Audit Report

HAZARDOUS MATERIAL MANAGEMENT ON
THE GRIZZLY PROGRAM

Report Number 99-160 May 17, 1999

Office of the Inspector General
Department of Defense

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Acronyms

PESHE	Programmatic Environmental, Safety, and Health Evaluation
SFFAS	Statement of Federal Financial Accounting Standards

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

May 17, 1999

MEMORANDUM FOR AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Audit Report on Hazardous Material Management on the Grizzly Program (Report No. 99-160)

We are providing this audit report for information and use. The Joint Logistics Commanders requested an audit of hazardous material management for major Defense systems. This report is the first in a series of reports resulting from the requested audit.

We considered Army comments on a draft of this report in preparing this final report. The comments on the draft report conformed to the requirements of DoD Directive 7650.3. Therefore, we do not require additional comments.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. John E. Meling at (703) 604-9091 (DSN 664-9091) (jmeling@dodig.osd.mil) or Mr. Jack D. Snider at (703) 604-9087 (DSN 664-9087) (jsnider@dodig.osd.mil). See Appendix D for the report distribution. The audit team members are listed inside the back cover.

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Office of the Inspector General, DoD

Report No. 99-160 **May 17, 1999**
(Project No. 8AE-5037.00)

Hazardous Material Management on the Grizzly Program

Executive Summary

Introduction. The Grizzly, an Acquisition Category II program, is an Army vehicle designed with a full-vehicle-width mine-clearing blade, a power-driven arm, and a commander's control station integrated on an M1 Abrams tank chassis. When fielded, a two-person crew will operate the Grizzly. The Army designed the Grizzly to clear lanes in natural obstacles, such as streams, dry gaps, and fallen trees, and in man-made obstacles, such as wire, craters, and mine fields, so that an Army maneuver force can safely advance through the cleared lanes. The Grizzly entered the engineering and manufacturing development acquisition phase in December 1996. The Grizzly Program Office plans to hold the low-rate initial production milestone review in the second quarter of FY 2000 and to acquire a total of 366 Grizzly vehicles from FYs 2000 through 2013 at estimated life-cycle costs of $4.6 billion for the program.

Objective. The Joint Logistics Commanders requested an audit of hazardous material management for major Defense systems. The Grizzly is one of nine programs included in this requested audit. The overall audit objective was to evaluate the adequacy of planning and providing for the reduction and control of hazardous materials used in the design, manufacture, maintenance, and disposal for the Grizzly. Specifically, we evaluated whether the program manager managed the selection, use, and disposal of hazardous materials so that DoD would incur the lowest cost required to protect human health and the environment over the system's life cycle consistent with the system's cost, schedule, and performance goals. We also evaluated the management control program as it related to the audit objective.

Results. Overall, the Grizzly Program Office planned and provided for the reduction and elimination of hazardous material in the design of the Grizzly consistent with program cost, schedule, and performance goals. However, the following two areas warrant management attention before the program enters low-rate initial production.

- The Grizzly Program Office did not include in the program's life-cycle cost estimate the cost of demilitarization and disposal of the Grizzly at the end of its useful life. Further, the Program Office did not verify that all environmental costs related to the acquisition, handling, and use of hazardous materials in the production, operation, and maintenance of the Grizzly were in the life-cycle cost estimate. As a result, the Program Office understated the total life-cycle costs for the Grizzly and would not be able to accurately report the liability for cleanup costs of hazardous waste related to the disposal of the Grizzly vehicle in Army financial statements when the Army fields the Grizzly (finding A).

- The Grizzly Program Office did not develop a programmatic environmental, safety, and health evaluation that included an environmental strategy, program environmental responsibilities, and a methodology for tracking and documenting the completion of the environmental strategy throughout the acquisition life cycle. Without

performing the required programmatic environmental, safety, and health evaluation, the Program Office would not have assurance that it is aware of mission and cost impacts arising from environmental, safety, and health issues (finding B).

Recommendations in this report, if implemented, will improve the hazardous material management of the Grizzly and correct the material management control weakness identified in the report (Appendix A).

Summary of Recommendations. We recommend that the Product Manager, Grizzly Program, verify that all costs associated with acquiring, handling, using, and disposing of hazardous material in the production, operation, maintenance, demilitarization, and disposal of the Grizzly are in the life-cycle cost estimate and prepare a programmatic environmental, safety, and health evaluation before the Grizzly's low-rate initial production decision milestone review, planned for the second quarter of FY 2000.

Management Comments. The Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) concurred and stated that the Grizzly Program Office would update the life-cycle cost estimate by February 25, 2000, and would complete the programmatic environmental, safety, and health evaluation, including a demilitarization and disposal plan, by November 26, 1999. A discussion of the management comments is in the Findings section of the report, and the complete text is in the Management Comments section.

