Executive Summary

ES.1 INTRODUCTION

The Defense National Stockpile Center (DNSC) has prepared a *Final Mercury Management Environmental Impact Statement* (MM EIS) to help determine how to manage its elemental mercury inventory over the long term, because it is no longer needed for our national defense.

DNSC's objectives in managing the mercury are to: protect human health and the environment, ensure the safety of the public and workers, comply with applicable laws and regulations, and minimize costs. Its approach has been to involve other Federal agencies, state, and local governments, community leaders, industry, public interest groups, and the general public in the decision process. The result is an MM EIS based on rigorous scientific research and analysis, public input, and review by the MM EIS Interagency Working Group,[1] and technical experts.

The **Proposed Action** is to select and implement an approach for the long-term [40 years] management of DNSC's excess mercury.

Why Is This Environmental Impact Statement Being Prepared?
The National Environmental Policy Act establishes a process for decisionmakers to use in considering the potential environmental impacts (both positive and negative) of major actions before making decisions. It requires a Federal agency to consider the potential environmental, human health, and socioeconomic effects of a proposed action and a range of reasonable alternatives for implementing the action, including the option of taking no action at all. The resulting environmental impact statement (EIS) is a detailed environmental analysis of the proposed action.

What Happens Next?
After the required 30-day waiting period a concise public record, referred to as the Record of Decision (ROD), will be published. The ROD will discuss all the factors considered and will present DNSC's decision on which alternative to implement.

The MM EIS evaluates three alternative ways to manage DNSC mercury over the long term. It describes the potential environmental, human health, and socioeconomic effects of each alternative. The alternatives evaluated are:

- No Action: continuing mercury storage at current locations
- Consolidation and storage of mercury at one site
- Sale of the mercury

The MM EIS concludes that most of the environmental and socioeconomic impacts of alternatives for mercury management would be small (referred to as 'negligible' to 'minor' in the analysis) for each of the three alternatives, and differences among them would not be sufficient in themselves to support selection of one alternative over the others.

DNSC has selected Consolidated Storage as its Preferred Alternative based on a combination of environmental, economic and technical factors; policy considerations; and public and stakeholder comments. 'Preferred Alternative' means that, at this time, DNSC believes that storing the mercury at one site is the best way to meet its objectives. Managing the mercury at

The **Preferred Alternative** is Consolidated Mercury Storage at one site. It would have negligible-to-minor impacts on the environment at the consolidation site, and it would have minor beneficial impacts at the existing storage locations after the mercury is removed.

[1] The Interagency Working Group, formed in early 2001, includes Federal agencies that either have significant mercury expertise or could be affected by decisions made as a result of the *Mercury Management Environmental Impact Statement*.

one site rather than at multiple sites would simplify storage operations and result in economies of scale (fewer resources would be required to maintain the mercury inventory). Consolidating the excess DNSC mercury inventory at one site is not predicted to result in significant environmental impacts at that site and would improve environmental conditions at any sites where the mercury would be removed. The Preferred Alternative would also support DNSC's long-term closure plans for various depots and would make available the stored DNSC mercury for future beneficial uses. After the Final MM EIS has been available for public review for a minimum of 30 days, a Record of Decision will be published that explains the basis for selection of the alternative that will be implemented.

What Is Mercury?

Elemental mercury is a dense, naturally occurring, silver-colored metallic element that is liquid at room temperature. Sometimes called "quicksilver," liquid mercury has been used extensively in manufacturing processes because it conducts electricity, reacts to temperature changes, and alloys with many other metals. Examples of products that contain mercury include electrical switches, hospital equipment and supplies, fluorescent lights, switches for automobile lighting, and dental fillings. While mercury has many uses, it is designated a hazardous substance under Federal law, and must be stored and managed appropriately.

ES.2 BACKGROUND

DNSC, which is part of the Defense Logistics Agency, manages materials in the National Defense Stockpile in a safe, secure, and environmentally sound manner. DNSC currently stockpiles 56 different commodities, including mercury, at government and private industry sites around the country. DNSC has safely stored mercury for more than 50 years.

After World War II, the National Defense Stockpile was created so that in times of national emergency the United States would not have to depend on foreign sources for strategic and critical materials. Many of these materials are no longer needed for national defense and have been declared excess by Congress. DNSC is scheduled to cease operation as an independent organization in 2007 and would prefer to arrange for the disposition of the mercury before this date.

DNSC manages these excess materials, often by selling them in domestic and international markets. Sales occur through open competitions. Mercury has been declared excess for more than 20 years, and Congress has granted DNSC the authority to sell the entire inventory. However, in 1994, DNSC voluntarily halted mercury sales because of concerns raised by the U.S. Environmental Protection Agency (EPA) and others about the effect of mercury on the global environment.

ES.3 DNSC MERCURY

DNSC elemental mercury is between 99.5 and 99.9 percent pure. DNSC sold 1,912 tons (1,735 metric tons) of mercury to U.S. and foreign buyers during the 1980s and early 1990s for a total of $8.4 million in revenue to the U.S. Treasury. Money generated from the sale of commodities is used to support various Federal programs such as military retirement benefits.

Typical Mercury Storage Warehouse

DNSC's mercury is currently stored in warehouses at three of its own depots and at a U.S. Department of Energy (DOE) site.

The three DNSC sites are the New Haven, Indiana; Somerville, New Jersey; and Warren, Ohio, depots. The DOE site is the Y–12 National Security Complex (Y–12) in Oak Ridge, Tennessee (see Figure ES–1).

