International City/County Management Association

A PUBLICATION OF ICMA'S MILITARY BASE REUSE CONSORTIUM

ICMA Special Report: The Impact of Unique Contaminants on BRAC Redevelopment

Cover and Layout Design: Will Kemp, Graphic Designer, ICMA

04-228

Contents

About ICMA and the Military Base Reuse Consortium

International City/County Management Association

The International City/County Management Association (ICMA) is the professional and educational association of over 8,000 local government executive administrators and their staffs. Members manage cities, counties, towns, townships, boroughs, regional councils, and other local governments in the United States and throughout the world with populations ranging from a few thousand to several million people. Founded in 1914, ICMA pursues the mission of enhancing the quality of local government and governance through professional management. Members rely on ICMA for information, research, and technical assistance made available through a range of publications, training programs, and other services.

Within its Research & Development Department, ICMA manages over 40 initiatives designed to enhance the capacity of local government management in environmental protection, economic development, community planning, public safety, and performance measurement. Through research, various publications, technical assistance workshops, the Internet, peer exchanges, focus groups, and case studies, ICMA offers a broad array of resources and capabilities to local governments nationwide. This mission is supported with grants and contracts from governmental agencies, academic institutions the private sector and non-profit foundations. ICMA also provides local governments with a forum to communicate constructive ideas and concerns directly to federal agencies and other institutions of similar interests.

Military Base Reuse Consortium

The ICMA Base Reuse Consortium brings together representatives from local governments, community organizations, academic institutions, the Department of Defense and the military services, and the private sector to share lessons learned and highlight recent developments in military base closure and reuse. The Consortium's forums and publications play a constructive role in improving the base reuse process. The Consortium includes more than 800 local government administrators and other local government representatives from over 90 communities with varying levels of base closure experience, and works with all involved parties, including federal and state agencies.

ICMA formed the consortium in 1995 to help communities learn about the reuse of military bases by:

- Facilitating the exchange of information between local governments with base closure experience and those who want to learn how to manage this complicated process;
- Providing local government administrators with the latest information on base closure and reuse programs; and
- Exploring opportunities for the prompt redevelopment and transfer of closed military bases.

The consortium's services and recent activities include:

- Publishing Baseline, a quarterly newsletter that features in-depth case studies and news related to developments in base reuse
- Facilitating peer exchanges and workshops to promote learning and provide direct technical assistance to help local governments prepare and respond to the challenges of base reuse
- Maintaining www.icma.org/military and a listserv to supply information and useful links about base reuse
- Publishing the second edition of a comprehensive Base Reuse Handbook and continuing to produce other special reports that focus on base-reuse issues affecting local governments, such as a report on the cleanup and reuse challenges at closed military installations containing lead paint and asbestos that ICMA will release in early 2004
- Hosting Best BRAC-tices Research Forums
  - Aurora, Colorado, August 2001
  - Sacramento, California, October 2002
  - Boston, Massachusetts, June 2004
- Convening National Stakeholders Forums on Land Use Controls at Federal Facilities, 2000.

Visit ICMA's Homepage, at www.icma.org/military, for previous editions of Baseline & the Base Reuse Bulletin. For more information, to receive Baseline, or to join the ICMA Base Reuse Consortium, contact:

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Acknowledgements

The ICMA Military Programs Team extends its gratitude to the many individuals who contributed to the development of this report. In particular, we would like to thank the ICMA Corporate Partner that conducted the peer review for technical and regulatory accuracy.

MACTEC Engineering and Consulting, Inc.

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Richard Kaufman, *Director of Business Development*

The local redevelopment authority representatives who completed the lead–based paint and asbestos surveys deserve special thanks. They took exceptional care to describe in detail the hazard cleanup difficulties and successes at their former military bases.

The Military Programs Team sincerely appreciates the efforts of those who assisted with the case studies. Their contributions included authorship, background documents, follow up interviews, and site tours.

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The ICMA Military Programs Team recognizes the project support and management from the staff of the U.S. Environmental Protection Agency (EPA). This report was developed under a cooperative agreement between ICMA and the U.S. EPA, Federal

Facilities Restoration and Reuse Office (Cooperative Agreement No. CR-82774301). The opinions in this report are solely those of the authors and do not necessarily reflect the views of the U.S. EPA or MACTEC Engineering and Consulting, Inc. All information contained herein is based on research and expertise of ICMA and MACTEC Engineering and Consulting, Inc. unless otherwise noted.

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Preface

Since the base realignment and closure (BRAC) rounds began in 1988, local governments and local redevelopment authorities (LRAs) have made great strides in their efforts to redevelop properties. Some sites have been modified so greatly from their original appearance that it is hard to tell that military bases ever existed there. However, even on many of these highly redeveloped sites, there still remain certain buildings or parcels that have been difficult to transform for civilian use. Often, the presence of a unique hazard, such as unexploded ordnance (UXO), encumbers the remediation of the site because of associated budgetary constraints or a lack of scientific knowledge. At many sites, the prevalent contaminants that have hindered redevelopment are lead-based paint (LBP) and asbestos-containing material (ACM).

Unlike other contaminants found at BRAC sites, ACM and LBP are not unique to military bases. For many years, both were used commonly in all types of buildings, including residential property. LBP and ACM were also used in military facilities, including base housing and barracks.

As with most BRAC cleanup issues, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and other federal regulations require the Department of Defense (DoD) to conduct or pay for cleanup. For a number of reasons, whether the DoD is required to pay for LBP and ACM removal has been a contentious issue.

The question of DoD responsibility for cleaning up LBP and ACM stems from how these materials become human health hazards. LBP is hazardous primarily when it begins to flake into fine dust particles and is inhaled by humans, especially children and pregnant women; ingestion is a secondary route of exposure. ACM becomes a potential health hazard when it is disturbed or damaged and asbestos fibers are made airborne where they can be inhaled. When these materials are maintained in an intact condition, they do not pose a serious hazard. Therefore, the LBP and ACM in these buildings often do not pose a serious health risk at the time DoD transfers responsibility for them.

Many of the significant cleanup and reuse problems arise when LRAs and local governments begin to redevelop them. In many cases, the buildings have deteriorated between the time of closure and transfer, and the LBP has begun to chip and the ACM has become damaged. Under these circumstances, a once “safe” building could contain potentially serious health hazards. These buildings, sometimes numbering in the

hundreds or thousands on a single installation, are not suitable for reuse in redevelopment plans. The problems multiply when the redevelopment plan calls for removal of these structures. The deconstruction stage requires that the LBP and ACM be disturbed and/or damaged, thereby releasing potentially harmful contaminants.

The safe removal, disposal, and handling of LBP and ACM are extremely costly and require specialized, highly skilled, and certified contractors—a prohibitive cost for most local government and LRA budgets. In addition, because many buildings pose no hazard when they are intact, DoD maintains that it is the redevelopment process itself that often leads to exposure of contaminants and creates health risks, and therefore contends that the department should not have to pay for cleanup and removal. The local governments and LRAs argue that DoD should fund the remediation since many of the buildings containing LBP and ACM are not fit for civilian use, and they are left with no other choice but to demolish them. Furthermore, the high cost of remediation may dissuade private developers from investing in these sites; remediation costs may surpass the overall value of the property after build out. As a result, there are many BRAC sites with large parcels containing, in some cases, hundreds of abandoned, contaminated buildings, and local governments and LRAs are often left with the responsibility of identifying cleanup and redevelopment solutions.

This report provides important background information about LBP and ACM issues at former military sites and outlines steps that LRAs and local governments have pursued to overcome these obstacles. The report will initially look at LBP and ACM separately and explain the reasons they are considered hazardous, describe relevant federal regulations and DoD polices governing their handling, and relate how laws impact redevelopment efforts. The report will present a comprehensive case study describing the efforts of the Fort Ord Redevelopment Authority (FORA) to address these challenges and its innovative plans to effectively overcome them. Additionally, two shorter case studies highlight the ways other communities redeveloped their BRAC sites while dealing with LBP and ACM removal and remediation. Finally, the report contains a series of LRA responses to a survey that characterizes the major challenges to redeveloping sites with these contaminants and quantifies to a limited degree the accuracy with which DoD identified their impact prior to turnover. The ultimate goal of this report is to equip local governments and LRAs with useful information to support LBP and ACM decision making and to present a series of situations from which they can draw applicable lessons for use at their own sites.

Lead-Based Paint

The Impact of Lead on Human Health

According to the U.S. Environmental Protection Agency (EPA), lead is a toxic metal of which "all recorded effects […] on living organisms are detrimental"[1] (Appendix A). According to the Department of Housing and Urban Development (HUD), lead "can cause permanent damage to the brain and other organs, and can result in reduced intelligence and behavioral problems"[2] (Appendix B). It can also cause abnormal development of the fetus in pregnant women[3] (Appendix C). More than 800,000 children below the age of 6 years living in the United States have levels of lead in their bodies above the Centers for Disease Control and Prevention's established "level of concern."[4] Sources for lead exposure include drinking water that has passed through lead pipes, food grown in soil containing lead, exposure at the workplace in factories and manufacturing plants where lead is used, and the ingestion of lead-containing dust.[5] Lead has been added to paint to increase its durability and appearance (Appendix D).[6] Leaded dust from the extensive use of these paints during the 19th and early 20th centuries is the most common source for childhood lead exposure in the United States.[7] Lead poisoning is especially problematic because an exposed person does not exhibit any immediate symptoms, and "no safe exposure level exists for lead since even limited exposure has been linked to some health threats."[8]

According to recent studies, three-quarters of U.S. housing built prior to 1978 contains some LBP, and LBP hazards exist in 30% of rental units nationwide;[9] however, as long as this paint is properly maintained, it "poses little risk" to human health.[10] In response to a growing body of research on the impact of LBP on human health, in1976 the Consumer Product Safety Commission banned the use of LBP (defined as lead content greater than 0.06% by weight or 600 ppm) for use in residential buildings constructed on or after January 1, 1978.[11]

Statutory and Regulatory Background

A number of laws govern the disclosure, cleanup, and transfer of federal property containing LBP and LBP hazards. Although DoD-specific requirements are more stringent than the federal standards, the most significant federal statutes governing LBP are Title X of the Housing and Community Development Act of 1992 and the Toxic Substances Control Act (TSCA).

Title X

Congress passed Title X of the Housing and Community Development Act of 1992 under the name of the *Residential Lead-Based Paint Hazard Reduction Act of 1992* (RLBPHRA),[12] which amended the RLBPHRA of 1971 and TSCA. The stated purposes of Title X are, among other things, "to develop a national strategy to build the infrastructure necessary to eliminate lead-based paint hazards in all housing as expeditiously as possible" and "to reduce the threat of childhood lead poisoning in housing owned, assisted, or transferred by the Federal Government."[13] An LBP hazard is defined as "any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, or lead-contaminated paint that is deteriorated [and] would result in adverse human health effects." LBP that is chipping or cracking is considered " a hazard that needs immediate attention"[14] (Appendix E).

Title X called on HUD to create regulations for the inspection and abatement of LBP and amended the TSCA Section 403 to require EPA to set forth regulations that identify LBP hazard levels in paint, dust, and soil. The HUD regulations that apply to a wide range of federally owned and subsidized pre-1978 housing were completed in 1999 and went into effect in September 2000. General exemptions to these regulations include housing exclusively for the elderly and those with disabilities and zero-bedroom dwellings, such as barracks, dormitories, efficiencies, etc.[15]

There are key differences between standard requirements for federally owned target housing and the requirements for military housing undergoing property transfer. A number of these differences are outlined below:

- Section 1013 of Title X amended the *Lead-Based Paint Poisoning Prevention Act*. It requires the inspection and abatement of LBP hazards in pre-1960 housing, but only requires the inspection and risk assessment (not abatement) of housing constructed between 1960 and 1978 prior to closing sale.
- The federal requirement excludes target housing scheduled for demolition and redevelopment for residential use from inspection, risk assessment, and abatement requirements, so long as the housing remains unoccupied until demolition.[16] In contrast, the DoD requirement mandates that the property be tested for soil-lead hazards and, if present, have the soil-lead hazards abated prior to redevelopment.
- Title X requires that abatement of LBP hazards must commence within 12 months of the conclusion of the risk assessment. The party purchasing the property from the federal agency may complete abatement of LBP hazards; however, abatement must be made a condition of the sale. Furthermore, the federal agency is responsible for ensuring that the abatement is conducted prior to the housing being occupied.[17]
- Title X also requires the federal agency to disclose to the buyer known LBP or LBP hazards. These regulations only apply to housing that was originally used for housing and not to buildings that will be converted into housing. The DoD requires that any "non-residential real property for which there is a reasonable certainty [will] be converted for residential [use]" be tested and have hazards abated prior to occupancy. These regulations apply to only those sales made after September 15, 2000.[18]

The disposition of federally owned housing, Title X Section 1013, includes a budget authority clause. If LBP inspection, risk assessment, and/or abatement of target housing impose additional costs on the Resolution Trust Corporation and the Federal Deposit Insurance Corporation, then the requirements to conduct those LBP activities are delayed until Congress appropriates enough money in the following budget cycle. If those appropriations are insufficient to cover the costs, then the LBP requirements will not apply to, in this case, DoD.[19] This means that if DoD's inspection, risk assessment, and/or abatement costs are too large, then a process is in place whereby fulfilling LBP requirements can be sidestepped.

Toxic Substances Control Act

To accomplish its goals, Title X, Subtitle B, § 1021, amended TSCA to add Title IV, consisting of Sections 401–412 (or § 2681–2692) and subtitled the *Lead-Based Paint Exposure Reduction Act*, which is Title 15 in the United States Code. The amendment requires the promulgation of regulations governing, among other things:

- Training and certification for individuals engaged in LBP activities
- Identification of dangerous LBP levels
- Disclosure of LBP in target housing offered for sale or lease[20]
- Control of LBP hazards at federal facilities.

TSCA details federal government policy for property containing LBP. It called on the administrator of EPA, within 18 months of October 1992, in conjunction with the Secretaries of Labor, HUD, and Health and Human Services (HHS), to create regulations regarding the proper training of those working with target housing scheduled for demolition and redevelopment for residential-use LBP.[21] Additionally, it called for regulations to be created regarding renovation and remodeling of buildings constructed before 1978[22] and for the EPA to conduct outreach and promote awareness of the dangers of LBP.[23]

The section of the TSCA amendment most significant to BRAC redevelopment requires all federal agencies and departments that have jurisdiction over any property or engage in any activity that may create an LBP hazard to comply with federal, state, and local LBP requirements "in the same manner, and to the same extent as any nongovernmental entity." Furthermore, in the same code, the "federal government expressly waives any immunity […] with respect to any such substantive or procedural requirement."[24] This means that DoD is required to comply with all federal, state, and local laws that pertain to regulations surrounding LBP at BRAC sites. All inspections, lead-hazard screens, and risk assessments must be conducted in accordance with TSCA Section 402, state, and local requirements.

The amendment further provides that it is "unlawful for any person to fail or refuse to comply with a provision of TSCA Subchapter IV—*Lead Exposure Reduction* or with any rule or order issued under that subchapter."[25] Civil penalties for violations of TSCA section 409 may be imposed pursuant to TSCA section 16(a).[26]

The section of the TSCA amendment most significant to BRAC redevelopment requires all federal agencies and departments that have jurisdiction over any property or engage in any activity that may create an LBP hazard to comply with federal, state, and local LBP requirements "in the same manner, and to the same extent as any nongovernmental entity."

It also requires the Secretary of HUD and the Administrator of EPA to promulgate regulations for the disclosure of "lead-based paint hazards in target housing which is offered for sale or lease."[27] These regulations were to require that, "before the purchaser or lessee is obligated under any contract to purchase or lease housing," the seller or lessor shall make certain disclosures to the purchaser or tenant.[28] In March 1996, EPA and HUD issued joint regulations known as the *Real Estate Notification and Disclosure Rule* (Disclosure Rule).[29] The Disclosure Rule generally provides that certain "activities shall be completed before the purchaser or lessee is obligated under any contract to purchase."

Department of Defense Policy

In December 1999, the Department of Defense (DoD) and the EPA issued a guidance, titled *Lead-Based Paint Guidelines for Disposal of Department of Defense Residential Real Property—A Field Guide*,[30]

to be used by their "personnel in the evaluation and control of lead-based paint at DoD residential real property scheduled for disposition under the base realignment and closure program"[31] (Appendix F). As covered by Title X and TSCA, the guidance applies to target housing constructed before 1978 and child-occupied facilities. It does not apply to nonresidential property, leased property, or residential property where the future use is residential or child occupancy. Before issuing the field guide, DoD policy on LBP at BRAC sites consisted of a short, one-page document that stated what DoD was required to do by law, but did not give any instruction to personnel in the field as to the means to fulfill those requirements.

A memorandum attached to the field guide signed by then Deputy Under Secretary of Defense (Environmental Security), Sherri W. Goodman, explains that DoD policy meets and exceeds Title X and TSCA provisions in that it requires:

- Abatement of lead found in soil surrounding housing constructed between 1960 and 1978, adding that transfer agreements may call on the buyer to perform the abatement
- Evaluation of "the need for interim controls, abatement, or no action for bare soil lead […] based on findings of lead-based paint inspection, risk assessment, and criteria contained in the field guide"
- Evaluation and abatement of LBP hazards in structures that will be used as "child occupied facilities" such as daycare centers, preschools, and kindergartens
- Evaluation and abatement of "soil-lead hazards for target housing demolished and redeveloped for residential use following transfer."[32]

The memo further explains that Title X exempts DoD from conducting inspections, risk assessments, and abatement of LBP hazards on housing that is either scheduled for demolition or not intended for post transfer residential habitation. In those cases, DoD would require the transferee to conduct the risk assessment and any necessary abatement.[33]

Several states and two Native American tribes have defined LBP inspection, assessment, and abatement training and certification requirements. These authorized programs may have more stringent standards in regard to the identification of hazardous levels of lead in paint, dust, and soil and the testing and disposal for LBP waste and debris than the those of the federal government.

Synopsis of the DoD and EPA LBP Field Guide

Chapter One

The field guide starts by citing the applicable federal regulations that necessitate the need for DoD's policies. Among them are Title X's requirements for:

- "Inspection and abatement of lead-based paint hazards in all federally owned target housing constructed prior to 1960," as well as "inspection for lead-based paint and lead-based paint hazards in all federally owned target housing constructed between 1960–1977"
- The disclosure of known LBP and LBP hazards before sale or lease of federally owned property.[34]

The field guide also cites TSCA's waiver of sovereign immunity subjecting the federal government to state (and local) laws and regulations.[35] Several states and two Native American tribes have defined LBP inspection, assessment, and abatement training and certification requirements. These authorized programs may have more stringent standards in regard to

the identification of hazardous levels of lead in paint, dust, and soil and the testing and disposal for LBP waste and debris than the those of the federal government.

"Local interest from communities, Land Reuse Authority, the BRAC Cleanup Teams, as well as prospective purchasers may also have some bearing on decisions made by DoD on property transfer issues, such as lead-based paint. In addition, where lead-based paint is associated with historic residential properties, state historic preservation offices should also be consulted regarding acceptable abatement requirements for planned restoration activities of historic properties."[36]

The field guide adds that while EPA has determined "that the release of lead to soil from lead-based paint from structures falls within the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) definition of a hazardous substance release, EPA and DoD agree that, for the majority of situations involving target housing, Title X is sufficiently protective to address the hazards posed by lead-based paint."[37] This is significant because in the past there has been disagreement between DoD and EPA over whether CERCLA gives EPA the authority to regulate lead found in soil on non-residential sites. ICMA reported in the *Base Reuse Consortium Bulletin* (January/February 1998; Appendix G) that the Department of the Navy's final position on LBP considered Title X requirements separate and distinct from CERCLA and therefore not under EPA's CERCLA jurisdiction. This argument was predicated on the point that Congress passed specific legislation regulating LBP (i.e., Title X) and the absence of a "substantial threat" of LBP in nonresidential areas.[38]

Chapters Two and Three

Chapters Two and Three define the exact process of how DoD and EPA personnel should:

- Conduct LBP evaluation
- Conduct LBP inspection
- Conduct a risk assessment
- Establish control measures
- Conduct abatement
- Dispose of LBP-covered debris and waste.

ICMA pulled select terms and their definitions from the Field Guide to reduce any ambiguity and increase the understanding of a common set of LBP technical information.

Lead Based Paint Evaluation means an inspection and a risk assessment and can also include a lead-hazard screen, paint testing, or a combination of these to determine the presence of lead-based paint hazards or lead-based paint.

Lead Based Paint Inspection is a surface-by-surface investigation to determine the presence of lead-based paint and the provision of a report explaining the results of the investigation.

Risk Assessment is an on-site investigation to determine and report the existence, nature, severity, and location of LBP hazards in residential dwellings.

Control Measures are a set of measures designed to reduce temporarily human exposure or likely exposure to LBP hazards, including specialized cleaning, repairs, maintenance, painting, temporary containment, ongoing monitoring of LBP hazards or potential hazards, and the establishment and operation of management and resident education programs.

Abatement is any set of measures designed to permanently eliminate LBP hazards.[41]

Two important points must be made here:

- "Lead-based paint inspections and risk assessments must be performed by DoD for all target housing prior to sale/transfer"[39]
- "All inspections, lead-hazard screens, and risk assessments must be conducted in accordance with TSCA Section 402, state, and local requirements."[40]

Chapter Four

Chapter Four of the guidance describes the Property Transfer Process as defined by the provisions in Title X for the transfer of federal target housing containing LBP. Title X requires the federal agency, in this case DoD, to establish controls

Army barracks with peeling LBP at the former Ft. Ord in Monterey, California

or conduct abatement prior to transferring the property or to require the transferee to conduct the abatement as a condition of sale. DoD or the transferee must conduct abatement or establish control measures within 12 months after the completion of the risk assessment. In the majority of cases, DoD prefers that "responsibility for control or abatement be transferred to the purchaser, in which case the service must ensure that abatement is conducted in accordance with Title X."[42] The transferee cannot occupy the site until all LBP abatement has been completed.

DoD and EPA also instruct their personnel that the "responsibility for any long-term monitoring, periodic inspection, and reevaluation of the control measures and abatement required to be performed after transfer should be made a condition of sale."[43]

The guidance also describes the disclosure requirements that must be met prior to transfer of property containing LBP hazards. The disclosure requirements are contained in and derived from *Lead—Requirements for Disclosure of Known Lead Based Paint and/or Lead Based Paints Hazards in Housing, Final Rule,* which are found in the federal register and developed by both HUD and EPA.[44] To fulfill the federal disclosure requirements:

- The services must supply the transferee with an EPA-approved lead hazard information pamphlet
- The "services must disclose to the transferee the presence of any known lead-based paint and/or lead-based paint hazards and provide any available lead hazard evaluation reports."[45]

The transferee then has 10 days to conduct their own risk assessment and/or inspection to identify the presence of LBP and/or LBP hazards, before the sale is formally binding.

The services must also provide the transferee with the following information as part of the sale or transfer documents:

- A Lead Warning Statement signifying the possibility that the property may present a risk of childhood lead poisoning
- A statement signed by the transferee that verifies that the transferee has read and understood the lead hazard information pamphlet and acknowledges that he or she had a 10-day opportunity before transfer to conduct a risk assessment or a paint inspection
- A list of any records or reports available to the services pertaining to LBP and/or LBP hazards in the housing that have been pro-

vided to the transferee; if no such records or reports are available, the service will indicate this in the attachment to the contract for sale/transfer agreement

- A statement by the transferee acknowledging the receipt of available reports and records
- A statement by the transferee that he or she has had an opportunity to conduct a risk assessment or inspection, or waived the opportunity
- "The signatures of the service representative and the transferee certifying the accuracy of their statements, to the best of their knowledge, along with the dates of the signatures."[46]

The guidance also instructs EPA and DoD personnel to incorporate reports from the LBP inspection and risk assessment into the environmental baseline survey (EBS). These sections of the EBS are then "referenced in the transfer agreement and referred to in the Invitation for Bids issued for public sale of the property."

Reports that identify parts of the building that have been abated or that have had controls placed on them are included in the transfer documents as part of the disclosure records. Additionally, a local government may require that the location of enclosed or encapsulated LBP be recorded with them "for future reference when construction permits for renovation are issued."[47]

The Finding of Suitability to Transfer (FOST) must "also reference the EBS report and the disclosure information for the property." In addition, the "transfer agreement or contract for sale should include disclosure statements and the agreements by which the transferee shall conduct any improvements or abatement of lead-based paint hazards, as well as any monitoring, periodic inspections, and other activities required for compliance with Title X for occupancy and future transfer of the property."[48]

Local governments are often not only consigned facilities that contain significant LBP hazards that are costly to remove or renovate, but in some cases, they are left with long-term commitments to ensure that the property is used in a safe manner due to the LBP contamination caused by the military.