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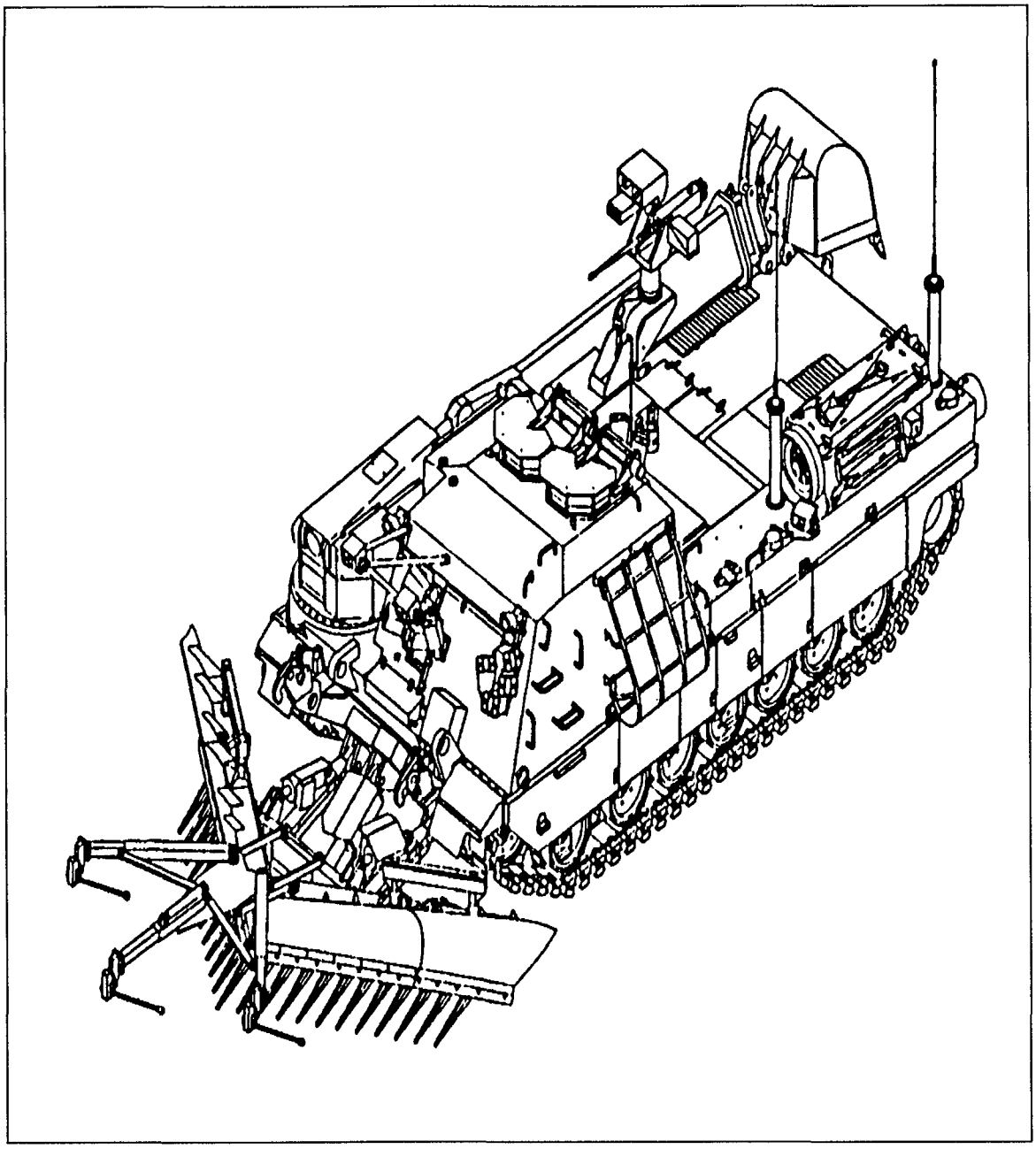

Grizzly Vehicle

Background

This report discusses the adequacy of planning and providing for the reduction and control of hazardous materials used in the design, manufacture, maintenance, and disposal for the Grizzly. DoD environmental management policy relating to hazardous materials is to prevent, mitigate, or remediate environmental damage that acquisition programs caused. In designing, manufacturing, testing, operating, and disposing of systems, DoD program managers are to prevent or reduce all forms of pollution at the source, whenever feasible. Prudent investments in pollution prevention can reduce life-cycle environmental costs and liability while improving environmental quality and program performance. Further, the Secretary of Defense, in his 1998 annual report to the President and Congress, stated that DoD urgently needed to reduce the total ownership costs of its systems to sustain force modernization and recapitalization. To reduce total ownership costs, program managers needed to focus on total life-cycle costs in the development and production phases of the weapon system acquisition life cycle so that trade-offs could be made between investments in the development and production phases with reduced costs in the operation and support phases of the system's life cycle. Appendix B provides definitions of technical terms used in this report.

The Grizzly, as shown on the opposite page, an Acquisition Category II program, is an Army vehicle designed with a full-vehicle-width mine-clearing blade, a power-driven arm, and a commander's control station integrated on an M1 Abrams tank chassis. When fielded, a two-person crew will operate the Grizzly. The Army designed the Grizzly to clear lanes in natural obstacles, such as streams, dry gaps, and fallen trees, and in man-made obstacles, such as wire, craters, and mine fields, so that an Army maneuver force can safely advance through the cleared lanes. The Grizzly entered the engineering and manufacturing development acquisition phase in December 1996. In January 1997, the Grizzly Program Office awarded the engineering and manufacturing development contract to United Defense Limited Partnership, York, Pennsylvania, for the design and fabrication of two Grizzly prototypes. The Grizzly Program Office plans to hold the low-rate initial production milestone review in the second quarter of FY 2000 and to acquire a total of 366 Grizzlies from FYs 2000 through 2013 at estimated life-cycle costs of $4.6 billion for the program.

