Act was passed in response to approximately 25 different major studies and reports since 1952 claiming a national materials policy is nonexistent. As such, this represents the first legislation to directly address a national materials policy and is viewed as a modest first step in putting in place the

necessary policies and programs to help assure for the U.S. an adequate and stable materials supply (8:70-71). The specific purpose of the Act, as reported is:

. . . to promote an adequate and stable supply of materials necessary to maintain national security, economic well-being, and industrial production with appropriate attention to achieving a long-term balance between energy needs, a healthy environment, natural resources conservation, and social needs (73:4872).

This Act requires the President, in accordance with the provisions and requirements of the Mining and Minerals Policy Act of 1970, to submit a Program Plan to Congress designed to implement a national policy to achieve these ends (62:87). In response, President Reagan sent his National Materials and Minerals Program Plan to the Congress in April 1982.

This Program Plan formally assigned responsibility for coordinating minerals and materials policy, under the direction of the President, to the Cabinet Council on Natural Resources and the Environment. According to the Plan, the Cabinet Council is to ensure high-level consideration of important minerals and materials issues (18:i). This Act also charged the Executive Office with the responsibility for coordinating federal departments and agencies, and among other measures to (68:Sec. 4):

- 1) direct that the responsible departments and agencies identify, assist, and make recommendations for carrying out appropriate policies and programs to ensure adequate, stable, and economical materials supplies essential to national security, economic well-being, and industrial production;
- 2) support basic and applied research and development to provide for, among other objectives--
 - A) advanced science and technology for the exploration, discovery, and recovery of nonfuel materials;
 - B) enhanced methods or processes for the more efficient production and use of renewable and nonrenewable resources;
 - C) improved methods for the extraction, processing, use, recovery and recycling of materials which encourage the conservation of materials, energy, and the environment; and
 - D) improved understanding of current and new materials performance, processing, substitution, and adaptability in

engineering designs;

- 3) provide for improved collection, analysis, and dissemination of scientific, technical and economic materials information and data from Federal, State, and local governments and other sources as appropriate;
- 4) assess the need for and make recommendations concerning the availability and adequacy of supply of technically trained personnel necessary for materials research, development, extraction, harvest and industrial practice, paying particular regard to the problem of attracting and maintaining high quality materials professionals in the Federal service;
- 5) establish early warning systems for materials supply problems;
- 6) recommend to the Congress appropriate measures to promote industrial innovation in materials and materials technologies;
- 7) encourage cooperative materials research and problem-solving by—
 - A) private corporations performing the same or related activities in materials industries; and
 - B) Federal and State institutions having shared interests or objectives;
- 8) assess Federal policies which adversely or positively affect all stages of the materials cycle, from exploration to final product recycling and disposal including but not limited to, financial assistance and tax policies for recycled and virgin sources of material and make recommendations for equalizing any existing imbalances, or removing any impediments, which may be created by the application of Federal law and regulations to the market for materials; and
- 9) assess the opportunities for the United States to promote cooperative multilateral and bilateral agreements for materials development in foreign nations for the purpose of increasing the reliability of materials supplies to the Nation.

The Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35)

The Budget Reconciliation Act contained several provisions affecting the stockpile. First, the President was authorized to dispose of a number of materials determined to be excess, including 105.1 million troy ounces (approximately 75 percent) of the stockpiled silver in fiscal years 1982-1984. However, the fiscal year 1982 Defense Appropriations Act suspended this disposal pending a redetermination by the President that this silver was indeed excess, and that the proposed disposal method had to be approved by Congress (19:2). This redetermination was to be submitted by July 1, 1982, but as of August 1984 this report had been drafted but not released (17:2).

Title II of this Act also amended the 1979 Stock Piling Act to require the President to submit to the Congress an Annual Materials Plan (AMP) reflecting the proposed operation of the stockpile. This report is to cover a five-year period of planned expenditures for acquisition and of anticipated receipts from disposals of stockpile materials. (For a more detailed discussion of the AMP refer to the section on the FEMA in Chapter 3).

Finally, the Omnibus Budget Reconciliation Act of 1981, amending the Stock Piling Act, prohibits any stockpile disposals which would result in a Transaction Fund balance in excess of \$500 million. The rationale behind this lies in the fact that the Fund can be used with other Treasury funds to balance the Federal budget (20:4). Subsequently, this amount has been reduced to \$250 million by the Department of Defense Authorization Act of 1985 (65:Sec 903:2).

Arctic Research and Policy Act of 1984 - National
Critical Materials Act of 1984 (P.L. 98-373)

This legislation resulted from the alleged ineffectiveness of the Cabinet Council on Natural Resources and the Environment as a coordinating and implementing mechanism for stockpile matters. As noted in testimony leading to this Act, "the Council [on Natural Resources and the Environment] has met only infrequently on materials issues and on an ad hoc basis without permanence or clearly defined lines of communication with the rest of the Federal Government" (71:2233).

The prevailing sentiment in Congress at this time was that the issue of stockpiling strategic and critical materials was important to preserving national security. They also felt that an organization was needed at a high level in the Executive Office of the President to establish responsibilities and coordinate materials programs. Therefore, the National Critical Materials Council was established to fulfill these requirements.

The explicit responsibilities of this three-member Council, according to the Act, are to (67:Sec. 202b):

(A) establish responsibilities for and provide for necessary coordination of critical materials policies, including all facets of research and technology, among the various agencies and departments of the Federal Government, and make recommendations for the implementation of such policies;

(B) bring to the attention of the President, the Congress, and the general public such materials issues and concerns, including research and development, as are deemed critical to the economic and strategic health of the Nation; and

(C) ensure adequate and continuing consultation with the private sector concerning critical materials, materials research and development, use of materials, Federal materials policies, and related matters;

One additional requirement of this Act was in the qualifications of the members of this Council. These members are required by law to have the training, experience, and achievement to accomplish the above responsibilities. Particular emphasis is now placed on obtaining individuals with these qualities in fields relating to materials policy or materials science and engineering. In addition, at least one member is required to have a background in and an understanding of environmentally related issues (67:Sec. 203).

Executive Orders Affecting the National Defense Stockpile

This section presents a description of those Executive Orders (E.O.s) issued by the President that are the most pertinent to stockpile matters. As such, these Orders have as their basic function the delegation of NDS responsibilities to the agencies and other organizations currently exercising control over the stockpile. This information was obtained by a legislative search from 1956 to the present, and has been updated as required by subsequent legislation.

E.O. 12417, May 2, 1983 Strategic and Critical Materials

This most recent Order transfers, from the President to the Director of

the Federal Emergency Management Agency (FEMA), the responsibility for submitting a statement to Congress as called for in the 1979 Stock Piling Act. The Act specifies that this written report is to be submitted to the appropriate committees of Congress for approval prior to any action on any proposed stockpile transaction that significantly changes a previously planned transaction, or that is itself a significant transaction that was not included in the President's Annual Materials Plan.

E.O. 12155, September 10, 1979 Strategic and Critical Materials

This Order distributes the indicated functions bestowed on the President by the 1979 Stock Piling Act to the following organizations:

1) FEMA - the Director of the FEMA is to determine which materials are strategic and critical, and the quantity and quality of these materials to be obtained. Also, the Director is required to submit an annual report (the AMP) to the Congress giving planned expenditures for materials and anticipated receipts from the disposal of stockpile materials for the next fiscal year plus an estimate for the following four years.

2) General Services Agency (GSA) - the Administrator of the GSA is to provide for the proper storage, security, rotation, and maintenance of stockpile materials. The Administrator, in accomplishing these duties, may appoint advisory committees knowledgeable in these areas for assistance. (Prior to this time, the GSA was to accomplish these duties under the direction of the FEMA, but now the GSA is given full responsibility).

3) Department of Interior (DoI) - the Secretary of Interior is charged to make scientific, technologic, and economic investigations concerning the development, mining, preparation, treatment, and utilization of ores and other mineral substances. These ores and substances are those that are (A) found in the U.S., or its territories or possessions, (B) essential to the national defense,

industrial, and essential needs of the U.S., and (C) found in known domestic sources in inadequate quantities or grades.

4) Department of Agriculture (DoA) - the Secretary of Agriculture is required to make scientific, technologic, and economic investigations of developing domestic sources of agricultural material supplies or for using agricultural commodities for manufacturing strategic and critical materials.

E.O. 11725, June 29, 1973 Transfer of Certain Functions
of the Office of Emergency Planning [now the FEMA]

The Administrator of the GSA under this Order is now responsible for the economic and disposal aspects of stockpiling the NDS. This responsibility is to be exercised in conformance with guidance provided by the National Security Council and with respect to the Council on Economic Policy. Included in this responsibility is the specific area of designating which strategic materials are to be acquired in return for bartering surplus agricultural commodities.

E.O. 11490, October 30, 1969 Assigning Emergency
Preparedness Functions to Federal Departments and Agencies

This Order consolidates the assignment of emergency preparedness to 29 separate departments and agencies, as previously specified in 21 other Executive Orders. The most applicable of these organizations are the Department of Defense and the General Services Agency, discussed below:

1) Department of Defense (DoD) - the Secretary of Defense is charged to develop a system, along with the Department of State, for the allocation of critical materials in a national emergency both within the United States and among foreign claimants. The Secretary is also to advise and assist the Director of the FEMA on the utilization of strategic and critical materials in defense production.

2) General Services Agency (GSA) - the Administrator of the GSA is to assist the Director of the FEMA in formulating plans, programs, and reports relating to the stockpile, and, to operate and administer the stockpile.

E.O. 11051, October 2, 1962 Emergency Planning
Prescribing Responsibilities of the Office of Emergency
Planning in the Executive Office of the President

This Order charges the Office of Emergency Planning (now the FEMA) to order, in case of an attack on the US, the release of materials from the stockpile in the amount, for the purpose, and on such terms as is deemed necessary by the Director.

E.O. 10662, March 16, 1956 Amendment of E.O. 10480
and Revocation of E.O. 10160, Relating to the Administration
of the Defense Production Act of 1950

The Director of the Office of Defense Mobilization (now the FEMA) is authorized and directed to make provisions for the development of substitutes for strategic and critical materials under the provisions of the Defense Production Act of 1950.

Commentary

A continuing trend from generality to *specificity can be seen in the legislative history of the stockpile*. The actions of Congress and the President represents a continuing delineation of responsibility as an apparent attempt to solve the problem of the stockpile not meeting its inventory goals. The most recent example is the creation of the National Critical Materials Council by Title II of the Arctic Research and Policy Act of 1984. The creation and qualification requirements of this Council by the 1984 Act are an attempt to correct a finding of the GAO, that the existing Cabinet Council on Natural Resources and Environment lacked the ability to ". . . ensure timely, high-level consideration of important minerals and materials policy issues . . ." (18:ii). However, it is notable that discussions with government officials revealed that this new Council, although authorized \$500,000 for FY 84, had no actual money appropriated and exists now only on paper.

Summary

This chapter began by examining the established organizations in the Legislative Branch that currently affect the National Defense Stockpile. Next, those committees and subcommittees of Congress who perform the most significant action on stockpile legislation were discussed. Finally, an abbreviated history of the significant legislation of the stockpile, including Executive Orders, was presented. In the next chapter, those groups (such as special interest) and other organizations outside the government who affect matters of the stockpile are discussed.

V. Organizations Outside the Government Affecting the NDS

Introduction

This chapter describes those organizations outside the government who contribute to matters affecting the National Defense Stockpile. The main contribution to these matters is provided by their inputs to the various committees and other decision makers within the government representing their particular areas of interest. For discussion, these organizations are divided into two groups: those representing the major users of strategic and critical materials, and those non-profit institutions that have, because of their purpose, examined issues relating to the field of strategic and critical materials. It should be noted that the list presented here is not intended to encompass all organizations possessing these characteristics, but rather those that have provided the most significant impact on stockpile matters in the recent past. Also excluded from this discussion are those individuals that have been called upon for advice or testimony on the stockpile, but are not members and do not act as representatives of these organizations.

Organizations Representing the Major Users of Strategic and Critical Materials

This section describes those organizations that represent the most significant users of materials considered strategic and critical.

The Aerospace Industries Association of America, Inc. (AIA)

The AIA, founded in 1919, consists of 58 manufacturers of ". . . aircraft, guided missiles, spacecraft, propulsion, navigation and guidance systems, accessories, parts, materials and maintenance of aerospace products" (16:22-23). This Association represents the Aerospace Industry before governmental agencies, the public, and other groups.

According to written statements presented to two separate Congressional subcommittees holding hearings on NDS matters, they (the AIA) feel that "One component of our national defense posture which the AIA membership considers of crucial importance is the National Defense Stockpile. . ." (54:113). The Association further states that the aerospace industry has long been concerned with the degree of U.S. foreign-source metal and mineral resources dependency (62:99).

Of the 58 members of the AIA, some of the most relevant aerospace defense contractors today are: Boeing, General Dynamics, Grumman, Hughes, Lockheed, Martin Marietta, McDonnell Douglas, Pratt and Whitney, Rockwell, Sperry Corp., and TRW. As such, this group represents the majority of strategic and critical material users within the defense sector today. In addition, several of these contractors have provided recent input to decisions affecting the stockpile, and are discussed below.