Conclusion

DoD established clear policy and guidance on how the services should transfer target residential property containing LBP. The guidance seeks to ensure that DoD complies with all applicable federal regulations. However, that still does not necessarily leave local governments in an advantageous position. Firstly, DoD states in the guidance that they prefer to transfer the responsibility of abatement to the transferee when possible. Secondly, the policy only covers residential property that will be reused as such. It does not cover residential property that will be demolished or put to a different use, such as commercial. The policy also excludes nonresidential property. This is significant because, according to the abstract of a survey conducted by EPA's Region 9 office, significant amounts of lead in soil surrounding nonresidential facilities were found at four BRAC sites in California. The survey concluded that the land would still be fit for reuse as commercial land "but would be of concern if the property were to be released for unrestricted land use."[49] This raises the issue of monitoring and enforcing land use controls to ensure suitable reuse, a responsibility that ultimately falls to local governments.

Local governments are often not only consigned facilities that contain significant LBP hazards that are costly to remove or renovate, but in some cases, they are left with long-term commitments to ensure that the property is used in a safe

manner due to the LBP contamination caused by the military.

DoD guidance loosely considers the TSCA Section 408 waiver of sovereign immunity by the federal government of local administrative orders. Its policy construes this rule to mean that the agency and individual services only need to be aware that "local interest from communities […] may also have some bearing on decisions made by DoD on property transfer issues."[50] Even in cases where DoD adheres to local concerns, the guidance frames its direction in such a way as to say that the waiver of sovereign immunity only applies to LBP activity on historic residential property and LBP hazard training and certification. Conversely, the LBP regulations clearly mandate in no uncertain terms that DoD, in its jurisdiction over property or engagement in activities that created LBP hazards, is subject to and must comply with federal, state, and local LBP requirements—the same as any other nongovernmental entity. The result of DoD policy on this matter leaves the local community interest in and authority over the transfer process as it relates to LBP hazards with a minor role that may or may not be important to DoD. DoD guidance appears to contradict the intention and direct, statutory provision that necessitates the agency's compliance with local requirements on LBP hazard detection and reduction procedures and activities.

DoD states that its policy exceeds compliance with Title X requirements. However, others argue that DoD minimally adheres to Title X by passing on the costs of LBP hazard abatement in pre-1960 housing to the transferee, which in most cases is an LRA or local government. Addressing LBP as a condition of sale allows DoD to account for and assume responsibility for overseeing and ensuring the completeness of LBP hazard checking and abatement by the transferee, which keeps it in compliance with Title X, but it avoids having to pay for it and conduct the work. The "condition of sale" clause, which permits this, trades efficiency and timeliness of the disposition process for equity in bearing fiscal cleanup responsibility for originating the environmental contamination—all at the expense of transferees. The lack of Title X explicitness about federal agency steps to implement the law on federally owned facilities and HUD's interpretation that abatement will not be required if the reuse is not to be target housing permits DoD to construct less comprehensive guidance, allowing it to avoid paying for the LBP abatement.[51]

The Department of the Navy argument that "substantial threats" of LBP did not exist in nonresidential areas was made before DoD devised its LBP policy. The findings from the EPA Region 9 investigation of LBP in soils in nonresidential areas at closing military bases counter the Navy's argument. The study found "lead contaminated soil around non-industrial buildings on the closing military bases," that "the extent of contamination is […] consistent with the findings of other residential lead-based paint studies," that "large metal structures such as water towers and bridges have a larger impacted area," and that "observed maximum concentrations of lead in soil were slightly higher than what was seen in the residential survey."[52] Evidence contrary to the Department of the Navy's argument leads to the conclusion that LBP cleanup responsibility and costs passed to transferees are more substantial when factoring nonresidential property.

Notes

1 US Environmental Protection Agency, *Lead Phase-Out,* US EPA Technical Information Package (Washington, D.C.: EPA, July 2001).

2 US Department of Housing and Urban Development Fact Sheet. *HUD Sets New Requirements to Prevent Childhood Lead Poisoning in Housing Assisted or Being Sold by the Federal Government* (Washington, D.C.: HUD, accessed November 2003).

3 US EPA and US Department of Housing and Urban Development Fact Sheet. *EPA and HUD Move to Protect Children from Lead-Based Paint Poisoning: Disclosure of Lead-Based Paint Hazards in Housing* (Washington, D.C.: HUD, EPA, March 1996).

4 Ibid.

5 *Lead Phase-Out*.

6 J. Hamill, D. Opalski, D. Stralka, and M. Work, *Investigation of Lead-Based Paint in Soils in Non-Residential Areas at Closing Military Bases* (ABS #343, San Francisco, CA, US Environmental Protection Agency, Region 9, publication date of abstract not available).

7 *EPA and HUD Move to Protect Children from Lead-Based Paint Poisoning: Disclosure of Lead-Based Paint Hazards in Housing*.

8 *Lead Phase-Out.*
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Asbestos

The Impact of Asbestos on Human Health

According to the U.S. Department of Health and Human Services (HHS), "most people do not become ill to the asbestos they are exposed to"[53] (Appendix H). It is also unlikely to become ill due to one high-level exposure or a short-term exposure to low levels of asbestos.[54] In fact, according to the EPA, there are no studies available on asbestos's short-term effects on humans.[55] However, according to HHS, exposure to asbestos can become a health concern when low concentrations of asbestos are inhaled over long periods of time, and as exposure increases, so does the likelihood of illness. It can take 10 to 40 years for someone to develop an asbestos-related illness due to asbestos exposure.[56]

Asbestos can cause various illnesses, including these occupational exposure-related diseases:

- Asbestosis —"a serious, progressive disease associated with long-term exposure to asbestos that causes" scarring to lung tissue.[57] Symptoms of asbestosis include shortness of breath, difficulty in breathing, and coughing.[58] In severe cases, asbestosis can lead to heart failure due to impairment of respiratory function.
- Lung cancer—EPA has classified asbestos as a Group A human carcinogen.[59] Furthermore, "asbestos is one of the leading causes of all types of lung cancers among nonsmokers."[60]
- Malignant mesothelioma—"a rare progressive cancer of the tissue lining of the chest or abdomen for which asbestos and similar fibers is the only known cause."[61]

According to the Navy Facilities Engineering Service Center, "These diseases are normally associated with industrial exposure to asbestos fibers, however, "the extensive use of asbestos in building materials has raised some concern about exposure in non-industrial settings"[62] (Appendix I).

The presence of asbestos is not necessarily a danger as long as ACM remains in good condition and is not disturbed or damaged. However, damaged, deteriorated, or disturbed ACM can lead to the release of asbestos fibers and exposure.[63] If ACM is dry and can be crumbled by hand it is called "friable." Friable ACM is more likely to release asbestos fibers than non-friable ACM[64] (Appendix J).

Asbestos is resistant to heat and chemical corrosion, is strong yet flexible, conducts electricity poorly, but insulates effectively. Because of these unique qualities, asbestos became popular as an additive to many building materials.[65] It was often used as insulation in both commercial and residential structures, as well as in ceiling and floor tiles. Other uses for asbestos included:

- Linoleum
- Pipe gaskets
- Pipe fittings
- Fume hood liners
- Plaster
- Spackling
- Lab countertops
- Siding
- Fireproofing
- Pipe insulation
- Boiler insulation
- Electrical insulation
- HVAC duct wrap
- Tank insulation.[66]

It is important to note that, like LBP, asbestos was a widely used material in the construction of facilities and housing. The problems of abating or demolishing structures with asbestos are not unique to BRAC bases or DOD facilities, but are a common concern with renovations in all types of structures throughout the civilian sector.

HHS recommends that workers wear respirators when conducting demolition of asbestos-containing buildings. It also recommends that measures be taken to limit the amount of dust released into the air by dampening settled dust. HHS adds that workers should shower and change into fresh clothes before returning home so that they do not carry the dust home with them. These precautions will decrease the possibility of exposing themselves and their families to the hazardous material.

These measures show the danger to workers who are demolishing buildings that contain asbestos materials, and this high risk in turn creates the high cost of asbestos abatement or demolition. One of the main issues with BRAC bases is identifying the party who pays for that high cost.

Statutory and Regulatory Background

The EPA and the Occupational Safety and Health Administration (OSHA) regulate use of and exposure to asbestos. OSHA's regulations seek to protect the health and safety of individuals who may be exposed to asbestos in the *workplace.*[67] OSHA has specific regulations for asbestos in a variety of workplaces, including industry, shipyards, and construction sites.[68] EPA is responsible for enforcing regulations that seek to protect the *general public* from exposure to asbestos.[69]

EPA Asbestos Regulations

The Clean Air Act (CAA) of 1970 required the EPA to "develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health," and in accordance with Section 112 of the CAA, EPA established National Emission Standards for Hazardous Air Pollutants (NESHAP).[70] EPA promulgated the Asbestos NESHAP on April 6, 1973.[71] Asbestos became one of the first hazardous air pollutants regulated.[72]

The Asbestos NESHAP seeks to minimize the release of asbestos fibers that may occur during the handling of asbestos. It also regulates asbestos waste handling and disposal.[73] When renovating and demolishing military base structures that contain threshold amounts of regulated asbestos-containing materials (RACM), workers must adhere to practices set forth in the Asbestos NESHAP.[74] The regulations require owners and operators to notify state and local agencies and/or their EPA Regional Offices before demolition or renovation activity begins on structures that contain RACM. The Asbestos NESHAP was recently amended so that EPA could clarify existing policies and regulations and "strengthen the requirements which govern asbestos waste disposal by requiring tracking and record keeping."[75]

There are different technical requirements for RACM and non-RACM that are beyond the scope of this report. RACM means friable asbestos material and is divided into different categories: category I nonfriable ACM that has become friable; category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by forces expected to act on the material in the course of demolition or renovation operations regulated by the Asbestos NESHAP (40 CFR §61.141).[76]

The Asbestos NESHAP requires that:

- Owners and operators of all facilities to be demolished, and of facilities that contain a certain amount of asbestos which are to be renovated, must now provide more detailed information in notifications, including the name of the asbestos waste transporter and the name of the waste disposal site where the ACM will be deposited.
- "Owners and operators must give a ten-day notice for planned renovations and demolitions."
- A person trained in the provisions of the Asbestos NESHAP "must supervise operations in which ACM is stripped, removed, or otherwise handled."
- "The owner and operator must describe the procedures to be followed if unexpected ACM is found in the course of demolition or renovation, and if non-friable asbestos becomes friable in the course of renovation or demolition."[77]

EPA guidance specifies that building owners remove asbestos if public exposure is possible.[78] Exposure is likely to occur during renovation and demolition. Local government redevelopment plans for BRAC properties with ACM-containing structures often call for the renovation and demolition of such structures to make way for productive reuse of the site. By the time renovation or demolition occurs, DoD has divested itself of the ACM-containing structures by transferring the property to an LRA, which then becomes the owner and the party responsible for asbestos removal. As such, LRAs incur the high costs for removal, which diverts money from other redevelopment phases and/or interests.

In 1979, under the TSCA, EPA began an asbestos technical assistance program intended for building owners, environmental groups, contractors, and industry representatives.[79] In 1989, EPA published the *Asbestos: Manufacture, Importation, Processing, and Distribution in Commerce Prohibitions; Final Rule* (40 CFR Part 763, Subpart I).[80] The Asbestos Ban and Phaseout Rule, as it is known, prohibits the manufacture, processing, and importation of most asbestos products. In October 1991, the U.S. 5th Circuit Court of Appeals vacated most of the Asbestos Ban and Phaseout Rule; however, "it left intact the portion of the rule that regulates products that were not being manufactured, produced, or imported when the rule was published on July 12, 1989."[81]

Unlike that for LBP, DoD does not have a field guide detailing how service personnel are supposed to abate asbestos and transfer BRAC property that contains asbestos.

DoD Policy

Unlike that for LBP, DoD does not have a field guide detailing how service personnel are supposed to abate asbestos and transfer BRAC property that contains asbestos. In October 1994, the then Principal Assistant Deputy Under Secretary of Defense (Environmental Security), Gary D. Vest, sent a memorandum to the services on the subject of "Asbestos, Lead Paint and Radon Policies at BRAC Properties"[82] (Appendix K). The respective policies were attached.

The memorandum states that it is DoD policy "to manage ACM in a manner protective of human health and the environment, and to comply with all applicable federal, state, and local laws and regulations governing ACM hazards."[83] DoD directs personnel that unless a "competent authority" determines that ACM in the property poses a threat at the time of transfer, that all property will be transferred through the normal BRAC process. One possible problem with the above statement is the use of the vague term "competent authority"—the policy does not give service personnel a way to determine what person or agency is considered a competent authority.

The policy later states that ACM will be remediated "prior to property disposal *only* if it is of a type and condition that is not in compliance with applicable laws, regulations, and standards, or if it poses a threat to human health at the time of transfer of the property."[84]

This creates an issue for local governments and LRAs that are redeveloping BRAC sites, as studies (environmental baseline surveys [EBSs]) for determining whether asbestos in a building has become a hazard often occur months, if not years, prior to transfer. Often the asbestos does not pose a problem at the time the military conducts the inspection, but eventually becomes one by the time the buildings are transferred. Therefore, when the military conducts the original study, it may decide that there is no need for abatement; however, when the LRA or local government takes ownership, the asbestos may have become friable, thus creating a hazard to human health and requiring abatement and removal.

The policy orders that all available information on the "existence, extent, and condition of ACM" be included in the EBS or other appropriate document that is given to the transferee.[85] The EBS should include:

- "[R]easonably available information on the type, location, and condition of asbestos in any building or improvement on the property
- Any results of testing for asbestos
- A description of any asbestos control measures taken for the property
- Any available information on costs or time necessary to remove all or any portion of the remaining ACM; however, special studies or tests to obtain this material are not required; and
- Results of a site-specific update of the asbestos inventory performed to revalidate the condition of ACM."[86]

Many LRAs experience great difficulty estimating asbestos removal costs because they rely on outdated studies that only point to some of the asbestos.

A major issue affecting BRAC redevelopment concerns the accuracy and completeness of environmental baseline surveys. Many LRAs experience great difficulty estimating asbestos removal costs because they rely on outdated studies that only point to some of the asbestos. Often, they encounter huge cost increases because they discover previously undocumented asbestos during demolition. The redevelopment project halts while new studies, at the financial and time expense of the LRAs, identify and characterize the asbestos and as highly trained specialists conduct cleanup. This can delay a redevelopment project by years.

DoD also maintains under this policy that remediation of asbestos will not be required if the building is going to be demolished by the transferee. This policy holds regardless of whether ACM poses a hazard at the time of transfer: "[…] the transfer document prohibits occupation prior to demolition; and the transferee assumes responsibility for the management of ACM in accordance with applicable laws."[87] As stated earlier, many buildings on BRAC bases have no civilian use and must be demolished so that the site can be redeveloped. Local governments and LRAs must demolish these structures, but because of this, DoD will not fund the abatement of asbestos.

Deteriorating coastal facilities at the former Ft. Ord in Monterey, California

DoD policy requires abatement of ACM when the asbestos is considered a threat to human health and the structure containing the ACM is not scheduled for demolition. Under those conditions, abatement can be conducted by the service that used the structure (or entire base), a service disposal agency, or the transferee. If the transferee assumes responsibility for abatement, it is negotiated as part of the contract for sale.

DoD policy does not take into account the EPA NESHAP requirement for removal of RACM prior to renovation or demolition activities impacting or potentially impacting known, suspected, or assumed ACM.

Conclusion

The EPA has extensive policies regulating the demolition of structures containing ACM and the disposal of ACM. DoD's policy does not contain many details and therefore does not provide service personnel with sufficient understanding of the federal regulations concerning asbestos and the procedures for demolishing and transferring sites containing ACM. The transfer process for these sites might be expedited if a field guide, like the one that exists for LBP, was available. Enabling the proper safe transfer and demolition of BRAC sites or facilities that contain potentially hazardous ACM requires detailed formal direction to field personnel.

BRAC sites contaminated with ACM present significant concerns and financial challenges to the transferee, namely LRAs. The same regulatory safeguards that govern the handling of ACM contribute to the high cost of its cleanup. The site characterizations and baseline surveys required for DoD to conduct tend to be out of date and of limited use to LRAs. These factors encumber the LRAs ability to project the cleanup costs and ultimately delay site redevelopment.

DoD's policy to manage ACM in place, when possible, to ensure protection of human health and the environment, puts LRAs in a difficult position. DoD can assume this stance because of the way ACM becomes a hazard. The LRAs need the property, but they are often left with little option other than assuming responsibility for addressing ACM. The LRAs primary tool prior to transfer involves the use of negotiation. Assuming LRAs have accurate information about the presence of ACM, per the military service's obligation to provide such information and the need to pay fair market value, LRAs can and should negotiate down the price of the ACM-contaminated property. The services are required to consider ACM in the contract for sale.

Notes

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Lead-Based Paint and Asbestos-Containing Materials Survey

Background and Purpose

The International City/County Management Association's (ICMA) Base Reuse Consortium conducted a survey to quantify data and extract empirical evidence about the experiences of LRAs with LBP and ACM at BRAC properties. The survey was sent to approximately 100 LRA points of contact, as identified by the DoD's Office of Economic Adjustment (OEA). Sixteen responses were received (Appendix L) at the time of publication. The results, therefore, are not representative of all experiences and situations. However, they do provide a snapshot and considerable insight into to some of the challenges and successes shared by LRAs.

The initial question asked LRAs to rate the accuracy of the military's characterizations of ACM and LBP on a scale of 1 to 5, with 1 being "not very accurate" and 5 being "very accurate." On average, the LRAs reported that the site characterizations for ACM (2.9) and LBP (2.7) were accurate or partially accurate.

The next question asked the LRAs to rate cost projections for cleaning up the LBP and ACM contamination using the same 1–5 accuracy scale. On average, the LRAs reported that their cost projections for remediating ACM (2.9) and LBP (2.7) were partially accurate.

Although three of the four averages fall just short of the "accurate" mark, the more telling evidence lies in the LRAs' responses to the remaining survey questions, which are as follows:

- What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
- What has been your major reuse challenge regarding either asbestos or LBP?
- Were the costs associated with remediation of asbestos and/or LBP figured into estimates of fair market value?
- What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
- How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?

Rows of Army barracks contaminated with LBP and ACM

Findings

When the responses are aligned with the ratings given to the first two "accuracy" questions, a pattern begins to develop that belies the quantified data to give a more complete picture.

Those respondents who gave 4 ratings across the board cautioned that early detection of ACM and LBP, followed by cost assessments for removal and mitigation, are important pieces of information for community understanding and completing the reuse plans. Determining future funding requirements based on an estimated cost per building or facility has been a major reuse challenge.

Even if cost estimates for asbestos and LBP remediation are accurate, the mere presence of these contaminants drives up the costs for demolition and renovation. One LRA rated cost estimates as "accurate" and noted that these cost increases were passed along to the tenant or purchaser. When identifying a potential developer's impact-mitigation responsibilities, the establishment of monitoring and enforcement procedures can help ensure developer accountability to the reuse plan goals. The same can be done for an inspection group.

One anomaly has more to do with luck than anything else. If the contaminated property has a higher and better reuse potential, then the cleanup of LBP and ACM should be manageable and affordable despite initial characterizations. However, by performing accurate assessments from the beginning, sellers can protect their profit margins by avoiding costly and lengthy inspection delays.

The high cost and length of time it takes to clean up these contaminants, even with mostly accurate site characterizations and cost estimates, lead many respondents facing asbestos and/or LBP problems on their BRAC properties to make the following recommendations:

- Make the extent and magnitude of the problem immediately known to the military service, Congressional representative, and local leaders
- Ensure that environmental contractors have state certification and specialize in asbestos and LBP inspection
- Proactively involve the state environmental department
- Establish monitoring and enforcement procedures for developers responsible for remediation and groups responsible for inspection
- Determine the quantity and size of abatement projects that offer ideal efficiencies in terms of dollars and timed saved.

LRA representatives suggested the following improvements for the process of remediating and transferring BRAC properties with these contaminants:

- Require military services to conduct comprehensive asbestos and LBP inspections on every building throughout the site using either an independent third party or their own team. After inspections are performed, military services should prepare a document that estimates the total cost for abatement; DoD should either fund the entire abatement or reduce the purchase price by the abatement estimate
- Establish and fund a formal mentoring program between LRA staff on different bases that share similar attributes and challenges
  - Standardize a curriculum
  - Have state and federal regulatory authorities provide a one-day seminar that outlines what is expected of LRAs, where their responsibilities begin, and the impacts of their decisions
- Modify the process to act more like the brownfields program, one for which a proactive, community-based organization oversees the environmental investigations and implements remediation strategies in line with reuse plans
- Involve the selected developer to save staff resources and expedite remediation and conveyance negotiations with the military service
- Use long-term planning and budgeting where sufficient and accurate data are present
- Shift the military's responsibility from containment to remediation of friable asbestos
- Protect the LRA and community by obtaining an insurance policy that overrides DoD's indemnification.

There appears to be a significant gap among LRAs as to the availability of inspection and cleanup accountability and enforcement mechanisms. LRAs that have trouble attracting developers to their contaminated property are not likely to make it more difficult to interest prospective buyers by adding cleanup requirements to the deal. Even with "very accurate" characterizations and cost estimates, the extent of contamination and the cost-prohibitive nature of cleanup reduce the reusability of the property and increase the risks to developers. Under such circumstances, the communities lose potential jobs and income.

Essentially, developer interest stems from the marketability of the property. Some LRAs cope with extensive contamination by passing along cleanup costs because the geographic proximity of the property to utilities, transportation, existing commercial corridors, residential settings, recreation areas, or—in some cases—heavy or light industry affects the marketability and, thus, the cleanup enforcement measures of any given property. Those LRAs with contaminated BRAC property not situated near or among this infrastructure must find alternate means of compensating for cleanup costs. This becomes especially problematic when ACM and LBP hazards are hidden, which is why accounting for the potential discovery of these contaminants is so important.

Finally, the survey found that factoring LBP and ACM remediation costs into a property's fair market value comes in different forms at varying levels. Some respondents were unaware of exactly how the fair market value was calculated. In some cases, it was not applicable, given that property was transferred under a no-cost economic development conveyance or a public benefit conveyance or was being leased. Some communities were able to have abatement costs included as part of fair market value, albeit on a limited basis and with financial repercussions in terms of receiving lower net rental income. Some of the military services only counted demolition costs and used abatement estimates only for buildings that were not intended for reuse. One service included only small amounts of rehabilitation costs in fair market value. Approximately one-third of the respondents indicated that fair market value did not include LBP and/or ACM abatement costs.

These findings lead to questioning the fairness of fair market value. It appears that the

military's fair market value is not entirely representative of the actual condition of the property. The purpose of this study was only to uncover the results of how the contaminated property was transferred. Given this limited nature, only inferences can be drawn as to how the negotiations between the military and the communities transpired.

The Former Fort Ord Building Removal Program

Summary

The Fort Ord Reuse Authority (FORA) is responsible for the removal of more than 1,200 obsolete and deteriorating structures, many of which have LBP hazards and/or ACM. The need to remove this vast, blighted ghost town is urgently supported by every jurisdiction in the Monterey Bay Region. These buildings have become a public safety issue, not to mention a visual blight along the Highway One Beautification Corridor. Moreover, they have increasingly attracted criminal activity to the area and have potentially released hazardous contaminants that may leach into the soil or wash into the adjacent Monterey Bay Marine Sanctuary.

These substandard, deteriorating structures present the single most significant barrier to the reuse of the former Fort Ord. Program seed funding will enable the removal effort to begin without the procurement of any other revenue source, while land sales revenues will be used to pay for the remaining $70 million to $90 million required for building removal.

FORA has developed a comprehensive multiphase, multiyear Building Removal Program based on sustainable development principles and practical knowledge derived from the previous FORA Pilot Deconstruction Project and Lead Based Paint Remediation Demonstration Project, which were funded by the David and Lucile Packard Foundation and Preston Park Revenues.

The critical first three phases of the Building Removal Program will require approximately $50 million in funding and will:

- Allow for coordination with the U.S. Army's World War II Building Removal Research Program so that it, as well as the Building Removal Program, can realize cost and efficiency benefits
- Remove hazards to the public and the environment
- Provide an example of building removal and contaminant disposal for other closed bases
- Remove visual blight.

FORA's portion of the land sales proceeds will finance subsequent phases of building removal until complete.