Objective

The Joint Logistics Commanders requested an audit of hazardous material management for major Defense systems. The Grizzly is one of nine programs included in this requested audit. The overall audit objective was to evaluate the adequacy of planning and providing for the reduction and control of hazardous materials used in the design, manufacture, maintenance, and disposal for the Grizzly. Specifically, we evaluated whether the program manager managed the selection, use, and disposal of hazardous materials so that DoD would incur the lowest cost required to protect human health and the environment over the system's life cycle consistent with the system's cost, schedule, and performance

goals. We also evaluated the management control program as it related to the audit objective. This report is the first in a series of reports on our ongoing audit of hazardous material management for major Defense systems. Appendix A discusses the scope and methodology used to accomplish the objective as well as management controls and prior audit coverage.

Noteworthy Environmental Efforts

The Grizzly Program Office incorporated environmental planning into the acquisition process by including hazardous materials management provisions in the engineering and manufacturing development contract, by implementing the National Environmental Policy Act, and by establishing an environmental team.

Engineering and Manufacturing Development Contract. The engineering and manufacturing development contract for the Grizzly requires the contractor to plan, develop, implement, monitor, and maintain an effective pollution prevention and hazardous materials management program and report to the Grizzly Program Office semi-annually on contractor pollution prevention efforts. The contractor provided the Program Office with its Hazardous Materials Management Program Plan in July 1997 and plans to provide the Program Office with a prioritized list of hazardous materials contained in the Grizzly in March 1999. The Program Office will use the prioritized list to determine the hazardous materials and processes that are candidates for further Army and contractor study. In addition, the contractor incorporated several "design-for-the-environment" items in the design for the Grizzly that reduce program life-cycle costs and benefit the environment. Appendix C lists the items.

National Environmental Policy Act. In August 1996, the Grizzly Program Office completed the Grizzly Program Office "Life-Cycle Environmental Assessment for the Breacher Vehicle" (the Environmental Assessment) in accordance with the National Environmental Policy Act. The Environmental Assessment examined the potential impacts to the natural and human environment from Grizzly development through demilitarization and disposal. Further, the Environmental Assessment stated that the Army would remove the Grizzly from its active inventory 30 years from initial production. After the Army removes the Grizzly from its active inventory, the Army Reserve and the Army National Guard plan to use the Grizzly for about another 20 years. The Environmental Assessment resulted in a finding of no significant impact.

Environmental Team. In June 1998, the Grizzly Program Office established the Grizzly Life-Cycle Environmental Team (the Team) to plan and coordinate an update to the Grizzly environmental assessment for the low-rate initial production decision review scheduled in the second quarter of FY 2000. The Team obtains environmental advice from the Materials, Environmental, Packaging, and Special Process Team, Tank-automotive Research, Development, and Engineering Center, Warren, Michigan. The Special Process Team forms partnerships with Tank-automotive and Armaments Command

program offices and industry to identify and test alternatives to hazardous materials common to Army vehicles. Further, the Army has funded ongoing research projects to study the following:

- alternative materials for the halon fire suppressant agent used in the crew compartment of the Grizzly and other Army vehicles and

- methods to reduce hazardous materials in the chemical-agent-resistant coating paint process for the Grizzly and other Army vehicles.

Overall, the Grizzly Program Office planned and provided for the reduction and elimination of hazardous material in the design of the Grizzly consistent with program cost, schedule, and performance goals. However, the Program Office did not include all environmental related costs in its life-cycle cost estimate for the Grizzly. In addition, the Program Office did not develop a programmatic environmental, safety, and health evaluation that included an environmental strategy, program environmental responsibilities, and a methodology for tracking and documenting completion of the environmental strategy throughout the acquisition life cycle. A discussion of the associated findings follows.

A. Environmental Life-Cycle Costs

The Grizzly Program Office did not include in the program's life-cycle cost estimate the cost of demilitarization and disposal of the Grizzly at the end of its useful life. Further, the Program Office did not verify that all environmental costs related to the acquisition, handling, and use of hazardous materials in the production, operation, and maintenance of the Grizzly were in the life-cycle cost estimate. The Program Office excluded demilitarization and disposal costs from the program's life-cycle cost estimate because it did not:

- have historical cost data and the technical expertise to estimate those costs or
- request technical assistance from other Army organizations.

The Program Office did not verify the costs related to the acquisition, handling, and use of hazardous materials because other Army organizations and the contractor did not specifically identify the hazardous material costs in their life-cycle cost estimate for the Grizzly. As a result, the Program Office understated the total life-cycle costs for the Grizzly and would not be able to accurately report the liability for cleanup costs of hazardous waste related to the disposal of the Grizzly vehicle in Army financial statements when the Army fields the Grizzly.