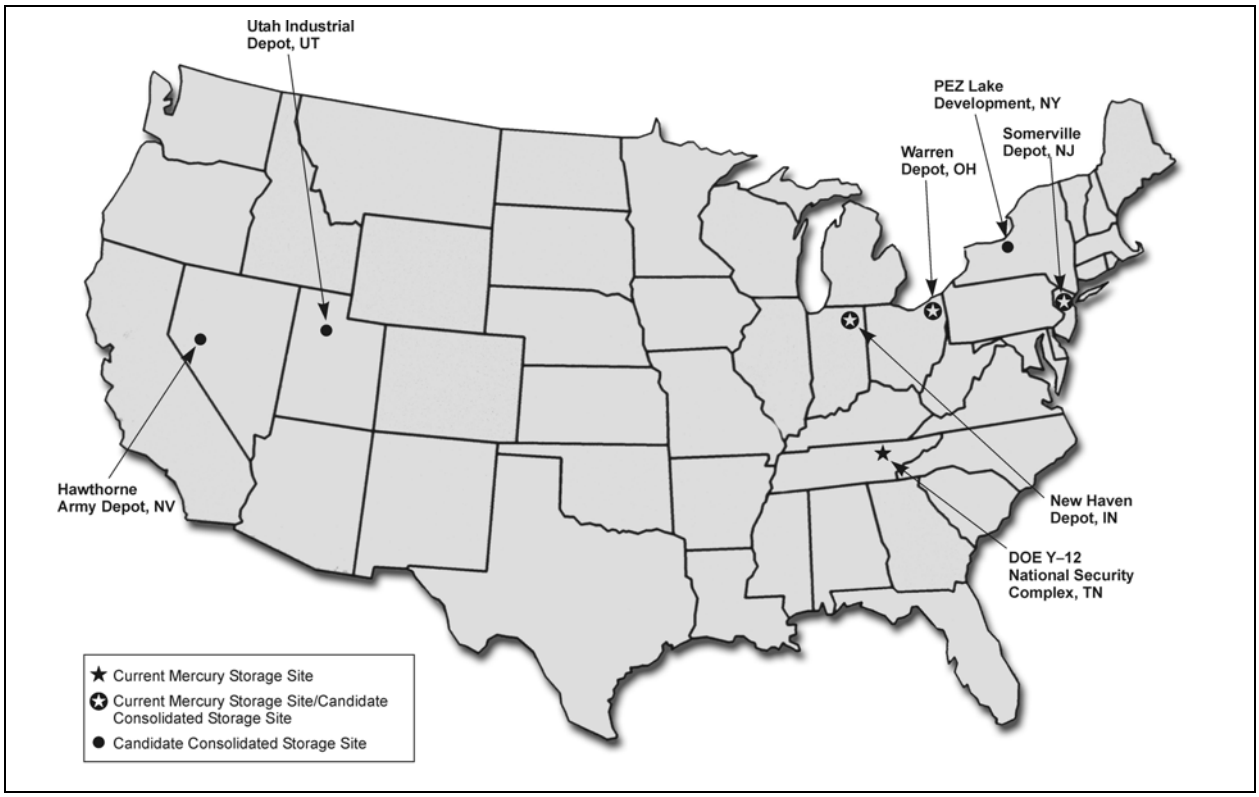

Figure ES–1. Locations of Current Mercury Storage Sites and Non-DNSC Candidate Consolidated Storage Sites

Approximately 4,890 tons (4,436 metric tons) of mercury is in storage. The mercury is in 128,662 steel flasks. Each flask contains 76 lb (34 kg) of mercury and has a current market value up to $195. The estimated value is $7.5 to $25 million.

Typical Steel Flask

Mercury is stored in flasks similar to the one shown in the photo on the far right. Some of the mercury storage flasks were made in the 1940s and 1950s; the DNSC mercury stored at Y–12 was placed in new flasks in the mid-1970s. The flasks at the three DNSC depots are stored in 30-gal (114-l) steel drums for extra protection, called "overpacking." The DNSC mercury flasks at the DOE site are not stored in drums because these seamless flasks are relatively new and not as subject to leakage as older, welded flasks.

Steel Storage Drums on Pallet

ES.4 THE NEED TO SAFELY MANAGE MERCURY

The toxic effects of mercury depend on its chemical form and the route of exposure. The organic form of mercury (e.g., methyl mercury) is the most toxic form. Mercury is emitted from human activities mostly in the inorganic form (e.g., elemental mercury vapor). Mercury can affect the immune system, alter genetic systems, and damage the nervous system, including coordination and senses of touch, taste, and sight. Methyl mercury can be particularly damaging to developing embryos. Exposure to methyl mercury is usually by ingestion; it is absorbed more readily than other forms of mercury. Elemental mercury vapors can cause tremors, gingivitis, and excitability when inhaled over a long period of time. If elemental mercury is ingested, it is absorbed slowly and may pass through the digestive system without causing damage.

Mercury is persistent, accumulates in the environment, is toxic, and poses human and ecological risks. As the quantity of mercury in the environment has increased, so have the risks of neurological and reproductive problems for humans and wildlife. This makes mercury a pollutant of environmental concern in the United States and throughout the world.

ES.5 ALTERNATIVES CONSIDERED IN THE MM EIS

Three alternatives for managing DNSC mercury are evaluated in the MM EIS (see Figure ES–2).

Under the **No Action Alternative**, DNSC would continue to store its excess mercury at the current storage sites. Monitoring and maintenance would continue. There would be no major modifications to existing storage buildings or the mercury storage containers.

For the **Consolidated Storage Alternative**, the MM EIS analyzes the potential environmental impacts of consolidating and storing mercury flasks in drums at each of the three DNSC depots where mercury is currently stored and at three non-DNSC sites (see Figure ES–1) which were identified by DNSC issuing a Notice of Request for Expressions of Interest in the *Federal Register* on March 5, 2001. The additional sites are: the Hawthorne Army Depot, Hawthorne, Nevada; PEZ Lake Development, Romulus, New York; and Utah Industrial Depot, Tooele, Utah. The PEZ Lake Development, is analyzed in the MM EIS as one of the sites representing a range of environmental and socioeconomic settings; however this site is no longer under consideration as a consolidated storage site. The Advantage Group, which manages the site, withdrew it from consideration based on business and site development plans.

Y–12 is not being considered as an alternative for consolidated storage. It does not have enough space for all the mercury, and long-term storage of mercury is not part of Y–12's national security mission.

At this time, DNSC does not have a preference for one of the consolidated storage locations evaluated. However, the site analyses demonstrate that mercury consolidation and storage do not pose an environmental concern across a wide range of environmental settings. The environmental analysis presented in the MM EIS is sufficient to allow selection of one of these sites in the Record of Decision. However, the consolidation site ultimately chosen may not be one of those analyzed in the MM EIS. If a site that was not evaluated in the MM EIS is considered for selection as a consolidation location, additional environmental documentation may be needed, with additional public notification and review.