The early phases of the Building Removal Program will provide the means for a sustainable program to continue until the entire blight is removed. The benefits for the entire Monterey Bay region substantially outweigh the investment of the anticipated $75 million to $90 million in total building removal funds, leveraging many times this sum in business opportunities, land sales revenues, and employment, while removing the need for tremendous long-term public safety and environmental remediation costs.

Introduction and Background

The Fort Ord U.S. Army Military Reservation, which opened in 1917, served as a training base and temporary home to millions of soldiers. The base totals 45 square miles, almost the same size as the city and county of San Francisco, and encompasses 28,000 acres, with over 7,000 buildings, which were developed to provide training, housing, and services, on approximately 6,000 acres. The former Fort Ord is situated on four miles of undeveloped Monterey Bay coastline and in the county of Monterey, California, which is in the heart of the Monterey Bay National Marine Sanctuary and extends approximately six miles eastward to the Salinas Valley. The county is 106 miles south of San Francisco and 241 miles north of Los Angeles.

Fort Ord played a central role in the economic vitality of the Monterey Bay region. The closure announcement in 1991 created significant local concern regarding the impacts to populations and economies of adjacent Santa Cruz and San Benito counties. More than 30,000 military and civilian personnel were relocated from the area. Monterey County, which has a full-time work force of more than 180,000 workers, contains two major urban areas, Salinas and the Monterey Peninsula. Agriculture and tourism account for the county's dominant industries. Transportation between these two major population centers is impossible without crossing a portion of the former Fort Ord.

The reuse of the former Fort Ord will require the removal of a substantial number of structures and facilities. There are approximately 1,200 World War II (W.W. II)-era buildings that served as temporary structures, do not meet current building or seismic codes, are heavily contaminated with LBP, and have substantial amounts of ACM. The lands that occupy these buildings are the primary areas where the redevelopment and reuse will occur (and has occurred). These substandard facilities are in the process of removal to make way for the economic reuse program of the property. In addition, 1,100 housing units of varying ages may need to be removed due to deterioration and vandalism. Add to these approximately 1,600 units of housing to be replaced by the U.S. Army, and the total removal involves more than 4,000 structures.

To promote the early success of the Fort Ord reuse, the Building Removal Program seeks to abate visual impacts and hazardous materials, resulting from substandard facilities, in the human environment. FORA used the U.S. Army's baseline data to estimate the cost of building removal under the bid-cost process at approximately $75 million (2002 dollars). The resulting redevelopment and reuse are anticipated to absorb up to 10 years of Monterey County's population growth and will work to protect Salinas Valley farmland from being utilized for development needs.

In 1994, FORA was (and remains) tasked by the state of California to facilitate the transfer of Fort Ord from U.S. Army ownership to the local jurisdictions. Governed by a 24-member board comprised of local, state, and federal representatives, FORA prepared and adopted the FORA Base Reuse Plan and Capital Improvements Plan in 1997. Guided by sustainable development principles and conservation measures, the plan seeks to stimulate the economic recovery of the area and to incorporate a phased financing structure to remove the obsolete buildings that prevent redevelopment and reuse. This comprehensive plan addresses specific issues of land reuse, transportation system development, land and water conservation, recreation, and business opportunities. The base reuse plan of the former Fort Ord includes approximately 7,500 acres for economic, educational, and institutional development over a 15-year period; 20,500 acres

for habitat, open space, and recreational uses; and a wide variety of programs and projects provided by a number of organizations to benefit the community.

Pilot Deconstruction Project

Collaborating with the University of California Santa Cruz (UCSC) Extension and the Presidio of Monterey BRAC Office, FORA sought funding to establish a specialized program that would test the feasibility of an environmentally effective approach to remove approximately 4,000 substandard structures and to abate the remnant hazards. The project began through the UCSC Extension Extra-Ordinary Program and transformed into the Pilot Deconstruction Project (PDP) in 1996 when FORA received a generous grant from the David and Lucile Packard Foundation to deconstruct five distinct building types, relocate three buildings, remodel three buildings, and monitor the cost, timing, and job creation results of each effort. The latter responsibility was central to testing the potential to reuse materials within the structures and to examine options for filling the limited landfill space with ACM and lead-contaminated building materials.

An exploration of the different alternatives led to certain discoveries about LBP and ACM regulations, worker training, building materials, and building reuse. Comprised of representatives from the regulatory agencies, politicians, contractors, and citizens, the PDP Technical Support Group assessed the project's progress and provided guidance on applicability of regulations on worker safety, hazard abatement, and acceptable reuse and disposal scenarios. One PDP lesson found that applying lead and asbestos regulations depends on the structure's type, size, previous and end use, owner, and location and relocation. A set of worker training guidelines on lead training, blood-level monitoring, and training in deconstruction techniques that emphasize the value of material emerged as a result of the PDP's work. FORA's experiences led to other discoveries and lessons:

- Profiling the building stock by type can aid in salvage and building removal projections

Demonstration for asbestos removal

LBP encapsulation method

- Deconstruction effectiveness increases as the speed of segregating and processing materials to meet specific market needs increases
- Know the history of buildings. In Fort Ord's case:
  - Reusing materials is complicated by the presence of LBP, which was originally thinned with leaded gasoline and resulted in the contamination penetrating the substrate material
  - Each building has a unique maintenance and repair history, which complicates hazardous material abatement projections
- Conducting additional field surveys augments existing U.S. Army environmental information; in Fort Ord's case, approximately 30% more ACM were found than previously identified
- LBP restricts the reuse and relocation of buildings from areas where there is potential for contact with children

- Hazardous material abatement accounts for almost 50% of building removal costs on the former Fort Ord
- Develop a program for systematically inspecting for and evaluating unknown hazardous materials early in reuse and cleanup planning
- Post-deconstruction soil sampling showed that deconstruction activities did not create any LBP soil contamination.

These discoveries can be generalized or investigated further for use by other LRAs. At the very least, they could serve as a starting point when dealing with LBP and ACM contamination at BRAC facilities. The most important lesson to take away from all this is that LBP impacts all aspects of building removal, including project planning, worker safety, material reuse, material disposal, site cleanup, and site redevelopment.

The efforts of the PDP were coordinated with:

- The 17th Congressional District Office
- U.S. EPA
- United States Department of Agriculture (USDA) Forest Products Lab
- California Department of Toxic Substance Control (DTSC)
- Regional Water Quality Control Board (RWQCB)
- Local jurisdictions
- Private industry.

Building on the efforts of and input from these parties lead to the creation of a decisive program for environmentally sensitive removal and disposal of buildings that could have impeded the sustainable reuse of the former Fort Ord.

Building Removal Program

Currently, FORA is implementing the Building Removal Program on a small scale based on those discoveries of the PDP that complement the Base Reuse Plan. The FORA Building Removal Program implements an organized, efficient, environmentally friendly, cost-effective, and self-sustaining program to remove the remaining obsolete buildings from the former Fort Ord. The program's flexibility allows FORA to respond to the communities' needs, changing regulations, individual site considerations, economic shifts, emerging financial opportunities, technological advances, and deteriorating building stock. The program must anticipate where building removal will be most pressing and then work according to that need. The total timeframe for building removal will be three to seven years, depending on a variety of factors ranging from availability of funding to the technological approaches that address remnant contaminants. The Building Removal Cost Estimates and Program Budget are detailed in Appendix M.

The resource-constrained nature of the Base Reuse Plan directs FORA to remove buildings with funds derived from the sale of the land occupied by these structures. However, the property is currently still in federal hands, and the "contaminated" nature of the buildings is an impediment to the private sector (banks) funding early costs using the property as collateral. Once the property is cleared and prepared for development, traditional bank financing can be sought. Until then, FORA is challenged by unique circumstances that require non-collateralized seed money to initiate building removal.

The Building Removal Program has worked directly with the Monterey Regional Waste Management District (MRWMD) as it seeks a variance from DTSC to dispose of the LBP-contaminated building materials at the Marina Landfill. The waste disposal variance request consists of three steps. Step 1 involves proper waste classification and concurrence from DTSC that the waste meets the criteria of "Special Waste." Step 2 approves a variance to bring the waste to the landfill facility. Step 3 allows the material to be shipped from the former Fort Ord to the landfill facility without the use of a hazardous waste hauler. Currently, DTSC is working on the final approval or disapproval of the Special Waste classification (Step 1). DTSC will not begin work on steps 2 and 3 until it has first completed step 1, which is expected in the near future.

The Building Removal Program will benefit from the FORA PDP and LBP Remediation Demonstration Program to accurately identify the LBP contamination levels on the building materials that are not safe for reuse or recycling. The Building Removal Program, in conjunction with the Fort Ord LBP Inter-Agency Working Group, has been working to identify technologies that can economically reduce the solubility of the contaminated lead so that land filling of this material is secure.

The effects of changing LBP regulations on labor, materials sales, site cleanup, and removal techniques are major, ongoing concerns. The PDP and the Monterey Bay Regional Air Pollution Control District organized the Fort Ord Lead-Based Paint (LBP) Inter-Agency Working Group and facilitated its meetings to assist the Building Removal Program with navigating the ever-changing myriad of LBP regulations. As an offshoot of the PDP's Technical Support Group, this group coordinated the efforts of all regulatory agencies concerned with the building removal and disposal of building materials. Additionally, the Fort Ord LBP Inter-Agency Working Group provided guidance to the LBP Remediation Demonstration Project in an effort to collect relevant LPB contamination data and best remediation practices from the 26 representative W.W. II wood structures of a recent road realignment project. These meetings broke new ground in the level of interorganizational cooperation. Regulatory agencies and land developers continue to work together to identify and eliminate potential problem spots and to streamline testing and sampling protocols that serve the needs of multiple agencies and provide added environmental protection.[88] The PDP collected LBP field data from building material and soil and related it to current regulations for public exposure, worker exposure, and waste disposal hazards according to the U.S. EPA standards for Total Threshold Limit and Soluble Threshold Limit Concentrations and the California Waste Extraction Test. Limited air monitoring during building removal activities has been preformed. Data derived from this testing will be used to guide the Building Removal Program. The LBP Inter-Agency Working Group will utilize this information to protect the public, ensure worker safety, and ensure proper disposal—critically important information when determining which building materials can be safely diverted from the landfills, reused, or recycled. The LBP Inter-Agency Working Group is tasked with providing program guidance, a level of fiscal accountability, and a monitoring progress on program goals.

Capitalizing on FORA'S Previous Building Removal Work

FORA brings hands-on experience to its Building Removal Program. Lessons in salvage values and techniques were gained from the PDP experience by dismantling representative W.W. II structures. It continues to prove valuable in predicting the eventual process for removal and narrowing cost projections of the Building Removal Program. It is important to note that this type of salvage operation (approximately 20% by weight for wood structures) does not appear to be able to economically support itself but, most likely, will need to be performed in coordination with standard demolition activities. The FORA "Hierarchy of Building Reuse," developed directly from the field experience, market studies, and industry input, prioritizes the most efficient reuse of obsolete buildings, focusing on the concepts that will produce the most savings: (1) renovation and reuse in place, (2) relocation and renovation, (3) deconstruction and reuse of building materials, and (4) mechanical demolition with aggressive recycling.

88 The Fort Ord LBP Inter-Agency Working Group is comprised of one Industrial Hygienist from Forensic Analytical and representatives from the following agencies: California Department of Health Services; CAL/OSHA; California Department of Toxic Substance Control; California Integrated Waste Management Board; City of Marina; City of Seaside; County of Monterey, Department of Environmental Health; Fort Ord Reuse Authority; Fort Ord BRAC; Monterey Bay Unified Air Pollution Control District; Monterey Regional Waste Management District; Presidio of Monterey, Directorate of Environmental and Natural Resources; Regional Water Quality Control Board; and the University of California and reuse the materials and Santa Cruz Extension.

Building deconstruction and relocation cleared the way for the 12th Street Realignment

FORA's experience from 2000, in terms of the Hierarchy of Building Reuse priority number 2 (relocation and renovation), led to an adjustment in the Building Removal Program. Twenty-six buildings in the 12th Street Realignment corridor were offered to the general public for relocation and reuse, if hazards were abated and recipients bore all costs. As a result of the offering, the Marina Coast Water District attempted to relocate one building. Consumers found that the cost to relocate and meet current building codes precluded reuse of these structures as residences and offices, and that local house-moving firms were completely inundated with the construction boom of 1999. This experience and analysis suggested that no more than 5% of buildings on Fort Ord were salvageable by relocation.

During the 12th Street Realignment, public-sector efforts to relocate the buildings made way for the first use of private-sector contractors to deconstruct buildings (at a cost of $13 per square foot) and reuse the materials on the former Fort Ord. It signaled the largest volume of Fort Ord buildings to be removed to date. Contractors conducted upfront testing of standing buildings, which allowed for source separation and presented a more accurate picture of hazard location, type, and extent. The remaining buildings underwent sampling and testing for LBP at the direction of the LBP Working Group and for asbestos by the Monterey Bay Unified Air Pollution Control District. The selected building removal contractor recycled 60–70% of the non–LBP-contaminated or clean materials. FORA used the proprietary technology of a private contractor, MT2, to reduce disposal costs. The experiences gained during the 12th Street Realignment project will be incorporated, like the work of the PDP, into the FORA Building Removal Program.

Ideal Building Removal Program

As a direct outcome of its years of work in addressing the complex issues associated with the removal of W.W. II vintage wood structures from the former Fort Ord, FORA developed the concept of the "Ideal Building Removal Program." The comprehensive program combines:

- Deconstruction techniques expedited with the speed and efficiency of heavy equipment use
- Training opportunities
- Livable wages to removal workers
- Local contracting and labor
- Abatement and conversion (where possible) of hazards to safe, usable products
- Production of usable energy.

Critical elements of the Ideal Building Removal Program include:

- Formal recognition and support by the state of California and the U.S. government for the building removal effort
- Coordinated state and national support efforts so that LBP-contaminated building materials can be quickly and efficiently disposed of in a controlled, cost-effective, and streamlined manner
- A state and federal partnership specifically set up to fund and regulate the removal of obsolete military buildings
- Support by strong state and national efforts to harmonize regulations and financial assistance that focus on unlocking the state's long-term savings and economic development opportunities after building removal and to mitigate the upfront fees that are typically charged by regulatory agencies during a building removal process
- Maintain local or regional control of building removal efforts
- Funding to develop and periodically refine the comprehensive building removal program until all building removal is completed (grant funding equal to approximately 1% of base-wide building removal costs upfront to develop a base-specific comprehensive building removal plan)
- Access to seed funding to begin building removal and unlock land value; seed funding allocated for:
  - A no- or low-interest five- to seven-year loan of approximately 25% of base-wide building removal cost specifically earmarked as seed funds for building removal
  - Ongoing technical assistance
- Employing a full-time building removal specialist to shepherd a comprehensive building removal program.

Local Government Involvement

To prepare for the transfer of lands from Fort Ord to their jurisdictions, the local governments of the county of Monterey and its component cities began to outline specific plans that would define their roles as stewards of the property. The local governments were anxious to keep open all alternatives for foreseeable development opportunities and, together with FORA, were able to draft a joint review to frame a basic, model agreement with potential developers. The evaluation criteria, which provide guidance for the local governments and ensure the availability of a variety of development options, included:

- Coordinating building removal priorities with known and anticipated development schedules
- Coordinating building removal with available funds
- Pacing building removal activities with need for roads and other infrastructure
- Coordinating and capturing income-producing opportunities with building removal
- Identifying feasibility of building reuse based on a report from FORA evaluating reuse opportunities under the FORA Reuse Hierarchy
- Developing land and buildings efficiently.

Criteria evaluated by FORA included:

- Facilitating land sales revenue to pay for building removal as base-wide costs
- Optimizing building removal costs and funding
- Removing obsolete buildings in Economic Development Conveyance (EDC) parcels
- Eliminating Highway One corridor impacts.

The three-step building removal process requires FORA and staff of component cities to review and make suggestions for building removal phasing based on the priorities of public and environmental safety needs, priorities defined by the cities' specific development plans, and road and infrastructure needs. Next, it requires city council approval, which incorporates city planning-department review. Finally, the removal requires FORA Board approval, which is advised by an administrative committee consisting of city and county managers and their counterparts in the FORA Ex-Officio Member Organizations.

Private-Sector Involvement

Key to implementing a Building Removal Program at the former Fort Ord is educating and interesting private industry in the findings of the PDP and using them to meet the needs of the local communities at the former Fort Ord. Some of these needs are contract and job opportunities, minimizing the burden of building removal costs, removing the blight and liability of degrading buildings, clearing land for new development opportunities to reuse, and maintaining the momentum needed to successfully reuse the former Fort Ord. FORA has crafted a request for qualifications that has resulted in a short list of building removal contractors that display the interest in, knowledge to, and experience to make a progressive Building Removal Program work.

Ideally, the Building Removal Program will base its request for proposals on the past request for qualifications work. The top three resulting proposals will be reviewed with the contractors to ensure that all parties understand the Building Removal Program's goals and to provide the contractor the opportunity to detail how these goals will be met.

The PDP also developed a request for proposals for worker development training. Training is anticipated to enable local workers to effectively engage in job opportunities in the Building Removal Program. Advanced training is anticipated to target workplace ethics, life management skills, job site safety, and personal fitness conditioning to meet the needs of the job and to prevent injuries. Successful trainees will be interviewed for job opportunities by the building removal contractors. The initial period of their employment with the building removal contract will be probationary and include on-the-job training that is supplemented with additional classroom skills as needed. The graduates will receive a certificate that recognizes their new skills and accomplishments attained through their classroom and on-the-job training.

The objective is to identify a training provider capable of training workers to accomplish the employment goals of the Building Removal Program and the needs of the building removal contractor. By doing so, the graduates will be knowledgeable of the necessary skill sets to maintain a successful career in the construction industry.

The Building Removal Program will coordinate, supplement, and support FORA's existing worker training programs and Contractors Academy. In response to local concerns expressed during base closure and reuse, FORA has implemented database and training programs to enable and assist local small and disadvantaged contractors to compete for jobs in the redevelopment process.

A Contractors Academy, with workshops provided by Hartnell Community College, has been created to provide construction contractors with the necessary training to successfully compete for contracts at the former Fort Ord. The academy offers a six-session program to assist contractors with starting a business, estimating work, contract law, permit processing, project management, and organizational management. The academy is currently being managed by the Local Builders Exchange.

Military Involvement

The U.S. Army's W.W. II Building Removal Program is extending its limited resources by working cooperatively with the U.S. Army to test state-of-the-art building removal technologies on the remnant Fort Ord building hazards. The Army has been directed by the U.S. Congress, under specific language in the 2001 Defense Authorization Bill introduced by Congressman Sam Farr, to find and locate at the former Fort Ord a test for new thermo-chemical treatment technology for hazardous wastes. The successful process(es) will be required to reduce the hazardous materials in the Fort Ord buildings to a nonhazardous reusable material. The Defense Authorization Bill language has since been modified to direct the U.S. Army to test other emerging technologies in order to determine their effects on and costs related to addressing the removal needs of the wooden, W.W. II–era buildings.

The Red River Army Depot

The Red River Army Depot was established in 1941 as an ammunition storage facility. The installation is located in the northeast corner of Texas in Texarkana, in central Bowie County. Texarkana is unique in that it actually comprises two cities with the same name: one located in Texas and the other located in Arkansas, connected by a manmade line called State Line Avenue, which runs through downtown. The 19,000-acre installation is located on land that contains mostly semi-improved acreage in pine and hardwood forests. Those areas include approximately 1,400 buildings consisting of ammunition igloos, standard magazines, warehouses, administrative offices, a training center, and other facilities.

In July 1995, the Base Realignment and Closure (BRAC) Commission recommended realigning Red River Army Depot by moving all maintenance missions, except for those related to the Bradley Fighting Vehicles, to other depot maintenance activities. The installation retained its ammunition storage mission, interim training center, and rubber production facilities. The Red River Commerce Park was developed by the Red River Redevelopment Authority to create a sound economic development program for Bowie County. The 765 acres transferred from the Red River Army Depot were used to conduct business activities within a community setting and established an industrial framework.

As part of the BRAC transfer process, legislation allows the military departments to transfer land from BRAC bases at or below fair market value, provided the property is used for job creation, and that any future benefits are reinvested for seven years in the economic redevelopment of the installation and the surrounding community. The Economic Development Conveyance (EDC) and no-cost EDC processes reduce the long, contentious price negotiations between communities and the military, thereby leading to final property transfer. The intended result is for communities to receive the property quicker, begin redevelopment sooner, and replace jobs faster. The military benefits from quick property transfers by reducing its operations and maintenance costs.

Unlike the no-cost EDC process, the EDC disposal process, which was used at Red River, calls for upfront cash payments to acquire surplus property for industrial-commercial purposes and for most residential uses. According to the Red River Redevelopment Authority Executive Director, Duane Lavery, most LRAs neither require the military services to identify all the asbestos in or LBP on buildings nor

review the information if available. As a result, there is a lack of information about the extent of LBP and asbestos—essential information for calculating the worth of facilities transferred according to the EDC process.

Asbestos and LBP severely increase demolition costs to an LRA. At Red River Army Depot, demolition of Building 161, a 19,000-square-foot warehouse originally constructed in 1942 and now part of the Red River Commerce Park, had an estimated cost of demolition of $117,000, or $6 per square foot. Because of the asbestos in and LBP on the primary wood structure, the actual cost was $160,000, or $8.72 per square foot. Much of the increased costs were due to the removal of asbestos floor tiles and gypsum wall panels and moving the debris containing LBP to an approved landfill. To demolish the building due to asbestos and LBP resulted in a 30% cost increase, or an additional $52,000.

The problem for the Red River Commerce Park was that the Army only noted that there were 800 square feet of asbestos floor tile in the building. The survey did not indicate that there were gypsum wall panels, which contain friable asbestos. As a result, the LRA bore the increase in costs for demolition of the building.

Some of the lessons learned from Red River Commerce Park were that LRAs should review all LBP and asbestos information carefully prior to the transfer of facilities. Additionally, the military services should seek to identify all the asbestos, friable and non-friable, and LBP in all buildings being transferred. The services should provide the LRA with this information to correctly reflect the true costs for rehabilitation and/or demolition of the buildings with LBP and asbestos. The LRA should also be provided the information to use in calculating the worth of facilities during the EDC disposal process.

George Air Force Base

Land use controls (LUCs) have become increasingly important in the cleanup of closed and closing military bases, Department of Energy (DOE) sites, and other federal facilities. The focus of environmental cleanups at these sites has shifted from full remediation of contaminated land to the establishment of cleanup standards based on the current or next anticipated land use, a trend that applies equally to federal facilities, brownfields, and private Superfund sites. To ensure the health and safety of local citizens and the environment, land-use-based cleanups require restrictions on property use.

Additionally, military/federal facility sites often have unique contaminants not typically found at other sites, including unexploded ordnance (UXO) and radiation contamination, that cannot be remediated to unrestricted use standards. Thus, at military/federal facility sites, LUCs are primarily employed in lieu of complete remediation for the following reasons (or combination of reasons):

- A determination has been made that the redevelopment and reuse of the property (as directed in the reuse plan and subsequent documents) do not require remediation to unrestricted use standards
- The costs associated with remediating the property to unrestricted use standards make reuse infeasible
- The contamination simply cannot be completely remediated due to a lack of technology.

George Air Force Base (AFB) covers 5,339 acres, which includes two runways, 6.3 million square feet of ramp space and facilities, 1,641 units of housing, a hospital, dormitories, and various buildings and industrial structures. The former AFB is located in the city of Victorville, California, in the Mojave Desert, approximately 90 miles northeast of Los Angeles.

In 1988, George AFB was scheduled in the first round of base closures passed by Congress. The base was officially decommissioned in December 1992. In 1993, President Clinton announced a "Five Part Plan" to speed economic recovery in communities where military bases were to be closed. One part of this plan called for improving public participation in the bases' environmental cleanup programs. George AFB was among a number of installations where environmental cleanup was placed on a "fast track" so that base property could be quickly transferred to the community for reuse.

Asbestos has become one of those contaminants for which the costs associated with remediating a parcel to unrestricted use standards can be considered infeasible. At the former George AFB, LUCs are used in every lease where asbestos or LBP has been found. The LRA, as the lessee, passes on the controls to its sublease tenets. All of the controls are then recorded in the city of Victorville's planning department.

Landfills, specifically landfills that contain asbestos or debris with possible asbestos, are areas where LUCs are being used for asbestos control rather than full remediation. Through due diligence and a site investigation, the LRA determined that the waste at a landfill containing asbestos and debris is nonhazardous if undisturbed. As such, the LRA and the city of Victorville placed land use restrictions with the planning department and placed warning signs on the site to serve as physical controls. The site posed no public health hazard. Access to the site is restricted, and the airfield operations retain control of the site.