Life-Cycle Cost Estimating and Reporting Guidance

DoD Guidance. DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," Change 3, March 23, 1998,[1] requires that life-cycle cost estimates be comprehensive and identify all costs for the development, production, and operation of a system regardless of the source of funding. As part of the life-cycle cost estimate, DoD Manual 5000.4-M, "Department of Defense Cost Analysis Guidance and Procedures," December 1992, requires that program offices identify the cost of any hazardous, toxic, or radiological materials that may be encountered or generated during the subsystem's development, manufacture, transportation, storage, operation, and disposal. Furthermore, the guidance states that program offices should include the costs of demilitarization, detoxification, or long-term waste storage in the cost estimates.

Army Guidance. Department of the Army Pamphlet 70-3, "Army Acquisition Procedures," February 28, 1995, requires program offices to identify the handling, treating, and disposing of hazardous waste, personal protective gear and practices, and legal protection cost to the program over the life cycle during the concept exploration phase of the acquisition process. Army Pamphlet 70-3

[1]DoD initially issued DoD Regulation 5000.2-R on March 15, 1996, and it included the guidance.

also requires program offices to update environmental resource requirements and life-cycle cost analyses during the program definition and risk reduction phase and to validate the environmentally related life-cycle costs during the engineering and manufacturing development phase of the acquisition process. The "Department of Army Cost Analysis Manual," July 1997 (the Cost Manual), Chapter 6, "Environmental Costing," requires that program office estimates of life-cycle costs include all relevant environmental costs as early as the concept exploration phase. Those costs include activities related to pollution prevention, compliance, remediation, restoration, conservation, litigation, liability, added management or overhead costs, and demilitarization and disposal of the system. The Cost Manual also states that Army cost estimators must include all environmental costs in the program estimate and identify the environmental costs so that acquisition decisions can be based on those costs. Where environmental costs cannot be separately broken out, the Cost Manual states that the life-cycle cost estimate should present evidence that the environmental costs are adequately accounted for elsewhere in the estimate.

Federal Financial Accounting Standards Guidance. The Statement of Federal Financial Accounting Standards (SFFAS) No. 6, "Accounting for Property, Plant, and Equipment," requires that Federal agencies, beginning in FY 1998, recognize a liability in agency financial statements for cleanup costs associated with Federal mission property, plant, and equipment, including weapons systems, when the agency places the property, plant, and equipment into service. SFFAS No. 6 defines cleanup costs as those costs to remove, contain, or dispose, or any combination of the three, of hazardous waste from material or property that is permanently or temporarily shut down. In addition, cleanup costs include decontamination, decommissioning, site restoration, site monitoring, closure, and post closure costs.

Grizzly Life-Cycle Cost Estimate

Demilitarization and Disposal Costs. The August 1996 environmental assessment states that the demilitarization and disposal phase for the Grizzly would take place over a 15-year period and would include costs for decommissioning and closing production facilities; costs for decontamination, demolition, transportation, disposal, and long-term storage of certain critical components for later reuse; and environmental and regulatory compliance costs. In addition, demilitarization and disposal costs would include costs incurred in establishing and maintaining facilities involved in the demilitarization and disposal process and the costs incurred in the disposal of the demilitarization and disposal facilities.

The Grizzly Program Office did not include in the program's life-cycle cost estimate the cost of demilitarization and disposal of the Grizzly at the end of its useful life because the Program Office did not:

- have historical cost data or technical expertise to estimate the Grizzly demilitarization and disposal costs or
- request technical assistance from other Army organizations.

In October 1998, the Program Office received a proposal from the Army Systems Readiness Center (the Readiness Center), part of the Armament Research, Development, and Engineering Center, Picatinny Arsenal, New Jersey, to assist the Program Office in the preparation of environmental documents for the low-rate initial production decision milestone review, planned for the second quarter of FY 2000. The Program Office provided funding to the Readiness Center for the estimating effort in February 1999. The Grizzly Program Office should verify that the demilitarization and disposal costs are in the life-cycle cost estimate.

Production, Operation, and Maintenance Environmental Costs. The Program Office did not verify that all environmental costs related to the acquisition, handling, and use of hazardous materials in the production, operation, and maintenance of the Grizzly were in the life-cycle cost estimate. The Program Office did not verify the costs related to the acquisition, handling, and use of hazardous materials because other Army organizations and the contractor provided cost estimates that did not specifically identify those costs in the life-cycle cost estimate for the Grizzly.

In September 1998, the Grizzly Program Office updated the total life-cycle cost estimate for the Grizzly to about $4.6 billion. The Program Office life-cycle estimate identified the cost of contractor environmental reports in the engineering and manufacturing development phase of the Grizzly Program, but could not provide documentation showing that environmental costs for the production, operation, and maintenance phases were in the Grizzly life-cycle cost estimate. As of March 1999, the Army did not have a model to assist program offices in estimating weapon system environmental life-cycle costs.

The Program Office computed Grizzly production cost estimates from contractor cost data and from an Anniston, Alabama, Depot cost estimate for the work that the Anniston Depot performed in tearing down M1 Abrams tanks and supplying the Abrams tank chassis to the contractor for integration in the Grizzly. In addition, the Program Office computed the Grizzly operation and maintenance cost estimate primarily from the Abrams tank cost history. However, the contractor, Anniston Depot, and Abrams tank cost data did not separately identify environmental costs. Further, the Program Office used the contractor, Anniston Depot, and Abrams tank cost data in its Grizzly life-cycle cost estimate without verifying that the cost data included all environmental costs. To obtain environmental costs for the production, operation, and maintenance phases for the Grizzly life-cycle cost estimate, the Program Office also requested that the Readiness Center review the current life-cycle cost estimate and develop a life-cycle cost estimate for the Grizzly that includes environmental costs for the production, operation, and maintenance phases. The Grizzly Program Office should verify that the Readiness Center included the costs in its life-cycle cost estimate.