Pratt and Whitney (Aircraft Corporation)

The Pratt and Whitney Group of United Technologies designs and manufactures jet engines for both commercial and military use. Currently, Pratt and Whitney produces the F-100 engine used in the F-15 and F-16 aircraft, the mainstays of the American fighter aircraft force. In the most recent hearings on the stockpile, the Vice-President of Technology for Pratt and Whitney stated in House of Representative's bill (H.R. 33) that they (Pratt and Whitney) support the proposal of revamping the organizational structure of the National Defense Stockpile. As he says, ". . . the current organizational structure of the national defense stockpile closely resembles a jig saw puzzle" (53:67). Further in their testimony, Pratt and Whitney indicates that there are a number of additional problems which would seriously hamper their ability to continue producing F-100 engines for the Nation's defense if the stockpile were their only source of

supply. They identify these other problems as the quantity, quality, and form of stockpiled materials (53:67).

TRW

The company of TRW represents one of the major producers of satellite components used by the Department of Defense. In a written statement on H.R. 3544, "National Defense Stockpile Amendments of 1983," TRW contends there is a fundamental and absolute need for a significantly improved state of national materials preparedness. In commenting on this proposed bill, TRW chose several explicit provisions of concern to express their opinions on. However, the overall position of TRW is reflected in their closing statement, in which they contend that the general provisions of H.R. 3544 would provide their industry with the confidence that they could meet their responsibilities in a national emergency (54:148-151).

American Mining Congress (AMC)

The AMC is an industry association whose members represent: (1) producers of most of America's metals, coal, industrial and agricultural minerals; (2) manufacturers of mining and mineral processing machinery, equipment and supplies; and (3) engineering and consulting firms and financial institutions that serve the mining industry (54:129). One specific purpose of the AMC is "To cooperate with government in furthering the national welfare and in developing mining and metallurgy" (1:24).

The AMC believes, as described in their declaration of policy, that the NDS is an important element of defense readiness for those essential metals on which the U.S. has a high degree of import dependence. They further believe that a national minerals policy should provide for greater consistency of policy adherence to the national security mission for which the stockpile was authorized. To accomplish this, the AMC has suggested ". . . that responsibility for the

stockpile be placed in an independent government corporation" (1:5).

Federation of Materials Societies (FMS)

Founded in 1972, the FMS is a group of 15 technical societies of analogous associations concerned ". . . in whole or in part with materials and their application, or dedicated to increasing the effectiveness of materials science or engineering" (16:477). Its individual membership represents numerous (in 1982 this amount was 750,000) professionals with materials expertise from industry, academia, government, and private consulting with one of their explicit purposes to provide technical studies for the federal government, including Congress.

The FMS maintains a Government Liaison Committee to help accomplish their purposes, and they frequently testify before Congress on stockpile and materials matters. One example of FMS's input to stockpile policy is reflected by their being invited to participate in developing the National Materials and Mineral Policy, Research and Development Act of 1980. Their present concern for the stockpile and minerals policy is reflected in Congressional testimony by the chairman of the FMS Government Liaison Committee who states that the FMS ". . . stands ready to assist in the implementation of materials and minerals policy [as called for in the 1980 Act]" (58:60).

National Association of Manufacturers (NAM)

This organization, founded in 1895, represents the manufacturing industry's views on national and international problems to government. As one of its functions, the NAM reviews current and proposed legislation, administrative rulings and interpretations, and judicial decisions and legal matters affecting industry (16:187).

In 1980, the Nonfuel Minerals Task Force was formed by the NAM because of the growing concern over materials and minerals issues. This Task Force consisted of 50 individuals representing companies of both producers and

consumers of the commodities essential to our economy and national defense. The Task Force in a 1983 written statement presented their findings and the position of the NAM to the Seapower and Strategic and Critical Materials Subcommittee, who was then considering the proposed 1983 National Strategic Materials and Minerals Assessment Act (54:141).

Nonprofit Organizations Affecting the Stockpile

This section describes those nonprofit organizations that were established specifically or that have examined materials issues as a portion of their jurisdiction.

National Academy of Sciences (NAS)

Since 1951, the NAS, through the National Materials Advisory Board (NMAB) and its predecessor boards, has assisted various government agencies in examining materials and stockpiling issues (37:v). The specific purpose of this private nonprofit organization, as stated, is to ". . .foster the advancement of materials science and engineering in the national interest" (16:478). To accomplish this, panels of distinguished individuals industry, higher education, research, and government are chosen and their findings published in the form of reports.

In 1982, an NMAB panel examined the methodology applicable to assessing forms in which materials are stored in the national stockpile and the advisability of retaining recyclable materials in the stockpile. Their report, **Considerations in Choice of Forms for Materials for the National Stockpile**, identified the problems and implications of existing policies or the lack thereof. Their most recent effort resulted in the **Priorities for Detailed Quality Assessments of the National Defense Stockpile Nonfuel Minerals**, which examined the potential usability of stockpile materials in the event of a national emergency. This latter study was requested jointly by the FEMA and the Office of Strategic Resources within the

Department of Commerce (37:v). Their subsequent findings resulted in six specific recommendations intended to increase the quality and usability of present stockpile materials (37:2-3).

Council on Economics and National Security (CENS)

The Council on Economics and National Security (CENS) is a project of the National Strategy Information Center, established in 1962 to conduct educational programs in the field of international security affairs. According to the inside cover of **Strategic Minerals: A Resource Crisis**, this private nonprofit organization was formed to ". . . attempt to answer the need for a broad informational-educational campaign, to inform and alert the people, media and policymakers of the United States and friendly nations concerning their vulnerability in the so-called resource war" (62:i).

The CENS periodically publishes topical **Issue Papers** on strategic resources, the defense industrial base, and emergency mobilization preparedness. One example is **Jamaican Bauxite: A Diffusion Study of a Strategic Material**, which traces this particular mineral from its initial mining in Jamaica to the defense and civilian end-usage in the United States. Also, the CENS publishes annually a **White Paper**, containing the most recent statistical data on strategic resources and current analysis of changing factors influencing worldwide supplies of both fuel and nonfuel minerals. The future plans of the CENS include the publication of a popular book on the resource war, the filming of a documentary to be used on television and in classrooms, and community programs and business conferences.

International Economic Policy Association (IEPA)

The IEPA is a nonprofit research organization that specializes in many areas, including natural resource issues. In a 1983 written statement before the Seapower and Strategic and Critical Materials Subcommittee, the IEPA states

that they have studied at length the problem of America's raw material vulnerabilities. Within this Association is a designated committee whose purpose is to investigate the specific area of natural resources (16:1060).

One interesting suggestion of this Association is reflected in their comments on H.R. 626, "National Strategic Materials and Minerals Assessment Act of 1983." In their written statement, the IEPA proposed that a project in private stockpiling be undertaken by the government. Under this proposal, eligible companies would receive financial incentives from the government to increase their normal inventory holdings of selected materials. According to the IEPA, this would reduce the cost to both parties, particularly the government (54:138).

Resources For the Future (RFF)

Resources For the Future is an independent nonprofit organization established in 1952 for research and education in the development, conservation, and use of natural resources. The RFF provides a significant source of knowledge and expertise that has guided policies in the field of natural resources, and they are often called upon as consultants by governmental agencies. According to the former Vice-President of the RFF, "It is my distinct impression that today on more routine policy problems, as well as on major issues, public officials look to RFF both formally and informally as a source of advice and counsel" (46:93).

Staff members of RFF frequently write articles for professional journals, magazines, and newspapers. In addition, RFF publishes a periodical, *Resources*, three times a year in which short articles by staff members and experts are extracted from new or forthcoming books. As of 1977, RFF has published over 200 such books on resource subjects ranging from statistical compilations to interpretive publications aimed at wide audiences (46:43-44). Two examples of books produced by the RFF are *U.S. Interests and Global Natural Resources: Energy, Minerals, Food, and World Mineral Trends* and *U.S. Supply Problems*.

One interesting note about this organization is that William S. Paley, who served as chairman of President Truman's Materials Policy Commission (known as the Paley Commission), was one of the original founders and now serves as an honorary director.

World Affairs Council of Pittsburgh

The World Affairs Council of Pittsburgh is a nonprofit, nonpartisan organization dedicated to educational efforts in world affairs. Its purpose is to aid and promote the public understanding and constructive development of American foreign policy by conducting educational activities including lecture programs, study groups, research, publications, and other appropriate means (35:i).

On June 17, 1980, the World Affairs Council held its 18th World Affairs Forum to provide a public discussion on a subject of current interest to its members and to Americans at large. The subject chosen for this forum represented the findings of 16 nationally-prominent experts regarding U.S. dependency on imported natural resources. Their publication, **The Resources War in 3-D—Dependency, Diplomacy, and Defense**, has proven to be a significant contributor to current resource issues philosophy (35:i).

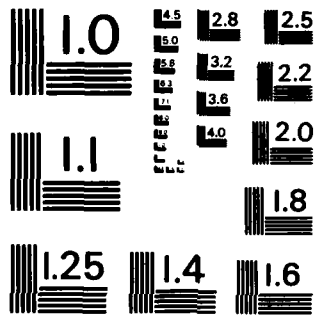
Commentary

Both groups of organizations discussed in this chapter provide, in differing degrees, inputs to decisions relating to the NDS. The comments of the organizations representing users of these materials reflect general concern with any proposed legislation affecting the status of the stockpile because of the potential disruption or enhancement of their financial position. Although the motivating factor of these organizations is quite often economic in nature, Congress is nevertheless concerned with the opinions of private industry. As an example, committees and subcommittees often reserve one or more days of hearings on proposed legislation to receive inputs from the private sector.

The second group, that of nonprofit organizations, lend their input in less direct but still important ways. The main product of these groups, their unbiased studies and publications, establishes or contributes to much of the knowledge base existing on materials today. Further, the fact that these organizations are comprised of individuals considered knowledgeable in these fields adds a strong credibility factor to their works. Because of our open style of government, both of these organizations should and will figure prominently in the future status of the National Defense Stockpile.

Summary

This chapter has examined those organizations outside the government that currently supply inputs to decisions affecting the NDS. Organizations representing both users of materials and nonprofit research institutions were discussed, including the major products of each. The next and final chapter summarizes the major points of this effort thus far and gives conclusions and specific recommendations on findings derived from this information. Also presented, based on these findings are the applicable areas considered worthy of receiving further research.



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

VI. Summary, Conclusions, and Recommendations

Summary

Chapter 1

In chapter one the National Defense Stockpile (NDS) was introduced as a form of national insurance against a number of different types of threats against national security; the rationale for the NDS is similar to the old maxim of saving for a rainy day. The problem examined in this thesis is the difficulty of coordinating the government's overall policy towards filling the stockpile's inventory goals. This problem was examined through studying the available literature and interviews of experienced government and non-government officials. Thus, this thesis is mainly an exploratory study on the organization of the government agencies that collectively formulate NDS policy which ultimately determines how quickly the stockpile's inventory goals are reached.

Chapter 2

This chapter started with an examination of the history of the NDS beginning with the World War One time frame. History shows that in every major war significant amounts of strategic and critical materials were required. The present status of the stockpile indicates it is about half full in terms of dollar value.

A discussion of world mineral dependency and the so called resource war reveals that the United States imports a significant percentage of critical materials but that the total dollar value is small compared to the cost of imported oil. The Department of Defense (DoD) share of the use of these materials is also small, with the exception of cobalt, titanium, chromium, and tantalum (See Table 2-1). Although DoD's share of the total is small, it is critical none the less: "While for lack of a nail the horse may be lost. . ." is the way Resources For the Future has described it (4:65). Finally a discussion of the need for an effective

materials policy and the difficulties surrounding that endeavor was given.

Chapter 3

Chapter three examined the Federal bureaucracy surrounding the NDS. The President has the overall responsibility but has delegated the authority to his Executive Office and other agencies in the Executive Branch. Most of the Cabinet level departments influence the overall policy formulation—especially the Departments of Defense, Commerce, and Interior. The Office of Management and Budget (OMB), General Services Administration (GSA), and Federal Emergency Management Agency (FEMA) are the three agencies exerting the most influence: FEMA sets the inventory goals; GSA buys, sells, and holds the stockpiled commodities; and OMB controls the purse strings which ultimately determines the levels of purchases and the time it will take to fill the inventory goals.

Chapter 4

The organizations in the Legislative Branch that affect the NDS were discussed in this chapter. All of the Congressional committees or subcommittees that have either proposed or held oversight hearings on legislation concerning the stockpile were listed and described. Although the stockpile is a priority to some congressional representatives, it is not one to the Congress as a whole as evidenced by the low funding the NDS has received. The various built in structural problems and the diffusion of responsibilities contribute significantly to the stockpile's low priority. The most profitable area for improvement is obtaining long-term, consistent funding at a significant level.

Chapter 5

This chapter discussed those organizations outside the government that have influenced the overall stockpile management policy in an indirect way. These organizations comprise a wide variety of types including defense/aerospace contractors, mining concerns, and representatives from general industry. A wide

variety of nonprofit groups such as the Council for Economics and Security, Resources For the Future, and a host of other technical societies have voiced opinions on the NDS. Individuals from all walks of life, including many former Congressmen, have given their advice during Congressional testimony but were not specifically addressed in this chapter.