Additionally, the former George AFB had scattered sites of wreckage and parts from aircraft and airfield operations. One site had the buried wreckage of an F-111. The aircraft wreckage may contain hazardous materials; specifically, the wings may contain asbestos. A geophysical survey detected the debris. Shallow soil borings indicated that at least three feet of fill materials cover the wreckage. The Air Force instituted a deed restriction when the property transferred to the LRA to prohibit disturbance of the wreckage through contraction, digging, etc. The site was determined to pose no threat to public health. Access to the site was limited in the past and is now restricted by the three feet of cover. The deed restriction was recorded in the city of Victorville, and signs were posted to warn of the debris.

Demolition costs for 1,400 substandard and "worn out" housing units ranged from $800 to $1,400 per unit. Private corporations looking to capitalize on the large hangars at former airfields can be a source of outside funding for LRAs struggling with the costs of asbestos and LBP remediation. General Electric is building a $17 million hangar that had scattered debris containing asbestos tile. However, the city of Victorville still needed to put in place deed restrictions in order to ensure protectiveness against and awareness of contamination at the site.

The trend on many closed facilities is that the services are walking away from asbestos and LBP, leaving the LRA to pay for the testing, cleanup and remediation, or the long-term enforcement and monitoring of LUCs. Reusing military housing is particularly challenging for LRAs because much of the housing stock contains both contaminants. In the case of George AFB, the use of Public Benefit Conveyances for some parcels did not help the LRA pay for the costs associated with LBP or asbestos. The LRA had to pay for all the testing on its leased buildings, although the Air Force gave the LRA volumes of studies concerning asbestos. During the initial talks with the community, the Air Force maintained that it would remediate and clean up the site, but not the LBP or asbestos. Conversely, the George AFB experience shows that information overload can adversely affect and hinder cleanup and reuse determinations in terms of cost and time.

Appendix A

EPA United States Environmental Protection Agency

LEAD PHASE-OUT

TABLE OF CONTENTS

INTRODUCTION

Lead is a toxic metal which has no known function in the human body; indeed, all recorded effects of lead on living organisms are detrimental. We know that lead bioaccumulates and that it persists in living organisms. In its pure form, is not changed by exposure to sunlight, air or water.

In addition to posing a threat to human health, acute lead toxicity can produce detrimental effects on eco-systems. These effects include low growth rates in plants; developmental, reproductive and nervous system problems in mammals, birds, and fish; and, in severe cases, death. Lead is highly toxic to aquatic life, particularly in soft water. Since lead bioaccumulates in the tissues of living organisms, it can result in secondary toxicity in animals and humans at the top levels of the food chain.

Physical characteristics of lead: Lead is a bluish-gray metal found in small amounts in the earth's crust. It occurs naturally and is typically present as lead oxide, lead salts and organic salts. It is also highly dense, malleable, resistant to corrosion, and has a low melting point -- characteristics which account for its continued use in a variety of manufacturing processes. (Lead is heavily used in battery production, as well as in the manufacturing of ammunition, solder and pipes, pigments, cable coverings, bearings, caulking, roofing, X-ray shields, and in some ceramics and crystal production. Leaded gasoline, leaded paints and cottage industries such as battery production, smelting and recycling are important contributors to a wide-spread lead exposure problem, especially in economically developing nations).

MAJOR SOURCES OF EXPOSURE

The major sources of lead exposure are:

- Breathing air containing lead: Lead in air comes from multiple sources, including the burning of leaded fossil fuels; lead smelting, refining and manufacturing industries; and tobacco smoke.

- Ingestion of lead-based paints : These paints may result in high levels of lead both indoors and outdoors as the paints age and degrade. Ingestion of lead-based paint chips is especially dangerous to infants and young children.
- Drinking water which has passed through lead pipes or lead soldered fittings.
- Breathing or ingesting contaminated soil, dust, air or water near waste sites , which frequently contain lead;
- Eating food grown on soil which contains lead, or which is covered with lead-containing dust, or which has been stored in tins containing lead solder.
- Occupational exposure: Occupational exposure is particularly common in lead-acid battery manufacturing and recycling; shipbuilding; iron processing; painting, resurfacing and demolition of steel structures; radiator manufacture and repair; scrap metal; firing ranges; fishing weight production; leaded glass manufacturing; lead ore production and smelting; recycling operations.

HEALTH EFFECTS OF LEAD EXPOSURE IN HUMANS

Lead poisoning is a particularly insidious public health threat because people exposed to harmful levels of lead usually do not show immediate or clear symptoms of such exposure. Consequently, standards to control absolute toxicity cannot be set as there is no reference dose (RfD). Since lead is pervasive and exposure to lead is common, no true "control" group exists for sensitive populations such as young children, and an exposure threshold for health effects cannot be identified at present. It is probable that no safe exposure level exists for lead since even limited exposure levels have been linked to some health threats.

Lead has no biological function in humans, though it is readily absorbed through the gut and persists in both blood and bone. The amount of lead absorbed from the gastro-intestinal tract of adults is typically 10-15% of the ingested quantity; for pregnant women and children, the amount absorbed can increase to as much as 50%. The quantity absorbed increases significantly under fasting conditions and in people suffering from iron or calcium deficiency.

Once in the blood, lead is distributed primarily among three compartments - blood, soft tissue (kidney, bone marrow, liver and brain), and mineralizing tissue (bones and teeth). Mineralizing tissue contains about 95% of the total body burden of lead in adults. The rate of lead uptake decreases as the dose increases, and a healthy diet can help reduce the absorption of ingested lead.

For additional information on the risks which lead can pose to human health, consult:

- EPA/600/D-86/185 Lead Exposures in the Human Environment (1986)-- Overview on lead exposure in humans; describes how exposure sources of environmental lead are determined; discusses how an exposure baseline is estimated and how other factors may then be added to complete an estimate for lead exposure. This publication may be ordered from EPA's National Service Center for Environmental Publications (NSCEP).

- EPA/440/4-85/010 Exposure and Risk Assessment for Lead (1985)-- This document contains a risk assessment for lead based on U.S. data. Areas studied include identification of lead releases to the environment during production, use or disposal of lead-containing substances; the fate of lead upon entering the environment; and ambient levels to which different human populations and aquatic life are exposed. Exposure levels are estimated and toxicity data available are presented and interpreted. Information on these different areas is then combined to assess the risks of lead exposure to various sub-populations. This publication may be ordered from EPA's National Service Center for Environmental Publications(NCEPI).

For on-line information from EPA on the health effects of lead and lead compounds, refer to the Health Effects Notebook for Hazardous Air Pollutants.

Also see the EPA Office of Emergency and Remedial Response's Lead and Human Health web site.

EFFECTS OF LEAD ON ADULTS

In adults, exposure to lead can damage the peripheral nervous system, affecting memory, vision, muscle coordination, and causes weakness in the fingers, wrist or ankles. Absorption at high levels can damage kidneys, result in anemia and miscarriage, and decrease fertility in both men and women. Studies have also shown that lead acetate and lead phosphate are carcinogens in animals. The effects of chronic low levels of lead exposure on adult health is not clear, but such exposure may be associated with hypertension, blood pressure problems and heart disease.

For some additional information on the effects on lead exposure of adults, see the following publication:

[No Publication Number] Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil (December 1996) -- This report describes a methodology for assessing risk associated with non-residential adult exposures to lead in soil. The methodology focuses on estimating fetal blood lead concentration in women exposed to lead contaminated soils. This approach also provides tools that can be used for evaluating risks of elevated blood lead concentrations among exposed adults.

EFFECTS OF LEAD ON CHILDREN

According to the U.S. Centers for Disease Control(CDC), lead poisoning is one of the most common preventable pediatric health problems. Recently, the CDC has estimated that as many as 1 in every 11 U.S. children under the age of 6 might have elevated levels of lead in their blood.

Improved monitoring over the past 25 years, has shown that unborn and young children can suffer metabolic and developmental damage from exposure levels which were previously thought safe. The U.S. Centers for Disease Control and Prevention (CDC) has lowered the acceptable blood lead level three times over the past 20 years, setting the current standard at 10 micrograms of lead per deciliter of blood (10 ug/dL) in 1991.

Children differ physiologically from adults, and the effects of exposure differ accordingly. Because of their small body sizes and their rapid development, children are more vulnerable than adults to the hazards of lead exposure. Children between one and two years of age absorb 40 to 50% of ingested lead, whereas adults absorb only 10 to 15% of ingested lead. In developing countries where leaded gasoline, leaded paint and other major exposure routes are still common, all children under 2 and more than 80 percent between the ages of 3 and 5 might have blood lead levels that exceed the World Health Organization (WHO) standard. It is estimated that 15 to 18 million children in economically developing countries might have suffered permanent damage from lead poisoning, resulting in lowered intelligence (as measured by IQ tests), learning disabilities, hearing loss, reduced attention span, and behavioral abnormalities.

Leaded gasoline continues to pose a major hazard to children in developing countries. Burning leaded gasoline generates lead-containing particles which eventually deposit as dust on soil. Since young children engage in a great deal of hand-to-mouth activity, they can ingest large amounts of lead from contaminated soil and dust. Deteriorating leaded paint also places children at risk: since lead paint tastes sweet, children are inclined to eat the paint chips. Babies can also be exposed to lead in-utero or through nursing if the mother has an elevated blood lead level.

- EPA/800/B-92/0002 Lead Poisoning and Your Children (1992)-- Lead is a teratogen and causes serious environmental health effects in young and unborn children. This publication provides basic information on how to reduce risk to children from common sources of lead poisoning.

- EPA/540/R-93/081 Guidance Manual for the Integrated Exposure Uptake

Biokinetic Model for Lead in Children (1993)-- Guidance document to assist user in providing appropriate input to the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead. This pharmacokinetics model integrates exposure from lead in air, water, soil, dust, diet, paint and other sources to predict blood lead levels in children 6 months to 7 years old. The manual provides background information on environmental exposure parameters and contains recommendations that allow flexibility in site-specific risk assessments. This publication may be ordered from EPA's National Service Center for Environmental Publications (NSCEP).

- EPA/540/R-94/039 Validation Strategy for Integrated Exposure Uptake Biokinetic Model for Lead in Children (1994) -- This document describes the considerations and methods for characterizing the confidence to place in output from the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children.

Additional information concerning the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children is available at the following web site: http://www.epa.gov/superfund/programs/lead/ieubk.htm

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EXPOSURE PATHWAYS

LEAD IN AIR

In the United States, emissions of lead have decreased nearly 90 percent during the last 20 years, mainly due to the phasing out of leaded gasoline. A parallel decline in blood lead levels accompanied the phase-out of leaded gasoline and the introduction of catalytic converters in 1973(figure 2). The current U.S. limit is 0.1 grams of lead per gallon (0.1 g/gal) of gasoline. Amendments to the U.S. Clean Air Act in 1990 called for a ban on manufacturing, sale or introduction of engines that required leaded gasoline after 1992, and for prohibition of all leaded gasoline for highway use after 1995.

It is estimated that the U.S. has saved over $10 for every $1 invested in phasing out leaded gasoline. These savings can be attributed to reduced health care costs, improved fuel efficiency and savings on engine maintenance (leaded gasoline causes corrosion of auto exhaust systems and requires more frequent oil and spark plug changes). Shifting gasoline production from leaded to unleaded form is also technically easy and inexpensive.

Worldwide, at least 25 other countries have made significant commitments to phase-out, but are hampered by technical complications. EPA recently completed its Implementer's Guide to Phase-Out Lead in Gasoline, and associated workshops are now being planned to target these 25 countries.

Unfortunately, most countries still permit the use of leaded gasoline, and airborne lead pollution from mobile sources remains a serious health threat in such countries. The combustion of tetraethyl lead, a gasoline additive used to prevent engine "knock", causes approximately 90% of the airborne lead pollution in cities. Lead concentrations in gasoline vary widely from country to country, and range from a low of 0.1 grams of lead per liter (g/L) of gasoline to a high of 0.84 g/L. Highly-leaded gasoline is a problem in economically developing nations, particularly in Africa. In 1993, petroleum in Benin, Barbados, Ecuador, Ethiopia, Indonesia, Phillippines, Uganda and Zimbabwe was shown to contain 0.75 or more g/L. Nevertheless, as a result of the "anti-lead in gasoline" campaign spearheaded by the United States, 78% of all gas sold world-wide is now unleaded gasoline. This amount is expected to rise to over 84% world-wide by 2003. By 2001, about 85% of the gasoline consumed in Latin America and the Caribbean will be lead-free.

Additional information on lead in air is available in the following EPA documents:

- EPA/160B/99/001 - Implementer's Guide to Phasing Out Lead in Gasoline (1999) - This Guide is intended to support the world-wide phase out of lead in gasoline by providing a checklist and guidance for government officials tasked with developing

and implementing a lead phase out policy, and by assembling the data and resources these officials need to carry out their task. This document may be ordered from the National Service Center for Environmental Publications (NSCEP).

- EPA/600/D-90/199 Control of Motor Vehicle Emissions--The U.S. Experience (1990) - This document gives an historic overview of the U.S. experience in controlling emissions from motor vehicles. The evolution of vehicle emissions certification, surveillance methods, inspection, maintenance and anti-tampering programs are discussed. Also presented are changes in motor vehicle design and fuel formulation, and the corresponding changes in motor vehicle emissions. Possible directions for future improvements are also described. This publication may be ordered from EPA's National Service Center for Environmental Publications (NSCEP).

- EPA/600/J-93/378 Human Health Effects of Air Pollution (1993) - This report contains the results from a multi disciplinary study (epidemiology, animal toxicology and controlled human exposure studies) on the health effects from air pollution from lead, sulfur dioxide, nitrogen oxides and carbon monoxide. This publication may be ordered from EPA's National Service Center for Environmental Publications(NSCEP).

- EPA/230/05/85/006 Costs and Benefits of Reducing Lead in Gasoline: Final Regulatory Impact Analysis (1985) - The cost versus the benefits of slowly reducing lead levels in gasoline versus phasing it out quickly are compared. Included are an in-depth review of the costs of reducing lead in gasoline, an analysis of human exposure to lead from gasoline, and an overview of the benefits to human health following reductions in lead levels. This publication may be ordered from EPA's National Service Center for Environmental Publications (NSCEP).

- EPA/410/R-97/002 Final Report on Benefits and Costs of the Clean Air Act, 1970 to 1990 - Appendix G: Lead Benefits Analysis (1997) - Describes in detail the analysis of benefits resulting from the estimated reduction in lead in gasoline and from stationary sources achieved pursuant to the Clean Air Act.

- EPA/450/2-77/012A Control Techniques for Lead Air Emissions, Volume I, Chapters 1-3 -- This report documents atmospheric emissions of lead and its compounds from various sources, methods for controlling these emissions and approximate costs for implementing these control methods. Estimates of energy and environmental impacts are given for specific model plants. This publication may be ordered from the National Technical Information Service (NTIS). EXIT EPA

- EPA/450/2-77/012B Control Techniques for Lead Air Emissions, Volume II: Chapter 4--Appendix B -- This publication describes the numerous sources of atmospheric lead emission in the United States and deals with the methods and estimated costs of emission control. This publication may be ordered from the National Technical Information Service (NTIS). EXIT EPA

- EPA/450/3-90/024 Risk Assessment for Toxic Air Pollutants: A Citizen's Guide (1990)-- Risk assessment is the process used to estimate the risk of illness from a specific human exposure to a toxic air pollutant. This brochure from EPA's Air Risk Center gives an overview of the 4-step assessment process.

LEAD IN PAINT

In the United States, as exposures from air, food and drinking water have declined, the relative importance of exposure from leaded paint has increased. Currently, leaded paint is viewed as the main cause of blood lead levels over the limit of 10 micrograms per deciliter (10 ug/dL). Over 80% of U.S. homes built before 1978 contain lead paint. Although lead-based house paint has not been sold in the U.S. for more than 20 years, children living in older homes may be exposed to chips of peeling old paint and, subsequently, to lead-contaminated dust, both indoors and outdoors. Families renovating older structures and low-income families living in dilapidated housing are especially at

risk.

- EPA/540/F-94/045 Guidance on Residential Lead-Based Paint, Lead-Contaminated Dust, and Lead-Contaminated Soil(1994)-- This guide is used to help decision makers prioritize primary prevention activities to reduce hazards from lead in and around residences. It is intended for use by decision makers (risk assessors, risk managers, etc.) to identify lead-based paint hazards, other sources of lead exposure, and the need for control actions in residential environments where children may be present. This publication may be ordered from the National Technical Information Service (NTIS). EXIT EPA

INDUSTRIAL SOURCES OF LEAD

Many developing countries engage in high levels of lead smelting and lead-acid battery production and recycling. Lead-acid battery production is technically straightforward, and batteries are an important, inexpensive and portable source of electricity. However, the manufacturing process generates air-borne lead dust and problems arise when the factories are improperly vented and when residences are located too close to the plant. Also, workers in these industries might accidentally expose their families to lead particles by bringing hazardous dust home on work clothing.

LEAD IN FOOD

Lead particles can enter the food supply through a number of routes. Lead-containing particles in air can deposit onto vegetables and fruits during harvesting, processing and distribution. Some agricultural pesticides also contain lead-based compounds which might remain as residues on crops. Lead solder in canned goods can also result in food contamination. In the U.S., the largest source of lead in food, though, is lead-glazed ceramics such as mugs, plates and bowls. Foil on wine bottles and bottled water, food additives and leaded crystal are other (lesser) sources of lead in food.

LEAD IN DRINKING WATER

Drinking water contamination occurs primarily from lead-containing components in plumbing. Lead and lead compounds show a wide range of solubility and are highly persistent in water, with a half-life (the time for half of a chemical to degrade) of over 200 days. While source water seldom contains high amounts of lead, chemical reactions between the water and lead connectors, water pipes, and materials including solder, brass and some plastics may result in lead leaching into the distribution system and into homes. The EPA has estimated that 20 to 40 percent of the average blood lead in U.S. children may come from lead in drinking water.

For additional information on lead in drinking water, refer to the following EPA documents:

- EPA/812/B-92/002 Lead in Drinking Water Regulation: Public Education Guidance (1992) -- This document contains information on conducting a community-based public education program, including organizing a community task force, developing an action plan, preparing public education materials, developing a water-testing program, and program implementation. Sample public education materials are included. This publication may be ordered from EPA's National Service Center for Environmental Publications (NSCEP).

- EPA/600/A-93/035 Corrosion Control Principles and Strategies for Reducing Lead and Copper in Drinking Water Systems (1993) -- This paper gives an overview of plumbing and corrosion issues and discusses the impact of water softeners on corrosion. Water sampling methods and the trade-offs in water quality associated with different methods of corrosion control are discussed. This publication may be ordered from EPA's National Service Center for Environmental Publications (NSCEP).

- EPA/625/R-93/001 Seminar Publication: Control of Lead and Copper in Drinking Water (1993) - This publication discusses five topics: (1) Regulation of drinking water in the United States; (2) the corrosive effects of water on lead and copper-

containing materials; (3) design and implementation of a corrosion-monitoring program; (4) corrosion control assessment, including methods to measure corrosion; (5) an overview of control strategies and secondary effects.

- EPA/812/K-93/001 Lead in Drinking Water: An Annotated List of Publications (1993) - List of documents about the problem of lead in drinking water. The list covers both documents published by the EPA as well as some documents published by other organizations.

The EPA also publishes seven documents which provide guidance on lead and copper monitoring for water systems serving communities of various sizes. These publications contain specific information on conducting a materials evaluation to identify lead and copper sampling sites, how and when to collect tap water samples for lead and copper, water quality parameter sampling, and source water sampling. Also included are sample forms and worksheets. Each of these publication is available from EPA's National Service Center for Environmental Publications (NSCEP):

- EPA 812/B-92-003 Lead and Copper Monitoring Guidance for Water Systems Serving < 100 persons
- EPA 812/B-92/004 Lead and Copper Monitoring Guidance for Water Systems Serving 101 to 500 persons
- EPA 812/B-92/005 Lead and Copper Monitoring Guidance for Water systems Serving 501 to 3,300 persons
- EPA 812/B-92/006 Lead and Copper Monitoring Guidance for Water Systems Serving 3,301 to 10,000 Persons
- EPA 812/B-92/007 Lead and Copper Monitoring Guidance for Water Systems Serving 10,001 to 50,000 Persons
- EPA 812/B-92/008 Lead and Copper Monitoring Guidance for Water Systems Serving 50,001 to 100,000 Persons
- EPA 812/B-92/009 Lead and Copper Monitoring Guidance for Water Systems Serving Over 1 00,000 Persons

Some additional information on the problem of lead in drinking water may be found on the following web site maintained by EPA's Office of Water: http://www.epa.gov/watrhome/pubs/leadl.html.

LEAD IN DUST AND SOIL

Lead concentrations of 500-1000 parts per million (ppm) in soil have been shown to correspond to increases in blood lead. Young children may ingest high levels of lead from soil and dust, but actual absorption of ingested lead (bioavailability) depends on both the chemical and physical characteristics of the lead-containing compound and the physiology and metabolism of each child. Industrial and mobile sources are significant sources of lead in soil in urban areas. For additional information, refer to:

- EPA/747/R-95/001 Residential Sampling for Lead: Protocols for Dust and Soil Sampling [Final Report](1995) -- This report contains finalized protocols for dust and soil sampling for lead in U.S. residential areas. It gives guidance for necessary equipment and supplies, sampling procedures and quality control for both dust and soil lead sampling. This publication may be ordered from EPA's National Service Center for Environmental Publications (NSCEP).

- EPA/747/R-95/007 Sampling House Dust for Lead: Basic Concepts and Literature Review (1995) - This report contains an extensive literature review of sampling methods for measuring lead in house dust. The report outlines issues related to dust in homes, defines terms, explains basic concepts, summarizes numerous house dust sampling methods and sampling strategies.

CONTROL MEASURES

In the United States, the phase out of leaded gasoline caused a sharp decline in air lead

levels between 1975 and 1988. Concerns over the health effects of lead also caused the U.S. to substantially reduce the amount of lead in paints, ceramics, caulking and pipe solder over the past 15 years; in addition, the use of lead solder in canned food was eliminated in the U.S. in the 1980's.

The control of lead exposure in the U.S. is now focused on risk reduction from drinking water, lead-based paint, household dust and contaminated soil. Efforts to reduce multimedia exposure pathways from pollutant sources (e.g. smelter emissions) are conducted through the tightening of regulatory controls, and by increasing voluntary and cooperative risk reduction efforts.

A broad perspective on lead issues is required to avoid undesirable trade-offs between different segments of the environment or the population. The EPA published a "Lead Strategy" in 1990 that specifies specific objectives for the United States: (1) To significantly reduce the number of children with concentrations exceeding 10 micrograms of lead per deciliter of blood (ug/dL). (2) To reduce the amount of lead released into the environment by 50% by 1995 (focusing on voluntary pollution reduction, beyond the level of existing regulatory requirements). To reach these goals, the EPA has focused on developing detection and abatement methods to tackle existing lead contamination. Another focus has been reduction of lead production and consumption (about 50% of lead used in the U.S. comes from recycled products), and on preventing further pollution using market-based incentives, regulation, and technology enhancement.

In many industrializing countries, childhood lead poisoning and occupational exposure to lead are typically more severe because of inadequately controlled industrial emissions, unregulated cottage industries, the use of leaded gasoline and the use of folk remedies and cosmetics containing lead. The average blood lead levels of many populations studied around the world was much higher that currently acceptable levels. Using preventive measures to address the problem is preferable since cleaning up contamination once lead has dispersed into the environment is difficult, costly and slow.

- EPA/540/2-91/014 Selection of Control Technologies for Remediation of Lead Battery Recycling Sites (1991) - This report discusses remedial action, waste treatment and waste management at lead battery recycling sites in the U.S. Treatment alternatives and cleanup services are presented, and the advantages and disadvantages of the different technologies are discussed. This document may be ordered from the National Technical Information Service (NTIS). EXIT EPA

- EPA/450/2-79/002 Guideline Series: Development of an Example Control Strategy for Lead (1979)-- This guide presents a method for developing a control strategy for lead. The guide covers the following topics: development of baseline emissions inventory and air quality data; projection and allocation of emissions; application of models and analysis of modeling results; and the testing, evaluation and selection of strategies.

- EPA/452/R-93/009 EPA Lead Guideline Document and Appendix (1993)-- This document is intended as a guide on lead policy; it compiles currently available policy and guidance for lead programs in the United States, reflecting statutory and regulatory sources such as the Clean Air Act. Each chapter summarizes relevant policy and guidance and provides detailed references for more comprehensive information sources. Topics include air quality status, air quality monitoring and modeling, and control strategies. This publication may be ordered from EPA's National Service Center for Environmental Publications (NSCEP).