Completeness of Life-Cycle Cost Estimate

By not including the cost of demilitarization and disposal and verifying the inclusion of all environmental costs of the Grizzly in the program's life-cycle

cost estimate, the Grizzly Program Office understated the total life-cycle costs for the Grizzly. Although those costs may not be highly significant in terms of percentage of system life-cycle cost, they should not be ignored. Without an accurate life-cycle cost, which includes the cost of demilitarization and disposal, the Program Office would not be able to accurately report the liability for Grizzly environmental cleanup and disposal costs in future Army financial statements. The Army is to begin reporting the environmental cleanup and disposal liability when it fields the Grizzly in FY 2004, in accordance with SFFAS No. 6. Cumulatively, the environmental cleanup and disposal costs for Army weapon systems are likely to represent a material value on Army and DoD-wide consolidated financial statements.

Recommendation and Management Comments

A. We recommend that the Product Manager, Grizzly Program, verify that all costs associated with acquiring, handling, using, and disposing of hazardous material in the production, operation, and maintenance of the Grizzly, as well as the cost of demilitarization and disposal of the Grizzly at the end of its useful life, are in the life-cycle cost estimate before the Grizzly's low-rate initial production decision milestone review, planned for the second quarter of FY 2000.

Management Comments. The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), concurred with the recommendation. The Deputy stated that the Grizzly Program Office would complete the initial draft and final reports for the environmental life-cycle cost estimate by December 17, 1999, and February 25, 2000, respectively. A summary of management comments on the management controls associated with this finding and our audit response are in Appendix A. The complete text is in the Management Comments section of this report.

B. Programmatic Environmental, Safety, and Health Evaluation

The Grizzly Program Office did not develop a programmatic environmental, safety, and health evaluation (PESHE) that included an environmental strategy, program environmental responsibilities, and a methodology for tracking and documenting the completion of the environmental strategy throughout the acquisition life cycle. The Program Office did not develop a PESHE before the engineering and manufacturing decision in December 1996 because the Program Office needed technical assistance to develop the PESHE and the Program Office experienced administrative delays initiating the PESHE. Without performing the required PESHE, the Program Office would not have assurance that it is aware of mission and cost impacts arising from environmental, safety, and health issues.

Environmental, Safety, and Health Evaluation Policy

DoD Regulation 5000.2-R, Change 3, March 23, 1998,[2] requires that all programs, regardless of acquisition category, conduct environmental, safety, and health analyses to integrate environmental, safety, and health issues into the system engineering process. The analyses are to support the development of a PESHE that the program office will include in the acquisition strategy. The program manager is to initiate the PESHE at the earliest possible time in support of a program initiation decision (usually Milestone I) and is to maintain an updated evaluation throughout the life cycle of the program. Acquisition managers use the PESHE to do the following:

- describe the program manager's strategy for meeting environmental, safety, and health requirements;
- establish program responsibilities; and
- identify how a program manager will track progress.

Environmental, Safety, and Health Evaluation

The Grizzly Program Office did not develop a PESHE that included an environmental strategy, program environmental responsibilities, and a methodology for tracking and documenting the completion of the environmental strategy throughout the acquisition life cycle.

In August 1996, the Program Office completed its life-cycle environmental assessment for the Grizzly. The life-cycle assessment examined the potential

[2]DoD initially issued DoD Regulation 5000.2-R on March 15, 1996, and it included the requirement.

impacts to the natural and human environment from Grizzly development through demilitarization and disposal and to integrate environmental issues into the system engineering process. The Program Office included an environmental risk assessment for the Grizzly in its integrated program summary for the Milestone II decision review in December 1996 for entering into the engineering and manufacturing development phase of the acquisition process. However, the Program Office did not develop a PESHE before the Milestone II decision review because the Program Office needed technical assistance to develop the PESHE and the Program Office experienced administrative delays initiating the PESHE.

In December 1996, the Office of the Program Executive Officer, Ground Combat Support Systems, began working with a support contractor to develop a single PESHE covering the Grizzly and related Army vehicles. The Office of the Program Executive Officer continued the PESHE effort through April 1997. At that time, the Army discontinued the PESHE effort for the Grizzly because the Army transferred the Grizzly Program from the Office of the Program Executive Officer, Ground Combat Support Systems, to the Office of the Deputy for Systems Acquisition, Combat Mobility Systems.

In June 1998, the Program Office requested the Army Systems Readiness Center (the Readiness Center) to develop a scope of work to perform environmental support for the Grizzly program. As a result, in October 1998, the Program Office received a proposal from the Readiness Center to assist the Program Office in the preparation of environmental documents for the low-rate initial production decision milestone review, planned for the second quarter of FY 2000. The Program Office provided funding to the Readiness Center for the PESHE effort in February 1999. The Program Office should prepare the PESHE in time for the low-rate initial production decision milestone review planned for the second quarter of FY 2000.