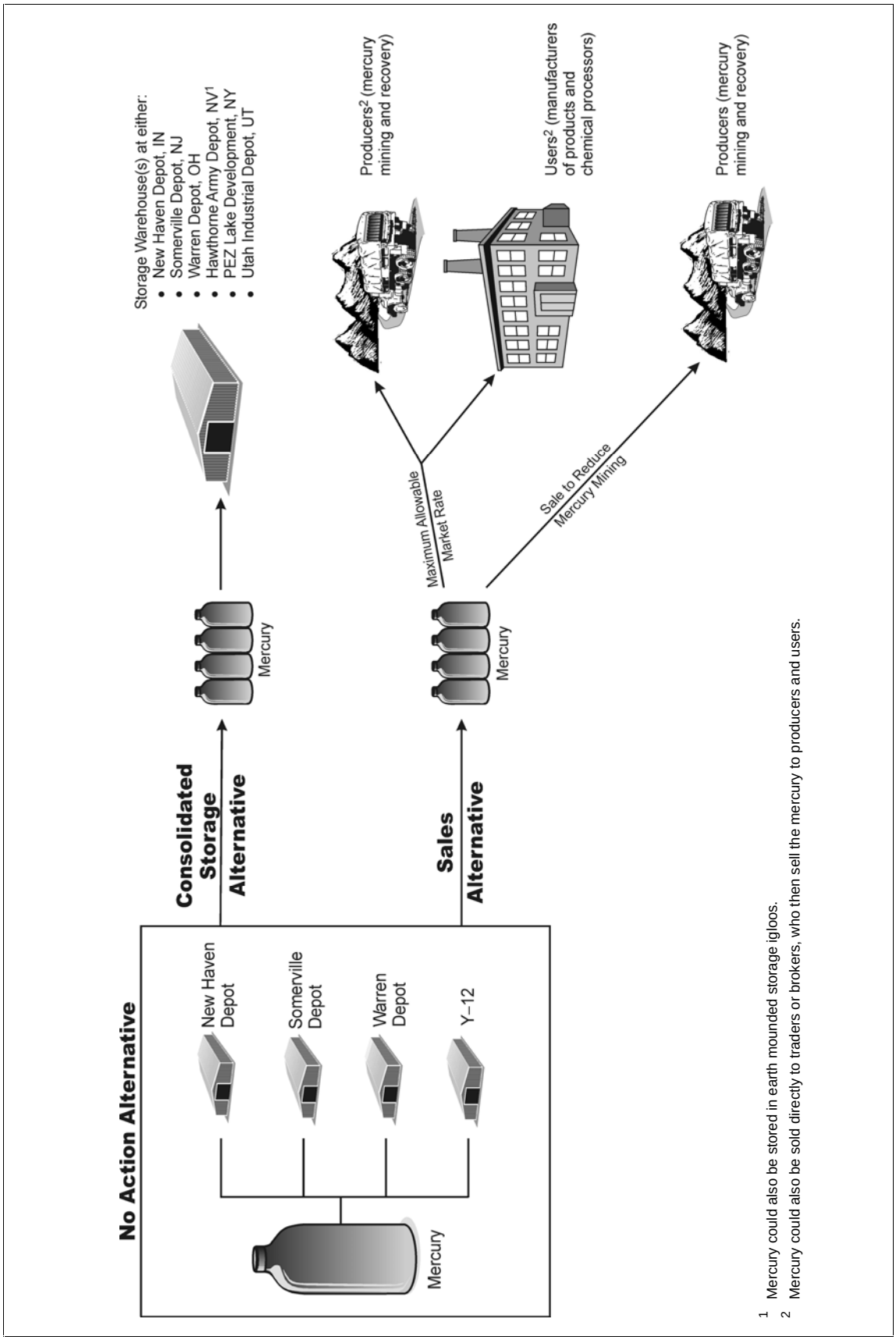

Figure ES–2. Alternatives for the Management of DNSC Excess Mercury Inventory

The **Sales Alternative** includes two options: selling mercury at the proposed maximum allowable market rate[2] over a period of years and selling the entire inventory all at once to reduce mercury mining.

Under the first option, the mercury would be sold directly to producers and users at the estimated maximum allowable market rate of 5,000 flasks per year. Producers include mercury mining, refining, and recovery companies. Users include chemical processors and manufacturers of such products as lighting, switches, thermometers, dental materials, and medicine. The mercury could also be sold to traders or brokers who would then sell it to producers and users.

The second sales option calls for sale of the entire inventory to a mercury mining company that, for the purpose of analysis in the MM EIS, is assumed to be in either Europe or Asia. It is expected that an agreement would be negotiated that would require the purchaser to sell DNSC mercury at a rate no greater than the rate of sale for newly mined mercury. Therefore, this alternative would also meet the requirements of the Strategic and Critical Materials Stock Piling Act of 1939, as amended (50 U.S.C. 98 et seq.) in that sales would not result in undue disruption of the mercury market.

ES.5.1 Monitoring and Maintenance

As described in the statement of proposed action, the mercury management alternatives require storage in dedicated facilities for a period of time ranging up to 40 years. During this time, periodic inspections and maintenance activities would be performed by trained personnel to ensure that the mercury remains safe and secure. Public access would be restricted.

Resource Areas Analyzed in the MM EIS

Meteorology, Air Quality, and Noise
Waste Management
Socioeconomics
Human Health Risk
Transportation
Geology and Soils
Water Resources
Ecological Resources
Cultural Resources
Land Use and Visual Resources
Infrastructure
Environmental Justice

ES.5.2 Transportation

If the mercury were to be stored at a single location or sold, it would need to be moved from site to site. Both trucks and railcars could be used to move the mercury, in accordance with the requirements of the Department of Transportation for shipping hazardous materials. If the mercury were sold to overseas buyers, it would be transported overland by truck or railcar and overseas by ship. The MM EIS analyzes moving materials, flasks, and overpacks as follows:

- Transport of mercury from existing storage locations to a consolidated storage site
- Transport of mercury from existing storage locations to buyers
- Transport of materials needed for operating a storage facility (e.g., new flasks and drums)

[2] The maximum allowable market rate is the rate that mercury can be sold without undue disruption of the usual markets of producers, processors, and consumers of mercury.

ES.6 IMPACTS SUMMARY AND COMPARISONS

This section summarizes the potential impacts of transporting and storing mercury for the various alternatives. Tables ES–1 and ES–2 provide the impact categories and definitions, and risk categories and definitions, respectively.

Table ES–1. Impact Categories and Definitions

Impact Category		Definition
Beneficial Impacts	Major	An action that would greatly improve current conditions
	Moderate	An action that would moderately improve current conditions
	Minor	An action that would slightly improve current conditions
Negligible or No Impact		An action that would neither improve nor degrade current conditions
Adverse Impacts	Minor	An action that would slightly degrade current conditions
	Moderate	An action that would moderately degrade current conditions
	Major	An action that would greatly degrade current conditions

Note: Impacts may also be categorized as short term (less than or equal to 5 years) or long term.

Table ES–2. Risk Categories and Definitions

Risk Category		Definition
Reduced Risk	High	An action that would greatly reduce risk
	Moderate	An action that would moderately reduce risk
	Low	An action that would slightly reduce risk
Negligible or No Increase in Risk		An action that would neither reduce nor increase risk
Increased Risk	Low	An action that would slightly increase risk
	Moderate	An action that would moderately increase risk
	High	An action that would greatly increase risk

Note: Risks may also be categorized as acute (less than or equal to 24 hours) or chronic.

Source: Based on the risk matrix presented in the *Human Health and Ecological Risk Assessment Report for the Mercury Management Environmental Impact Statement*.

As shown in Table ES–3, the potential environmental and socioeconomic impacts of alternatives for mercury management are generally negligible to minor. Key resource areas include air quality and noise, waste management, socioeconomics, human health and ecological risk under normal operating and accident conditions, transportation risk, water resources, land use, infrastructure, and environmental justice. Other resources, including geology and soils, ecological resources, cultural resources, and visual resources, are not presented here because these resources are essentially unaffected by the mercury management alternatives. These resources are largely unaffected because the alternatives do not involve building construction and land disturbance. Few discriminating factors among the alternatives were identified. The major differences in impacts are largely due to the number of sites affected and the duration of the impacts.

The term **"impact"** when used in the MM EIS, refers to adverse, long-term impacts, unless otherwise stated.