Conclusions

Introduction

The National Defense Stockpile is a small but important program. It can be thought of as an insurance policy; but anyone who has ever bought or sold insurance knows it is difficult to spend money for something that has no immediate utility and may never be used. The 1952 Paley Commission report complained that the material shortages for the beginning of the Korean War were brought about because

In 1949, when supplies and prices of materials were generally favorable to building up the stocks, Congress cut 100 million dollars from the year's contract authority, a reduction of more than 15 percent. In 1950 the outbreak of fighting in Korea was followed by larger appropriations for stockpiling and a general strengthening of the program, but by that time prices had risen and private buyers and other governments were scrambling for supplies—a repetition of the failures of 1939 (45:162).

If the failures of 1939 were repeated in 1949 they could easily be repeated again; it is simply too late to prepare for a national emergency after it starts.

Cost

A discussion of the background and cost of the Nation's imported minerals was briefly stated in chapter two. Although this cost is just a fraction of that for imported oil, it is potentially more critical. The majority of stockpiled materials do not depreciate and have actually increased in value over time. According to the Interior Department's National Strategic Materials and Minerals Program

Advisory Committee (NSMMPAC),

In 1962, when the Kennedy Administration expressed the view that the stockpile was excessive, the then current value of all holdings was approximately \$8 billion dollars. Since then, the aggregate disposals of materials declared surplus have netted the Government in excess of \$8 billion dollars. Yet the most recent report of stockpile activities shows that inventories on hand as of March 31, 1984, had a value at current market \$10.9 billion dollars--this despite the fact that purchasing for the stockpile in the intervening 22 years has been extremely limited [about \$.3 billion] (38:1).

Some individuals forget that the large purchase costs will be recouped when the stockpile is used and that the real costs are for operation and maintenance. Moreover, manpower, energy, transportation, other economic resources, and above all--time--are intrinsically stored with the stockpiled materials. The costs of the stockpiled commodities would be miniscule compared to the price this Nation could conceivably have to pay for a military deployment in order to secure foreign source(s).

Deterrent Value

Another indirect benefit of the NDS is its value as a deterrent. A three year supply in the US would be a formidable deterrent to any individual country or cartel group trying to cause a national emergency or wage a conventional attack. A related benefit of a complete stockpile concerns the reduction of the probability of a nuclear war. In his classic case study, **Stockpiling Strategic Materials: Politics and the National Defense**, Glenn Snyder states

A giant step in this direction [reducing the chances of a nuclear exchange] would be to maintain conventional forces fully capable of defeating the conventional forces of an enemy, thus eliminating the need to initiate nuclear war as the only alternative to defeat. A stockpile of the most critically essential raw materials would be a logical counterpart of such capability and strategy (49:294).

It would seem that a nation with a 300 billion dollar annual defense budget and a

4 trillion dollar economy to protect would be willing to invest in a relatively inexpensive \$20 billion national stockpile.

Organizational Aspects

The organizational aspects of stockpile policy-making is one of the major reasons why the NDS has not fulfilled its objective of a complete inventory of strategic and critical materials. Another factor, closely related to the organizational aspects, is the lack of appropriated funds for new purchases. As one GSA official stated in Congressional testimony "The only thing between keeping me from having a 100-percent goal in the stockpile is about \$10 billion" (53:74). With a trillion dollar national debt and \$200 billion-plus annual deficits it is understandable why funds are closely guarded. Perhaps no imminent threat of war and Congress' short-term distractions keep the stockpile at an obviously low priority among most law makers.

A short-term aid to increase funding was to make the stockpile Transaction Fund an off-budget activity. Only about \$15 billion out of almost a trillion dollar national budget is classified as an off-budget activity. This \$15 billion is for activities that are run like a business, that generate their own funds through sales of services and supplies. The most notable is the Postal Service but the Strategic Petroleum Reserve (SPR) is also. However, the SPR generates its own material (oil) from Federally-owned land. Off-budget activities also do not go through the full budgetary process. Legislation making the Transaction Fund an off-budget activity was attempted in the 97th Congress as Senate bill 2906. This legislation did not get very far for a variety reasons, one of which was that it reverses the trend of putting all appropriations in the complete federal budgetary process. Data from the most recent Stockpile Report to Congress indicate that if all the excess materials are sold, \$3.8 billion in revenue would be generated. An additional \$6.4 billion is still required to fill the inventory.

Unfortunately, the two largest revenue generating items are tin and silver (See Figure 9 of Appendix A) worth \$3.2 billion. Silver sales are on an indefinite hold and tin sales are limited by an agreement with the International Tin Council. Thus, as a rotating fund the Transaction Fund is not self-generating to any significant degree and will eventually need Congressional appropriations.

General Recommendations

In view of the organizational problems discussed in this thesis, a list of the major criteria for possibly selecting an alternative to the present stockpile management is made below. It should be kept in mind that the alternative should not be worse than the problem, it should be long-term in nature, and it should recognize that today's problems are often caused by a static application of yesteryear's solutions.

Management Consolidation

Stockpile management needs to be consolidated so a single agency has direct responsibility. Thus the organization should have stockpile management as its only responsibility to insure high-level involvement in management decisions.

Justification

Chapter three discussed how low in GSA's priorities the stockpile funding was and that the NDS is probably the only government program where one agency sets the budget requirement (FEMA in the Annual Materials Plan) and another has to obtain those funds (GSA). Chapter four discussed how FEMA and GSA go to different appropriation subcommittees and that neither of these committees are defense oriented. The heads of the FEMA and GSA are preoccupied with a myriad of other duties their offices entail. Thus, the stockpile does not receive the attention it deserves. Currently everyone is to blame and no one is to blame for the quantitative and qualitative shortfalls in the stockpile's inventory. There is no single focus for stockpile management.

Consistent Budgeting

The second criteria is that the National Defense Stockpile must be removed from the annual budgetary process it is now embroiled in. Ideally a long-term, consistent capitalization of the stockpile's transaction fund would transcend the ever changing administrations and congresses.

Justification

Table 3-1 revealed how the NDS's funding progresses through the annual budgetary progress. Congress has even refused to appropriate moneys in the Stockpile Transaction Fund—funds that can not be used for any other purpose but to purchase strategic and critical materials. The moneys in the Transaction Fund were generated by the sale of excess materials and not from appropriations from general treasury receipts.

Financial Flexibility

The third criteria is that the NDS management organization should have greater financial flexibility to take advantage of market opportunities.

Justification

The stockpile has a prior historical tendency of selling low and buying high. The run up of silver prices was an ideal time to sell even a small amount, but the opportunity would have been lost by the time congressional approval could have been obtained. The current time period of depressed mineral prices is an excellent time for new purchases. But due to a lack of funds, the money is being saved for the purchase of higher priority materials (See Appendix D).

Comparison of Alternatives

Based on the preceding discussion, there are basically two alternatives to improved stockpile management. Although a detailed examination of these alternatives is beyond the scope of this thesis, a brief discussion is made below.

Alternative No. 1. Transfer Stockpile Management to the Secretary of Defense

Pros:

Congressman Bennett, chairman of the Seapower and Strategic and Critical Materials Subcommittee is one of the leading proponents of this alternative and gives the following three major benefits of DoD management. First, DoD would be able to prepare and defend the stockpile's funding through Congressional authorization and appropriation. It is argued that neither FEMA nor GSA has the required political clout within the Executive Branch to obtain the necessary funding. Since the stockpile is of a defense nature, it would fare better before the Armed Services Committees who also authorize the sales of excess materials listed in the Annual Materials Plan. DoD could defend the program before OMB with more success than FEMA or GSA has been able to do in the past.

The second major benefit of the NDS placed under Defense is that DoD management could give the NDS stronger centralized direction. Here it is argued that the split and diffused responsibilities of FEMA and GSA has resulted in both agencies giving it a low priority. Representative Bennett believes that DoD should place it at the Assistant Secretary level and that it will therefore receive a high priority.

The third major benefit is that DoD management would allow the stockpile goals to ". . . be more realistically and promptly established on the basis of current war plans and projected requirements for military equipment and supporting industries" (53:2). Proponents of DoD management argue that DoD is the best qualified to integrate stockpile requirements with war plans based on their expertise with wartime scenarios, force structure, and logistical support requirements.

Cons:

Those opposed to DoD management include the Defense Department itself.

Actually, this feeling began long ago according to Snyder's case study:

. . . by 1952 the military had shifted to the opposite extreme of wanting to get rid of a program [the NDS] which they had realized was rather unmilitary in nature, politically controversial, and a competitor for scarce funds with more important defense programs (49:270).

In hearings on a bill (H.R. 33, 98th Congress) to transfer the NDS to the Secretary of Defense the DoD, FEMA and GSA offered their opposition based on the four main arguments. The primary argument against changing the present management is that a broader civilian view is necessary because the stockpile is supposed to supply the military, industrial, and basic civilian needs of the US during a national emergency. Thus the argument is that the FEMA is the logical choice because it already has all the broad emergency preparedness responsibilities. Civilian as opposed to military control will enable a more equitable distribution of resources.

The second argument against DoD management follows from the first: A conflict of interest in the stockpile would result if DoD was both a claimant and the one who allocates the materials. This conflict would arise when the Defense Department allocated a disproportionate share of materials for its own use.

The third main argument against transfer is more of a practical nature: A significant disruption in stockpile management would occur. The GSA has had custody of the records and physical inventory since 1949 despite the fact that the agency setting stockpile operating policy has changed. The GSA representative at the hearing of H.R. 33 stated that "The administrative burden and cost in time and money in effecting the transfer of this custodianship would be immense" (53:127).

The fourth and final main argument against transfer comes from Snyder's case study: Stockpile funding could actually suffer under DoD because it would compete with more important [weapon system] acquisition programs. The argument here is if the DoD is ever constrained for funds the stockpile would be the first cut as military planners opt for spare parts, war reserve spare kits, additional weapon systems, and other items nearer to combat.

Alternative No. 2. Transfer the NDS Management to an Independent Body

Pros:

A new independent organization could be formed inside the government and modeled, for example, after the Federal Reserve Board. Or it could be outside the government and modeled after a quasigovernmental corporation such as COMSAT (Communication Satellite Corporation). The major proponent of this alternative is the Interior Department's National Strategic Materials and Minerals Program Advisory Committee (NSMMPAC). Their November 1964 resolution listed the following four major benefits of management by an independent quasigovernmental corporation. The first benefit is that the more active management would occur at all levels because the corporation would have no other responsibilities except to administer the stockpile (38:1). The government would still be involved in stockpile activities because "Procurement goals for commodities in the stockpile should continue to be established by Government agencies responsible for national security" (38:1).

The second benefit of government corporate management argued by the NSMMPAC is that the National Defense Stockpile program would ". . . not be entangled in the annual budgetary process." The NSMMPAC goes on to argue that "Long-term planning of acquisitions and disposals will be facilitated" (38:2).

The third major advantage according to the NSMMPAC is that more

innovative financing options for stockpiled materials are possible since these are unavailable to Government agencies. They give the example of expanded use of barter but do not elaborate on how this would actually work, or any other examples. This advantage also would allegedly allow stockpile transactions to be made under market conditions most favorable to the government.

The final advantage to independent management by a quasigovernmental corporation is that ". . . the Corporation should be able to attract experienced, highly-qualified negotiators and managers who may not be available under the constraints of the civil service employment system" (38:2). The NSMMPAC continues its argument that if a corporation managed the stockpile ". . . it would operate in a business-like manner, free of much of the bureaucratic procedures which delay decisions and tend to deprive the Government of the opportunity to buy or sell at maximum advantage." They go on to state that past experience with government corporations such as Tennessee Valley Authority (TVA) and others show that both quality management and adherence to the will of Congress is possible (38:2).

Cons:

Arguments against this type of management are essentially the same as those opposed to DoD management of the NDS. During 1982 hearings on establishing an independent commission in the government, the FEMA used the following arguments against removing the NDS from their control: (1) National materials policy, including the NDS, is already being coordinated by the Cabinet Council on Natural Resources and Environment. (2) ". . . taxpayers should have a right to expect that stockpile transactions compete with other equally important programs, especially other defense programs, for scarce Federal resources." (3) Recent legislation (the 1979 and 1980 Acts) ". . . have gone a long way toward solving past problems" and that FEMA should be given a chance to prove their

management ability. (4) An independent commission is just ". . . another bureaucracy when a reduction in the Government is called for." (5) An independent body would be ". . . removed from the mainstream of national security planning and policy formulation" (61:52-53).

These are strong reasons to keep the current NDS management in its current configuration. However, progress toward inventory goal fulfillment is still decades away at the current funding level. In spite of the current management's best intentions, a change will have to be effected for any real progress to be made. In his case study, Snyder states that "The fear which military spokesmen had expressed before passage of the Stockpiling Act of 1946—that a stockpile in civilian hands would become a political football—has proved to be amply justified" (49:286). The recommendation discussed in the next section will help de-politicize the stockpile's overall management.

Specific Recommendation for Stockpile Management

The two main alternatives to the current stockpile management have strengths and weaknesses, as does the choice of continuing present management. There is no guarantee that DoD management will improve the rate of progress towards a complete inventory, unless the Armed Services Committees forced it to put a priority on the NDS. An independent body would probably face significant political opposition in obtaining approval because it would be removing a certain degree of congressional control. The present organizational structure however is hampering the progress the NDS should be making towards reaching its inventory goals.