Benefits of Environmental, Safety, and Health Evaluation

When program managers perform the analyses required for the PESHE, they gain timely information on the potential environmental, safety, and health impacts of developing, fielding, storing, demilitarizing, and disposing of their weapons system. That information is critical because any unforeseen environmental, safety or health impact that violates local, state, or Federal law can cause lengthy program delays and large mission and cost impacts. Therefore, it is only prudent for a program to analyze and document all possible programmatic actions and maintain an updated evaluation throughout the life cycle of the program. The programmatic environmental evaluation should include the environmental strategy, program environmental responsibilities, and a methodology for tracking and documenting the completion of the environmental strategy throughout the acquisition life cycle.

The Program Office staff already had access to much of the information needed to support a PESHE. In July 1997, United Defense Limited Partnership provided the Program Office with its Hazardous Material Management Program Plan. In March 1999, the contractor was going to provide the Program Office

with a prioritized list of hazardous materials contained in the Grizzly. Earlier, in May 1992, the Program Office prepared a System Safety Management Plan and established a Hazard Tracking System for the resolution of Grizzly system safety and health hazards identified by the Program Office and the contractor.

Recommendation and Management Comments

B. We recommend that the Product Manager, Grizzly Program, prepare a programmatic environmental, safety, and health evaluation before the Grizzly's low-rate initial production decision milestone review, planned for the second quarter of FY 2000.

Management Comments. The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), concurred with the recommendation. The Deputy stated that the Grizzly Program Office began preparing the PESHE in June 1998 and increased the scope of the effort to include the development of a demilitarization and disposal plan for the Grizzly. The Program Office will use the plan along with other environmental documentation discussed in the report to update its life-cycle cost estimate before the Grizzly's low-rate initial production decision. The Deputy also stated that the Program Office would complete the initial drafts and final reports for the PESHE and the demilitarization and disposal plan by September 30, 1999, and November 26, 1999, respectively. The complete text is in the Management Comments section of this report.

Appendix A. Audit Process

Scope and Methodology

We conducted this audit from November 1998 through February 1999 and reviewed documentation dated from May 1992 through February 1999. To accomplish the audit objective, we took the following steps:

- discussed the issues relating to DoD environmental management and the associated acquisition strategy with Government and contractor personnel;
- assessed whether the Grizzly Program Office implemented the DoD environmental management process in accordance with DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs," Change 3, March 23, 1998;
- reviewed life-cycle costs of the Grizzly Program to determine whether environmental costs were included;
- evaluated Defense Contract Management Command involvement to reduce life-cycle environmental costs and liability while improving environmental quality and program performance;
- reviewed contractors' environmental program for the Grizzly Program and reviewed available environmental documentation supporting their environmental program;
- determined whether the Grizzly Program Office had adequate funding in the engineering and manufacturing development contract to test alternative environmental technologies to reduce pollution;
- determined whether the Grizzly Program Office searched for opportunities to form partnerships for environmental projects, environmental alternative test and evaluation, and validation testing; and
- determined whether the Grizzly Program Office had adequate environmental awareness of and training in the environmental management process.

Auditing Standards. We conducted this program audit in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We included such tests of management controls as we deemed necessary.

Use of Computer-Processed Data. We did not rely on computer-processed data to develop conclusions on this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within DoD and United Defense Limited Partnership. Further details are available upon request.

DoD-Wide Corporate-Level Government Performance and Results Act Goals. In response to the Government Performance and Results Act, DoD established 6 DoD-wide corporate-level performance objectives and 14 goals for meeting the objectives. This report pertains to achievement of the following objective and goal.

> **Objective:** Fundamentally reengineer DoD and achieve a 21st century infrastructure. **Goal:** Reduce costs while maintaining required military capabilities across all DoD mission areas. **(DoD-6)**

DoD Functional Area Reform Goals. Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following acquisition functional issue area objective and goal.

> **Objective:** Fostering Partnerships. **Goal:** Reduce total release of toxic chemicals by 20 percent. **(ACQ-2.4)**

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in DoD. This report provides coverage of the Defense Weapons Systems Acquisition high-risk area.

Management Control Program Review

The DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, requires DoD managers to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of Review of the Management Control Program. In accordance with DoD Directive 5000.1, "Defense Acquisition," March 15, 1996, and DoD Regulation 5000.2-R, acquisition managers are to use program cost, schedule, and performance parameters as control objectives to implement the requirements of DoD Directive 5010.38. Accordingly, we limited our review to management controls directly related to the hazardous material management of the Grizzly.

Adequacy of Management Controls. We identified a material management control weakness concerning the environmental life-cycle costs as defined by DoD Directive 5010.38. The Grizzly Program Office did not ensure that the total life-cycle costs for the Grizzly included demilitarization and disposal costs and did not ensure that the life-cycle cost estimate was accurate and complete. Recommendation A., if implemented, will improve the life-cycle cost estimate for the Grizzly and ensure that costs associated with acquiring, handling, using, and disposing of hazardous material in the life-cycle cost estimate for the Grizzly are valid. We will provide a copy of this report to the senior official responsible for management controls in the Army.