Table ES–3. Comparison of the Impacts of Mercury Management Alternatives

		Alternatives			
				Sales	
	Topics	No Action[a]	Consolidated Storage[b]	At Maximum Allowable Market Rate[c]	To Reduce Mercury Mining[d]
Environmental and Socioeconomic Impacts	Meteorology, Air Quality, and Noise	Negligible	Minor short term	Minor	Minor short term
	Waste Management	Negligible short term	Minor short term	Negligible short term	Negligible short term
	Socioeconomics	Negligible	Negligible	Negligible	Negligible short term
	Water Resources	Negligible	Negligible to minor	Negligible	Negligible short term
	Land Use	No	No	No	Negligible short term
	Infrastructure	Negligible	Negligible to minor	Negligible	Negligible short term
	Environmental Justice	No	No	No	No
Human Health Risks/Ecological Risks	Risks from Normal Operations	Negligible/ Negligible	Negligible/ Negligible	Negligible/ Negligible	Negligible short term/Negligible short term
	Risks from Accidents	Low/ Negligible	Moderate/ Moderate	Moderate/ Moderate	Moderate/ Moderate
	Transportation Risk	No/No	Low/Moderate	Moderate/High	Moderate/High

[a] This column indicates the potential impacts that would result at the existing storage locations.

[b] This column indicates the potential impacts that would result at the consolidation locations and along the transportation routes. This alternative would also result in minor beneficial impacts and low reduced risk at existing storage locations after the mercury is removed. This is DNSC's preferred alternative.

[c] This column indicates the potential impacts that would result at the existing storage locations and along the transportation routes. Minor beneficial impacts and low reduced risk would also occur at existing storage locations after the mercury is removed. This alternative would also result in negligible or no additional impacts and risks at the mercury buyer's and user's locations.

[d] This column indicates the potential impacts that would result at the existing storage locations and along the transportation routes. Minor beneficial impacts and low reduced risk would also occur at existing storage locations after the mercury is removed. This alternative would also result in moderate beneficial impacts and moderate reduced risk from reduced mercury mining and refining.

The **No Action Alternative** would have negligible impacts at the four existing storage locations. However, because DNSC depots would not be able to close, this alternative is incompatible with DNSC's long-term closure strategy.

The **Consolidated Storage Alternative** would affect the selected consolidation location with negligible-to-minor impacts. There would also be minor beneficial impacts at the existing storage locations after the removal of mercury.

The impacts of the **Sales Alternative** are described below:

- Sales at the Maximum Allowable Market Rate would primarily affect the four existing storage locations with negligible-to-minor impacts. Sales at the Maximum Allowable Market Rate would also result in negligible or no impacts at the mercury buyers' and users' locations.

- Sales to Reduce Mercury Mining would primarily affect the four existing storage locations with short-term negligible-to-minor impacts. Sales to Reduce Mercury Mining would also result in moderate beneficial impacts from reduced mercury mining and refining.

- Under the Sales Alternative, minor beneficial impacts would also occur at the existing storage locations after the mercury is removed.

The human health and ecological risks of alternatives for mercury management are within the normal ranges to be expected for these types of activities. The human health risks would be negligible for all mercury management alternatives during normal operations. Human health risks from facility accidents would range from low for the No Action Alternative to moderate for the Consolidated Storage and Sales Alternatives. Human health risks from transportation accidents would range from no additional risk for the No Action Alternative to moderate risk for both Sales Alternatives.

The ecological risks would be negligible for all mercury management alternatives during normal operations. Ecological risks from facility accidents would range from negligible for the No Action Alternative to moderate for the Consolidated Storage and Sales Alternatives. Ecological risks from transportation accidents would range from no additional risk for the No Action Alternative to high ecological risk for both Sales Alternatives. The high ecological risk for both Sales Alternatives is a result of the longer transportation distances for the truck transport segments associated with shipping mercury to overseas buyers.

The Consolidated Storage and Sale Alternatives would result in low reduced human health risk at the existing storage locations after the mercury is removed. The Sales to Reduce Mercury Mining Alternative is estimated to result in moderate reduced human health and ecological risk from reduced mercury mining and refining.

ES.7 COST COMPARISON

The estimated cost for 40 years of storage under the No Action Alternative is approximately $26 million. The estimated cost for 40 years of storage under the Consolidated Storage Alternative is $29 million. The Sales at Maximum Allowable Market Rate Alternative ranges from costs of $6.1 million to revenues of $12 million. The market price of mercury at the time of sale (low of $58 per flask to high of $195 per flask) accounts for the variation in estimated revenue. This alternative includes the cost of storage for up to 26 years before all the mercury is sold. The estimated revenue from the Sales to Reduce Mercury Mining Alternative ranges between $7.5 and $25 million. The market price of mercury at the time of sale accounts for the variation in estimated revenue. This alternative does not include storage costs because all the mercury is sold in less than 1 year.

ES.8 CUMULATIVE IMPACTS

Cumulative effects are impacts on the environment that result from an action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes the action. DNSC determined the following resource areas to have a potential for limited cumulative impacts and needed to be analyzed: air quality; waste management; human health risk from normal operations; transportation infrastructure; and employment, site infrastructure and land use. Cumulative impacts for the other resources are omitted because, as described in Chapter 4 (Environmental Consequences) of the MM EIS, their potential for environmental impacts would be negligible. The methodology used to analyze cumulative impacts is described in more detail in Appendix E of the MM EIS.

Table ES–4 summarizes the cumulative impacts for the potential mercury management locations. Cumulative impacts were estimated to be minor at most locations. The impacts from mercury management activities would represent a negligible-to-minor contribution to the total cumulative impacts in the areas near these sites.

Table ES–4. Summary of Cumulative Impacts and Risks at Potential Mercury Management Locations[a]

	Impacts				
Site[b]	Air Quality	Waste Management	Transportation Infrastructure	Employment, Site Infrastructure, and Land Use	Human Health Risk from Normal Operations
New Haven Depot	Minor	Minor	Minor	Minor	Negligible
Somerville Depot	Moderate[c]	Minor	Moderate[c]	Moderate[c]	Negligible
Warren Depot	Minor	Minor	Minor	Minor	Negligible
Y–12	Minor	Minor	Minor	Minor	Negligible
Hawthorne Army Depot	Minor	Minor	Minor	Minor	Negligible
PEZ Lake Development	Minor	Minor	Moderate[d]	Moderate[d]	Negligible
Utah Industrial Depot	Moderate[c]	Moderate[d]	Moderate[c, d]	Moderate[c, d]	Negligible

[a] Cumulative impacts are estimated for the maximum impact alternative.

[b] The maximum impact alternative for these sites is the Consolidated Storage Alternative, except for the No Action Alternative for Y–12.

[c] Increased development in the regions around these sites could result in moderate impacts to these resources.

[d] Redevelopment of the PEZ Lake Development and Utah Industrial Depot in agreement with their reuse plans could result in moderate impacts to these resources.