Despite the changeover cost and political ramifications, the second alternative is the more favorable of the two. Since a detailed examination of the alternatives presented has not been accomplished, only a tentative recommendation

based on the knowledge gained through this exploratory work is given below.

Transfer stockpile management to an independent, quasigovernmental corporation which would be capitalized on a long-term basis, e.g. one billion dollars per year for ten years. Inventory goals would still be set by the FEMA and the purchases and sales would still be under Congressional review. Only the largest or most sensitive transactions would be subject to prior approval. The President and FEMA would continue to have control during a national emergency.

The main rationale for this recommendation is that the NDS must transcend short-run political and budgetary considerations. The stockpile is a dynamic entity due to the changes in technology, national security planning factors, and others. All levels of NDS management should reflect this dynamic character. Although the DoD could just as well manage the stockpile, Congress would have to interfere and almost manage it themselves in the likely event DoD wanted to use stockpile funds for other purposes.

Recommendations for Future Research

Areas for further research include examining the various alternatives to current stockpile management in detail, searching for innovative financing arrangements, and improving the conditions that the current NDS management works under. Some specific research questions reflecting these areas are

- (1) Is there some combination of the various aspects of each alternative that would be the most optimal in the long run?
- (2) How can the Transaction Fund's authorization and appropriation be streamlined or consolidated?
- (3) Are there any innovative ideas on how to obtain significant, long-term financing for new purchases?
- (4) What laws could be changed or exceptions be made to give FEMA and the GSA greater financial flexibility?
- (5) If stockpile management was transferred to the DoD or an independent body how should the new management organization be structured?

Appendix A. The National Defense Stockpile (NDS) Inventory

The following description of the NDS inventory is taken from the October 1983 - March 1984 Stockpile Report to Congress, which is the most recent as of February 1985. Germanium was added to the list of stockpiled materials on June 29, 1984 and is not shown in any of the tables or figures of this appendix. Table 1 below lists the abbreviations of the measurement units used in Table 2 and also in Figures 1 through 10 of this appendix.

Table 1. List of Abbreviations (in order of appearance in Table 2)

ST	Short Ton	(2,000 Pounds)
LDT	Long Dry Ton	(Excludes Excess Free Moisture)
LCT	Long Calcined Ton	(Excludes Water of Hydration)
LB	Pound	
SDT	Short Dry Ton	
PC	Piece	
KT	Carat	(200 Milligrams of Diamond)
FL	Flask	(76-Pound)
AMA LB	Anhydrous Morphine Alkaloid	(in Pounds)
Tr Oz	Troy Ounces	(12 Tr Oz Per Pound)
Av Oz	Avoirdupois Ounce	(16 Av Oz Per Pound)
MT	Metric Ton	(2204.6 LBS or 1,000 Kilograms)
LT	Long Ton	(2,240 Pounds)

Table 2 lists the inventory in the NDS. The inventory data does not include materials that were sold but not shipped from the depots. Offsets are the ". . . allocation of an equivalent amount of one form of a material as a credit toward the goal for another form" (15:21). This offsetting has the effect of reducing the deficit and are explained in the footnotes at the end of Table 2. Figures 1 through 10 (following Table 2) list some important information on the current status of the stockpile. Figures 1 and 2 list acquisitions and disposal for the six month reporting period. Figures 3 and 4 give the same information for the period starting in 1979. Figures 5 and 6 give financial data. Figure 7 shows the progress towards goals. Figures 8 and 9 show the significant inventory shortfalls and excesses. Figure 10 lists the dates of the latest purchase specifications.

Table 2

NATIONAL DEFENSE STOCKPILE INVENTORY OF STRATEGIC AND CRITICAL MATERIALS

March 31, 1984

Material	Unit	Goal	Inventory	Value of Inventory (Millions \$)	Quantity After Crediting Offset	
					Excess	Deficit
1. Aluminum Metal Group	ST Al Metal	7,150,000	4,043,784	\$ 782.7		3,102,858
Alumina	ST	0	0	-		-
Aluminum	ST	700,000	2,080	3.4		697,920
Bauxite, Metal Grade, Jamaica Type	LDT	21,000,000	11,454,413	515.4	a	9,545,587
Bauxite, Metal Grade, Surinam Type	LDT	6,100,000	5,299,597	263.9		800,403
2. Aluminum Oxide, Abrasive Grain Group	ST Ab Grain	638,000	259,124	128.6		378,876
Aluminum Oxide, Abrasive Grain	ST	0	50,904	63.6	b	b
Aluminum Oxide, Fused, Crude	ST	0	249,867	65.0	b	b
Bauxite, Abrasive Grade	LCT	1,000,000	0	-		-
3. Antimony	ST	36,000	38,841	106.0		2,841
4. Asbestos, Amosite	ST	17,000	38,495	27.0		21,495
5. Asbestos, Chrysotile	ST	3,000	10,751	19.6		7,751
6. Bauxite, Refractory	LCT	1,400,000	199,926	40.4		1,200,074
7. Beryllium Metal Group	ST Be Metal	1,220	1,061	204.2		159
Beryl Ore (11% BeO)	ST	18,000	17,987	21.8		13
Beryllium Copper Master Alloy	ST	7,900	7,387	93.5		513
Beryllium Metal	ST	400	229	88.9		171
8. Bismuth	LB	2,200,000	2,081,298	5.0		118,702
9. Cadmium	LB	11,700,000	6,328,809	10.4		5,371,191
10. Chromium, Chemical and Metallurgical Group	ST Cr Metal	1,353,000	1,315,823	1,006.8		28,077
Chromite, Chemical Grade Ore	SDT	675,000	242,414	13.6		c
Chromite, Metallurgical Grade Ore	SDT	3,200,000	2,456,225	237.0		c
Chromium, Ferro, High Carbon	ST	185,000	402,696	266.7	c	c
Chromium, Ferro, Low Carbon	ST	75,000	318,892	418.0		c
Chromium, Ferro, Silicon	ST	90,000	58,357	43.3		c
Chromium, Metal	ST	20,000	3,763	28.2		c
11. Chromite, Refractory Grade Ore	SDT	850,000	391,414	42.6		458,586

Table 2 (continued)

Material	Unit	Goal	Inventory	Value of Inventory (Millions \$)	Quantity After Crediting Offset	
					Excess	Deficit
12. Cobalt	LB Co	85,400,000	46,193,915	\$ 577.4		39,206,085
13. Columbium Group	LB Cb Metal	4,850,000	2,532,419	23.0		2,317,581
Columbium Carbide Powder	LB Cb	100,000	21,372	.6		78,628
Columbium Concentrates	LB Cb	5,600,000	1,806,218	15.5		d
Columbium, Ferro	LB Cb	0	930,911	5.3		d
Columbium, Metal	LB Cb	0	44,851	1.6		d
14. Copper	ST	1,000,000	29,048	44.0		970,952
15. Cordage Fibers, Abaca	LB	155,000,000	0	-		155,000,000
16. Cordage Fibers, Sisal	LB	60,000,000	0	-		60,000,000
17. Diamond, Industrial Group	KT	29,700,000	37,048,492	411.4	7,348,492	
Diamond Dies, Small	PC	60,000	25,473	1.1		34,527
Diamond, Industrial, Crushing Bort	KT	22,000,000	22,001,353	38.5	1,353	
Diamond, Industrial, Stones	KT	7,700,000	15,034,403	371.8	7,334,403	
18. Fluorspar, Acid Grade	SDT	1,400,000	895,983	161.3		504,017
19. Fluorspar, Metallurgical Grade	SDT	1,700,000	411,738	51.5		1,288,262
20. Graphite, Natural, Ceylon, Amorphous Lump	ST	6,300	5,498	10.7		802
21. Graphite, Natural, Malagasy, Crystalline	ST	20,000	17,880	53.6		2,120
22. Graphite, Natural, Other Than Ceylon & Malagasy	ST	2,800	2,804	2.0	4	
23. Iodine	LB	5,800,000	7,450,930	51.3	1,650,930	
24. Jewel Bearings	PC	120,000,000	71,951,970	61.7		48,048,030
25. Lead	ST	1,100,000	601,025	318.5		498,975
26. Manganese, Dioxide, Battery Grade Group	SDT	87,000	215,505	20.4	128,505	
Manganese, Battery Grade, Natural Ore	SDT	62,000	212,494	16.2		e
Manganese, Battery Grade, Synthetic Dioxide	SDT	25,000	3,011	4.2		e

Table 2 (continued)

Material	Unit	Goal	Inventory	Value of Inventory (Millions \$)	Quantity After Crediting Offset	Deficit
					Excess	
27. Manganese, Chemical & Metallurgical Group	ST Mn Metal	1,500,000	1,954,922	\$ 489.5	470,395	
Manganese Ore, Chemical Grade	SDT	170,000	191,653	15.7	21,653	
Manganese Ore, Metallurgical Grade	SDT	2,700,000	3,360,168	159.9		f
Manganese, Ferro, High Carbon	ST	439,000	599,978	262.5		
Manganese, Ferro, Low Carbon	ST	0	0	-		
Manganese, Ferro, Medium Carbon	ST	0	28,920	20.8		f
Manganese, Ferro, Silicon	ST	0	23,574	9.9		f
Manganese Metal, Electrolytic	ST	0	14,172	20.7		f
28. Mercury	FL	10,500	176,515	53.8	166,015	
29. Mica Muscovite Block, Stained & Better	LB	6,200,000	5,212,445	27.8		987,555
30. Mica Muscovite Film, 1st & 2nd Qualities	LB	90,000	1,179,537	13.8	1,089,537	
31. Mica Muscovite Splittings	LB	12,630,000	17,388,788	26.1	4,758,788	
32. Mica Phlogopite Block	LB	210,000	130,745	.7		79,255
33. Mica Phlogopite Splittings	LB	930,000	1,641,699	3.3	711,699	
34. Molybdenum Group	LB Mo	0	0	-		
Molybdenum Disulphide	LB Mo	0	0	-		
Molybdenum, Ferro	LB Mo	0	0	-		
35. Morphine Sulphate and Related Analgesics	AMA LB	130,000	71,303	26.2		58,697
Crude	AMA LB	0	31,795	4.9	9	
Refined	AMA LB	130,000	39,508	21.3		
36. Natural Insulation Fibers	LB	1,500,000	0	-		1,500,000
37. Nickel	ST Ni+Co	200,000	32,209	143.7		167,791
38. Platinum Group Metals, Iridium	Tr Oz	98,000	26,590	9.5		71,410
39. Platinum Group Metals, Palladium	Tr Oz	3,000,000	1,255,008	201.4		1,744,992
40. Platinum Group Metals, Platinum	Tr Oz	1,310,000	452,642	179.9		857,358
41. Pyrethrum	LB	500,000	0	-		500,000
42. Quartz Crystals	LB	600,000	2,060,936	12.4	1,460,936	
43. Quinidine	Av Oz	10,100,000	1,874,504	6.7		8,225,496

Table 2 (continued)

Material	Unit	Goal	Inventory	Value of Inventory (Millions \$)	Quantity After Crediting Offset	
					Excess	Deficit
44. Quinine	Av Oz	4,500,000	3,246,164	\$ 8.2		1,253,836
45. Ricinoleic/Sebacic Acid Products	LB	22,000,000	12,524,242	9.2		h
46. Rubber	MT	864,000	120,882	154.4		743,118
47. Rutile	SDT	106,000	39,186	12.7		66,814
48. Sapphire and Ruby	KT	0	16,305,502	.2	16,305,502	
49. Silicon Carbide, Crude	ST	29,000	80,550	36.2	51,550	
50. Silver, Fine	Tr Oz	0	137,505,946	1,326.8	137,505,946	
51. Talc, Steatite Black & Lump	ST	28	1,081	.4	1,053	
52. Tantalum Group	LB To Metal	7,160,000	2,426,387	142.0		4,733,613
	LB To	0	28,688	4.7	1	
	LB To	0	201,133	44.2	1	
	LB To	8,400,000	2,584,195	93.1		i
53. Thorium Nitrate	LB	600,000	7,131,812	19.6	6,531,812	
54. Tin	MT	42,700	190,354	2,450.8	147,654	
55. Titanium Sponge	ST	195,000	32,331	353.4		162,669
56. Tungsten Group	LB W Metal	50,666,000	77,472,074	496.1	26,806,074	
	LB W	2,000,000	2,032,942	23.3	1	
	LB W	0	2,025,361	24.8	1	
	LB W	1,600,000	1,898,831	24.5	1	
	LB W	55,450,000	84,036,358	423.5	1	
57. Vanadium Group	ST V Metal	8,700	541	6.5		8,159
	ST V	1,000	0	-		1,000
	ST V	7,700	541	6.5		7,159
58. Vegetable Tannin Extract, Chestnut	LT	5,000	14,082	9.5	9,082	
59. Vegetable Tannin Extract, Quebracho	LT	28,000	131,250	89.8	103,250	
60. Vegetable Tannin Extract, Wattle	LT	15,000	15,001	10.6	1	
61. Zinc	ST	1,425,000	378,316	403.9		1,046,684

Figure 1
Acquisitions of Stockpile Materials
October 1, 1983-March 31, 1984

Material	Unit	Quantity	Cost	Origin
Stockpile Transaction Fund				
Iridium	Tr Oz	1,200	\$ 402,000	South Africa
Tantalum	LB Ta	249,990	9,912,146	Various
Titanium	ST	4,500	29,260,000	Japan, Domestic
Total Purchase Contract Awards			\$39,574,146	
Bauxite	LDT	400,000 ^a	12,078,000	Jamaica-Barter
Total Obligations from Transaction Fund			\$51,652,146	
Other				
Jewel Bearings	PC	741,736	1,078,000 ^b	Domestic
Total Cost of Materials			\$52,730,146	

^a Title to one million long dry tons of bauxite will be transferred to the stockpile during Fiscal Years 1988-1990. GSA has physical custody of 400,000 long dry tons of this material as of this report period.