Adequacy of Management's Self-Evaluation. The Tank-automotive and Armaments Command designated the Office of the Deputy for Systems Acquisition as an assessable unit. The Grizzly Program Office is one program office within the Office of the Deputy for Systems Acquisition. For FY 1998, the Office of the Deputy for Systems Acquisition conducted semiannual reviews of the cost, schedule, and performance of all programs under its cognizance, including the Grizzly. In addition, the Grizzly Program Office conducted management control evaluation reviews of its use of civilian overtime and the purchase card program. Consequently, the Office of the Deputy for Systems Acquisition did not identify or report the material management control weakness found by the audit. The semiannual reviews and the management control evaluation reviews did not detect any management control problems that the Office of the Deputy for Systems Acquisition or the Grizzly Program Office considered being material weaknesses.

Management Comments on Management Control Program Review and Audit Response

Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) Comments. The Deputy for Systems Management and Horizontal Technology Integration, Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), provided comments concerning the "Adequacy of Management's Self-Evaluation." He stated that the audit was correct in stating that the Office of the Deputy for Systems Acquisition conducted semiannual program reviews addressing cost, schedule, and performance as part of its management control process. However, the objective of those reviews was to track program progress against the last milestone and the Acquisition Program Baseline, not to analyze every cost estimate of the program office life-cycle cost estimate, including estimates for programs that are not yet in production. He also stated that the milestone review is the proper forum at which to review the specific cost elements that are beyond the programming and planning years. The program office life-cycle cost estimate should address those cost elements and, as the Grizzly Program approaches its Milestone III production decision, the milestone decision authority should consider those cost elements. In this instance, his office would provide oversight to ensure that the actions to update the life-cycle cost estimate by February 25, 2000, and to complete the programmatic environmental, safety, and health evaluation, including a demilitarization and disposal plan, by November 26, 1999, are completed to support the Milestone III decision.

Audit Response. The actions of the Army would improve the life-cycle cost estimate for the Grizzly and ensure that costs associated with acquiring, handling, using, and disposing of hazardous material in the life-cycle cost estimate for the Grizzly are valid.

Summary of Prior Coverage

During the last 5 years, the General Accounting Office; the Inspector General, DoD; and the Military Department audit agencies have not issued reports specifically addressing the adequacy of planning and providing for the reduction and control of hazardous materials for the Grizzly.

Appendix B. Definitions of Technical Terms

Acquisition Category. An acquisition category is an attribute of an acquisition program that determines the program's level of review, decision authority, and applicable procedures. The acquisition categories consist of I, major Defense acquisition programs; IA, major automated information systems; II, major systems; and III, all other acquisition programs.

Acquisition Program Baseline. An acquisition program baseline embodies the cost, schedule, and performance objectives for a program.

Demilitarization. Demilitarization is a subset of disposal and is the act of deactivating or rendering a system inoperable by destroying the military offensive or defensive advantage inherent in a system.

Disposal. Disposal is the process of redistributing, transferring, donating, selling, or demilitarizing a system.

Engineering and Manufacturing Development. Engineering and manufacturing development is the third phase in the acquisition process, following Milestone II. The system and principal items necessary for its support are fully developed, engineered, designed, fabricated, tested, and evaluated. The intended output is, as a minimum, a preproduction system that closely approximates the final product, the documentation necessary to enter the production phase, and the test results that demonstrate that the production product will meet stated requirements.

Environmental Assessment. The environmental assessment is used to determine whether the preparation of an environmental impact statement or a finding of no significant impact is required to comply with the National Environmental Policy Act when an environmental impact statement is not necessary and to facilitate preparation of an environmental impact statement when an environmental impact statement is required. The DoD Components should prepare an environmental assessment as early as possible after identifying the requirement. Based on an environmental assessment, if a DoD Component determines that an environmental impact statement is not necessary, the Component will prepare a finding of no significant impact and make the finding of no significant impact available to the affected public. If the DoD Component determines that a categorical exclusion exists, an environmental impact statement or a finding of no significant impact is not necessary.

Environmental Impact Statement. An environmental impact statement provides full disclosure of significant environmental implications of the program, informs decisionmakers and the public of the alternatives considered and mitigating environmental measures being implemented on the selected alternative, and serves to ensure that the policies and goals defined in the National Environmental Policy Act are incorporated into the program and the decisionmaking process.

Finding of No Significant Impact. A finding of no significant impact is a document that a Federal agency prepares to briefly present the reasons why an action will not have a significant effect on the human environment and why an environmental impact statement is not necessary. Additionally, the document includes the environmental assessment or a summary of the environmental assessment.

Hazardous Material. Hazardous material is any waste that, because of its quantity; toxicity; corrosiveness; flammability; or physical, chemical, or infectious characteristics, may do one of the following:

- cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or

- pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of.

Life-Cycle Cost. Life-cycle cost is the total cost to the Government of acquisition and ownership of that system over its useful life and includes the cost of development, acquisition, operation, support, and disposal of the system.

Low-Rate Initial Production. Low-rate initial production is the production of a system in limited quantity to provide articles for operational test and evaluation, to establish an initial production base, and to permit an orderly increase in the production rate sufficient to lead to full-rate production upon successful completion of operational testing.