ADDITIONAL REFERENCE DOCUMENTS

- U.S. EPA. 1997. Executive Summary: Laboratory Study of Lead-Cleaning Efficacy. (EPA/747/R-97/002)
- U.S. EPA. 1998. Review of Studies Addressing Lead Abatement Effectiveness [updated version]. (EPA/747/B-98/001)
- U.S. EPA. 1996. Executive Summary: Comparative Abatement Performance Study, Volumes 1 and 2. (EPA/230/R-94/013a + 013b)

ADDITIONAL OPPORTUNITIES FOR OBTAINING TECHNICAL INFORMATION

OPPT LEAD WEB SITE

EPA's Office of Pollution Prevention and Toxics (OPPT) Lead Page contains many electronic links to lead poisoning prevention documents. These documents include EPA residential lead hazard guidance and standards, technical reports, and public education materials; links to EPA offices including the Office of Water and Office of Air; links to non-EPA resources including the Department of Housing and Urban Development (HUD), the Centers for Disease Control and Prevention (CDC), the Occupational Safety and Health Administration (OSHA) and the National Lead Information Center.

NATIONAL LEAD INFORMATION CENTER EXIT EPA

This site is produced and maintained by the National Lead Information Center (NLIC). NLIC operates under a cooperative agreement with the U.S. EPA, with funding from the EPA, the Centers for Disease Control and Prevention, and the Department of Housing and Urban Development. NLIC provides the general public and professionals with information about lead poisoning and its prevention.

Inquiries to NLIC may also be made through the organization's hotline or by mail. The hotline is staffed Monday through Friday from 8:30 a.m. to 5:00 p.m. Eastern Standard Time. Call 1-800-424-5323 to speak with an information specialist. Specialists can answer (in English or Spanish) specific questions on lead-related issues. To reach the NLIC by fax, dial 1-202-659-1192. To reach the NLIC by email, send messages to: ehc@cais.com

AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY EXIT EPA

The Agency for Toxic Substances and Disease Registry is part of the Unites States Public Health Service. The agency's web site contains detailed information on the health effects of lead exposure.

HOUSING AND URBAN DEVELOPMENT LEAD PROGRAM EXIT EPA

The Office of Lead Hazard Control at the U.S. Department of Housing and Urban Development (HUD) maintains this web site. The site contains general technical information on lead, but concentrates on lead-based paint issues.

Appendix B

HUD Sets New Requirements to Prevent Childhood Lead Poisoning in Housing Assisted or Being Sold by the Federal Government

The regulation sets hazard reduction requirements that give much greater emphasis...to reducing lead in house dust.

SUMMARY

The U.S. Department of Housing and Urban Development (HUD) has issued a new regulation to protect young children from lead-based paint hazards in housing that is financially assisted by the federal government or being sold by the government. The regulation, "Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance," was published in the Federal Register on September 15, 1999. The hazard reduction requirements in this regulation are based on scientific research and the practical experience of cities, states, and others who have been controlling lead-based paint hazards in low-income housing through HUD assistance. The requirements apply to housing built before 1978, the year lead-based paint was banned nationwide for consumer use.

The new regulation puts all of the Department's lead-based paint regulations in one part of the Code of Federal Regulations, making it much easier to find HUD policy on the subject. The new requirements will take effect on September 15, 2000, one year after publication, to allow time for housing owners and state and local agencies to prepare for compliance. HUD estimates that about 2.8 million housing units will be affected by the regulation during its first five years.

LEAD POISONING PREVENTION

Lead poisoning can cause permanent damage to the brain and many other organs, and can result in reduced intelligence and behavioral problems. Lead can also harm the fetus. More than 800,000 children younger than 6 years old living in the United States have lead in their blood that is above the level of concern set by the Centers for Disease Control and Prevention (CDC). A large portion of these children are in families of low income and are living in old homes with heavy concentrations of lead-based paint. The most common sources of childhood exposure to lead are deteriorated lead-based paint and lead-contaminated dust and soil in the residential environment.

HUD estimates that the regulation will protect more than two million children from exposure to lead during its first five years. The estimated net benefits (that is, benefits minus costs) from the first five years are $2 billion, mostly from increased lifetime earnings but also including reductions in medical and special education costs. Additional benefits that have not been estimated in dollar terms include reduced family time, and anxiety involved in caring for lead-poisoned children, increased stature and hearing ability, reduced hypertension in later life, and reduced juvenile delinquency and crime.

The new regulation puts all of the Department's lead-based paint regulations in one part of the Code of Federal Regulations, making it much easier to find HUD policy on the subject.

LEGISLATIVE BACKGROUND

The new regulation is being issued under sections 1012 and 1013 of the Residential Lead-Based Paint Hazard Reduction Act of 1992, which is Title X ("ten") of the Housing and Community Development Act of 1992. Sections 1012 and 1013 of Title X amended the Lead-Based Paint Poisoning Prevention Act of 1971, which is the basic law covering lead-based paint in federally associated housing. The new regulation appears within title 24 of the Code of Federal Regulations as part 35 (24 CFR 35).

WHAT ARE THE REQUIREMENTS?

The regulation sets hazard reduction requirements that give much greater emphasis than existing regulations to reducing lead in house dust. Scientific research has found that exposure to lead in dust is the most common way young children become lead poisoned. Therefore the new regulation requires dust testing after paint is disturbed to make sure the home is lead-safe. Specific requirements depend on whether the housing is being disposed of or assisted by the federal government, and also on the type and amount of financial assistance, the age of the structure, and whether the dwelling is rental or owner-occupied.

A summary of the hazard reduction requirements for the various types of housing programs is attached to the Questions and Answers issued in association with this regulation. More detailed information is available in training and guidance material, in the regulation itself, and in the Department's explanation of the regulation, published in the Federal Register.

TYPES OF HOUSING COVERED

- Federally-owned housing being sold
- Housing receiving a federal subsidy that is associated with the property, rather than with the occupants (project-based assistance)
- Public housing
- Housing occupied by a family receiving a tenant-based subsidy (such as a voucher or certificate)
- Multifamily housing for which mortgage insurance is being sought
- Housing receiving federal assistance for rehabilitation, reducing homelessness, and other special needs

TYPES OF HOUSING NOT COVERED

- Housing built since January 1, 1978, when lead paint was banned for residential use
- Housing exclusively for the elderly or people with disabilities, unless a child under age 6 is expected to reside there
- Zero-bedroom dwellings, including efficiency apartments, single-room occupancy housing, dormitories, or military barracks
- Property that has been found to be free of lead-based paint by a certified lead-based paint inspector
- Property where all lead-based paint has been removed
- Unoccupied housing that will remain vacant until it is demolished
- Non-residential property
- Any rehabilitation or housing improvement that does not disturb a painted surface

FOR MORE INFORMATION

If you want copies of the regulation or have general questions, you can call the National Lead Information Center at (800) 424-LEAD, or TDD (800) 526-5456 for the hearing impaired. You can also download the regulation and other educational materials at www.hud.gov/lea. For further information, you may call HUD at (202) 755-1785, ext. 104, or e-mail HUD at lead_regulations@hud.gov.

Appendix C

United States Environmental Protection Agency | Prevention, Pesticides, and Toxic Substances ( ) | EPA-747-F-96-002 March 1996 7404 (Revised 12/96)

FACT SHEET

EPA and HUD Move to Protect Children from Lead-Based Paint Poisoning; Disclosure of Lead-Based Paint Hazards in Housing

SUMMARY

The Environmental Protection Agency (EPA) and the Department of Housing and Urban Development (HUD) are announcing efforts to ensure that the public receives the information necessary to prevent lead poisoning in homes that may contain lead-based paint hazards. Beginning this fall, most home buyers and renters will receive known information on lead-based paint and lead-based paint hazards during sales and rentals of housing built before 1978. Buyers and renters will receive specific information on lead-based paint in the housing as well as a Federal pamphlet with practical, low-cost tips on identifying and controlling lead-based paint hazards. Sellers, landlords, and their agents will be responsible for providing this information to the buyer or renter before sale or lease.

LEAD-BASED PAINT IN HOUSING

Approximately three-quarters of the nation's housing stock built before 1978 (approximately 64 million dwellings) contains some lead-based paint. When properly maintained and managed, this paint poses little risk. However, 1.7 million children have blood-lead levels above safe limits, mostly due to exposure to lead-based paint hazards.

EFFECTS OF LEAD POISONING

Lead poisoning can cause permanent damage to the brain and many other organs and causes reduced intelligence and behavioral problems. Lead can also cause abnormal fetal development in pregnant women.

BACKGROUND

To protect families from exposure to lead from paint, dust, and soil, Congress passed the Residential Lead-Based Paint Hazard Reduction Act of 1992, also known as Title X. Section 1018 of this law directed HUD and EPA to require the disclosure of known information on lead-based paint and lead-based paint hazards before the sale or lease of most housing built before 1978.

WHAT IS REQUIRED

Before ratification of a contract for housing sale or lease:

- Sellers and landlords must disclose known lead-based paint and lead-based paint hazards and provide available reports to buyers or renters.
- Sellers and landlords must give buyers and renters the pamphlet, developed by EPA, HUD, and the Consumer Product Safety Commission (CPSC), titled *Protect Your Family from Lead in Your Home*.

- Home buyers will get a 10-day period to conduct a lead-based paint inspection or risk assessment at their own expense. The rule gives the two parties flexibility to negotiate key terms of the evaluation.
- Sales contracts and leasing agreements must include certain notification and disclosure language.
- Sellers, lessors, and real estate agents share responsibility for ensuring compliance.

WHAT IS NOT REQUIRED

- This rule does not require any testing or removal of lead-based paint by sellers or landlords.
- This rule does not invalidate leasing and sales contracts.

TYPE OF HOUSING COVERED

Most private housing, public housing, Federally owned housing, and housing receiving Federal assistance are affected by this rule.

TYPE OF HOUSING NOT COVERED

- Housing built after 1977 (Congress chose not to cover post-1977 housing because the CPSC banned the use of lead-based paint for residential use in 1978).
- Zero-bedroom units, such as efficiencies, lofts, and dormitories.
- Leases for less than 100 days, such as vacation houses or short-term rentals.
- Housing for the elderly (unless children live there).
- Housing for the handicapped (unless children live there).
- Rental housing that has been inspected by a certified inspector and found to be free of lead-based paint.
- Foreclosure sales.

EFFECTIVE DATES

- For owners of more than 4 dwelling units, the effective date is September 6, 1996.
- For owners of 4 or fewer dwelling units, the effective date is December 6, 1996.

THOSE AFFECTED

The rule will help inform about 9 million renters and 3 million home buyers each year. The estimated cost associated with learning about the requirements, obtaining the pamphlet and other materials, and conducting disclosure activities is about $6 per transaction.

EFFECT ON STATES AND LOCAL GOVERNMENTS

This rule should not impose additional burdens on states since it is a Federally administered and enforced requirement. Some state laws and regulations require the disclosure of lead hazards in housing. The Federal regulations will act as a complement to existing state requirements.

FOR MORE INFORMATION

- For a copy of *Protect Your Family from Lead in Your Home* (in English or Spanish) , the sample disclosure forms, or the rule, call the National Lead Information Clearinghouse (NLIC) at (800) 424–LEAD, or TDD (800) 526–5456 for the hearing impaired. You may also send your request by fax to (202) 659–1192 or by Internet E-mail to ehc@cais.com. Visit the NLIC on the Internet at http://www.nsc.org/nsc/ehc/ehc.html.
- Bulk copies of the pamphlet are available from the Government Printing Office (GPO) at (202) 512–1800. Refer to the complete title or GPO stock number 055–000–00507–9. The price is $26.00 for a pack of 50 copies. Alternatively, persons may reproduce the pamphlet, for use or distribution, if the text and graphics are reproduced in full. Camera-ready copies of the pamphlet are available from the National Lead Information Clearinghouse.
- For specific questions about lead-based paint and lead-based paint hazards, call the National Lead Information Clearinghouse at (800) 424–LEAD, or TDD (800) 526–5456 for the hearing impaired.
- The EPA pamphlet and rule are available electronically and may be accessed through the Internet.

  Electronic Access:

  Gopher: gopher.epa.gov:70/11/Offices/PestPreventToxic/Toxic/lead_pm

  WWW: http://www.epa.gov/opptintr/lead/index.html
  http://www.hud.gov

  Dial up: (919) 558–0335

  FTP: ftp.epa.gov (*To login, type "anonymous." Your password is your Internet E-mail address.*)

Appendix D

ABS#343 INVESTIGATION OF LEAD-BASED PAINT IN SOILS IN NON-RESIDENTIAL AREAS AT CLOSING MILITARY BASES. D. Stralka, J. Hamill, D. Opalski, M. Work. US Environmental Protection Agency, Region 9, San Francisco, CA, USA.
Sponsor: J Christopher.

Abstract

Lead contamination in soils from the use of lead-based paints has been an environmental concern in residential areas for some time and has been the focus of legislation and various remediation efforts. This investigation was to ascertain the extent of lead contamination around buildings in non-residential settings that had previously used leaded paints and have no operational history of lead usage. Several closing military bases in California representing the major branches of military service were investigated, affording a variety of building types, operational histories, construction materials, maintenance practices, and ages. Buildings were selected for investigation if they currently had lead-based paint, as indicated by handheld x-ray fluorescence, or were of the age that could have had leaded paint. Sampling was further based on the extent of painted surfaces and paint condition. Since the contribution of lead in soil from lead-based paint would be expected to be deposited in the near surface, soil samples were collected at 0 to 1 inch below ground surface near the building foundation and at the building dripline. Samples were collected wherever there was soil at approximately 30-foot intervals around the selected buildings. There was no attempt to include or exclude paint chips from the sampling. Visible gravel, pebbles, and plant material were excluded from the samples. On selected sites that demonstrated lead in soil, the concentration change with distance was investigated by doing additional sampling at distances of ½, 2 and 4 times the building dripline. Additional composite samples to 6 inches were also collected to reveal lead impact with depth and to correlate with previously collected data. Four bases were investigated. A total of 64 buildings and 979 samples were analyzed. Results yielded a few individual samples with percent-by-weight levels of lead in soil. In general, concentrations drastically decreased with distance from the building and with depth. The overall volume of soil impacted was small; however, large metal structures, such as bridges and water towers, impacted larger surface areas. Building material was weakly correlated with lead in soil, with metal and wood structures having the highest burdens. Building age was also weakly correlated with soil burdens. These results may be used to evaluate the risk from and risk management decisions needed for dealing with lead in soils in other than residential areas to effectively speed military base closure property transfers.

Introduction

Lead is added to paints to increase its durability and appearance. However, maintenance and weathering of these painted surfaces has released large amounts of lead to the environment, generally near these painted surfaces. In 1978, the use of lead-based paint on residential buildings was banned by the Consumer Product Safety Commission. Subsequent legislation, the Lead-Based Paint Hazards Reduction Act of 1992, has addressed the lead hazards in residential areas. General guidelines were set up for sampling and evaluation of soil lead greater than 400

ppm. In support of these guidelines, the Department of Housing and Urban Development (HUD) conducted a National Survey of Lead-Based Paint in Housing in 1990. This National Survey inspected 381 housing units for lead on interior and exterior painted surfaces, lead in interior dust and lead in exterior soil. Form this survey it is estimated that 23% of privately owned homes built before 1980 have average soil-lead levels that exceed 400 ppm and 3% are above 5000 ppm. While the use of lead-based paint is now prohibited in residential applications, there are no restrictions on the use of lead-based paint for non-residential uses.

Under the Base Realignment and Closure Act of 1995, military bases across the nation were slated for closure. Prior to transfer of federal property, these bases are to address environmental concerns under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Under existing guidance there are clear procedures and actions that must be taken for soil lead in residential areas; however, varying proportions of these bases are not residential. The question that this survey addressed was the extent of soil-lead contamination greater than the 1000 ppm industrial screening level in non-residential areas to assess the threat of lead hazards in soil, and if controls would be warranted for future land uses. Soil was sampled for lead in non-residential areas of several closing bases in California. Structures that were sampled had lead-based paint or could have had lead-based paint. The structures ranged in age back to 1860 and were constructed of various materials. Various factors were investigatedwith correlations for increased soil lead.

Methods

Buildings were selected based on the extent of painted surfaces and the presence of lead-based paint on the building as measured using a handheld X-ray fluorescence (XRF) detector. Field notes were made on the type of building and condition of the painted surface. Those buildings with lead-based paint with exposed soil had discrete surface soil (0-1" bgs) collected near the foundation and at the dripline of the painted surfaces taken at each 30 linear feet of each face of the structure. Samples were then analyzed by XRF using a mobile field lab. 10% of the samples or a minimum of 20 per day were sent to a fixed lab and analyzed for lead by EPA Method 6010B for confirmation. Since the primary analysis was done by mobile lab and the results were returned to the field crews the next day, those buildings with elevated lead were sampled more extensively to determine the change of lead concentration with distance from the building. Additional samples were collected at ½, 2 and 4 times the dripline distance. Buildings were sampled on four closing military bases in California with a total of 64 buildings investigated and 979 samples analyzed.

Conclusions

Results indicate that there is lead contaminated soil around non-industrial buildings on these closing military bases. The mobile lab XRF procedures proved to be consistent with the fixed lab analysis and afforded an expedited focused investigation of those buildings with higher lead burden. The extent of contamination is generally close to the building and is consistent with the findings of other residential lead-based paint studies. However, large metal structures such as

water towers and bridges have a larger impacted area which is believed to be a function of the free fall distance to the ground and historic maintenance practices such as unconfined sand blasting. Observed maximum concentrations of lead in soil were slightly higher then what was seen in the residential survey, 11% vs 2%, and the mean of the average soil lead was elevated which would be expected with the biased sampling toward the more contaminated areas. Although the sampling effort was not extensive, there are a few trends that can be gleaned from the data. There is a weak trend with age of the building as seen in the national residential survey. Additional parameters that seem important to address are the building material and the frequency of maintenance cycles. In the context of their contribution to the soil burden, both could have significant impacts. Of the 64 buildings sampled in this study, 45% had a average soil lead greater than the 1000 ppm screening level and 3% were higher than 10,000 ppm. In general, with the small volume of soil impacted, future land use would be consistent with commercial reuse but would be of concern if the property were to be released for unrestricted land use. Individual areas with large metal structures should be investigated separately. The mobile XRF labs could be used to easily and cost effectively investigate areas of concern.

Appendix E

GSA

GSA Public Buildings Service

Office of Property Disposal

Title X: The Residential Lead-Based Paint Hazard Act New Regulations, Effective September 15, 2000

What is Title X?

In 1992, Congress enacted Title X, the Residential Lead-Based Paint Hazard Reduction Act to provide a national framework for addressing lead-based paint hazards at Federal residential property. Title X, commonly known as the Residential Lead-Based Paint Hazard Reduction Act, amended the Lead-Based Paint Poisoning Prevention Act of 1971 and introduced new requirements for the reduction of hazards associated with lead-based paint.

Title X required HUD to promulgate regulations addressing lead-based paint (LBP) inspection and abatement activities, and amended Section 403 of the Toxic Substances Control Act (TSCA) requiring EPA to identify lead-based paint hazard levels for paint, dust, and soil. The HUD regulations were promulgated in 1999 and go into effect on September 15, 2000 (See the reference list on page 5 for the Website with regulation text).

To what types of property do the regulations apply?

The regulations apply to specially defined residential property called ***target housing***. Target housing is defined as any housing constructed prior to 1978, except housing for the elderly and persons with disabilities or zero bedroom dwellings (unless a child younger than six years old resides or is expected to reside in the housing). Subpart C specifically applies to Federally owned housing other than HUD properties.

What property is exempt from the regulations?

- Non-residential buildings
- Zero bedroom dwellings*
- Housing for the elderly and disabled*
- Target housing that is to be demolished
- Residential property constructed after 1978
- Residential property in which all LBP has been identified, removed or clearance has been achieved before September 2000

*Zero bedroom dwellings and housing for the elderly and disabled are exempt unless occupied by a child younger than six years old.

What do the regulations require?

- For pre-1960 target housing, the regulations require both **inspection and abatement** of lead-based paint hazards.
- For 1960-78 target housing, the regulations require an **inspection and risk assessment** but not abatement of lead-based paint hazards.

  See Table 2: *Summary of Lead-Based Paint Requirements* on page 4 for further clarification.

What is a lead-based paint "hazard"?

A lead-based paint "hazard" is any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, or lead-contaminated paint that is deteriorated or is present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects, as established by the appropriate Federal agency. Peeling, chipping, chalking or cracking lead-based paint is a hazard that needs immediate attention.

GSA

For 1960-78 residential property, when must inspection and risk assessment be performed?
The lead-based paint inspection and risk assessment must be conducted by the holding agency before the closing of the sale.

What is abatement?
Abatement encompasses any set of measures designed to permanently eliminate lead-based paint hazards including:
(1) removal of lead-based paint and lead-contaminated dust, permanent enclosure or encapsulation of lead-based paint, replacement of lead-painted components or fixtures, and/or removal or covering of lead-contaminated soil, and (2) all preparation, cleanup, disposal, and post-abatement clearance testing activities associated with such measures.

When must abatement be performed?
Abatement must be initiated within 12 months of the risk assessment being completed. If abatement is not started within this period and the property has not yet been sold, the holding agency would be responsible for updating the risk assessment.

Can abatement be performed after sale?
Yes, abatement of lead-based paint hazards may be completed by the purchaser and abatement may be made a condition of sale, but the holding agency is responsible for assuring that the abatement is carried out by the purchaser before occupancy of the property. It is recommended that the disposal agency require in the Contract for Sale, Offer to Purchase, or Invitation for Bid (IFB) that the purchaser send a copy of the certified abatement report to the holding and disposal agencies once abatement is completed.

What are interim controls and how are they used?
Interim controls are measures designed to temporarily reduce human exposure or likely exposure to lead-based paint hazards, and includes specialized cleaning, repairs, maintenance, painting, temporary containment, and ongoing monitoring of lead-based paint hazards or potential hazards. HUD's 1995 guidelines recommended the use of interim controls for potential hazard areas (400-2000ppm), but the new Title X regulations do not currently provide for their use, except as an alternative to abatement for hazards.

GSA

Where can a Realty Specialist or Holding Agency find qualified lead service providers?
The National Lead Service Providers' Listing System, The Lead Listing, has been developed to help consumers locate qualified lead service providers (lead inspectors, risk assessors, and abatement contractors), renovators trained in lead-safe practices (lead-trained renovators), and recognized lead analysis laboratories in a timely fashion. Please be aware that the holding agency is responsible for complying with the Title X requirements.

The Lead Listing: http://www.leadlisting.org/

Is notification/disclosure still required?
Yes, the regulations promulgated jointly by HUD and EPA pursuant to Section 1018 of Title X (March 1996) require disclosure of known LBP or LBP hazards by persons selling or leasing target housing. The disclosure requirements found below are currently in effect and will not be amended by the new regulations, effective September 15, 2000.

If the property is non-residential but the highest and best use is residential, do the regulations apply?
No, according to HUD guidance (September 21, 2000), the LBP regulations do not apply to pre-1978 property that is not housing at the time of sale. The Federal responsibility to inspect and abate applies only to existing pre-1978 target housing, not property that will be converted to or used as housing after sale. HUD does recommend that the Federal agency inform the buyer that LBP hazards may be present if it is known or suspected that the structure will be used as housing.

If a property is sold on September 14th but the closing does not occur until October 1st, do the regulations apply?
No, the regulations only apply to a property with a sale date on or after September 15, 2000.

Table 1: Disclosure Requirements

∞ Disclose the presence of known lead-based paint and/or lead-based paint hazards to purchaser ∞ Disclose additional information available concerning the known lead-based paint and/or lead-based paint hazards (e.g., location of hazards, basis for such a determination, and condition of the painted surfaces) to purchaser ∞ Provide any available records or reports pertaining to lead-based paint and/or lead-based paint hazards to purchaser ∞ Provide to purchaser an approved lead hazard information pamphlet ∞ Allow 10 days for purchaser to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards	The Sales Contract, IFB, Offer to Purchase or lease must include an attachment containing the following elements: ∞ "Lead Warning Statement" ∞ Statement disclosing the presence of known lead-based paint and/or lead-based paint hazards ∞ Statement disclosing additional information available concerning the known lead-based paint and/or lead-based paint hazards (e.g., location of hazards, basis for such a determination, and condition of the painted surfaces) to purchaser ∞ List of records or reports that have been provided to purchaser ∞ Statement by purchaser affirming receipt of seller's disclosure statements, records and reports, and lead hazard information pamphlet ∞ Statement by purchaser that an opportunity to conduct the risk assessment or inspection has been received ∞ Signatures of seller and purchaser certifying the accuracy of their statements

GSA

Table 2: Summary of Lead-Based Paint Requirements
(24 CFR Part 35)[1]

	Paint Inspection	Risk Assessment	Abatement of Lead-Based Paint Hazards	Disclosure
Pre-1960 Target Housing	YES Prior to Sale/ Transfer	YES Prior to Sale/ Transfer	YES[2,3] Must be performed within 12 months of risk assessment	YES
1960-1978 Target Housing	YES Prior to Sale/ Transfer	YES Prior to Sale/ Transfer	NO	YES
Target Housing to be demolished and the site redeveloped for residential use[4]	NO	NO	NO	NO
Non-Residential Buildings	NO	NO	NO	NO

[1] The regulations, effective September 15, 2000, only apply to specially defined residential property (i.e., target housing).