However, at the Somerville Depot and Utah Industrial Depot, increased development could produce moderate impacts in the region around the depots. Forested and agricultural lands are increasingly being converted to housing developments, office parks, and commercial strips. Development results in increased land use, reduced and fragmented habitats for plants and animals, increased traffic, and increased air pollution from building heating, cars, and trucks. Nonetheless, the impacts from mercury management activities at the Somerville Depot and Utah Industrial Depot would still represent only a negligible-to-minor contribution to the total cumulative impacts from increased development near these depots.

At the PEZ Lake Development and Utah Industrial Depot, redevelopment in agreement with the sites' reuse plans could result in moderate impacts to transportation infrastructure, employment, site infrastructure, and land use.

REGIONAL AND GLOBAL ISSUES

Potential regional and global cumulative impacts for transportation, mercury concentrations and human health risk, ozone depletion and global warming, and biodiversity also are discussed in the MM EIS.

Transportation. The worst-case alternative for transportation is likely to be Sale of Mercury to Reduce Mercury Mining because it is estimated to result in 0.3 to 2.4 million truck miles or 0.2 to 1.3 million rail miles to move the mercury from the current storage locations to a U.S. port, 2.7 to 4.5 million vessel miles to ship the mercury across the ocean, and 154,000 truck miles to move the mercury from the foreign port to the buyer's location. These transportation distances would be a small increment of the transportation miles that are expected every year from other activities. Therefore, impacts to regional and global transportation are not expected.

Mercury Concentrations and Human Health Risk. Background mercury concentrations in the air around the world are estimated at 1 to 2.5 nanograms per cubic meter. Mercury concentrations tend to be higher around population centers where the effects of man's activities are the greatest. As described in Section 4.3.4, the small amount of mercury vapor that could escape from the mercury storage buildings would not cause an appreciable rise in regional or global concentrations of mercury and represents a negligible contribution to cumulative human health risk at a regional or global level.

Ozone Depletion and Global Warming. Alternatives for mercury management are not expected to use or discharge significant quantities of any ozone-depleting chemicals. Any release of ozone-depleting compounds during operations would be incidental to the mercury management activities, such as might occur during the repair or replacement of older air conditioning systems that contain ozone-depleting compounds. In any case, emissions of ozone-depleting compounds would be very small and would represent a negligible impact on the earth's protective ozone layer.

Most scientists believe that increases in atmospheric concentrations of certain pollutants such as carbon dioxide, can produce changes in the Earth-atmosphere energy balance and influence global climate. This is commonly referred to as global warming. Carbon dioxide is emitted during the burning of fossil fuels such as natural gas, oil, gasoline, and coal. As described in the air quality impacts sections of the MM EIS, emissions associated with incidental fuel burning and producing heat and electricity are expected to represent a negligible contribution to global warming.

Carbon dioxide is also emitted from vehicle exhaust. As described in the *Human Health and Ecological Risk Assessment Report for the Mercury Management EIS*, sales to reduce mercury mining would have the largest emission of this pollutant over the shortest interval; a maximum of 1,643 tons (1,490 metric tons) of carbon dioxide. This would be a very small fraction of the carbon dioxide estimated to be emitted from vehicles in the United States each year and therefore, would represent a negligible contribution to increased global warming.

Biodiversity. Alternatives involving storage of mercury would involve no new construction and scant emissions of mercury. Therefore, there would be little chance for impacts on regional or global biodiversity.

ES.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible and irretrievable commitments of resources for each alternative potentially would include the commitment of land and material resources during the life of the project, and energy and water used in operating a mercury storage facility. The commitments of capital, energy, labor, and materials during the implementation of the alternatives generally would be irreversible. Commitment of these resources to support the storage or sale of mercury would make them unavailable for other purposes. Capital would be committed permanently. The commitment of equipment and labor would be only for the duration of the project. The Sales Alternative would require the least commitment of land, materials, and energy resources.

ES.10 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The use of land for mercury storage at existing mercury storage locations and at non-DNSC candidate consolidated storage locations would constitute short-term uses of the environment. Upon completion of mercury management activities at any of these locations, land could be returned to other uses, including long-term productive uses. Disposal of mercury packaging wastes (including contaminated drums and flasks) would occur at commercial facilities that commonly perform these types of activities. Although disposal of these materials could contribute to an associated long-term commitment of land subject to restricted uses, no substantial impacts to long-term productivity would be expected to result from any of the proposed mercury management alternatives.

ES.11 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

A number of alternatives were considered, but are not evaluated in detail in the MM EIS because of technical immaturity, prohibitive cost, regulatory unacceptability, or because they did not support the purpose and need of the proposed action.

ES.11.1 Storage Related Options

Alternatives for consolidated storage at multiple (two to three) locations are not evaluated in the MM EIS. The MM EIS evaluates continued storage of the mercury stockpile at the four current locations (No Action Alternative) and storage of the entire mercury stockpile at one location (Consolidated Storage Alternative). Therefore, the range of alternatives evaluated encompasses alternatives for storage at two to three sites.

The MM EIS evaluates consolidated storage of excess DNSC mercury in warehouses and igloos. Alternatives for consolidated storage in below-ground facilities such as bunkers and mines were considered but are not evaluated. It is expected that conditions in below-ground facilities such as bunkers would be similar to the igloos at Hawthorne, which are evaluated in the MM EIS. Therefore, the analysis of the impacts of storage in igloos at Hawthorne can be used to represent other forms of below-ground storage. Because of the limited availability of existing mines, inspection considerations, additional material handling, and regulatory issues, the use of mines for storage of excess DNSC mercury is not considered to be a reasonable alternative.

DNSC considered evaluating the construction of a new storage building. This alternative was eliminated from detailed evaluation because existing facilities are currently available that would not need major modifications, avoiding the impacts that could occur during construction of a new building. For

comparison, construction specifications, resource needs, and potential impacts for construction of a new building are provided in Appendix F, Construction of a New Mercury Storage Building, of the MM EIS.

ES.11.2 Treatment and Storage

DNSC considered evaluating a treatment and storage alternative that would have involved processing the mercury to a stabilized less toxic form and storing it so that it would be available for future beneficial uses. It was eliminated from detailed analysis in the MM EIS because mercury can be safely stored in its elemental form and because elemental mercury is the preferred form in most industrial processes that require mercury. Treatment and storage would result in additional environmental impacts and costs, without significant benefits.

ES.11.3 Treatment and Disposal

DNSC considered evaluating treatment and disposal in a qualified landfill. However, DNSC's preliminary research found that there are no commercially available technologies to render large quantities of elemental mercury more stable or less toxic. Based on the immaturity of the bulk mercury treatment technologies and the lack of an EPA-approved path forward for treatment and disposal of elemental mercury, this alternative is not evaluated in detail in the MM EIS.