Programmatic Environmental, Safety, and Health Evaluation. The programmatic environmental, safety, and health evaluation describes the program manager's strategy for meeting programmatic environmental, safety, and health evaluation requirements; establishes responsibilities; and identifies how progress will be tracked. The program manager initiates the programmatic environmental, safety, and health evaluation at the earliest possible time in support of a program initiation decision (usually Milestone I) and maintains an updated evaluation throughout the life cycle of the program.

Appendix C. Design-for-the-Environment Items

United Defense Limited Partnership, the contractor, incorporated several "design-for-the-environment" items in the design for the Grizzly that reduce program life-cycle costs and benefit the environment, as noted in the following examples:

Design-for-the-Environment Item	Environmental Benefit
• Used hydraulic fuses in hydraulic lines.	• Reduces excess hydraulic fluid loss and contamination of the environment.
• Reduced the many different lubricant requirements to just a few for multiple applications.	• Reduces waste generated.
• Changed from cadmium and zinc-plated hydraulic fittings to unplated brass and stainless steel fittings.	• Eliminates the plating process, which uses hazardous chemicals. Also unplated brass and stainless steel are easier to recycle.
• Redesigned drain valves to ensure that leaking fluids, hydraulic fluids, and fuel remain in chassis for proper disposal.	• Reduces environmental pollution to the land and water.
• Used low or no volatile organic compound adhesives.	• Reduces air pollution.
• Used a hydraulic reservoir breather that closes off to prevent hydraulic oil spill in case of vehicle rollover.	• Reduces oil contamination.

Appendix D. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition and Technology
  Deputy Under Secretary of Defense (Environmental Security)
  Director, Defense Logistics Studies Information Exchange
Under Secretary of Defense (Comptroller)
  Deputy Chief Financial Officer
  Deputy Comptroller (Program/Budget)
Assistant Secretary of Defense (Public Affairs)

Department of the Army

Commander, Army Materiel Command
Assistant Secretary of the Army (Financial Management and Comptroller)
Assistant Secretary of the Army (Research, Development, and Acquisition)
  Deputy for Systems Acquisition, Tank-automotive and Armaments Command
    Project Manager, Combat Mobility Systems
      Product Manager, Grizzly Program
Auditor General, Department of the Army

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller)
Deputy Chief of Naval Operations (Logistics)
Deputy Chief of Staff (Installations and Logistics), Headquarters, Marine Corps
Auditor General, Department of the Navy

Department of the Air Force

Commander, Air Force Materiel Command
Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force
Chairman, Joint Acquisition Sustainment Pollution Prevention Activity

Other Defense Organizations

Director, Defense Contract Audit Agency
Director, Defense Logistics Agency
  Commander, Defense Contract Management Command
    Commander, Defense Contract Management Command East
    Commander, Defense Contract Management Command West
Director, National Security Agency
  Inspector General, National Security Agency
Inspector General, Defense Intelligence Agency

Non-Defense Federal Organizations and Individuals

Office of Management and Budget
General Accounting Office
National Security and International Affairs Division
Technical Information Center

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Management, Information, and Technology, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform

Department of the Army Comments

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
ACQUISITION LOGISTICS AND TECHNOLOGY
103 ARMY PENTAGON
WASHINGTON DC 20310-0103

REPLY TO
ATTENTION OF
SAAL-SC

06 MAY 1999

MEMORANDUM FOR U.S. ARMY AUDIT AGENCY, ORGANIZATIONAL EFFECTIVENESS, ATTN: SAAG-PMO-L, 3101 PARK CENTER DRIVE, ALEXANDRIA, VIRGINIA 22302-1596

SUBJECT: Audit Report on Hazardous Material Management on the Grizzly Program (Audit Report: 8AE-5037)

The Army concurs with the Audit Report recommendations. As noted in Section B, the program office for Grizzly had initiated an effort to begin preparation of the Programmatic Environmental Safety and Health Evaluation (PESHE) in June 1998. The scope of that effort, which is currently underway, has been increased to develop a DEMIL/Disposal Plan for the Grizzly That plan, as well as other environmental documentation which this report notes as already successfully completed, will be used to update the program office estimate (POE) prior to Grizzly's low-rate initial production decision. The following is the schedule for implementation and compliance with the recommended actions: (1) PESHE: First Draft - 30 September 1999 and Final Report - 26 November 1999; (2) DEMIL/Disposal Plan: Initial Draft - 30 September 1999 and Final Report - 26 November 1999; (3) Environmental life cycle cost estimate: Initial Draft - 17 December 1999 and Final Report – 25 February 2000.

Clarification to the DOD IG's Audit Report relative to the auditor's assessment of the Management Control Process (Appendix A) is forwarded herewith: The audit report is correct in stating that the DSA as a part of its Management Control Process conducted semi-annual program reviews addressing cost, schedule and performance. The objective of those reviews was to track progress against the last milestone and the Acquisition Program Baseline not to analyze every cost estimate that makes up the POE. This is especially true for a system that is not yet in production. The Milestone reviews are the proper forum to review specific elements that make up the cost that are beyond both the programming and planning years. The POE should address those costs and as this program approaches a production decision this would be an item to be considered by the Milestone Decision Authority. In this instance, we will provide oversight to insure that the actions identified above are completed in a timely manner to support the Milestone III Decision.

Should you require additional information, my point of contact is Mr. Todd Wagenhorst at (703) 604-7150.

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The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, produced this report.

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