[2] Where abatement of lead-based paint hazards is not completed before the closing of the sale, the holding agency shall be responsible for assuring that the abatement is carried out by the purchaser before occupancy of the property.

[3] In the case of a purchaser who will not be an owner/occupant, the agency could make abatement a condition of sale with sufficient funds escrowed.

[4] Target housing to be demolished and redeveloped for residential use is exempt from the requirements so long as the housing remains unoccupied until demolition. Please be aware, other state and Federal environmental laws may apply.

GSA

Where can I find out more information?

Regulations: Final Rules

HUD's Title X September 15, 1999 Federal Register Notice: *Final Rule for the Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance*	http://www.access.gpo.gov/su_docs/fedreg/a990915c.html
HUD/EPA Disclosure Regulations March 6, 1996 Federal Register Notice: *Final Rule—Lead; Requirements for Disclosure of Known Lead-Based Paint and/or Lead-Based Paint Hazards and Housing; Final Rule*	http://www.epa.gov/opptintr/lead/fr06mr96.pdf
EPA's Work Practice Standard August 6, 1999 Federal Register Notice: *Amendment to Final Rule: Lead; Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities; Certification Requirement and Work Practice Standards for Individuals and Firms*	http://www.epa.gov/lead/fr8699.pdf

Proposed Rule Making

EPA Toxic Substance and Control Act (TSCA) 403 June 3, 1998 Federal Register Notice: *EPA Proposed Rulemaking for Identification of Dangerous Levels of Lead*	http://www.epa.gov/lead/403nprm.pdf

U.S. EPA Websites

EPA Office of Pollution and Toxic (OPPT) Lead Programs	http://www.epa.gov/lead/
EPA OPPT Residential Lead Hazard Standards—TSCA Section 403	http://www.epa.gov/lead/leadhaz.htm
EPA OPPT Training and Certification Program for Lead-Based Paint Activities in Target Housing and Child Occupied Facilities-Section 402/404	http://www.epa.gov/lead/leadcert.htm
EPA Lead Hazard Information Pamphlet "Protect Your Family From Lead in Your Home" and Sample Disclosure Formats	http://www.hud.gov/lea/leadhelp.html

GSA

HUD Websites

HUD Office of Lead Hazard Control	http://www.hud.gov/lea/leahome.html
HUD Reference Library for Title X	http://www.hud.gov/lea/leadwnlo.html

DoD (For BRAC Property Only)

Lead-Based Paint Guidelines for Disposal of Department of Defense Residential Real Property—A Field Guide	http://www.dtic.mil/envirodod/brac/publish.html

Others

NSCLnet Search: Lead Poisoning Prevention-State Contacts Directory	http://www.ncsl.org/programs/esnr/pbDir.htm
National Lead Information Center	1-800-424-LEAD

Glossary

Abatement: Any set of measures designed to permanently eliminate lead-based paint hazards in accordance with standards established by appropriate Federal agencies. Such measures may include (1) removal of lead-based paint and lead-contaminated dust, permanent enclosure or encapsulation of lead-based paint, replacement of lead-painted components or fixtures, and/or removal or covering of lead-contaminated soil and (2) all preparation, cleanup, disposal, and post-abatement clearance testing activities associated with such measures.

Disclosure: Notification of and information about known lead-based-paint and/or lead-based paint hazards, and any available records or reports pertaining to the lead-based paint and/or lead-based paint hazards to the purchaser by the seller regarding most housing built before 1978. The disclosure requirements stated below are currently in effect and will not be amended by the new regulations, effective September 15, 2000. However, the requirements will be moved from Subpart H to Subpart A of the Code of Federal Regulations, Title 24, Part 35 when the new regulations become effective.

Evaluation: A risk assessment, a lead hazard screen, a lead-based paint inspection, paint testing, or a combination of these to determine the presence of lead-based paint hazards or lead-based paint.

Federally owned housing: Residential dwellings owned or managed by a Federal agency, or for which a Federal agency is a trustee or conservator. Properties seized by Federal law enforcement agencies and held for less than 270 days are exempt.

Interim controls: A set of measures designed to temporarily reduce human exposure or the likelihood of exposure to lead-based paint hazards, including specialized cleaning, repairs, maintenance, painting, temporary containment, ongoing monitoring of lead-based paint hazards or potential soil lead hazards, and the establishment and operation of management and resident education programs.

Lead-based paint: Paint or other surface coatings that contain lead equal to or in excess of 1.0 mg/cm^2 of lead or 0.5 percent lead by weight.

Lead-based paint hazard: Any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, or lead-contaminated paint that is deteriorated or is present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects, as established by the appropriate Federal agency.

Paint Inspection: A surface-by-surface investigation to determine the presence of lead-based paint and the provision of a report explaining the results of the investigation.

Risk assessment: An on-site investigation to determine and report the existence, nature, severity, and location of lead-based paint hazards in residential dwellings, including (1) information gathered regarding the age and history of the housing and occupancy by children under age 6; (2) visual inspection; (3) limited wipe sampling or other environmental sampling techniques; (4) other activity as may be appropriate; and (5) provision of a report explaining the results of the investigation.

Target housing: Housing constructed before 1978, except housing for the elderly or persons with disabilities (unless a child younger than six years old resides or is expected to reside in the housing) or zero bedroom dwellings. Child care facilities are not target housing unless located at residence that itself is target housing.

Appendix F

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY

JAN 07 2000

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY
(INSTALLATIONS, LOGISTICS, AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY
(INSTALLATIONS AND ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE
(MANPOWER, RESERVE AFFAIRS, INSTALLATIONS AND ENVIRONMENT)
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Lead-Based Paint Policy for Disposal of Residential Real Property

The Department of Defense (DoD) policy is to manage lead-based paint in a manner protective of human health and the environment and to comply with all applicable Federal, State, or local laws regulating lead-based paint and lead-based paint hazards.

The attached Field Guide is a joint DoD and Environmental Protection Agency (EPA) guidance document for use by DoD and EPA personnel in the evaluation and control of lead-based paint at DoD residential real property scheduled for disposition under the base realignment and closure (BRAC) program. Lead-based paint requirements are defined by Title X, the Residential Lead-Based Paint Hazard Reduction Act of 1992, which amended the Lead-Based Paint Poisoning Prevention Act (42 U.S.C, Section 4822) and its implementing regulations (under the EPA Toxic Substances Control Act (TSCA) Section 403 rule and the Department of Housing and Urban Development (HUD) Section 1013 rule). DoD will issue separate policy on lead-based paint requirements for transferring non-residential properties.

The Field Guide provides a general roadmap summarizing the requirements for the evaluation and control of lead-based paint hazards in target housing as defined by Title X and TSCA. In addition to existing Title X requirements, the Field Guide also specifies some actions that exceed Title X requirements. These actions represent DoD's desire to go beyond actions strictly required by law to ensure that activities taken in this regard are protective of human health and the environment. DoD policy is to:

- Abate soil-lead surrounding housing constructed between 1960 and 1978 (Title X requires abatement of lead-based paint hazards in target housing constructed prior to 1960). The transfer agreement may require the purchaser to perform the abatement activities.
- Evaluate the need for interim controls, abatement, or no action for bare soil lead concentrations between 400 and 2000 ppm (excluding children's play areas) based on the findings of the lead-based paint inspection, risk assessment, and criteria contained in the Field Guide.

- Evaluate and abate lead-based paint hazards in structures reused as child-occupied facilities located on residential real property. Child-occupied facilities are day care centers, preschools, and kindergarten classrooms visited regularly by children under six years of age.
- Evaluate and abate soil-lead hazards for target housing demolished and redeveloped for residential use following transfer. Under Title X, residential dwellings that are demolished or not intended for occupancy after transfer do not require an inspection and risk assessment or lead-based paint control and hazard abatement. However, DoD requires that the terms of property transfer include a requirement for the transferee to evaluate and abate any soil-lead hazards prior to occupancy of any newly constructed dwelling units.

By adding these additional measures as a matter of policy, DoD believes it exceeds measures necessary to reduce potential lead exposures in children and will significantly contribute to the elimination of adverse effects in children from exposures to lead from lead-based paint in federally-owned target housing subject to disposition.

This lead-based paint policy supersedes the DoD 31 October 1994 lead-based paint policy attached to the PADUSD (ES) memorandum, Asbestos, Lead Paint, and Radon Policies at BRAC Properties. The asbestos and radon policies referenced in the memorandum remain in effect. Property transfer agreements executed under the previous policy are not required to meet these requirements. The effective date implementing these requirements is 30 March 2000.

Sherri W. Goodman
Deputy Under Secretary of Defense
(Environmental Security)

Attachment

Appendix G

The Lead-Based Paint Debate

Last winter a disagreement percolating between the U.S. Environmental Protection Agency (EPA) and the Department of Defense (DoD) about lead-based paint at closing military bases came to a boil. Immediately taking opposite sides on a policy see-saw, the two agencies spent the majority of 1997 at odds, but are now showing signs of reconciliation.

To some extent, the disagreement hinges on whether the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) gives EPA the authority to regulate lead-based paint in soil. Legally, a plausible argument can be made either way, and unfortunately, it has turned into a very expensive tit for tat. Some of the points that the Department of Navy make are: 1) Since special legislation was passed in 1971 and in 1992 regulating lead-based paint, Congress intended lead-based paint to be a separate subject from CERCLA; 2) Lead-based paint is a consumer product used as directed, and thus is excluded under CERCLA 42 U.S.C. 9601(9); 3) CERCLA 120 requires the federal government to respond to the same extent as any other private party. States are prohibited from applying requirements at federal facilities that exceed those applied elsewhere; 4) No other owner must sample for lead-based paint in soil in nonresidential areas before transferring property; and 5) There is no evidence of a "substantial threat" in nonresidential areas from lead-based paint. DoD has issued a policy to comply with Title X of the Housing and Community Development Act of 1992, which regulates residential areas, and also the regulations upon which EPA and the Department of Housing and Urban Development (HUD) are currently working, but it does not agree with sampling in nonresidential areas.

EPA argues in the contrary by stating that 120 (h)(3) presents a whole set of requirements that do not apply to the private sector and that CERCLA section 104(a)(1) reads: "Whenever any hazardous substance is released or there is a substantial threat of such a release into the environment . . . the President is authorized to act . . ." EPA's bottom line is that to be protective of human health, it must be able to regulate lead-based paint releases.

Aside from the issue of CERCLA applicability, there are no specific statutes or regulations requiring property owners to check and abate for lead-based paint in nonresidential areas. Exhaustive studies have been done on children in residential settings and strict lead levels have been set to guide abatement. However, recent State studies have revealed that blood-lead levels once considered low in adults may have adverse health affects, including increased risk of heart disease and early kidney damage. The question is: How readily can lead in soil be transmitted to people?

Acknowledging that there might be some risk, EPA decided not to concur on Findings of Suitability to Transfer (FOSTs) and on Findings of Suitability to Lease (FOSLs), unless DoD sampled for lead-based paint in nonresidential areas.

In recent interviews, Paul Yaroschak, the Director of the Navy's Office for Environmental Compliance & Restoration Policy, and Jim Woolford, the Director of the U.S. EPA's Federal Facilities Restoration Reuse Office, spoke about the current status of the lead-based paint disagreement and if a compromise can be reached.

Mr. Yaroschak stated from the beginning of the interview that the Department of the Navy (DoN) does not have an issue with the EPA over residential standards and DoN will comply with EPA's and HUD's standards. Lead sources other than paint, like battery shafts, will be cleaned up under CERCLA no matter where they are located on a base. For DoN, the disagreement centers upon the nonresidential areas. Mr. Yaroschak pointed out that bridges, structures, and county courthouses all over the country were painted with lead-based paint. One must ask: "Does this present a hazard?" If so, a national policy should be set in place — not just a policy dictating what remediation DoN needs to complete before it can transfer or lease property. According to Mr. Yaroschak, the Department "is not in any way, shape, or form, in a position to determine whether hazards exist from the natural weathering of paint." He believes that regulators need to determine whether or not lead-based paint is a hazard in nonresidential areas. If so, the regulators must decide under what scenarios they would or would not want sampling and the

action levels needed. Mr. Yaroschak believes that "the same specific and national vetting procedure that

nonresidential."

EPA's FOST
(LRA).

required to come back to the site if lead-based paint in soil is determined to be a hazard in the future. In extreme cases, some parcels may have to be treated to residential standards, but according to Mr.
"[the
based paint in a nonresidential scenario presents an unacceptable risk."

EPA's main concern, on the other hand, is whether DoD is implementing Title X in residential areas

fully understands Title X requirements. Mr. Woolford remarks that the "Services were telling us that

with us about what they were doing. . . We asked them if they were doing [actions] consistently across

EPA does not understand DoD's indignation over the sampling issue. EPA's lack of approval on a FOST
a risk to human health and the environment. It will not prevent a property from being transferred, and,

though one individual sample may be cheap to conduct, sampling every BRAC installation in its entirety

This issue has placed both agencies, and possibly LRAs, in a bad position. Though the Consortium is unaware of an LRA reaching this stage, it is hypothesized that LRAs will have a difficult time finding
FOST.
may scare banks and lending institutions away from BRAC property. As a result, without specific

At Fort Benjamin Harrison, the Indiana Department of Environmental Management (IDEM) invoked the dispute resolution clause under the IDEM/Army memorandum of agreement. IDEM contends that

disagreement has delayed the property transfer. ICMA predicts similar actions will occur in other States for residential areas.

If EPA decides to develop a national policy for nonresidential areas, it could take years to complete. Then, considering DoD's limitation in cleanup funds, the LRA would need to wait a few more years for the Department to return to the site. Since the LRAs will suffer if they own unsafe property, are forced to pay for extensive remediation themselves, or must wait to begin economic redevelopment, ICMA hopes for a speedy resolution.

polarized for a very long time and right now, personally, I'm optimistic that we will now be able to move forward and solve some of the problems that we are facing." For almost three years, DoD and EPA disagreed on residential and nonresidential areas, but "over the past month, [we] decided to work
"[hopes]
and EPA] can come to an agreement by the middle of May," at least for the residential areas, and that the
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Appendix H

September 16, 2001 Contact: HHS Press Office
(202) 690-6343

ASBESTOS

What is asbestos?

Asbestos is a naturally occurring strong mineral fiber that is resistant to heat and has many desirable properties. Because asbestos fibers are resistant to heat and most chemicals, they have been used as insulation materials in many residential and commercial buildings throughout the country. Asbestos fibers are found in nature and float easily. Nearly everyone is exposed to asbestos at some time during their life.

How much asbestos causes illness?

Most people do not become ill from the asbestos they are exposed to. Asbestos exposure becomes a health concern when high concentrations of asbestos fibers are inhaled over a long time period. People who become ill from asbestos are almost always those who are exposed on a day-to-day basis in a job where they work directly with the material. As a person's exposure to fibers increases, either by breathing more fibers or by breathing fibers for a longer time, that person's risk of disease also increases. It can take anywhere from 10 to 40 years for someone to develop an asbestos-related illness after their exposure. Disease is very unlikely to result from a single, high-level exposure, or from a short period of exposure to lower levels.

What are some illnesses caused by prolonged or concentrated exposure to asbestos in the workplace?

Asbestosis -is a serious, progressive disease associated with long-term exposure to asbestos that causes damage (called 'scarring') to lung tissue. The symptoms of the disease (like shortness of breath) can be managed under the care of a doctor.

Lung cancer - Asbestos is one of the leading causes of all types of lung cancers among nonsmokers, and asbestos-exposed smokers have dramatically high rates of this disease.

Malignant mesothelioma -a rare progressive cancer of the tissue lining the chest or abdomen for which asbestos and similar fibers is the only known cause.

What are some things that can be done to limit exposure?

For the general public, the best way to avoid exposure is to avoid breathing in dust as much as possible. We do not know if all of the dust has asbestos. If there is asbestos in the dust, short-term exposures are unlikely to cause harm.

Workers involved in demolition and removal of the debris from these disasters, should wear respiratory protection (a NIOSH-approved respirator such as an N-95 or more protective respirator). It is essential that when these respirators are used, they are properly fit on the worker. Workers should wear the respirator while working inside established work zones. The respirators are not required outside of the established work zones. Additionally, there are

measures that the workers within the zone can take to reduce the dust released. For example, a limited dampening of settled dust with a fine water mist can markedly reduce the amount of dust that is raised by activity. Workers should also remove dusty clothing while wearing respiratory protection and then shower completely and change into fresh clothing before going home to avoid carrying the dust into their cars or homes.

Where can a person get more information on asbestos?

For more information on asbestos and your health please call 1-888-42ATSDR or visit the Web site at http://www.atsdr.cdc.gov. For occupational health information call 1-800-35NIOSH or http://www.cdc.gov/niosh on the web.

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Note: All HHS press releases, fact sheets and and other press materials are available at http://www.hhs.gov/news.

Appendix I

NFESC **ASBESTOS**

Asbestos in Buildings

Asbestos is a general name for a group of naturally occurring mineral silicates, e.g. chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, and actinolite asbestos or any products composed of these minerals.

Asbestos is generally a fibrous material which is incombustible and possesses high tensile strength, good thermal and electrical insulation properties, and moderate to good chemical resistance. Because of its inherent properties of softness, pliability and resistance to heat and chemical corrosion, asbestos became popular as an additive to many building materials.

Asbestos is now known to be a major health hazard. Inhalation of asbestos fibers may cause asbestosis, pleural thickening, lung cancer and mesothelioma and also may cause cancer of the gastrointestinal tract. If exposure is combined with smoking , the risk of developing lung cancer is increased dramatically. These diseases are normally associated with *industrial* exposure to asbestos fibers, however, the extensive use of asbestos in building materials has raised some concern about exposure in non-industrial settings.

The presence of asbestos is not necessarily a danger to building occupants. As long as asbestos-containing materials (ACM) remain in good condition and are not disturbed or damaged, exposure is unlikely. However, damaged, deteriorated, or disturbed ACM can lead to fiber release and exposure. Unauthorized removal or disturbance of asbestos materials is not only potentially unhealthy but also illegal. **Only trained, certified workers should handle or remove ACM.** Unauthorized or uncontrolled disturbance of asbestos materials is a violation of Navy policy and EPA or OSHA regulations.

ASBESTOS GUIDELINES

- **Do not** damage, disturb, or remove asbestos-containing materials.
- **Promptly report** potential asbestos debris or damaged asbestos materials (e.g., damaged pipe insulation and loose/missing floor tiles) to your supervisor, the safety office, or asbestos program manager.
- **Stop** improper cleaning or maintenance activities being done on suspect materials, and contact your supervisor, safety office or asbestos program manager.

TYPES OF ASBESTOS BUILDING MATERIALS

Asbestos has been used in literally hundreds of products. Asbestos gained wide

spread use because it is plentiful, readily available and low in cost. Because of its unique properties – fire resistant, high tensile strength, poor heat and electric conductor, and generally impervious to chemical attacks – asbestos proved well suited for many uses in the construction trades. The beneficial properties of asbestos make it ideal for many diverse uses such as:

- floor tile
- ceiling tiles
- linoleum
- mastic (glue between floor tiles, linoleum, carpet and floor)
- acoustical finishes
- pipe gaskets
- pipe fittings
- fume hood liners
- plaster
- spackling
- lab countertops
- roofing felts and asphalt
- siding
- transite
- fireproofing
- pipe insulation
- boiler insulation
- electrical insulation
- HVAC duct wrap
- tank insulation
- fire doors

Building materials that may contain asbestos must be treated as if they do until laboratory testing proves that they do not contain asbestos. If you have any questions about whether a material contains asbestos, contact your safety office or activity asbestos program manager.

MOST COMMON APPLICATIONS [1]

The EPA identifies three categories of ACM used in buildings:

1. <u>Surfacing Material</u> - defined as any material sprayed or troweled on surfaces (walls, ceilings, and structural members) for acoustical, decorative, or fireproofing purposes. This includes plaster and fireproofing insulation.

a. Structural Fireproofing – non-fireproofing structural steel frames of buildings could melt or loose their strength if exposed to the excessive heat of a building fire. Thus, the steel components of many buildings were sprayed with a mineral fireproofing which often contained asbestos. Asbestos content varies from a few percent up to 40% or 50%. Usually, structural fireproofing can vary from fairly hard to very soft and friable. Thickness can vary from one inch up to three or four inches.

b. Acoustic Insulation – asbestos is commonly found in spray or trowel applied acoustic insulation on building ceilings and walls. The concentration can vary from less than 1% up to 25%. Chrysotile is by far the most common variety of asbestos found in acoustic applications but amosite occurs occasionally. Spray applied product are almost always friable. Troweled on insulation can be somewhat friable but is often very hard and cement-like (cementitious).

c. Textured Paints and Plasters – many textured and plasters used to contain asbestos in relatively low concentrations. Usually the variety of asbestos involved is chrysotile. Textured paints and plasters run the range from fairly friable and soft to very hard and non-friable.

2. Thermal System Insulation (TSI) - material used to inhibit heat transfer or prevent condensations on pipes, fittings, boilers, tanks, ducts or other various other components of hot and cold water systems and heating, ventilation and air conditioning (HVAC) systems. This includes pipe lagging, pipe wrap, block, batt, and blanket insulation, cements and "muds", and a variety of other products such as gaskets and ropes.

a. Pipe Insulation – Hot steam and water pipes were very commonly insulated with asbestos containing materials. The asbestos present can be in several forms:

   - Aircell – a corrugated asbestos paper product, which looks, like gray cardboard. Various trade names include Asbestocel, Carcycel, and others. Aircell almost always contains chrysotile, usually in very high concentrations, ranging from 50 to 90%. Aircell can be very friable if damaged.

   - Block insulation – asbestos was mixed with other binders and cast into rigid forms to form block pipe insulation. Most types of block insulation are covered with lagging cloth made of canvas, tar paper, metal jackets or woven asbestos. However, certain types were designed to be used without any surface covering. Block insulation ranges from 10 to 80% in asbestos content, mostly chrysotile and amosite. Pipe or block insulation with a decaying outer surface is almost always friable. The following types of block insulation are commonly encountered on pipes:

     - Carbonate of Magnesia: Chemically the major ingredient of this material is basic magnesium carbonate, commonly called magnesia. Asbestos fiber was mixed with it, and the slurry was cast in appropriate molds. A mixture of 85% magnesia and 15% asbestos-fiber reinforcement was the best known and most commonly used insulation.

     - Laminated Asbestos Felt: Often called asbestos sponge felt, this product was made by all manufacturers of the 85% percent magnesia, in both pipe covering and block or sheet form. It is a very heavy product, weighing about 30 lbs. per cubic foot. It was supplied as pipe covering in sectional form for all commercial pipe sizes.

     - Amosite Sheeting: Amosite fiber was processed and felted to produce an insulation material having good mechanical strength and insulation efficiency. It was sold as pipe insulation, blocks or sheets, but it is basically a single layer material, particularly for pipe insulation.

     - Hydrous Calcium Silicate: Calsil is very similar to 85% magnesia in look, conductivity, weight, and cost. Calsil is a chemical

compound of lime and silica with no added binder. A "nominal" percentage of asbestos fibers is included for mechanical effect. High-temperature calcium silicate insulation, a more expensive later development, was used against hot surfaces, and applied under layers of cheap insulation to back up refractory walls in furnaces and boilers and for fireproofing steel columns, supports, and skirts of vessels and similar applications.

- Diatomaceous Earth with Asbestos Fiber: This is a high temperature material for service up to 1900^{o} Fahrenheit. It is composed of calcined diatomaceous earth, which is nearly pure silica, and asbestos fiber compounded together to obtain a mechanical bond. Diatomaceous silica is composed of the remains of diatoms, one of the simplest forms of marine life. The combination of this refractory material with asbestos fiber and bonding clay is molded into pipe covering and blocks. This insulation was generally used as a first layer in combination with cheaper materials in high temperature application.