^b The cost of the bearings purchased for the Stockpile is funded under a separate program appropriation to the General Services Administration.

Figure 2
Disposals of Excess National Defense Stockpile Materials
October 1, 1983-March 31, 1984

Material	Unit	Sales During Period		Balance of Disposal Authority (Quantity)
		Value	Quantity	
Antimony	ST	\$ 1,494,231	1,000	0
Asbestos, Amosite	ST	—	—	30,024
Asbestos, Crocidolite	ST	—	—	831
Asbestos, Chrysotile	ST	—	—	2,000
Celesite	SDT	—	—	13,415
Diamond, Industrial, Crushing Bort	KT	444,005	191,536	1,354
Diamond, Industrial, Stones	KT	3,892,569	501,506	1,015,948
Kyanite	SDT	—	—	1,187
Iodine	LB	283,000	80,000	1,213,000
Manganese Dioxide, Battery Grade, Natural Ore	SDT	202,500	2,700	77,296
Manganese Ore, Chemical Grade	SDT	240,000	3,000	121,761
Manganese Ore, Metallurgical Grade	SDT	—	—	666,246
Mercuric Oxide	LB	50,510	14,100	695,153
Mercury	FL	554,283	1,800	35,124
Mica Muscovite Block Stained & Lower	LB	—	—	50,000
Mica Muscovite Film, 1st & 2nd Qualities	LB	165,644	49,912	35,027
Mica Muscovite Splittings	LB	314,642	657,517	4,343,544
Mica Phlogopite Splittings	LB	26,694	31,523	707,361
Quartz Crystals	LB	—	—	1,798,324
Rare Earth Oxides	SDT	—	—	487
Talc, Steatite Block & Lump	ST	—	—	886
Talc, Ground	ST	—	—	1,089
Thorium Nitrate	LB	—	—	6,055,529
Tin	LT	12,431,741	935	21,498
Tungsten Ores & Concentrates	LB W	7,373,805	1,704,537	59,116,669
Vegetable Tannin Extract, Chestnut	LT	443,193	549	4,942
Vegetable Tannin Extract, Quebracho	LT	2,070,705	2,983	33,552
Total Sales During Period		\$29,987,522		

Figure 3
Cumulative Disposals of Excess Stockpile Materials
July 30, 1979-March 31, 1984

Material	Unit	Quantity	Value
Antimony	ST	1,884	\$ 2,798,830
Asbestos, Chrysotile	ST	1,000	1,493,830
Celestite	SDT	1,000	1,000
Diamond, Industrial, Crushing Bort	KT	2,375,123	5,196,183
Diamond, Industrial, Stones	KT	4,984,051	66,529,264
Kyanite	SDT	300	30,000
Iodine	LB	561,888	3,212,529
Magnesium	ST	362	763,820
Manganese Dioxide, Battery Grade, Natural Ore	SDT	48,819	3,639,628
Manganese Ore, Chemical Grade	SDT	29,391	2,344,376
Mercuric Oxide	LB	15,100	56,020
Mercury	FL	14,876	4,937,907
Mica Muscovite Film, 1st & 2nd Quality	LB	99,826	339,741
Mica Muscovite Splittings	LB	4,205,385	3,386,830
Mica Phlogopite Splittings	LB	1,176,901	1,093,454
Quartz Crystals	LB	401,106	1,564,574
Rare Earth Oxides	SDT	702	533,000
Rubber	LT	646	469,343
Silver	Tr Oz	2,000,000	18,123,325
Talc, Steatite Block & Lump	ST	10	4,000
Thonium Nitrate	LB	26,875	63,599
Tin	LT	13,517	195,483,317
Tungsten Ores & Concentrates	LB W	9,751,388	69,463,543
Vegetable Tannin Extract, Chestnut	LT	3,590	2,335,732
Vegetable Tannin Extract, Quebracho	LT	18,250	11,440,124
Vegetable Tannin Extract, Wattle	LT	1,350	940,749
Total Sales Since July 30, 1979			\$396,243,888
Receipts from Sales Prior to July 30, 1979			44,699,494
Total Receipts Since July 30, 1979			\$440,943,382

Figure 4
Cumulative Obligations from the National Defense Stockpile Transaction Fund
July 30, 1979-March 31, 1984

Material	Unit	Quantity	Cost	Origin
Bauxite, Metallurgical Grade	LDT	3,600,000	\$122,350,000	Jamaica
Bauxite, Refractory	LCT	25,327	3,891,000	China
Beryllium	ST	60,000	14,398,000	Domestic
Cobalt	LB	11,700,000	113,794,000	Zaire & Zambia
Iridium	Tr Oz	10,800	3,926,000	South Africa
Quinidine	Av Oz	273,387	932,000	Netherlands
Rubber ^a	LT	398	418,000	Various ^a
Tantalum Minerals	LB Ta	290,154	11,408,000	Various ^b
Tantalum Sponge	ST	4,500	29,279,000	Various ^c
Vanadium	ST V	101	851,000	Domestic
Total Obligations			\$301,247,000	

^a Malaysia, Indonesia, and Thailand

^b Brazil, Australia, Germany, Thailand, the Netherlands, Zaire, Mozambique, Nigeria, Malaysia, Canada, Rwanda, Zimbabwe, South Africa, Namibia, Singapore, Spain, Portugal, China, and Argentina

^c Japan, United Kingdom, and the United States

Figure 5
Financial Status of the National Defense Stockpile Transaction Fund
July 30, 1979-March 31, 1984
(Millions of Dollars)

Period	Receipts	Authority	Purchase Obligations	Balance in Fund (End Date)
August 1, 1979 to September 30, 1979	\$ 7.3	\$ 0	\$ 0	\$ 7.3
October 1, 1979 to September 30, 1980	87.0	0	0	94.3
October 1, 1980 to September 30, 1981	99.2	100.0 0.4 ^a	78.0	115.5
October 1, 1981 to September 30, 1982	161.0	57.6 0.3 ^b	44.0	232.5
October 1, 1982 to September 30, 1983	53.2	120.0	145.0	140.7
October 1, 1983 to March 31, 1984	33.2	120.0	51.6 (17.4) ^c	139.7 ^d
Totals	\$440.9	\$398.3	\$301.2	

^a Consists of approximately \$400,000 in authority for the rotation of rubber under Section 6(a)(4) of the Stock Piling Act.

^b Consists of approximately \$300,000 in authority for the rotation of chrysotile asbestos under Section 6(a)(4) of the Stock Piling Act.

^c The amount of \$17,387,000 was debilitated during the reporting period to effect adjustments to previously estimated obligations for transportation costs on the bauxite purchase and the current bauxite barter agreement.

^d Includes \$97.1 million that is authorized to be obligated and \$42.6 from current receipts that will require future authorization before obligation

Figure 6.
Comparison of Inventory and Goals
National Defense Stockpile
as of March 31, 1984
(Billions of Dollars)

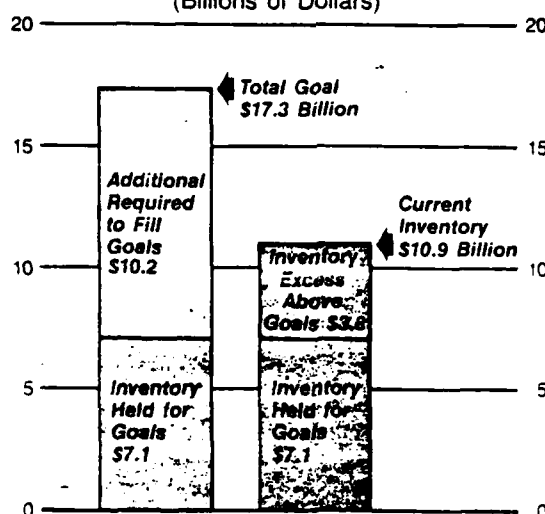


Figure 7.
Progress Toward Major Stockpile Goals
as of March 31, 1984
 (\$ Billions)

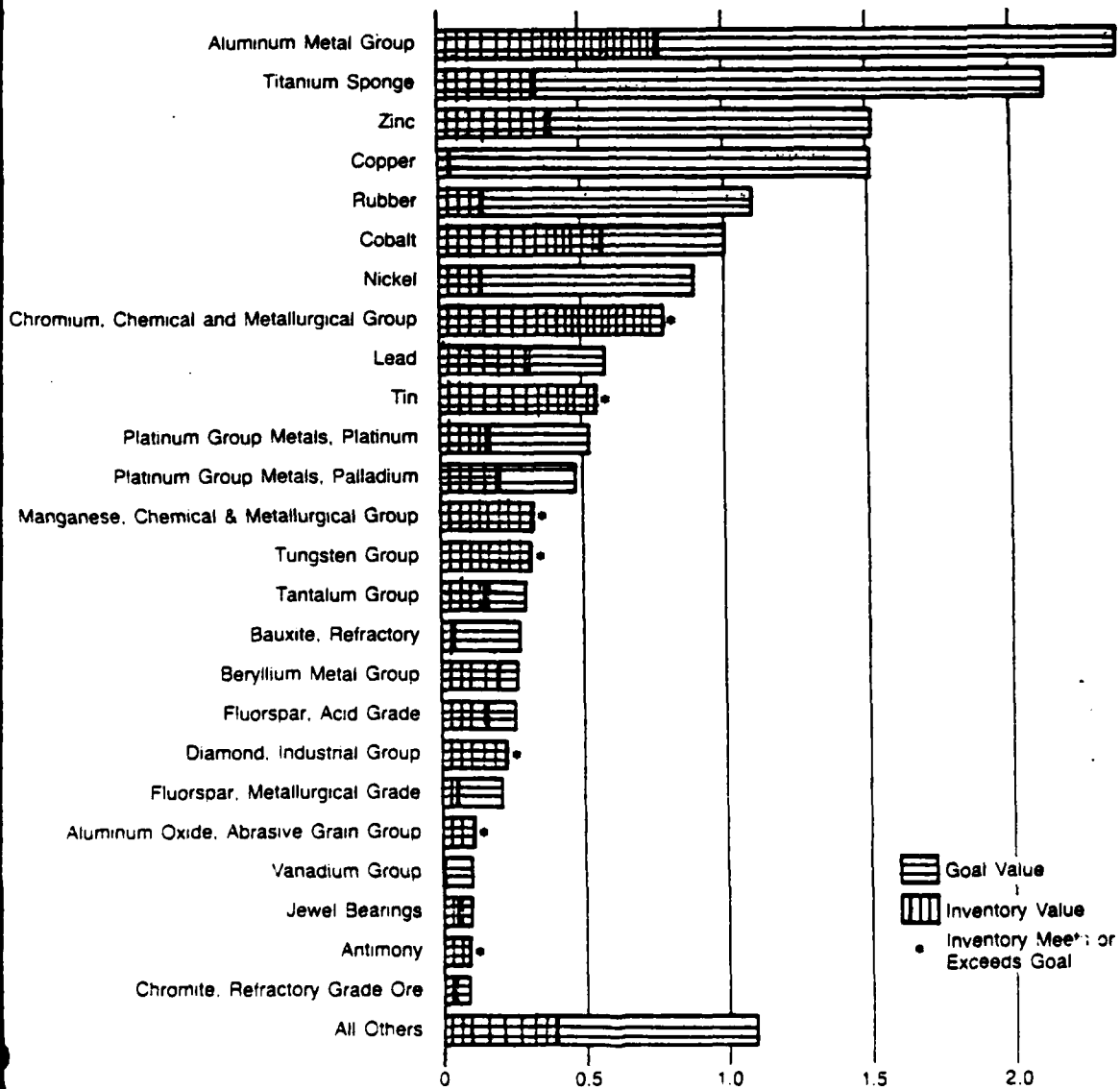


Figure 8.
Shortfalls in Inventory of
Stockpile Materials
as of March 31, 1984
 (\$ Billions)

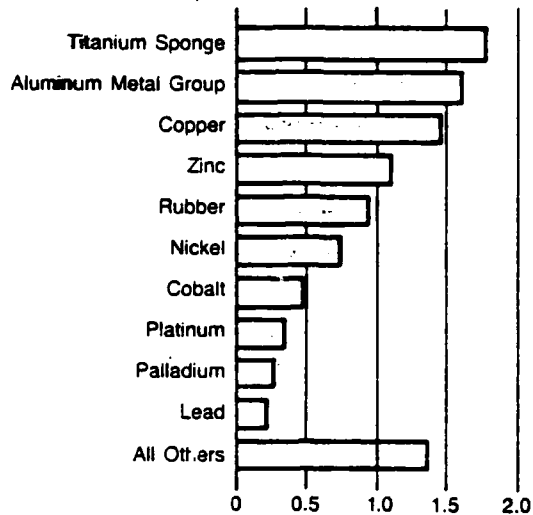


Figure 9.
Excesses in Inventory of
Stockpile Materials
as of March 31, 1984
 (\$ Billions)