ES.11.4 Sales Related Options

In addition to selling the entire mercury inventory to a mercury mining company or selling the inventory at the maximum allowable market rate, unrestricted sale of mercury was considered. An unrestricted sales option would allow DNSC to sell any portion of the mercury inventory at any point in time. This could result in sales at a rate greater than the maximum allowable market rate. This option is considered to be unreasonable because it could result in undue disruption of the world mercury market, which is prohibited under the Strategic and Critical Materials Stock Piling Act of 1939, as amended (50 U.S.C. 98 et seq.).

In addition to selling mercury directly from the existing storage locations, mercury could be sold after being moved to a consolidated storage location. Although this alternative is not expressly evaluated in the MM EIS, the transportation of mercury from the consolidation location to domestic or foreign buyers is likely to be bounded by the transportation evaluated for the Sales Alternative. In this alternative, mercury is shipped from the existing storage locations to ports in New York or San Francisco, and then overseas.

ES.11.5 Transportation Methods

Air transport is not considered a reasonable option because of the additional cost and handling required to move the mercury by truck or rail to and from the airports. In part because mercury is very heavy, air transport costs 3 to 35 times more than transport by truck or rail. The movement of mercury within the continental United States by barge is also not a reasonable option due to the limited number of barge routes in the United States and the additional handling required to move the mercury by truck or rail to and from the barge route.

ES.12 ORGANIZATION OF THE FINAL MM EIS

The Final MM EIS consists of two volumes. Volume I contains the main text of the MM EIS and technical appendixes that support the analyses. Volume II contains the comments received on the Draft MM EIS during the public review period, along with DNSC responses (i.e., the Comment Response Document). A separate *Human Health and Ecological Risk Assessment Report for the Mercury Management Environmental Impact Statement* is also available on request.

The Final MM EIS contains Chapters 1 through 9 as described below:

- Chapter 1, **Purpose of and Need for the Proposed Action**, outlines the proposed action and provides background information on the DNSC mercury stockpile. It also describes the scope of the MM EIS and applicable legal and regulatory requirements.

- Chapter 2, **Alternatives for the Management of Mercury**, describes the DNSC mercury analyzed in the MM EIS, the three alternatives for management of the mercury, how the alternatives were developed, the activities that would take place under each alternative, and alternatives that initially were considered and subsequently eliminated from detailed study in the MM EIS. This chapter also provides a summary of impacts and estimated costs of the alternatives and a description of DNSC's Preferred Alternative (i.e., consolidated storage).

- Chapter 3, **Affected Environment**, describes the potentially affected environments at the candidate sites and the approach taken in defining these affected environments. The level of detail presented for each resource (e.g., air, water, ecosystems) depends on the likelihood that the resource will be affected by mercury management activities.

- Chapter 4, **Environmental Consequences**, describes the potential impacts on the affected environments presented in Chapter 3 from the proposed mercury management alternatives, including cumulative impacts and unavoidable adverse impacts. It also discusses potential future decontamination and decommissioning activities, irreversible and irretrievable commitments of resources, and the relationship between short-term uses of the environment and long-term productivity.

- Chapter 5, **Environmental Regulations, Permits, and Consultations**, provides a description of the environmental and health and safety compliance requirements governing implementation of the alternatives, a summary of permit requirements, and the status of required consultations with Federal and state agencies and Native American tribal governments.

- Chapters 6, 7, 8, and 9 are the **Glossary**, **List of Preparers**, **Distribution List**, and **Index**, respectively.

The nine appendixes include descriptions of methods used to estimate environmental impacts of the alternatives and the detailed information to support the impact analyses. The appendixes are as follows:

- Appendix A – *Federal Register* Notices
- Appendix B – Contractor Disclosure Statement
- Appendix C – Facility and Activity Data
- Appendix D – Cost Analysis
- Appendix E – Impact Assessment Methods
- Appendix F – Construction of a New Mercury Storage Building
- Appendix G – Environmental Justice Analysis
- Appendix H – Cooperating Agency Agreements
- Appendix I – Consultation Letters

ES.13 PUBLIC PARTICIPATION

DNSC is committed to communication with the public to ensure that all affected communities have a full understanding of the proposed action and are given the opportunity to participate in decisions that may affect them. DNSC representatives are available to work with communities, including minority and low-income communities, to explore the most effective ways to gain input from those who may be affected by the proposals presented in the MM EIS. Information meetings can be arranged throughout the EIS development process.

ES.13.1 Scoping Process

DNSC began the MM EIS process by publishing a Notice of Intent in the *Federal Register* on February 5, 2001, to let the public know that it was considering an action. The Notice of Intent described the proposed action, provided background information on anticipated issues and potential impacts, and identified a preliminary list of alternatives to implement the proposed action.

The public scoping process began once the Notice of Intent was published. DNSC welcomed comments from the public on the proposed alternatives, issues, and environmental impacts to be analyzed in the MM EIS. Five public scoping meetings were held in communities near current mercury storage sites and in Washington, DC. Issues raised at the meetings are documented in the report, *Scope of the Mercury Management EIS*. The scoping period closed on June 30, 2001.

ES.13.2 Draft MM EIS Review Process

In April 2003, DNSC published the Draft MM EIS. The Draft MM EIS or the Executive Summary was distributed to more than 830 individuals and organizations. The comment period on the Draft MM EIS began on April 11, 2003, and provided the public with more than twice the required 45 days to comment. In response to public requests to extend the comment period, the deadline for submittal of comments was extended informally from July 18, 2003, to September 2, 2003.

During the comment period, DNSC held seven meetings to receive comments on the Draft MM EIS. The meetings were held in the communities that could be affected by the proposed actions, as well as in Washington, D.C. Approximately 230 persons attended the public meetings. Transcripts of the meetings

are available at the 15 information repositories listed on the project Web site (www.mercuryeis.com) and identified in the *Federal Register* notice (68 FR 17786).

DNSC received 295 comment documents containing 633 comments. Volume II of the Final MM EIS presents the comment documents, identifies the specific comment(s) from each, and provides DNSC's responses.

In accordance with EPA's responsibilities under Section 309 of the Clean Air Act, National Environmental Policy Act (NEPA), and the Council on Environmental Quality regulations implementing NEPA, EPA reviewed the Draft MM EIS and assigned a Lack of Objections rating to the proposed action, EPA's highest rating. In EPA's opinion, the Draft MM EIS provided adequate documentation and suitable analysis upon which to base a decision.

A ***comment document*** is a comment or set of comments submitted by an individual or organization. Examples of comment documents include letters, emails, voice mail messages, faxes, and meeting transcripts.

A ***comment response*** is DNSC's written reply to a comment or group of comments submitted during the public comment period on the Draft MM EIS.

ES.13.3 Public Comments on the Draft MM EIS

The majority of the comments received on the Draft MM EIS are related to the Consolidated Storage Alternative; impacts on human health and safety; and environmental and economic impacts. The following is a summary of the major issues raised by the commentors and DNSC's responses.