- Elbow/Joint Mud & Fillers: "Insulation mud" (sometimes referred to as "cement"), which often contained 5-30% asbestos, was commonly used for two applications. The first is for the insulation of irregular surfaces such as ells, tees, valves, and other fittings up to 3 inches in size. The second important use is for finishing, that is, to smooth off the surface of block insulation or to provide a hard, even surface over blanket type materials. Chrysotile and amosite mixed with bonding clays (and occasionally mineral wool or expanded mica) were very common in this application. Pure asbestos was also used as a "filler" to be poured into space that are otherwise inaccessible. Intact elbow mud is usually fairly hard and non-friable. Damaged or decaying mud is extremely friable.

b. Air Supply Duct Wrap – Hot air supply ducts in homes, small apartments and school building were often wrapped with one or more varieties of asbestos containing products. All of these "duct wraps" are asbestos paper products where the asbestos fibers have been substituted for cellulose fibers. The most common application is aircell, similar to the corrugated, cardboard-liked product found around pipes. Sometimes the exterior surface of the aircell is coated with a thin metal foil. Another common product is asbestos sheeting, flat sheets or thick paper wrapped around the duct in many layers. Another very common product is asbestos taping; a thick, textured asbestos paper tape used in registers and ductwork seams or return air ducts. Asbestos tape was often applied inside of air supply registers. In large building, asbestos tape was very commonly applied at the edges of fiberglass sheets installed over air ducts for acoustic insulation purposes.

   All of these asbestos paper products manufactured before the early 1960’s

contained high (50-90%) levels of asbestos, almost exclusively chrysotile. Paper-based insulation products manufactured after the early 1960's usually contained 35-50% asbestos. Friability ranges from low for well adhered, thin products to fairly high for deteriorating, poorly adhered applications.

c. Boiler Insulation – Boilers are very commonly insulated with asbestos blocks and mud products similar to those found on pipes. Preformed blocks, sheets and bricks of asbestos plus binders were wrapped around the exterior metal surface of the boiler and held in place with asbestos mud and a covering cloth of canvas or asbestos. As in block pipe insulation, asbestos concentration can vary widely, in this instance from 10 to 80%. Chrysotile is the most common asbestos variety. Amosite shows up occasionally, especially in the mudding compounds. Intact boiler insulation is non-friable. Damaged or decaying insulation can be extremely friable. Asbestos containing gaskets or seals can also be found in boilers.

d. Furnace Insulation – Hot air furnaces and plenums were often wrapped with asbestos products identical to those used on pipe insulation. Occasionally, some internal components have been insulated with asbestos products. The characteristics of these products are described above under pipe and duct insulation.

e. Exhaust Systems – Many exhaust ventilation ducts running off of water heaters, small furnaces and some laboratory fume hoods are made of asbestos cement, commonly referred to by the trade name transite. Asbestos cement contains 10-50& of chrysotile, amosite, or crocidolite. Intact transite ductwork is non-friable. However, any activity which disturbs the material integrity such as drilling, or sawing will release asbestos fibers into the air. Portion of these exhaust ducts are often made of copper or sheet metal and the seams are commonly wrapped with 4" wide asbestos taping.

f. Fabric Vibration Isolation Joints – Large HVAC fans are often isolated from their associated ductwork with a flexible cloth made of asbestos. This cloth is 50-90% chrysotile asbestos and is usually friable.

3. <u>Miscellaneous Materials</u> include other products and materials such as floor tile, ceiling tile, roofing felt, concrete pipe, outdoor siding, and fabrics.

a. Walls – Building walls were constructed with a number of products, which might contain asbestos. Asbestos was very common in joint or taping compound used to fill the cracks in drywall barriers. Drywall itself rarely contains asbestos. Plaster can contain asbestos but it is fairly rare. Sometimes, walls are made of asbestos cement (transite) sheets, which contain 10-50% asbestos, that are nailed to studs. All of these wall applications for asbestos are non-friable unless they are cut into, subject to abrasion or decaying.

b. Roofing – Asbestos was and continues to be used extensively in roofing products. Asbestos containing roofing products include asphalt asbestos shingles, asbestos cement shingles, roofing felt, roofing felt, roofing paint and roof patching compound. All of these products are considered non-friable when they are new. Heat, water and time can cause these products to become moderately friable. Asbestos content varies widely; chrysotile is by far the most common type.

c. Ceiling Tiles – A very small percentage (0.05%) of acoustic ceiling tiles contain asbestos. Usually, these tiles are made of pressed cellulose, wood pulp, fiberglass, or other mineral wool, alone or in combination. When present, the concentration of asbestos is usually in the range of 5-20%. Most ceiling tiles are considered slightly to moderately friable.

d. Vinyl or Asphalt Asbestos Floor Tiles – Asbestos was very commonly used to reinforce vinyl or asphalt floor tiles. Many 9"X9" tiles and some larger 12" square tiles were produced with 5-25% asbestos. Vinyl asbestos floor tiles are generally considered non-friable unless severely disturbed or subjected to abrasion. However, the compound used to hold these tiles to the sub-floor often contains asbestos. Old adhesive can be quite friable and may release fibers if the overlying tile is removed.

e. Vinyl Sheet Floor Covering (linoleum) – Old linoleum can possess a semi-friable backing of 20-60% chrysotile asbestos. This backing is not very friable on the non-installed product; however, tearing up old linoleum, which was glued down, can severely disrupt this backing material, and release asbestos fibers.

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[1] Information in this section is derived from EPA's *Model Curriculum for Schools Asbestos Inspector*

Appendix J

The Asbestos Informer

What is asbestos?

Asbestos is a mineral. It is mined in much the same way that other minerals, such as iron, lead, and copper, are. Asbestos is composed of silicon, oxygen, hydrogen, and various metal cations (positively charged metal ions). There are many varieties of asbestos: the three most common are chrysotile, amosite, and crocidolite. Chrysotile fibers are pliable and cylindrical, and often arranged in bundles. Amosite and crocidolite fibers are like tiny needles. The first commercial asbestos mine -- a chrysotile mine -- opened in Quebec, Canada, in the 1870's. Crocidolite asbestos was first mined in South Africa during the 1980's. Amosite asbestos also comes from Africa and was first mined in 1916. Unlike most minerals, which turn into dust particles when crushed, asbestos breaks up into fine fibers that are too small to be seen by the human eye. Often individual fibers are mixed with a material that binds them together, producing asbestos containing material (ACM).

Why has asbestos been so widely used?

Asbestos appealed to manufacturers and builders for a variety of reasons. It is strong yet flexible, and it will not burn. It conducts electricity poorly, but insulates effectively. It also resists corrosion. Asbestos may have been so widely used because few other available substances combine the same qualities.

How many products contain asbestos?

One study estimated that 3,000 different types of commercial products contained asbestos. The amount of asbestos in each product varied from as little as one percent to as much as 100 percent. Many older plastics, paper products, brake linings, floor tiles and textile products contain asbestos, as do many heavy industrial products such as sealants, cement pipe, cement sheets, and insulation. The final Asbestos Ban and Phaseout Rule prohibits the manufacture, processing and importation of most asbestos products.

How long has asbestos been in use?

Asbestos was first used in the United States in the early 1900's, to insulate steam engines. But until the early 1940's, asbestos was not used extensively. However, after World War II, and for the next thirty years, people who constructed and renovated schools and other public buildings used asbestos and asbestos - containing materials (ACM) extensively. They used ACM primarily to fireproof, insulate, soundproof, and decorate. The Environmental Protection Agency (EPA) estimates that there are asbestos containing materials in most of the nation's approximately 107,000 primary and secondary schools and 733,000 public and commercial buildings.

How are people exposed to asbestos?

When asbestos fibers are in the air, people may inhale them. Because asbestos fibers are small and light, they can stay in the air for a long time.

People whose work brings them into contact with asbestos -- workers who renovate buildings with asbestos in them, for example -- may inhale fibers that are in the air:

this is called occupational exposure. Workers' families may inhale asbestos fibers released by clothes that have been in contact with ACM: this is called paraoccupational exposure. People who live or work near asbestos- related operations may inhale asbestos fibers that have been released into the air by the operations: this is called neighborhood exposure.

The amount of asbestos a worker is exposed to will vary according to

- The concentration of fibers in the air
- Duration of exposure
- The worker's breathing rate (workers doing manual labor breathe faster)
- Weather conditions
- The protective devices the worker wears

It is estimated that between 1940 and 1980, 27 million Americans had significant occupational exposure to asbestos. People may also ingest asbestos if they eat in areas where there are asbestos fibers in the air.

When is ACM most likely to release asbestos fibers?

Damaged ACM is more likely to release fibers than non-damaged ACM. In a 1984 survey, EPA found that approximately 66 percent of those buildings that contained asbestos contained damaged ACM. If ACM, when dry, can be crumbled by hand pressure -- a condition known as "friable" -- it is more likely to release fibers than if it is "non-friable." Fluffy, spray-applied asbestos fireproofing material is generally considered "friable." Some materials which are considered "non-friable," such as vinyl-asbestos floor tile, can also release fibers when sanded, sawed or otherwise aggressively disturbed. Materials such as asbestos cement pipe can release asbestos fibers if broken or crushed when buildings are demolished, renovated or repaired. ACM which is in a heavy traffic area, and which is therefore often disturbed, is more likely to release fibers than ACM in a relatively undisturbed area.

How can asbestos be identified?

While it is often possible to "suspect" that a material or product is/or contains asbestos by visual determination, actual determinations can only be made by instrumental analysis. Until a product is tested, it is best to assume that the product contains asbestos, unless the label, or the manufacturer verifies that it does not.

The EPA requires that the asbestos content of suspect materials be determined by collecting bulk samples and analyzing them by polarized light microscopy (PLM). The PLM technique determines both the percent and type of asbestos in the bulk material. EPA Regional Offices can provide information about laboratories that test for asbestos.

Does asbestos exposure cause health problems?

Some people exposed to asbestos develop asbestos-related health problems; some do not. Once inhaled, asbestos fibers can easily penetrate body tissues. They may be deposited and retained in the airways and lung tissue. Because asbestos fibers remain in the body, each exposure increases the likelihood of developing an asbestos-related disease. Asbestos related diseases may not appear until years after exposure. Today we are seeing results of exposure among asbestos workers during World War II. A medical examination which includes a medical history, breathing capacity test and chest x-ray may detect problems early. Scientists have not been able to develop a "safe" or threshold level for exposure to airborne asbestos. Ingesting asbestos may be harmful, but the consequences of this type of exposure have not been clearly documented. Nor have the effects of skin exposure to asbestos been documented. People who touch asbestos may get

a rash similar to the rash caused by fiberglass.

What illnesses are associated with asbestos exposure?

Asbestos is

Asbestosis is a serious, chronic, non-cancerous respiratory disease. Inhaled asbestos fibers aggravate lung tissues, which causes them to scar. Symptoms of asbestosis include shortness of breath and a dry crackling sound in the lungs while inhaling. In its advanced stages, the disease may cause cardiac failure.

There is no effective treatment for asbestosis; the disease is usually disabling or fatal. The risk of asbestosis is minimal for those who do not work with asbestos; the disease is rarely caused by neighborhood or family exposure. Those who renovate or demolish buildings that contain asbestos may be at significant risk, depending on the nature of the exposure and precautions taken.

Lung Cancer

Lung cancer causes the largest number of deaths related to asbestos exposure. The incidence of lung cancer in people who are directly involved in the mining, milling, manufacturing and use of asbestos and its products is much higher than in the general population. The most common symptoms of lung cancer are coughing and a change in breathing. Other symptoms include shortness of breath, persistent chest pains, hoarseness, and anemia.

People who have been exposed to asbestos and are also exposed to some other carcinogen -- such as cigarette smoke -- have a significantly greater risk of developing lung cancer than people who have only been exposed to asbestos. One study found that asbestos workers who smoke are about 90 times more likely to develop lung cancer than people who neither smoke nor have been exposed to asbestos.

Mesothelioma

Mesothelioma is a rare form of cancer which most often occurs in the thin membrane lining of the lungs, chest, abdomen, and (rarely) heart. About 200 cases are diagnosed each year in the United States. Virtually all cases of mesothelioma are linked with asbestos exposure. Approximately 2 percent of all miners and textile workers who work with asbestos, and 10 percent of all workers who were involved in the manufacture of asbestos-containing gas masks, contract mesothelioma.

People who work in asbestos mines, asbestos mills and factories, and shipyards that use asbestos, as well as people who manufacture and install asbestos insulation, have an increased risk of mesothelioma. So do people who live with asbestos workers, near asbestos mining areas, near asbestos product factories or near shipyards where use of asbestos has produced large quantities of airborne asbestos fibers.

The younger people are when they inhale asbestos, the more likely they are to develop mesothelioma. This is why enormous efforts are being made to prevent school children from being exposed.

Other Cancers

Evidence suggests that cancers in the esophagus, larynx, oral cavity, stomach, colon and kidney may be caused by ingesting asbestos. For more information on asbestos-related cancers, contact your local chapter of the American Cancer Society.

Who regulates asbestos?

The U.S. Environmental Protection Agency and the Occupational Safety and Health

Administration (OSHA) are responsible for regulating environmental exposure and protecting workers from asbestos exposure. OSHA is responsible for the health and safety of workers who may be exposed to asbestos in the work place, or in connection with their jobs. EPA is responsible for developing and enforcing regulations necessary to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health.

The EPA's Worker Protection Rule (40 CFR Part 763, Subpart G) extends the OSHA standards to state and local employees who perform asbestos work and who are not covered by the OSHA Asbestos Standards, or by a state OSHA plan. The Rule parallels OSHA requirements and covers medical examinations, air monitoring and reporting, protective equipment, work practices, and record keeping. In addition, many State and local agencies have more stringent standards than those required by the Federal government. People who plan to renovate or remove asbestos from a building of a certain size, or who plan to demolish any building, are required to notify the appropriate federal, state and local agencies, and to follow all federal, state, and local requirements for removal and disposal of regulated asbestos-containing material (RACM).

EPA's advice on asbestos is neither to rip it all out in a panic nor to ignore the problem under a false presumption that asbestos is "risk free." Rather, EPA recommends a practical approach that protects public health by emphasizing that asbestos material in buildings should be located, that it should be appropriately managed, and that those workers who may disturb it should be properly trained and protected. That has been, and continues to be, EPA's position. The following summarizes the five major facts that the Agency has presented in congressional testimony:

FACT ONE: Although asbestos is hazardous, human risk of asbestos disease depends upon exposure.

FACT TWO: Prevailing asbestos levels in buildings -- the levels school children and you and I face as building occupants -- seem to be very low, based upon available data. Accordingly, the health risk we face as building occupants also appears to be very low.

FACT THREE: Removal is often not a school district's or other building owner's best course of action to reduce asbestos exposure. In fact, an improper removal can create a dangerous situation where none previously existed.

FACT FOUR: EPA only requires asbestos removal in order to prevent significant public exposure to asbestos, such as during building renovation or demolition.

FACT FIVE: EPA does recommend in-place management whenever asbestos is discovered. Instead of removal, a conscientious in- place management program will usually control fiber releases, particularly when the materials are not significantly damaged and are not likely to be disturbed.

What are EPA's regulations governing asbestos?

TSCA

In 1979, under the Toxic Substances Control Act (TSCA), EPA began an asbestos technical assistance program for building owners, environmental groups, contractors and industry. In May 1982, EPA issued the first regulation intended to control asbestos in schools under the authority of TSCA; this regulation was known as the Asbestos-in-Schools Rule. Starting in 1985, loans and grants have been given each year to aid Local Education Agencies (LEAs) in conducting asbestos abatement projects under the Asbestos School Hazard Abatement Act (ASHAA).

AHERA

In 1986, the Asbestos Hazard Emergency Response Act (AHERA; Asbestos Containing Materials in Schools, 40 CFR Part 763, Subpart E) was signed into law

as Title II of TSCA. AHERA is more inclusive than the May 1982 Asbestos-in-Schools Rule. AHERA requires LEAs to inspect their schools for asbestos containing building materials (ACBM) and prepare management plans which recommend the best way to reduce the asbestos hazard. Options include repairing damaged ACM, spraying it with sealants, enclosing it, removing it, or keeping it in good condition so that it does not release fibers. The plans must be developed by accredited management planners and approved by the State. LEAs must notify parent, teacher and employer organizations of the plans, and then the plans must be implemented. AHERA also requires accreditation of abatement designers, contractor supervisors and workers, building inspectors, and school management plan writers. Those responsible for enforcing AHERA have concentrated on educating LEAs, in an effort to ensure that they comply with the regulations. Contractors that improperly remove asbestos from schools can be liable under both AHERA and NESHAP. For more information on AHERA, request the pamphlet entitled "The ABC's of Asbestos in Schools" from the EPA Public Information Center.

ASBESTOS BAN & PHASEOUT RULE

In 1989 EPA published the Asbestos: Manufacture, Importation, Processing, and Distribution in Commerce Prohibitions; Final Rule (40 CFR Part 763, Subpart I). The rule will eventually ban about 94 percent of the asbestos used in the U.S. (based on 1985 estimates). For example, asbestos containing drum brake linings and roof coatings will be banned. The rule will be implemented in three stages between 1990 and 1997.

NESHAP

The Clean Air Act (CAA) of 1970 requires EPA to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with Section 112 of the CAA, EPA established National Emission Standards for Hazardous Air Pollutants (NESHAP). Asbestos was one of the first hazardous air pollutants regulated under Section 112. On March 31, 1971, EPA identified asbestos as a hazardous pollutant, and on April 6, 1973, EPA promulgated the Asbestos NESHAP in 40 CFR Part 61, Subpart M. The Asbestos NESHAP has been amended several times, most recently in November 1990. For a copy of the Asbestos NESHAP contact the Asbestos NESHAP Coordinators listed in the Appendix.

What are the basic requirements of the Asbestos NESHAP?

The Asbestos NESHAP is intended to minimize the release of asbestos fibers during activities involving the handling of asbestos. Accordingly, it specifies work practices to be followed during renovations of buildings which contain a certain threshold amount of friable asbestos, and during demolitions of all structures, installations, and facilities (except apartment buildings that have no more than four dwelling units). Most often, the Asbestos NESHAP requires action to be taken by the person who owns, leases, operates, controls, or supervises the facility being demolished or renovated (the "owner"), and by the person who owns, leases, operators, controls or supervises the demolition or renovation (the "operator"). The regulations require owners and operators subject to the Asbestos NESHAP to notify delegated State and local agencies and/or their EPA Regional Offices before demolition or renovation activity begins. The regulations restrict the use of spray asbestos, and prohibit the use of wet applied and molded insulation (i.e., pipe lagging). The Asbestos NESHAP also regulates asbestos waste handling and disposal.

Why was the Asbestos NESHAP recently amended?

The Asbestos NESHAP was amended for several reasons. EPA wanted to clarify existing regulatory policies, and to add regulations which explicitly address monitoring and record keeping at facilities which mill, manufacture, and fabricate asbestos. Also, because of the high risk associated with the transfer and disposal of ACM, EPA also wanted to strengthen the requirements which govern asbestos waste disposal by requiring tracking and record keeping. Furthermore, EPA

determined that the Asbestos NESHAP needed to take into account the availability of improved emission controls. EPA also wanted to make the NESHAP consistent with other EPA statutes that regulate asbestos.

What sources are now covered by the asbestos NESHAP?

The following activities and facilities are currently regulated by the Asbestos NESHAP:

- The milling of asbestos.
- Roadways containing ACM.
- The commercial manufacture of products that contain commercial asbestos.
- The demolition of all facilities.
- The renovation of facilities that contain friable ACM.
- The spraying of ACM.
- The processing (fabricating) of any manufactured products that contain asbestos.
- The use of insulating materials that contain commercial asbestos.
- The disposal of asbestos-containing waste generated during milling, manufacturing, demolition, renovation, spraying, and fabricating operation.
- The closure and maintenance of inactive waste disposal sites.
- The operation of and reporting on facilities that convert asbestos containing waste material into non-asbestos material.
- The design and operation of air cleaning devices.
- The reporting of information pertaining to process control equipment, filter devices, asbestos generating processes, etc.
- Active waste disposal sites.

What were the major change s to the Asbestos NESHAP?

Milling, Manufacturing, and Fabricating Sources

Businesses which are involved in asbestos milling, manufacturing, and fabricating now must monitor for visible emissions for at least 15 seconds at least once a day (during daylight hours), and inspect air cleaning devices at least once a week. The facilities must maintain records of the results, and submit each quarter a copy of the visible emissions monitoring records if visible emissions occurred during the quarter. Facilities that install fabric filters (to control asbestos emissions) after the effective date of the revision must provide for easy inspection of the bags.

Demolition and Renovation

All facilities which are "demolished" are subject to the Asbestos NESHAP. The definition of demolition was expanded to include the intentional burning of a facility, in addition to the "wrecking or taking out . . . any load-supporting structural member of a facility." Owners and operators of all facilities which are to be demolished, and of facilities that contain a certain amount of asbestos which are to be renovated, must now provide more detailed information in notifications, including the name of

the asbestos waste transporter and the name of the waste disposal site where the ACM will be deposited.

Owners and operators must give a 10-day notice for planned renovations and demolitions. They must renotify EPA in advance of the actual start date if the demolition or renovation will begin on a date other than the one specified in the original notification. Telephone re- notifications are permitted, but must be followed by written notice.

Starting one year after promulgation of the regulation, a person trained in the provisions of the Asbestos NESHAP, and in the methods of complying with them, must supervise operations in which ACM is stripped, removed or otherwise handled. This supervisor is responsible for all on-site activity. Before wetting is suspended, the EPA administrator must approve. When wetting of asbestos during its removal is suspended due to freezing temperatures, owners or operators must measure the air temperature in the work area three times during the workday, and must keep those records for at least two years.

The revisions also clarify EPA's position regarding the handling and treatment of non- friable asbestos material. The owner and operator must inspect the site for the presence of non-friable ACM, and include in the notification an estimate of how much non-friable ACM is present. Also, the owner and operator must describe the procedures to be followed if unexpected ACM is found in the course of demolition or renovation, and if non-friable asbestos becomes friable in the course of renovation or demolition.

Waste Transport and Disposal

Vehicles used to transport ACM must be marked according to new guidelines during loading and unloading. Labels indicating the name of the waste generator and the location where the waste was generated must be placed on containers of RACM. When ACM waste is transported off-site, a waste shipment record (WSR) must be given to the waste site operator or owner at the time that the waste is delivered to the waste disposal site. The owner or operator must send a signed copy of the WSR back to the waste generator within 30 days, and attempt to reconcile any discrepancy between the quantity of waste given on the WSR and the actual amount of waste received. If, within 15 days of receiving the waste, the waste site owner or operator cannot reconcile the discrepancy, he or she must report that problem to the same agency that was notified about the demolition or renovation. New disposal sites must apply for approval to construct, and must notify EPA of the startup date. Existing disposal sites must supply EPA with certain information concerning their operations, such as the name and address of the owner or operator, the location of the site, the average weight per month of the hazardous materials being processed, and a description of the existing emission control equipment. If a copy of the WSR signed by the waste site owner or operator is not received by the waste generator within 35 days of the date that the waste was accepted by the initial transporter, the waste generator must contact the transporter and/or disposal site owner or operator to determine the status of the waste shipment. If a signed copy of the WSR is not received within 45 days of the date that the waste was accepted by the initial transporter, the waste generator must submit a written report to the same agency that was notified about the demolition or renovation.

Owners of disposal sites must record on the deed to the disposal site that the property has been used for ACM disposal. They must also keep records that show the location, depth, area and volume of the asbestos waste; they must indicate on the deed that these records are available. Owners of inactive disposal sites must obtain written approval before they excavate or otherwise disturb ACM waste that has been deposited on the site.

Where can I get more information?

There are ten EPA Regional Offices around the country. You can obtain more information about the Asbestos NESHAP by contacting your EPA Regional Office's NESHAP coordinator or the appropriate State or local agency. You can obtain more

information about AHERA by contacting your EPA Regional Asbestos Coordinator (RAC). You may also call the EPA Toxic Substances Control Act (TSCA) Hotline to ask general questions about asbestos, or to request asbestos guidance documents. The Hotline number is (202) 554-1404. The EPA Public Information Center can send you information on EPA regulations. You can reach the center at (202) 382-2080 or (202) 475-7751. The Office of the Federal Register (202-382-5475) can send you copies of any regulations published in The Federal Register, including the Asbestos NESHAP. Finally, the EPA has an Asbestos Ombudsman to provide information on the handling and abatement of asbestos in schools, the work place and the home. Also, the EPA Asbestos Ombudsman can help citizens with asbestos-in-school complaints. The Ombudsman can be reached toll-free at (800) 368-5888, direct at (703) 557- 1938 or 557-1939.