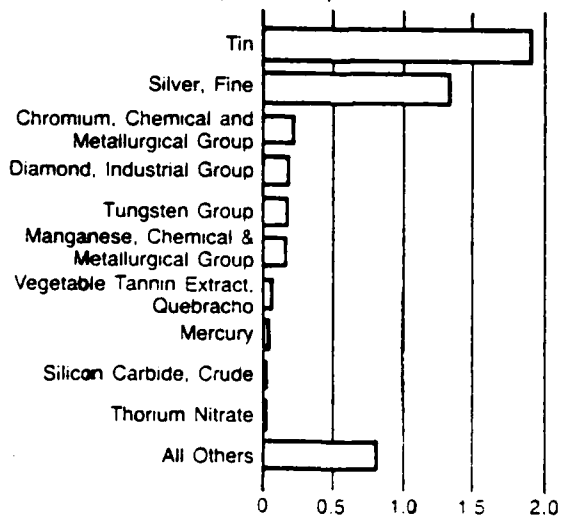


Figure 10

NATIONAL DEFENSE STOCKPILE PURCHASE SPECIFICATIONS

Number	Material	Date Issued
P-90-R3	Aluminum Oxide Abrasive, Fused, Crude	November 13, 1980
P-2a-R4	Antimony Metal	June 10, 1980
P-2b-R2	Antimony Sulphide Ore and Concentrates - Chemical Grade	June 10, 1980
P-3-R6	Asbestos - Chrysotile	February 26, 1982
P-90a	Bauxite - Abrasive Grade	June 22, 1981
P-5b-R1	Bauxite, Metal Grade, Jamaican Type	February 9, 1983
P-5c-R5	Bauxite, Refractory Grade	June 22, 1982
P-6-R5	Beryl Concentrates	November 13, 1980
P-94-R3	Beryllium - Copper Master Alloy	November 13, 1980
P-110a-R	Beryllium Metal, Hot-Pressed Powder Billets	March 25, 1983
P-110-R2	Beryllium Metal, Vacuum Cast Ingot	June 25, 1981
P-7-R4	Bismuth	June 10, 1980
P-8-R2	Cadmium	March 7, 1979
P-9-R3	Castor Oil	June 22, 1982
P-86-R2	Chestnut Tannin Extract	February 1, 1980
P-65-R4	Chromite - Chemical Use	February 1, 1980
P-11a-R6	Ferrochromium - Low Carbon	June 9, 1978
P-11b-R4	Ferrochromium - High Carbon	July 25, 1983
P-13-R5	Cobalt	June 28, 1983
P-113-R2	Columbium Source Materials	January 27, 1984
P-16a-R3	Copper	March 16, 1984
P-17b-R6	Cordage Fibers - Sisal	October 19, 1977
P-18-R2	Corundum - Massive Micro-Crystalline Ore	January 23, 1977
P-69a-R2	Fluorspar - Acid Grade	January 2, 1978
P-69b-R2	Fluorspar - Metallurgical Grade	January 2, 1978
P-40-R	Iridium	June 25, 1981
P-25-R2	Jewel Bearings	March 27, 1981
P-28-R3	Lead	March 16, 1984
P-98-R3	Manganese Metal - Electrolytic	June 9, 1978
P-30a-R4	Ferromanganese (Standard High Carbon)	July 25, 1983
P-37a-R	Morphine Sulphate	March 7, 1979
P-36-R4	Nickel - High Purity	January 26, 1983
P-37-R3	Opium	March 7, 1979
P-99-R6	Palladium	June 25, 1981
P-41-R5	Platinum	June 25, 1981
P-42-R2	Pyrethrum Extract	February 1, 1980
P-44-R3	Quebracho Tannin Extract	February 1, 1980
P-45-R4	Quinidine Sulfate	January 26, 1983
P-46-R3	Quinine Sulfate	November 13, 1980
P-48a-R5	Rubber - Crude Natural	October 19, 1977
P-48b-R	Rubber - Technically Specified Rubber (Hevea)	June 2, 1982
P-48c	Rubber - Parthenium (Guayule)	February 1, 1980
P-49-R6	Rutile	November 3, 1981
P-25a	Sapphire and Ruby Components, Synthetic	March 27, 1981
P-95-R2	Silicon Carbide - Crude	January 12, 1981
P-112-R2	Silver	June 10, 1980
P-53-R2	Talc (Steatite) Block	June 10, 1980
P-53a-R2	Talc (Steatite) Lump	June 10, 1980
P-106-R3	Tantalum Carbide Powder	February 1, 1980
P-113a	Tantalum Source Materials	August 3, 1981
P-55-R3	Tin	June 10, 1980
P-97-R7	Titanium Metal Sponge	June 2, 1982
P-58-R2	Vanadium Pentoxide	June 25, 1981
P-100-R1	Ferrovandium	October 19, 1980
P-87-R2	Wattle Tannin Extract	February 1, 1980
P-59-R1	Zinc	March 16, 1984

Table 2 (continued)

Footnotes

- a. Bauxite, Metal Grade, Jamaica Types: Includes 400,000 LDT in the physical custody of GSA, title to which will be transferred to the Stockpile during Fiscal Years 1988-1990.
- b. Aluminum Oxide, Fused Grade: Hold 50,904 ST of aluminum oxide abrasive grain and 249,867 ST of aluminum oxide fused crude as offset against 379,253 LDT of bauxite abrasive grade.
- c. Chromium Group, Chemical and Metallurgical Grades: Metallurgical grade ore goal is 3,200,000 SDT of specification grade; inventory 1,956,824 SDT; shortfall 1,243,176 SDT.
- (1) Hold 217,695 ST of Fe Cr high carbon against shortfall of 544,238 SDT of specification grade ore.
 - (2) Hold 243,892 ST of Fe Cr low carbon against 609,730 SDT of specification grade ore.
 - (3) Hold 89,208 SDT of nonspecification grade metallurgical ore against the balance of the 89,208 SDT specification grade ore shortfall.
 - (4) Hold 47,466 SDT of nonspecification grade metallurgical ore against a shortfall of 31,644 ST of Fe Cr Si.
 - (5) Hold 56,830 SDT of nonspecification grade metallurgical ore against a shortfall of 16,237 ST of chromium metal.
 - (6) Hold 337,715 SDT of nonspecification grade metallurgical ore against 337,715 SDT of chemical grade ore shortfall.
- d. Columbium Group:
- (1) Hold 930,911 pounds Cb as Fe Cb against 1,095,189 pounds Cb as concentrates.
 - (2) Hold 44,851 lb Cb as Cb metal against 52,766 lb Cb as concentrates.
- e. Manganese, Dioxide, Battery Grade Group:
- Hold 21,989 SDT of manganese, battery grade, natural ore against a shortfall of 21,989 SDT of manganese, battery grade, synthetic dioxide.
- f. Manganese Group, Chemical and Metallurgical Grades: Metallurgical grade ore goal is 2,700,000 SDT; inventory 2,409,160 SDT; shortfall 290,840 SDT of stockpile grade ore.
- (1) Hold 16,172 ST of Mn metal against 35,430 SDT of metallurgical ore.
 - (2) Hold 23,574 ST of Fe Mn Si against 42,433 SDT of metallurgical ore.
 - (3) Hold 28,920 ST of Fe Mn medium carbon against 57,840 SDT of metallurgical ore.
 - (4) Hold 77,569 ST of Fe Mn high carbon against 155,138 SDT of metallurgical ore.
 - (5) Hold remaining 83,409 ST of Fe Mn high carbon against reduction of ore value in desired inventory mix.
- g. Opium: Hold 31,795 AMA lb of opium gum against 31,795 AMA lb of opium salt goal.
- h. Ricinate/Sebacic Acid Products: Sebacic acid inventory is credited toward goal at the rate of 2.5 to 1.
- i. Tantalum Group:
- (1) Hold 201,133 lb Ta as Ta metal against 237,337 lb Ta as concentrates.
 - (2) Hold 28,688 lb Ta as Ta C against 33,852 lb Ta as concentrates.
- j. Tungsten Group:
- (1) WC powder goal is 2,000,000 lb W; stockpile grade inventory 1,921,167 lb W; shortfall 78,833 lb W. Hold 111,775 lb W as nonspecification grade WC to offset 78,243 lb W as WC specification grade (assume 70% recovery of usable W).
 - (2) W metal powder goal is 1,600,000 lb W; inventory stockpile grade 1,566,964 lb W; shortfall 33,036 lb W. Nonstockpile grade W metal powder inventory is 331,947 lb W. Assume 70% recovery as usable material, then 331,947 x .70 = 232,363 lb W. Hold 47,194 lb W as nonspecification grade powder to offset shortfall of 33,036 stockpile grade W powder.
 - (3) Hold balance of nonstockpile grade W powder 232,363 - 33,036 = 199,327 lb W as powder against 234,209 lb W as concentrate.
 - (4) Hold 800,752 lbs W as Fe W stockpile grade against 987,884 lb W as concentrate. Hold 1,184,609 lb W nonstockpile grade Fe W at 70 percent recoverable against 974,341 lb W concentrate.

Appendix B. Major Defense Uses of Selected Stockpile Materials

<u>Material</u>	<u>Uses</u>
ALUMINUM	Possesses many useful qualities, including lightness, resistance to corrosion, electrical conductivity and ease of working. Primary uses are in aircraft, missiles, cartridge cases, bridging equipment, and electric power transmission cable.
ANTIMONY	Alloys containing this material expand on cooling and thus reproduce the fine details of a mold. Its chief uses on metals are for lead, solder, battery plates, and to impart hardness and smoothness to soft-metal alloys used in transportation equipment.
BERYLLIUM	Beryllium is used principally as an alloying element with copper to produce a tough, hard alloy which has great resistance to fatigue and shock. These alloys are used in electrical and electronic components for communications, computers, and gyroscopes.
BISMUTH	One major use of this material is for production of low-melting point lead alloys. These alloys are used as a holding medium for machining fragile parts and in metal forming and foundry casting components used in manufacturing various types of machinery.
CADMIUM	The largest use of this material is in the electroplating industry. This includes points, batteries, night-vision devices, and other uses.
CHROMIUM	The principal use of low carbon ferrochromium is in the production of very low carbon alloy and stainless steels and in high temperature alloys. High carbon ferrochromium is used in the higher carbon grades of both stainless and alloy steel. The major uses of this material include gasoline refinement, jet engines, nuclear reactors, stainless steel and superalloys.
COBALT	The principal uses of cobalt are in alloys, especially permanent magnets, high-temperature high-strength superalloys, and high-speed tool steels. End use consumption of cobalt are in catalysts, electronics, fiber optics, jet engines, nuclear reactors, and superalloys.
COLUMBIUM (NIOBIUM)	Columbium metal has important potential uses in nuclear and aerospace applications and as a superconductor of electricity at cryogenic temperatures. Currently, this material is used in jet engines, nuclear reactors, semiconductors, stainless steel, and superalloys.
COPPER	Copper is tough, malleable, ductile, and corrosion resistant. Its high electrical conductivity recommends its use in communications, power transmission, wiring for electrical distribution, transformers, and switch gears. As the base metal in

brass and bronze, copper is also used in small arms military cartridge and shell cases, bearings, and castings.

- DIAMONDS Industrial diamonds are used principally in grinding wheels to shape and sharpen tungsten carbide cutting tools. They are also used for turning, grinding, boring and drilling hard metals, ceramics, glass, and for core drilling of rock. Diamond powder is used for polishing, lapping, and as the cutting agent in drilling very small holes in hard materials.
- GERMANIUM The major uses for germanium are infrared optics, fiber optic systems, semiconductors (including transistors, diode, and rectifiers), and detectors. Other applications include catalysts phosphors, metallurgy, and chemotherapy.
- LEAD Transportation is the major end use, with lead being used in batteries, gasoline additives, bearing, and the electrical industry. Also, lead is used in ammunition, paints, pigments, solder, cable coverings, type metal castings, and in certain brasses and bronzes.
- MANGANESE In the form of ferromanganese, this material is used in producing steel. It imparts strength, toughness, hardness, and hardenability, and is used primarily in batteries and stainless steel.
- MERCURY Mercury is used in industrial control instruments, thermometers, barometers, batteries, switches, mercury vapor lamps, and rectifiers. Another large use is as a cathode in the electrolytic preparation of chlorine and caustic soda.
- NICKEL Nickel is one of the most versatile of the alloying materials and its predominating use is as an alloy in the steel industry. It is essential in military uses such as nuclear applications, jet engines, aircraft frames, submarines, armor plate and many other direct defense requirements.
- PLATINUM The petroleum industry uses platinum in catalytic reforming to increase the octane numbers of naphthas, and in synthesizing aromatic hydrocarbons for the subsequent manufacture of chemicals. The platinum group metals are used separately and in combination with each other and with other metals in the electrical field, for electrodes of all kinds, electrical contact points, thermocouples, resistance thermometers, and resistors.
- SILVER End use applications of this material include photographic materials, contacts and conductors, brazing alloys and solder, batteries, and dental and medical supplies.
- TANTALUM This metal continues to be in strong demand for electronic applications, for chemical and corrosion resistant equipment, as an addition to nonferrous alloys, and in tantalum-base nonferrous alloys for high-temperature applications.