CONSOLIDATED STORAGE AND NO ACTION ALTERNATIVES

Issue Summary. More comments were received on consolidated storage than on any other issue. Many commentors were opposed to the Consolidated Storage and No Action Alternatives. The most frequently cited reasons for opposition included concerns about: (1) human health risks from leaks, accidents, and terrorist acts; (2) proximity of the storage locations to populated areas; (3) adverse effects on property values and negative perceptions affecting economic growth in the surrounding communities; and (4) adverse effects on the environment. Some commentors suggested that DNSC obtain approval of state and local governments and the community before a site is selected for consolidated mercury storage.

DNSC Response. DNSC's preferred alternative is consolidated storage at one location. However, no decisions will be made until after the EPA's Notice of Availability for the Final MM EIS is published in the *Federal Register*. Decisions on mercury management will be based on the environmental analyses presented in the EIS, including health and safety, security, and socioeconomics, and other factors such as cost, strategic considerations, and public input. DNSC will announce its decisions and the reasons for them in the Record of Decision (ROD), which will be published no earlier than 30 days after publication of the Final MM EIS Notice of Availability. The ROD may specify the Consolidated Storage Alternative (preferred alternative), No Action Alternative, Sales Alternative, or a combination of these alternatives.

DNSC has supported a vigorous public outreach program. DNSC has hosted 12 public meetings nationwide, and provided information on the MM EIS in the form of newsletters, fact sheets, reports, exhibits, and a Web site. Email and toll-free telephone and fax numbers have been available for public queries and comments. Postcards were sent to households in the immediate vicinity of potential storage sites to inform them of public meetings and comment opportunities. DNSC has also provided briefings for state and local officials and others in communities potentially affected by mercury management activities, and will continue to inform communities affected by the mercury management alternative that is selected.

SALES ALTERNATIVE

Issue Summary. A number of commentors expressed support for the Sales Alternative. Some suggested a hybrid alternative that would include consolidated storage and sale of all or a portion of the inventory from the consolidated storage location. A few commentors suggested that the sale of existing mercury stockpiles would be preferable to new mercury mining. Others were concerned about or opposed to the sale of mercury. Some commentors said that any mercury sold on the open market would increase the amount of mercury in the global environment. Some expressed concern that sales of large quantities of mercury would depress mercury prices and result in the increased use of mercury. Other commentors questioned whether DNSC mercury is a marketable commodity or a hazardous waste.

DNSC Response. The sale of mercury is evaluated in the MM EIS. Two subalternatives are described: (1) sales at the maximum allowable market rate (assumed to be 5,000 flasks per year), and (2) sales to reduce mercury mining. As described in Section ES.6, there would be negligible-to-minor environmental and socioeconomic impacts from the Sales Alternatives. Risks to the public from normal operations and facility accidents would be negligible to low.

Note that a hybrid alternative, combining the Consolidated Storage and Sales Alternatives, could be selected. The environmental impacts of hybrid alternatives would be bounded by impacts evaluated in the MM EIS.

As discussed in Section ES.5, the entire inventory of DNSC excess mercury could be sold to a mercury mining company with the agreement that mining would be reduced proportionately to compensate for the release of the DNSC mercury into the market. In the event the mercury is sold, it is expected that an agreement would be negotiated that would require the purchaser to sell DNSC mercury at a rate no greater than the rate of sale for newly mined mercury. Therefore, this alternative would meet the requirements of the Strategic and Critical Materials Stock Piling Act of 1939, as amended (50 U.S.C. 98 et seq.) that sales would not result in undue disruption of the mercury market. European producers of chlorine and alkali are considering this approach. The Sales to Reduce Mercury Mining Alternative could produce beneficial impacts by reducing impacts of mercury mining and refining.

DNSC mercury is not a waste; it is a marketable commodity that is 99.5 percent to 99.9 percent pure. Mercury of this quality is currently bought and sold on the open market for uses such as thermometers, barometers, blood pressure monitors, switches, light bulbs, dental fillings, and medicines, among others. Mercury is designated a hazardous substance under Section 307(a) of the Clean Water Act (33 U.S.C. 1251 et seq.), Section 112 of the Clean Air Act (42 U.S.C. 7401 et seq.), and U.S. Department of Transportation (DOT) hazardous materials regulations (49 CFR 172.101).

STORAGE BUILDING DESIGN AND OPERATION

Issue Summary. Some commentors expressed concern that the storage buildings are not appropriate for mercury storage. Some questioned the mercury packaging and leak containment provisions, while others questioned whether the buildings are secure. However, some commentors said that they believe that the mercury is safely stored.

DNSC Response. Mercury at the DNSC depots is stored in 76 lb (34 kg) capacity flasks sealed in airtight 30 gal (114 l) drums. The flasks are separated by dividers inside the drums and rest on an absorbent mat that doubles as cushioning material. Flasks are enclosed in plastic bags and sealed with wire ties. Drum lids have half inch rubber gaskets, and a steel locking ring is bolted in place to seal the drum lid. The drums rest on catch trays on wooden pallets on sealed floors. The catch trays can contain the contents of several flasks. Floor curbing was recently installed in the mercury storage buildings at

the New Haven, Somerville and Warren depots. Therefore, leakage of mercury in an amount sufficient to escape the warehouse is unlikely.

DNSC has safely stored mercury for over 50 years. Periodic inspections would ensure that mercury storage containers are in good condition and leak free. Any defects in the packaging would be quickly corrected. Inspections would be conducted by appropriately trained DNSC or contract personnel.

Warehouses would be kept locked except for inspections and other periodic maintenance work. In addition to security, perimeter fencing, and closely controlled access comparable to the levels of protection at the current mercury storage sites, DNSC would work with local authorities to ensure that even the most unlikely scenarios would be handled properly.

HEALTH AND SAFETY

Issue Summary. Many commentors expressed concerns about risks to public health and safety from storing the mercury, while others said that the mercury is safely stored.

DNSC Response. DNSC has safely stored mercury for more than 50 years. Because mercury is a hazardous material, DNSC imposes strict controls to prevent exposure or release to the environment or to personnel working in the storage locations. As described in Section ES.6, risks to the general public from normal operations would be negligible at any of the candidate sites for all the alternatives considered.

ACCIDENTS AND NATURAL DISASTERS

Issue Summary. Many commentors were concerned about the potential for adverse environmental and human health effects of accidents caused by natural disasters or human error. They referred to small spills and leaks of mercury and larger releases due to fire or natural disasters (e.g., tornados and earthquakes). Some were particularly concerned about the proximity of the storage facilities to populated areas. Some commentors were concerned that adequate emergency response capability is not available to respond to an accident involving mercury.

DNSC Response. As described in Section ES.6, risks to the public from mercury released during facility accidents would be negligible to low at any of the candidate sites for all the alternatives considered. Mercury vapors that might escape from the storage facility after an accident would be diluted to low concentrations before reaching the public. This includes mercury that could be released during natural disasters such as earthquakes and tornadoes and human-initiated spills, leaks, and other accidents.

Populations residing near the candidate sites are unlikely to face a major public health threat. This is because the risks are already negligible to low for an individual member of the public under the worst conditions that can reasonably be expected, and thus the risks for the general public would be even lower.