Appendix K

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY 31 OCT 19 9

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY
(INSTALLATIONS, LOGISTICS & ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY
(INSTALLATIONS & ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE
(MANPOWER, RESERVE AFFAIRS, INSTALLATIONS & ENVIRONMENT)
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Asbestos, Lead Paint and Radon Policies at BRAC Properties

The purpose of this memorandum is to request that you implement the attached Department of Defense (DoD) policies on asbestos, lead paint and radon at base realignment and closure (BRAC) properties.

As you may recall, these policies were drafted and accepted within the Defense Environmental Security Council (DESC) structure. During its May 6, 1994, meeting the DESC accepted the draft DoD policy on radon at BRAC properties. At that meeting, the draft policies on asbestos and lead paint were referred to the Environment, Safety and Occupational Health Policy Board (ESOHPB) for revision and acceptance. During its May 10, 1994, meeting the ESOHPB accepted the revised draft DoD policies on asbestos and lead paint at BRAC properties.

Subsequent to DESC and ESOHPB action, these polices were coordinated formally with the Assistant Secretary of Defense (Economic Security) and the Office of the Deputy General Counsel (Acquisition & Logistics). If there are any questions concerning this request, please contact Ed Dyckman, DESC Executive Secretary at 703-697-9107.

{Signed}

Gary D. Vest
Principal Assistant Deputy Under Secretary
of Defense (Environmental Security)

Attachments

DoD Policy on Asbestos at Base Realignment and Closure Properties
DoD Policy on Lead-Based Paint at Base Realignment and Closure Properties
DoD Policy on Radon at Base Realignment and Closure Properties

DOD POLICY ON ASBESTOS AT BASE REALIGNMENT AND CLOSURE PROPERTIES

Department of Defense (DoD) policy with regard to asbestos- containing material (ACM) is to manage ACM in a manner protective of human health and the environment, and to comply with all applicable Federal, State, and local laws and regulations governing ACM hazards. Therefore, unless it is determined by competent authority that the ACM in the property does pose a threat to human health at the time of transfer, all property containing ACM will be conveyed, leased, or otherwise disposed of as is through the Base Realignment and Closure (BRAC) process.

Prior to property disposal, all available information on the existence, extent, and condition of ACM shall be incorporated into the Environmental Baseline Survey (EBS) report or other appropriate document to be provided to the transferee. The survey report or document shall include:

- reasonably available information on the type, location, and condition of asbestos in any building or improvement on the property;
- any results of testing for asbestos;
- a description of any asbestos control measures taken for the property,
- any available information on costs or time necessary to remove all or any portion of the remaining ACK; however, special studies or tests to obtain this material are not required; and
- results of a site-specific update of the asbestos inventory performed to revalidate the condition of ACM.

Asbestos-containing material shall be remedied prior to property disposal only if it is of a type and condition that is not in compliance with applicable laws, regulations, and standards, or if it poses a threat to human health at the time of transfer of the property. This remediation should be accomplished by the active Service organization, by the Service disposal agent, or by the transferee under a negotiated requirement of the contract for sale or lease. The remediation discussed above will not be required when the buildings are scheduled for

demolition by the transferee; the transfer document prohibits occupation of the buildings prior to the demolition; and the transferee assumes responsibility for the management of any ACM in accordance with applicable laws.

Return to Memorandum

BRAC DOCUMENTS

Appendix L

Bergstrom AFB

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	*4*	5	Very Accurate
LBP	Not Very Accurate	1	2	3	*4*	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	*4*	5	Very Accurate
LBP	Not Very Accurate	1	2	3	*4*	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Did not hamper reuse, but did impact cost, albeit small compared to the total .

What has been your major reuse challenge regarding either asbestos or LBP?
None, really.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
Fair market value was not a determinant in our reuse.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Early detection is highly recommended, followed by a cost assessment for removal/mitigation.
Mitigation/removal could be made part of the reuse agreement between owner and lessee. However, the community is better off knowing at the beginning what it is getting into, before reuse plans are completed.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
Ours was very successful, and stemmed from a strong and sincere commitment from BRAC/Dept of Defense/Center for Env.Excellence. Other communities should be so lucky!

Cecil Field NAS

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey
12/8/03

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	(4)	5	Very Accurate
LBP	Not Very Accurate	(1)	2	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	(2)	3	4	5	Very Accurate
LBP	Not Very Accurate	(1)	2	3	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Additional costs estimated at $2 million were incurred for studies and abatement.

No LBP studies were completed prior to turnover, causing all redevelopment projects to require LBP surveys.

What has been your major reuse challenge regarding either asbestos or LBP?
Confirming asbestos and LBP and attempting to determine future funding requirements based on an estimated cost per building or facility.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
No. Fair market value was based on market/appraisal completed and were not offset by remediation.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Assume there will be some remediation, get surveys completed early and establish priority list of facilities that will require remediation.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
Asbestos surveys were fairly complete, LBP surveys did not exist. Improvements can be made by either DOD funding some costs of remediation or offset the value (selling price) of the property by the estimated remediation costs.

Charleston Naval Complex

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	(1)	2	3	4	5	Very Accurate
LBP	Not Very Accurate	(1)	2	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	(3)	4	5	Very Accurate
LBP	Not Very Accurate	1	2	(3)	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Increased demolition and renovations costs, however, these costs are passed through to the tenant or purchaser

What has been your major reuse challenge regarding either asbestos or LBP?
Increased cost of construction.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
An allowance is considered only for demolition.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Dealing with ACM and LBP should not be a major problem if the property has a higher/better use.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
In our experience, the process has not hindered reuse.

Chase Field NAS

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	(4)	5	Very Accurate
LBP	Not Very Accurate	1	(2)	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	(2)	3	4	5	Very Accurate
LBP	Not Very Accurate	(1)	2	3	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Delay in making the facilities available due to the mediation of LBP and Asbestos .

What has been your major reuse challenge regarding either asbestos or LBP?
Delay in making the facilities available due the remediation of LBP and Asbestos.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
Don't know. However, many of the problems with paint seems to have been caused by leaky roof over a period of years.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
1.) Deal with it sooner on a maintenance basis.

2.) Quickly understand the reuse of the property and start that process. Do not wait.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
The acquirer of the properties should:
1.) Get professional assistance prior to taking over the property.
2.) Operations and maintenance plans need to be implemented at the time of transfer.

Fitzsimons AMC

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	(2)	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	(4)	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	(4)	5	Very Accurate
LBP	Not Very Accurate	1	2	3	(4)	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Some areas, especially the Family Housing areas of Fitzsimons had a significant amount of asbestos in the mechanical crawl spaces and basements under the multi-tenant buildings, discovered after we took over the housing. The Army portrayed these areas as inspected and safe of all friable asbestos, which was not true. These spaces never had been inspected by the Army, which we were told were!

What has been your major reuse challenge regarding either asbestos or LBP?
Besides the issue in the housing areas, most of all the older facilities and buildings contained a lot of asbestos to include asbestos contaminated soil and debris in the crawl spaces, and steam tunnels. The costs associated with the abatement and remediation of the asbestos has been very significant.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
Not entirely : Our estimates for asbestos and/or LBP abatement were used as fair market estimates for only the buildings and facilities that we planned on not reusing, even on temporary basis and planned on demolishing. Asbestos and LBP issues were not addressed for reuse building. Because of lack of Army complete inspection (reference the first item above).

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?

- Make the extent and magnitude of the issue/problem know immediately to the Army or Service, and your Congressman and local leaders.

- Insure that you have a competent and State Certified Environmental company that specialized in asbestos and Lead Based Paint Inspection (consultant)

- Go out of your way to involve the appropriate State Department of Health and Environmental people, as asbestos is state regulated in the state of Colorado and most states.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
The Army or appropriate service, should conduct (be required to conduct), a comprehensive asbestos, HAZMAT and LBP inspection of every building and facility to include utility facilities on the entire BRAC site. This should include all areas of the buildings, and facilities (i.e.: crawl spaces, attics, and maintenance access areas in addition to the entire rest of the facilities. Then a comprehensive cost document should be prepared showing the Total Estimated Costs for Abatement. Then the Government should either fund the entire abatement or reduce the purchase price by at least this abatement amount.

Fort Ord

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM Not Very Accurate 1 2 3 4 5 Very Accurate
GRADE = 1

LBP Not Very Accurate 1 2 3 4 5 Very Accurate
GRADE = 1

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM Not Very Accurate 1 2 3 4 5 Very Accurate
GRADE = 1

LBP Not Very Accurate 1 2 3 4 5 Very Accurate
GRADE = 1

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?

Originally, our communities anticipated disposal of LBP and non-friable asbestos containing waste at the local landfill, a six-mile drive from the base. The lack of information on the levels of lead in the structures and the inaccuracy of the asbestos reports due to them being created for O&M use and degradation of materials over time have resulted in most of the lead and asbestos materials being shipped to a Class 1 disposal facility, a four and a half hour drive away. The resulting cost differential between what the communities had expected to manage during building removal for reuse and what is currently being experienced is approximately $20 millions or more.

Unexpected costs like these can really blow away carefully prepared reuse plans and demand relocation of funds with resulting reduction in the quality of the reuse project.

What has been your major reuse challenge regarding either asbestos or LBP?

Coordinating the efforts of all the regulatory agencies as the materials are found, classified, removed hauled and disposed. If for instance the initial classification is not done to the standards required by even one of the agencies that will regulate it further down the chain to disposal then the material must be retested and many original assumptions for the ultimate fate of the material must be rethought and agreed upon. Finally, once these protocols have been agreed upon between regulatory agencies so coordination is achieved this information must be passed on

to hygienists, engineers, contractors and the workforce or the whole thing can breakdown.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
Yes, but indirectly. They were a part of the over all demolition cost estimate that was used to set the value of the land. i.e.: Raw land value minus demolition estimate equals value of land.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Get the management of State Agencies involved as soon as your base is closed to help you assess what the true burden will be that the community will be taking on. Look at what other bases have had to do…study them closely, especially bases in your state and with a mission similar to the one your had. Call the Executive Officer at these bases and visit these bases for a tour. Ask questions.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
My suggestion:
For each new base closed, set up a formal mentoring process for the entity the community has designated to manage their base reuse and have this entity/team come spend a week with the staff of one of two bases that they have identified as having similar attributes to their base and set aside some funding to pay for both base reuse teams to be able take the time to do a nice job of mentoring. Develop a standard curriculum for the mentoring program so that all the basic topics are touched on during the resulting visits. Have the Regulatory Agencies put on a combined one-day seminar during the mentoring period so that the team in training has names, faces and contact information and can discuss what they are thinking and find out what is expected of them and understand the impacts of their decisions. This should be helpful for ACM, LBP issues or all other base reuse issues.

If you have further questions you can contact me at 831-883-3672

Sincerely,

Stan Cook
FORA, Director Facilities and Operations

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Has added to cost of redevelopment, including situations where LRA is pursuing demolition activity in order to create new development sites.

What has been your major reuse challenge regarding either asbestos or LBP?
Financing cost for remediation, increases timeline for redevelopment projects because of need to incorporate ACM/LBP investigations and when needed remediation/abatement components into development process.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
No! However, this did not affect negotiations with military on disposition of property since property is being conveyed under a no cost EDC and Airport PBC.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Government regulations need to be reviewed and made more realistic. LBP and ACM regulations are overly onerous and in many instances are overkill. There is no relationship between costs and benefits.

Federal government needs to follow through with commitment to support community reuse of former military installations by providing more funding to EDA for base redevelopment. EDA funding for base redevelopment has been zeroed out in Bush Administration. Federal government has broken its promise to help communities with reuse of former military installations. This is a potential obstacle for those communities that will be faced with challenges of redeveloping a military installation in BRAC 05.

Military services (at least Air Force) do not view PBP and ACM as an environmental hazard except where there is an immediate threat to health and safety. Therefore abatement/remediation is a burden imposed on reuse authority and at no cost to the Air Force.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
Government should provide funding directly to communities for environmental investigations and remediation as opposed to running this through bureaucracies of military services and federal acquisition/procurement processes. This should be designed more like a Brownfields program where a proactive – community based organization can oversee environmental investigations and implement remediation strategies that are linked to local reuse strategy.

Guam Ship Repair Facility

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Delays in the property transfer along with imposed deed restrictions and/or restrictive covenants on the use of the property.

What has been your major reuse challenge regarding either asbestos or LBP?
Environmental clean-up for these contaminants are expensive and even more importantly, time consuming to remedy, therefore delaying the property transfer process.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
Not applicable. BRAC properties on Guam were transferred under either under a Public Benefit Conveyance (PBC) or an Economic Development Conveyance (EDC) to the Government of Guam and no cost.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Throughout the environmental review process, certain impact mitigation can be identified for developer responsibility. Monitoring and enforcement procedures may need to be established that will ensure developer accountability to the reuse plan goals.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
The involvement of the selected developer can save staff resources by expediting the negotiations process around remediation and conveyance. The developer agreements provide a signal to regulators that the private sector is ready to invest as soon as parcels are remediated. This strengthens the position of the community in pressing for earlier cleanup and transfer of remediated parcels.

Lexington AD

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Additional cost in preparing buildings for occupancy. Also, additional time and effort, especially when presence of ACM/LBP was unknown until late in the process.

What has been your major reuse challenge regarding either asbestos or LBP?
Additional expense and planning. Has not so far resulted in the inability to reuse buildings.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
Not to my knowledge.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Ideally, ACM and LBP should be abated or at least surveyed by Army in great detail prior to initiating transfer process. If abatement is necessary, fewer, larger abatement projects are more efficient than many smaller ones.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
Long term planning and budgeting.

Mare Island NSY

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	[illegible]	1	2	3	4	5	Very Accurate

[illegible]

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

ANS: Unknown – The Navy did not provide an estimate for asbestos and lead based paint remediation. The Navy position is that they contain friable asbestos, but not remove. As far as lead based paint they do not remediate. The developers remediate as required.

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Substantial – the developers are required to absorb the cost of asbestos and LBP cleanup where required in the development of their property. The eventual private sector owners will have to remediate as the asbestos and LBP is removed.

What has been your major reuse challenge regarding either asbestos or LBP?
None.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
I don't know. See second question

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
None

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
As I indicated above, the Navy contains the friable asbestos and leaves in place.
They do not remediate, i.e. remove.
Please call me at (707) 649-5452 for additional information.
Sincerely,
Gil Hollingsworth, Mare Island Conversion Program Manager

Memphis DDD

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	(4)	5	Very Accurate
LBP	Not Very Accurate	1	2	3	(4)	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	(3)	4	5	Very Accurate
LBP	Not Very Accurate	1	2	(3)	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Very Little

What has been your major reuse challenge regarding either asbestos or LBP?
One building became an issue for reuse because asbestos remediation was too much of an unknown. Additional studies and work program were necessary.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
A small portion of all rehab and redevelopment.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
Take asbestos and LBP into consideration when negotiating the price for transfer.

Philadelphia Naval Complex

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	(1)	2	3	4	5	Very Accurate
LBP	Not Very Accurate	(1)	2	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	(2)	3	4	5	Very Accurate
LBP	Not Very Accurate	1	(2)	3	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
It is a tremendous cost issue, especially on top of the other premium costs found at military facilities.

What has been your major reuse challenge regarding either asbestos or LBP?
The navy only surveyed and estimated remediation costs for uncontained ACM & LBP. In reality, buildings when they are demolished or rehabbed require all contained and uncontained materials to be remediated. Finding unreported asbestos in caulking, plaster and other areas is all to common.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
No, not fully given the true costs.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
All surveys should consider contained and uncontained materials so a true estimate can be realized.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
Better surveying by military and more funding for complete remediation to support actual re-use.

Pueblo Depot Activity

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	(1)	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	(2)	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	(1)	2	3	4	5	Very Accurate
LBP	Not Very Accurate	(1)	2	3	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Significantly added to the cost of improvements of existing buildings. Stopped demolition program.

What has been your major reuse challenge regarding either asbestos or LBP?
LBP warehouse doors costs @$1,100 for disposal.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
No. Our interest is lease.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Require a 3rd party accurate and complete survey of LBP, including costs for disposal. Some ACM is considered non-friable when in place, but treated as friable if removed. Major difference in cost. BE INFORMED when making decisions. Know the legal aspects of decisions. Know the legal aspects of ACM and LBP and the BRAC laws related to each.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
Accurate and complete survey of ACM and LBP. NO MORE LOWRY AFB.

Reese AFB

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	(4)	5	Very Accurate
LBP	Not Very Accurate	1	2	3	(4)	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	(4)	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	(5)	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
In most cases, it has been a public concern and is a PR nightmare to address with prospective tenants; they do not want the risk of possible hidden cost. Most of our facilities were abated in 1992. The problem is that a few buildings still have hidden areas in ceilings, wall panels, floor tile with mastic, ,insulated pipes in walls and piping in mechanical areas with ACM's. LBP has not been an issue as of this date. The cost of ACM removal or remediation is prohibitive and reduces any reuse of a building with these issues. We simply do not have the funds to address these problems. A new tenant will not take the risk and we can not help with the cost, so we lose both the potential new jobs and the rent.

What has been your major reuse challenge regarding either asbestos or LBP?
Identification of funds to remediate issues, or leave the building vacant with the loss of jobs and income from rent. Both are very difficult. If ACM's/LBP are discovered at the redevelopment stage, it becomes a severe financial loss. There is no way to fund it.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
Not by the AFBCA. However, in most cases, we tried to include cost for possible remediation in case of undiscovered conditions. (ie: We have spent as much as $8,000 for a small HVAC room(150 s.f.) in one building to remove hidden ACM's. The entire renovation was only $10,000 so it blew our budget.)It makes some buildings un-rentable because the rent is already low and any clean-up factor pushes the rent out of the market range.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
1. Better surveys before the property is transferred-hold the inspection group accountable
2. Dedicated fund within BRAC program to address these issues upon discovery
3. Better plans and maps of ACM/LBP locations

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
1. See above.

Richards-Gebaur AFB

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	4	5	Very Accurate
LBP	Not Very Accurate	1	2	3	4	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
The buildings at Richards-Gebaur all contain some measure of ACM and LBP. We had no report that precisely outlined where ACM and LBP were present and to what extent. When we received a report asking us to clean up specific buildings, we found that in many cases the Air Force was calling materials ACM or LBP when, in fact, no such materials were present. In attempting to lease out the buildings, we have had to find a prospective tenants who were willing to undertake the necessary remediation to rehabilitate the buildings for their use. As such remediation is very costly, there are few potential tenants who wish to carry that burden. As a result, many of the buildings have remained empty over the course of many years.

What has been your major reuse challenge regarding either asbestos or LBP?
Finding prospective tenants willing to take on a building containing asbestos and/or LBP.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
Where we have had a tenant willing to take on the necessary remediation and repair, we have had to factor the costs of rehabilitating the building into the lease rate. As a result, we are receiving far less rental income on the property than we would have had the buildings been remediated prior to being turned over to us.

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
Before agreeing to take over the property, Kansas City did not do a formal assessment of the costs associated with remediating the ACM and LBP. Communities might want to look at the buildings critically before they ever agree to take on the burden. We took the buildings "as is" without taking the associated costs into consideration. Communities tend to believe that they are receiving a boon

from the Federal Government when these properties are turned over. Instead, the properties are more of a liability than an asset. Because of the environmental concerns, the market value is more often negative than positive.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
It would be helpful if the military would have current, complete information about the buildings that they are transferring. As it is, the communities have to do their own investigation to assure that they have all pertinent information. What is provided is often inaccurate and, of course, no associated costs are ever given to the community up front.

Warminster NAWC AD

ICMA

Asbestos-Containing Material (ACM) & Lead-Based Paint (LBP) Survey

How would you rate the accuracy and completeness of the asbestos and/or LBP characterization provided to you by your military service? (circle one)

ACM	Not Very Accurate	1	2	3	(4)	5	Very Accurate
LBP	Not Very Accurate	1	2	3	(4)	5	Very Accurate

How would you rate your cost estimates for remediation of the asbestos and/or LBP found at your installation? (circle one)

ACM	Not Very Accurate	1	2	3	4	(5)	Very Accurate
LBP	Not Very Accurate	1	2	3	(4)	5	Very Accurate

What effect has asbestos and/or LBP had on your reuse planning and redevelopment efforts?
Major effect in the disposition of the existing building space. The LRA was required to remove all asbestos (FAD and Non FAD) before the development community would consider purchasing the property.

What has been your major reuse challenge regarding either asbestos or LBP?
The major challenge was with DOD in allowing the LRA to continue operating clean up after contract period with DOD had ended.

Were the costs associated with remediation of asbestos and/or LBP figured into estimates of Fair Market Value?
No

What are your recommendations or suggestions for communities facing asbestos and/or LBP problems on their BRAC properties?
I believe the only way to protect the LRA/ community is to write a proper insurance policy to over ride the DOD's indemnification.

How can the process of remediating and transferring BRAC properties contaminated with asbestos and/or LBP be improved?
See above.

Appendix M

APPENDIX: COST ESTIMATES

Seed Funding Required: $13,224,000

Total Funds Required for Building Removal Program: $76 to $90 million. The upper end of this spectrum accounts for the removal of:

- Driveways
- Secondary roads
- Underground utilities.

Anticipated Economic Development Conveyance (EDC) Land Sales Revenue: $77 million.

Funding Sources That Will Leverage Building Removal Funds

- Income from EDC property sales once buildings have been removed
- Private land development funds
- Cost savings from reuse of five percent of barracks stock
- Property rental income on existing warehouse and industrial buildings*
- Preston Park lease revenue
- U.S. Army W.W. II building removal research
- Federal, state, and local training funds.

* Note: May require a formal agreement with the city of Marina or Seaside to direct income from rental to building removal activities.

Building Removal Program Budget

Typical phase building removal cost:

Building removal contract (contract)	$6,000,000.00
Update hazardous surveys (contract)	200,000.00
Manage hazardous materials (staff)	85,000.00
Manage building removal (staff)	85,000.00
Pre–removal phase planning (Staff)	42,000.00
CEQA review of building removal phase	200,000.00
Training (contract with others)	0.00
Total cost per phase	$6,612,000.00

Total building removal program costs years 2002–2013 (12 phases)

12 phases @ $6,612,000 each	$79,344,000.00.00
Savings for 5 percent barracks reuse	–1,474,500.00
Income on 50 percent of warehouse and industrial reuse for 10 years; may require a formal agreement with the city of Marina or Seaside to direct income from rental to building removal activities	–1,875,000.00
Total building removal costs	$75,994,500.00

Proposed Budget Building Removal Program Years 2002–2005

Building removal years 2002–2005 (Three Phases)

Three phases @ $6,612,000 each	$19,836,000
Savings for 5 percent barracks reuse	–368,525.00
Income on 50 percent of warehouse and industrial reuse for 3 of 10 years*	–468,750
Total for three phases from years 2002–2005	$18,998,725.00

Assumptions:

- Ten-year Building Removal Plan
- Twelve removal phases of approximately 400,000 square feet of building stock per phase
- A new phase is started every 10 months.
- Start Phase 1 Building Removal January 2003
- Based on 2002 dollar values
- Five percent of barracks building reused in place (98,300 square feet)
- Reused barracks considered as having 100 percent saving in removal costs
- Fifty percent of warehouse and industrial buildings reused for 10 years (625,000 square feet)*
- Warehouse and industrial rent figured at $0.60 per square foot with 50 percent vacancy in 10 years
- Training opportunities to be provided, but training costs to be paid by others.

Building Removal Program Seed Funding Requirements
(Phase 1 and start-up of phase 2 of building removal)

Requirements:	Phase 1	Phase 2 Start-Up
Contracts for building removal Based on: • Four years of work under the Pilot Deconstruction Project • Estimates by five prequalified building removal contractors		$13,224,000
Worker training Outreach and trainee selection; classroom and on-the-job training: • Basic work ethics • State-mandated lead and asbestos worker training • Deconstruction training	$200,000	Contract with other organizations
Building Removal Program Environmental Review • California Environmental Quality Act (CEQA) Review • Public notification • Public hearing • Public comment • Responses		Included above
Profiling surveys • Hazmat survey updates required by Monterey Bay Air Pollution Control District • Salvageable materials surveys required for waste diversion • Waste Profiling Surveys required by the California Department of Toxic Substance Control and the State Water Quality Control Board for waste diversion efforts • Cost estimates provided by licensed industrial hygienist • Includes savings realized by coordinating		Included above
FORA personnel and administration		Included above
Total seed fund needs (accomplishes phases 1 & 2)		$13,224,000
Funds available		
Total seed money required to begin Building Removal Program		$13,224,000