- TIN** Important uses of tin for the electrical, construction and transportation industries are in solders, babbitts and other bearing metals. The primary defense use is in the production of batteries.
- TITANIUM** About 85 percent of the titanium metal consumed in the United States is for aerospace applications including aircraft and guided missile assemblies, space craft, and turbine engines for aircraft. The remainder is used in the chemical processing industry and in marine and ordinance applications.
- TUNGSTEN** Some of the more important applications of this material are for use in the manufacture of rocket nozzles and other aerospace applications; counter weights and balances in the horizontal and vertical stabilizers of aircraft; electrical contact points in electrical circuits; armor-piercing projectiles; for reclaiming nuclear fuel.
- VANADIUM** The chief use of this metal is as an alloying agent for steels and iron. It is used to reduce and control grain size, to impart toughness, strength, and resistance to abrasion. Titanium base vanadium alloys are used in the aircraft industry and in tool manufacturing.
- ZINC** Zinc is used in the galvanizing of steel sheet, pipe wire and structural shapes for construction. Brass, a copper-zinc alloy, is used to produce brass sheet, tube, castings and other copper-based products. Brass sheet (cartridge brass) is used in large quantities to manufacture small arms ammunition shell cases.

Source: **Strategic and Critical Materials: Descriptive Data**, GSA, Dec. 1973.

Appendix C. Studies Calling for a More Coherent National Materials Policy

1984: General Accounting Office. Implementation of the National Minerals and Materials Needs Better Coordination and Focus.

1983: Congressional Budget Office. Strategic and Critical Nonfuel Minerals: Problems and Policy Alternatives.

Congressional Research Service. Seventh Biennial Conference on National Materials Policy.

-- Materials Availability: A Cause for Concern? [by] Lennard G. Kruger.

Department of Commerce. Critical Materials Requirements of the U.S. Steel Industry.

"How Vulnerable are U.S. Sources of Strategic Materials?" Energy and Technology Review.

1982: General Accounting Office. Review of Selected Aspects of Strategic and Critical Materials Stockpile Management.

-- Implementation of NDS Plans Would Require Amending Existing Legislation.

-- Actions Needed to Promote a Stable Supply of Strategic and Critical Materials.

National Materials Advisory Board. Considerations in Choice of Form for Materials for the National Stockpile.

Mullins, Gen. James P. "Scarcity and the Challenge," Air Force Journal of Logistics.

1981: Congressional Research Service. A Congressional Handbook on U.S. Materials Import Dependency/Vulnerability.

Department of Commerce. Proceedings, U.S. Department of Commerce Public Workshop on Critical Materials Needs in the Aerospace Industry, February 9, 10, 1981.

Goldwater, Sen. Barry. "U.S. Dependency on Foreign Sources for Critical Materials," Vital Speeches of the Day.

Smith, Cecil. Strategic Materials: An American Achilles Heel.

1980: World Affairs Council of Pittsburgh. The Resource War in 3-D—Dependency, Diplomacy, and Defense.

Frischman, Leonard L. World Mineral Trends and U.S. Supply Problems.

Appendix D. Mineral and Country Risk Assessments

Explanation

Tables 1 and 2 of this appendix are adapted from British author David Hargreaves' book titled **World Index of Strategic Materials** (28). The purpose of presenting these tables is that since the US and its allies make up the majority of the world market the ratings below are illustrative of factors the national security agencies consider.

Table 1

Table 1 on the following page lists the total strategic ratings for the minerals in the National Defense Stockpile. The total strategic rating was determined by multiplying the likelihood of a supply disruption by the cost of such a disruption. It should be noted that Table 1 is from the perspective of the mineral's impact on the rest of the world during peacetime. However, the total stockpile inventory goal would consider the risks associated with the mineral reaching the United States during a three year national emergency that is global in character. Note that the five highest ranking materials have received much attention because they are necessary in the construction of the Nation's weapon systems and essential industrial goods.

Likelihood of a Supply Disruption

The likelihood of a supply disruption is the average of three risk categories: transportation risks, trade risks, and three of the five factors that make up the total production risk category. The transportation risk category was determined by averaging the primary and secondary risks. Primary risk is the likelihood of a disruption during movement of ore from the mine to the smelting site or some other intermediate processing stage. Secondary risk is the chance of a disruption from the intermediate site to the final consumer. Trade risk is the

average of the likelihood of collusive price agreements on the part of the producers and the chance of the mineral being embargoed. The three production risk factors taken into consideration in calculating the likelihood of a supply disruption include: existing capacity versus current demand, the historical record of labor disputes in the major production areas, and the chance of wars, revolution, and insurrection in these same production areas.

Table 1. MINERAL RISK ASSESSMENT
(1.0 Lowest Risk, 10.0 Highest Risk)

NDS FAMILY NO.	MINERAL	LIKELIHOOD OF SUPPLY DISRUPTION			COST OF SUCH A DISRUPTION		TOTAL STRATEGIC RATING	RANK
		TRANSPORTATION RISKS (AVG)	TRADE RISKS (AVG)	PRODUCTION RISKS (AVG)	APPLICATIONS/USE RISKS (AVG)			
1	Aluminum	4.0	4.5	3.4	9.00	24.50		
3	Antimony	1.0	1.0	2.4	2.50	3.20		
7	Beryllium	2.0	3.5	4.0	6.50	17.19		
8	Bismuth	1.0	1.0	2.2	2.25	3.40		
9	Cadmium	1.5	1.0	1.6	3.75	4.45		
10	Chromium	5.0	6.5	6.0	8.00	41.67	1	
12	Cobalt	5.5	5.5	5.8	6.75	35.83	3	
13	Columbium	3.5	4.5	3.8	5.00	17.29		
14	Copper	4.5	3.0	5.0	8.50	29.71	4	
17	Diamond	2.5	5.0	4.0	5.00	17.86		
	Germanium	1.5	1.5	3.6	6.00	11.79		
25	Lead	2.0	1.5	2.6	5.25	9.00		
27	Manganese	8.0	5.0	4.8	8.25	40.29	2	
28	Mercury	2.0	4.5	1.8	4.00	8.50		
34	Molybdenum	1.0	2.0	4.2	7.75	14.67		
37	Nickel	5.0	3.0	3.4	6.50	20.24		
38	Platinum Gp	4.0	8.5	4.8	5.00	28.29	5	
49	Silicon	1.0	1.0	1.0	6.00	4.33		
50	Silver	1.0	4.5	3.0	4.00	10.48		
52	Tantalum	3.0	3.0	3.8	5.50	14.10		
54	Tin	4.0	5.5	4.8	4.25	21.40		
55	Titanium	3.0	2.5	4.0	8.00	18.62		
56	Tungsten	3.5	2.0	3.6	6.00	15.00		
57	Vanadium	2.0	4.5	4.2	5.75	16.71		
61	Zinc	4.5	3.0	3.0	5.50	15.88		

Cost of Such a Disruption

The cost of such a disruption is the average of the remaining two

factors of production, and the application/use risk category. The other two factors of production consider the distance of primary supply sources to primary users and the time lag for securing new supplies. Four factors make up the application/use category. The first is the total economic impact on the world market. A widely used mineral would score higher than a lesser used one, for example copper versus gallium. The second is the industry the loss of the mineral affects the most. Growth industries such as electronics and defense receive a higher rating. The third is the availability of substitutes and the cost and risks associated with those substitutes. The fourth is the chance of longer-term substitutability.

Table 2

Table 2 indicates seven risk categories for specific countries. This table is the impact the individual country has on the rest of the world during peacetime. The labor risk considers the incidences of strikes, quality of labor, and general unrest in the country. Political risk takes into consideration the history, stability, and external dangers a country faces. Location risk takes into account a country's hostile borders and critical land/sea routes. Mineral reserves risk looks at the adequacy of reserves, costs of production, and developmental appeal. Financial and economic risk category is the average of the following five factors: currency performance, vulnerability to manipulation, external indebtedness, domestic productivity, and foreign ownerships. Energy reserves risk considers domestic as well as foreign sources and production. Dependence on Foreign resources risk is made up of the one factor. The total country risk is calculated by taking the weighted average of the seven risk categories (700:16).

Taking into consideration the country risk (Table 2) and the mineral risk (Table 1) for where the US obtains its strategic and critical materials should give the reader a feeling for where potential trouble would lie in an emergency.

Table 2. COMPONENTS OF COUNTRY RISK ASSESSMENT
(1.0 Lowest Risk, 10.0 Highest Risk)

COUNTRY NAME	*TOTAL * *COUNTRY* *RISK* ****	LABOR RISK	POLITICAL RISK	LOCATION RISK	MINERAL RESERVES RISK	FINANCIAL & ECONOMIC RISK	ENERGY RESERVES RISK	DEPENDENCE ON FOREIGN NATURAL RESOURCES RISK
Australia	4.70	4.0	4.0	3.5	5.3	6.0	5.0	2
Bolivia	6.60	6.7	7.3	6.0	8.3	7.2	4.0	5
Botswana	5.84	4.3	5.3	7.5	5.7	6.2	5.3	9
Brazil	5.81	5.7	5.0	5.0	5.0	7.4	5.7	5
Canada	4.55	5.3	5.7	1.5	5.0	6.8	1.3	2
Chile	5.69	6.3	6.3	5.5	5.0	5.0	6.3	6
Finland	5.90	3.7	7.0	7.0	7.7	4.4	6.6	7
France	6.35	5.3	7.0	5.0	7.0	5.6	7.7	8
Gabon	5.15	5.3	5.7	4.0	5.3	5.8	4.0	5
F. R. Germany	5.45	4.3	4.7	6.5	7.0	3.8	7.0	8
Guyana	7.25	7.7	7.3	6.0	7.3	7.2	7.7	7
India	6.58	5.0	7.0	6.5	7.3	6.3	6.7	9
Indonesia	5.45	4.7	7.3	7.5	5.7	5.2	2.3	8
Ireland	6.30	6.7	5.7	1.5	7.3	7.4	6.3	8
Italy	5.80	5.0	7.3	4.0	7.0	5.0	6.0	7
Jamaica	7.06	7.0	7.0	5.0	7.7	6.8	7.7	9
Japan	4.97	2.7	2.7	5.5	7.7	3.8	7.7	7
Malaysia	5.89	6.0	6.3	7.0	6.3	5.6	4.3	7
Mexico	5.06	5.7	4.7	3.0	5.7	7.2	2.3	4
Namibia	6.72	7.7	8.0	7.5	5.7	5.2	7.7	6
Papua New Guinea	5.40	6.3	5.3	5.5	4.7	5.2	5.0	7
Peru	6.06	7.3	5.7	5.0	7.7	7.0	3.0	5
Phillippines	6.30	6.0	6.0	7.0	5.3	7.0	6.0	7
R. S. Africa	5.28	5.3	7.3	7.0	3.3	5.4	4.3	4
Spain	5.41	4.7	5.7	2.5	4.7	6.6	6.3	6
Thailand	5.94	5.3	7.3	8.0	5.3	5.8	4.0	8
United Kingdom	4.98	4.3	3.3	4.0	7.3	6.4	2.3	8
United States	4.30	3.0	2.7	1.5	6.3	5.6	4.0	7
Zaire	6.75	7.0	7.3	7.5	6.0	7.0	5.7	7
Zambia	6.75	7.7	5.3	6.0	6.3	6.8	7.7	8
Zimbabwe	5.96	7.3	4.7	6.5	5.7	6.2	6.7	2

Bibliography

1. Beizer, James, ed. "Declaration of Policy," American Mining Congress Journal, 69: 1-24 (December 28, 1983).
2. Bureau of Mines. The Domestic Supply of Critical Minerals. Washington: Government Printing Office, 1983.
3. Calabrese, Teri, ed. Congressional Yellow Book. Washington: Washington Monitor, Summer 1984.
4. Castle, Emery N. and Kent A. Price, eds. Global Natural Resources and Minerals Policy. Washington: Resources For the Future, 1983.
5. Congressional Budget Office. Strategic and Critical Nonfuel Minerals: Problems and Policy Alternatives. Report No. 23-960. Washington: Government Printing Office, 1983.
6. ----- US Raw Materials Policy: Problems and Possible Solutions. Background Paper No. 16. Washington: Government Printing Office, December 26, 1976.
7. Congressional Research Service. Agricultural Barter for Strategic Materials: Cost Considerations of Storage, Handling, and Deterioration. Washington: Government Printing Office, August 1984.
8. ----- A Congressional Handbook on U.S. Materials Import Dependency/Vulnerability. Report series 83-515. Washington: Government Printing Office, 1981.
9. Crist, George B. Memorandum for the Secretary of Defense. Military Assessment of the National Defense Stockpile for JCS. JCSM-322-83, 29 December 1983.
10. Department of Commerce. Critical Material Requirements of the U.S. Aerospace Industry. Washington: Government Printing Office, 1983.
11. ----- Market Trends and Forecasts for Selected Strategic Materials. Washington: Government Printing Office, 1983.
12. ----- Critical Material Requirements of the U.S. Steel Industry. Washington: Government Printing Office, 1981.
13. ----- Defense Materials System and Defense Priorities System. Washington: Government Printing Office, 1977.
14. Emergency Mobilization Preparedness Board. Fact Sheet. April 24, 1984.
15. Federal Emergency Management Agency. Stockpile Report to the Congress. October 1983-March 1984. Washington: FEMA, 1984.
16. Gale Research Corporation. Encyclopedia of Associations. Vol I. Detroit, Michigan: Gale Research Corporation, 1983.