Plans are in place should a leak or spill occur. The mercury storage sites have approved Spill Prevention Control and Countermeasures Plans and Installation Spill Contingency Plans to ensure that the appropriate response to a spill is made. DNSC maintains equipment and trains the workforce at its mercury storage locations to respond to mercury spills. State and local emergency response teams are aware of the mercury storage. Should there be a mercury spill, an appropriate response would occur and the spill would be cleaned up to applicable standards.

TRANSPORTATION

Issue Summary. Some commentors were concerned about the potential for adverse environmental and human health effects of transporting the mercury stockpile, including vehicle accidents.

DNSC Response. Mercury has been transported as a common industrial commodity for many years. If required, transportation of mercury would be in accordance with DOT hazardous material shipping requirements for using commercial truck and rail routes. The MM EIS evaluates the potential consequences of truck and rail transportation for both the Consolidated Storage and Sales Alternatives.

Risk is a function of both frequency and consequence, and the more miles traveled, the greater the opportunity for an accident to occur. Therefore, the greatest risk to the public would result from a truck transportation accident resulting in a mercury spill and fire under the Sales Alternative. This risk would be moderate if it were raining when the accident occurred. For the Consolidated Storage Alternative, risk from this accident would be low if the accident occurred while it was raining. The risk of a mechanically induced fatality occurring somewhere along the route would be moderate for the Sales Alternative and low for the Consolidated Storage Alternative.

Ecological risks resulting from this postulated accident range from negligible to high, depending on the receptor organism and the weather. High ecological risk would result under the Sales Alternative for certain ecological receptors, but only if it were raining at the time of the accident. Moderate ecological risk would result for certain ecological receptors under the Consolidated Sales Alternative. However, the probability that a fire would occur while it is raining and the limited area involved suggests that the ecological risks of transportation accidents are likely to be lower than estimated.

TERRORIST ATTACK

Issue Summary. Many commentors were concerned about the potential for adverse human health effects of sabotage of the mercury storage facilities. Some commentors referred to attacks on the World Trade Center and the Pentagon, as support for their concerns.

DNSC Response. DNSC provides armed security, perimeter fencing, and closely controlled access at the depots. DNSC also works with local authorities to ensure that even the most unlikely scenarios would be handled properly. DNSC has prepared a risk analysis of a deliberate aircraft crash and conducted vulnerability assessments to ensure that the mercury storage depots remain safe and secure. These internal reports, which indicate that the mercury stockpile is not a likely target for terrorists, are not available to the public for security reasons.

ENVIRONMENT

Issue Summary. Some commentors expressed concern about potential impacts of the stored mercury on the environment, particularly impacts on surface waters such as lakes and rivers and on groundwater, as well as impacts on fish and other wildlife.

DNSC Response. There would be no new construction and therefore no impacts on the environment from land-disturbing activities. As described in Section ES.6, negligible-to-minor environmental impacts would result from activities associated with the alternatives considered.

SOCIOECONOMICS

Issue Summary. A number of commentors were concerned about impacts on property values due to a negative perception of mercury storage. Others were concerned about discouraging more desirable development in the region. Some commentors were concerned about their community being labeled a "dumping ground" for wastes and other hazardous materials.

DNSC Response. DNSC has worked with the public throughout the EIS process to help them understand the potential risks presented by the mercury management alternatives so that opinions can be formulated based on facts and not perception. DNSC has safely stored mercury for more than 50 years and has taken additional precautions to ensure that it continues to be stored safely over the next 40 years by overpacking the mercury in steel drums and making modifications to the storage buildings. Section ES.3 describes mercury storage at the existing locations. Potential human health risks from normal operations and facility accidents are summarized in Section ES.6. The analyses indicate that there is negligible to low risk to the general public associated with consolidated mercury storage at any of the candidate sites.

COST

Issue Summary. Some commentors questioned the validity of the mercury storage cost estimates and asked why the estimated costs differ greatly among the candidate sites.

DNSC Response. Cost estimates have been revised in the Final MM EIS. Facility cost estimates provided in the Draft MM EIS were based on actual square foot and other costs being paid by the Government at or near the properties being considered as possible consolidation sites. Commentors on the Draft EIS noted that these estimated costs, particularly for the Western sites, appeared higher than would be expected. DNSC analyzed the basis for these estimates and found that the costs included assumptions that were not consistent for all locations. For these reasons, DNSC decided to treat basic facility costs generically. Actual facility costs in the event that the long-term consolidated storage alternative is chosen would be established based on best value to the Government during a procurement process.

STEWARDSHIP

Issue Summary. A few commentors asked who would provide regulatory oversight of a mercury storage facility.

DNSC Response. DNSC mercury will remain U.S. Department of Defense (DoD) property, and DoD will continue to fund and oversee the mercury storage operations. The storage facility would be required to comply with all applicable state and Federal laws and regulations.

MM EIS SCHEDULE

Issue Summary. A number of commentors questioned why DNSC is taking so long to complete the MM EIS and requested that the mercury be removed immediately from their communities. Other commentors asked when the EIS process would be complete and how long it would take to ship the mercury.

DNSC Response. DNSC is prohibited by NEPA from removing mercury from the existing storage locations until the EIS process has been completed. The Final MM EIS is currently scheduled for publication in early 2004. The ROD can be published no earlier than 30 days after the Final MM EIS is

published. If the preferred alternative (consolidated storage) is selected, the ROD may or may not specify one of the candidate sites analyzed in the MM EIS. If one of the candidate sites is not specified, additional time would be needed to identify another storage location and, possibly, to prepare additional environmental review. DNSC anticipates it will require approximately one year to stage and move the mercury to a consolidated storage site.

PUBLIC OUTREACH

Issue Summary. A few commentors asked for an extension of the public comment period.

DNSC Response. Because of requests for additional time to review and comment on the Draft MM EIS, DNSC informally extended the timeframe for submitting comments from July 18, 2003, to September 2, 2003.

OTHER SITE ISSUES

Issue Summary. A few commentors were concerned about existing contamination at the current DNSC mercury storage locations. Other commentors were concerned that mercury storage could slow cleanup activities at a given site.

DNSC Response. The cleanup of existing environmental contamination at the DNSC depots is ongoing. DNSC uses the four step approach required under the Defense Environmental Restoration Program in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq.). The goal is to identify and characterize contamination and restore depot property. The first two steps focus on identifying possible environmental problems. The three DNSC depots (New Haven, Somerville, and Warren) are currently at the third step, where the investigations are being expanded to define the nature and extent of suspected contamination. The fourth step involves actual cleanup (remediation). The environmental restoration process is progressing independent of the decision on mercury management.

ES.14 ADDITIONAL INFORMATION

The *Scope of the Mercury Management EIS,* Draft MM EIS, and Final MM EIS are available for public review at the MM EIS Information Repositories and on the MM EIS Web site (www.mercuryeis.com). To be placed on DNSC's mailing list, please contact DNSC using the information provided below.

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