17. General Accounting Office. Comments on Provisions in H.R. 5167 and S. 2723 to dispose of National Defense Stockpile Silver. Washington: GAO, August 8, 1984.
18. -----. Implementation of the National Minerals and Materials Needs Better Coordination and Focus. Washington: GAO, March 1984.
19. -----. Unresolved Issues Concerning the Disposal of Stockpile Silver. Washington: GAO, January 18, 1983.
20. -----. Implementation of NDS Plans Would Require Amending Existing Legislation. Washington: GAO, July 16, 1982.
21. -----. Review of Selected Aspects of Strategic and Critical Materials Stockpile Management. Washington: GAO, June 17, 1982.
22. -----. Actions Needed to Promote a Stable Supply of Strategic and Critical Minerals and Materials. Washington: GAO, June 3, 1982.
23. -----. Mineral Critical to Developing Future Energy Technologies, Their Availability and Projected Demand. Washington: GAO, June 25, 1981.
24. General Services Administration. Strategic and Critical Materials: Descriptive Data. Washington: GSA, December 1973.
25. Gilpin, Susan. "Minerals and Foreign Policy," Africa Report, 27: 16-21 (May-June 1982).
26. Goldwater, Sen. Barry. "U.S. Dependency on Foreign Sources for Critical Material," Vital Speeches of the Day, 47: 517-520 (June 15, 1981).
27. Gordon, Michael R. "Will the US Be Left Vulnerable If a 'Resource War' Breaks Out?" National Journal, (April 18, 1981): 641-644.
28. Hargreaves, David. World Index of Strategic Materials. Cambridge: Information and Research Services Ltd., 1982.
29. Harrison, Lt Colonel James A. The United States Strategic Stockpile of Critical Minerals and Our National Security. Unpublished research report, No. AD-A116716, U.S. Army War College, Carlisle Barracks PA, 1982.
30. Institute For Defense Analyses. Strategic And Critical Materials For Defense Needs (Executive Summary). 3 Volumes, IDA Report No. R-264. Arlington VA: Institute for Defense Analyses, 1981.
31. Maimoni, A., and I. Y. Borg. "How Vulnerable are U.S. Sources of Strategic Materials?" Energy & Technology Review (February 1982): 1-10.
32. -----. Strategic Materials Shortages: Institutional and Technical Issues, Report series UCRL-53203. Lawrence Livermore Laboratory, September 22, 1981.

33. Marsh, Alton K. "Domestic Production Stimulant Sought," Aviation Week and Space Technology, 112: 51-53 (May 5, 1980).
34. McNeil, Mary L. ed. How Congress Works. Washington: Congressional Quarterly Inc., 1983.
35. Miller, James Arnold et al. eds. The Resource War in 3-D. Pittsburgh: World Affairs Council of Pittsburgh, 1980.
36. Mullins, General James P. "Scarcity and the Challenge," Air Force Journal of Logistics, 6: 5-6 (Winter 1982).
37. National Materials Advisory Board. Priorities For Detailed Quality Assessments of the National Defense Stockpile Nonfuel Minerals. NMAB 403. Washington: National Academy Press, 1984.
38. National Strategic Materials and Minerals Program Advisory Committee (NSMMPAC). Recommendation and Background (on Management of the National Defense Stockpile), November 13, 1984.
39. Office of the Federal Register. Defense Priorities and Allocations System; Final Rule. Washington: Government Printing Office, July 30, 1984.
40. Office of the Federal Register. The United States Government Manual 1984/1985. Washington: Government Printing Office, 1984.
41. Office of Science and Technology Policy. Inventory of Federal Materials Research and Technology. Washington: Government Printing Office, June 1983.
42. Overton, J. Allen, Jr., "The Resources War: It Can't Be Won Without Being Waged," American Mining Congress Journal. Washington D.C.
43. Reagan, Ronald. National Materials and Minerals Program Plan and Report to Congress. Washington: Government Printing Office, 1982.
44. Report of the President's Private Sector Survey on Cost Control (Grace Commission) on The Environmental Protection Agency, The Small Business Administration and the Federal Emergency Management Agency, by J. Peter Grace, Chairman. Washington: Government Printing Office, 1983.
45. Report of the President's Materials Policy Commission (Paley Commission) on Resources for Freedom, by William S. Paley, Chairman. 5 volumes. Washington: Government Printing Office, 1952. Volume 1: Foundations for Growth and Security.
46. Resources For the Future. The First Twenty Five Years. Washington: Resources For the Future, 1977.
47. Sale, Robert. "The Core of Modern Coinflict," Defense & Foreign Affairs, 9: 20-21 (June 1981).
48. Santini, James D. "An Island Nation," Seapower, 26: 24-26 (January 1983).

49. Snyder, Glenn H. Stockpiling Strategic Materials. San Francisco: Chandler Publishing Co., 1966.
50. Strategic Minerals: A Resource Crisis. Washington: Council on Economics and Security, 1981.
51. Sullivan, Maureen P. "Raw Material Supplies and Related Subjects," Concepts, 4: 28-39 (Winter 1981).
52. Tricomi, Frank L. Strategic Materials and Structures in Weapon Systems. Fort Leavenworth KS: U.S. Army Command and General Staff College, 1981.
53. U.S. Congress. House of Representatives. Committee on Armed Services. Hearing on H.R. 33. Hearing, 98th Congress, 1st Session, 1983. Washington: Government Printing Office, 1984.
54. ----- Hearings on H.R. 3980, H.R. 3544, H.R. 626 Hearings, 98th Congress, 1st Session, 1983. Washington: Government Printing Office, 1983.
55. ----- Hearings on H.R. 2603, H.R. 2784, H.R. 2912, and H.R. 3364. Hearings, 97th Congress, 1st Session, 1981. Washington: Government Printing Office, 1981.
56. ----- The Ailing Defense Industrial Base: Unready for Crisis. 96th Congress, 2nd Session, 1980. Washington: Government Printing Office, 1980.
57. U.S. Congress. House of Representatives. Committee on Science and Technology. Hearings on Materials Research and Development Policy Hearings, 98th Congress, 1st Session, May 17, 18, 19, and June 24, 1983. Washington: Government Printing Office, 1984.
58. ----- Oversight Hearings on P.L. 479, and H.R. 4281. Hearings, 98th Congress, 2nd Session, April 20 and 22, 1983. Washington: Government Printing Office, 1982.
59. U.S. Congress. House of Representatives. Rules Adopted by the Committees of the House of Representatives. 97th Congress, 1st Session, 1981. Washington: Government Printing Office, 1981.
60. U.S. Congress. House of Representatives. Rules of the House of Representatives. 98th Congress, 1st Session, 1983. Washington: Government Printing Office, 1983.
61. U.S. Congress. Senate. Committee on Armed Services. Hearings on S. 1982 and S. 2429. Hearings, 97th Congress, 2nd Session, June 9-10, 1982. Washington: Government Printing Office, 1982.
62. U.S. Congress. Senate, Committee on Commerce, Science, and Transportation. Subcommittee on Science, Technology, and Space. Hearings on National Materials and Minerals Policy, Hearings, 97th Congress, 2nd Session, June 23, 1982. Washington: Government Printing Office, 1982.

63. ----- Hearings on Critical Minerals and Materials, Hearings, 97th Congress, 1st Session, March 2, 1981. Washington: Government Printing Office, 1981.
64. U.S. Congress. Senate. Standing Rules of the Senate and Congressional Budget and Impoundment Control Act of 1974, As Amended. 98th Congress, 1st Session, 1983. Washington: Government Printing Office, 1983.
65. U.S. Congress. DoD Authorization Act of 1985. Public Law No. 525, 98th Congress, 2nd Session. Washington: Government Printing Office, 1984.
66. ----- Arctic Research and Policy Act of 1984. Public Law No. 373, 98th Congress, 2nd Session. Washington: Government Printing Office, 1984.
67. ----- Defense Production Act Amendments of 1984. Public Law No. 265, 98th Congress, 2nd Session. Washington: Government Printing Office, 1984.
68. ----- National Materials and Minerals Policy, Research and Development Act of 1980. Public Law No. 479, 96th Congress, 2nd Session. Washington: Government Printing Office, 1980.
69. ----- Energy Security Act of 1980. Public Law No. 294, 96th Congress, 2nd Session. Washington: Government Printing Office, 1980.
70. ----- Strategic and Critical Materials Stock Piling Act of 1979. Public Law No. 41, 1st Session. Washington: Government Printing Office, 1979.
71. West Publishing Co. United States Code Congressional and Administrative News. Volume 7. St. Paul: West Publishing Co., 1984.
72. ----- United States Code Congressional and Administrative News. Volume 5. St. Paul: West Publishing Co., 1980.
73. ----- United States Code Congressional and Administrative News. Volume 3. St. Paul: West Publishing Co., 1980.
74. ----- United States Code Congressional and Administrative News. Volume 3. St. Paul: West Publishing Co., 1979.

VITAS

Captain Robert A. Batchelor was born in Chicago on 28 November 1955. He graduated from Reavis High School in June of 1973 and attended the Air Force Academy from which he received the degree of Bachelor of Science in Biology in June of 1977. After graduation he attended Undergraduate Navigator Training at Mather AFB California. From there he went to Carswell AFB to attend B-52D Combat Crew Training School. In November of 1978 he was stationed at Dyess AFB Texas where he served as a navigator and radar navigator in the 337th Strategic Bombardment Squadron. In May of 1983 he entered the Air Force Institute of Technology to pursue a Masters degree.

Permanent Address:

8319 S. Laramie Avenue
Burbank IL 60459

Captain James E. Kirby, Jr. was born on 25 October 1954 in Florence, South Carolina. He graduated from high school in 1972 and attended the Baptist College at Charleston SC and received a Bachelor of Science in Mathematics in May 1976. Upon graduation, he received a commission in the USAF through the ROTC program. He completed Undergraduate Pilot Training and received his wings in April 1978. He then served as a C-141A/B pilot and flight examiner in the 41st Military Airlift Squadron, Charleston AFB SC until attending the Air Force Institute of Technology in May 1983.

Permanent Address:

1527 Wakendaw Road
Mt. Pleasant SC 29464

UNCLASSIFIED

AD-A 162 242

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS			
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.			
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE			4. PERFORMING ORGANIZATION REPORT NUMBER(S) AFIT/GSM/LSP/85M-1			
6a. NAME OF PERFORMING ORGANIZATION School of Systems and Logistics			6b. OFFICE SYMBOL (If applicable) AFIT/LS		5. MONITORING ORGANIZATION REPORT NUMBER(S)	
6c. ADDRESS (City, State and ZIP Code) Air Force Institute of Technology Wright-Patterson AFB, Ohio 45433			7b. ADDRESS (City, State and ZIP Code)			
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (If applicable)		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8c. ADDRESS (City, State and ZIP Code)			10. SOURCE OF FUNDING NOS.			
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WRK UNIT NO.
11. TITLE (Include Security Classification) See Box 19						
12. PERSONAL AUTHOR(S) Robert A. Batchelor, Capt, USAF			James E. Kirby, Jr., Capt, USAF			
13a. TYPE OF REPORT MS Thesis		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Yr., Mo., Day) 1985 March		15. PAGE COUNT 125
16. SUPPLEMENTARY NOTATION						
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)			
FIELD	GROUP	SUB. GR.	National Defense Stockpile, Stockpile Management, Stockpile Policy, Strategic Materials, Critical Materials			
15	05					
19. ABSTRACT (Continue on reverse if necessary and identify by block number)						
Title: THE NATIONAL DEFENSE STOCKPILE: AN ORGANIZATIONAL PERSPECTIVE Thesis Advisor: William C. Pursch, PhD						
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS <input type="checkbox"/>			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED			
22a. NAME OF RESPONSIBLE INDIVIDUAL William C. Pursch, PhD			22b. TELEPHONE NUMBER (Include Area Code) 513-255-3944		22c. OFFICE SYMBOL AFIT/LSP	

Approved for public release: LAW AFB 18047
 LYNNE E. WOLAVER
 Dean for Research and Professional Development
 Air Force Institute of Technology (ATC)
 Wright-Patterson AFB OH 45433

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

The United States is dependent on foreign sources for many strategic and critical materials vital to its survival and national security. To counter the affects of a disruption in the supply of these materials, the US maintains a National Defense Stockpile (NDS) made up of over a hundred separate depots located in various parts of the country. The management and policy formulation of various aspects of the NDS are distributed across a wide spectrum of agencies in the Executive and Legislative Branches. These organizations along with associated legislation are examined for their impact on the policy-formulation process. This study also reviews organizations outside the government that affect stockpile policy. General and specific recommendations on proposed management alternatives are presented at the end of the study. *Remarks:*

two

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

END

FILMED

2-86

DTIC