



*US ARMY CORPS OF ENGINEERS
WATERWAYS EXPERIMENT STATION*

BROAD AGENCY ANNOUNCEMENT

(BAA-FY98)



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*3909 Halls Ferry Road
Vicksburg, Mississippi
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PREFACE

The U.S. Army Engineer Waterways Experiment Station (WES) is a Corps of Engineers research complex consisting of five (5) laboratories: Coastal and Hydraulics Laboratory, Geotechnical Laboratory, Structures Laboratory, Environmental Laboratory and Information Technology Laboratory. WES is responsible for conducting basic research in the broad fields of hydraulics, rehabilitation of hydraulic structures, coastal engineering, instrumentation, oceanography, remote sensing, earthquake engineering, soil dynamics, concrete, expedient construction, nuclear and chemical explosion effects, vehicle mobility, self-contained munitions, military hydrology, fixed installation camouflage, environmental impact, environmental engineering, geophysics, pavements, protective structures, aquatic plants, water quality, dredged material, computer science, telecommunications management and business automation, graphic arts and printing, library services, and records management.

This research is conducted by Government personnel and by contract with educational institutions, non-profit organizations and private industries.

The provisions of the Competition in Contracting Act of 1984 (P.L. 98-369) as implemented in the Federal Acquisition Regulation provide for the issuance of a Broad Agency Announcement as a means of soliciting proposals for basic and applied research and that part of development not related to the development of a specific system or hardware procurement. This announcement must be general in nature, identify the areas of research interest, include criteria for selecting proposals, and solicit the participation of all offerors capable of satisfying the Government's needs. The proposals submitted under this Broad Agency Announcement will be subject to peer or scientific review. Proposals that are selected for award are considered to be the result of full and open competition and in full compliance with the provisions of PL 98-369, "the Competition in Contracting Act of 1984".

This guide constitutes the Broad Agency Announcement of this Command and conforms with regulatory requirements of the Federal Acquisition Regulation. This guide provides prospective offerors information on the preparation of proposals for basic or applied research. Suggestions as to form and procedures are included.

Offerors shall submit a brief letter pre-proposal not to exceed five pages addressing (i) the major research thrust; (ii) the technical approach; (iii) the research goals; (iv) total estimated cost and relevancy to the research described herein. Pre-proposal inquiries will be responded to within 60 days of receipt, either encouraging submission of a complete proposal or advising the offeror not to submit.

Persons contemplating submission of a proposal are also encouraged to contact the appropriate WES scientist identified in this publication to ascertain the extent of interest which WES may have in a specific research project.

Proposals from U. S. Government facilities and organizations will not be considered under this program announcement. Additionally, requests for conference and symposium support are exempt from this announcement.

All pre-proposals and proposals regarding this Broad Agency Announcement should be submitted to the **U.S. Army Engineer Waterways Experiment Station, ATTN CEWES-CT-Z, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199**, and should reference this announcement. Reference must be made to the code number for the specific research area. These code numbers are listed at the end of each topic (e.g., CHL-1, ITL-2).

PERSONS SUBMITTING PROPOSALS ARE CAUTIONED THAT ONLY A CONTRACTING OFFICER MAY OBLIGATE THE GOVERNMENT TO ANY AGREEMENT INVOLVING EXPENDITURE OF GOVERNMENT FUNDS.

This Broad Agency Announcement supersedes the January 1997 edition and shall remain in effect until superseded.

WES encourages Historically Black Colleges and Universities (HBCUs), Minority Institutions (MIs), small business concerns, women owned businesses, and small disadvantaged business concerns to submit research proposals for consideration.

The Bidder/Offeror, by submission of a bid or offer or execution of a contract in response to this solicitation, certifies that the Bidder/Offeror is not debarred, suspended, declared ineligible for award of public contracts, or proposed for debarment pursuant to FAR 9.406-2. If the Bidder/Offeror cannot so certify, or if the status of the Bidder/Offeror changes prior to award, then the Bidder/Offeror must provide detailed information as to its current status.

NOTE: PREPARATION INSTRUCTIONS AND ADDRESS SHOWN ON PAGES 57-60

TABLE OF CONTENTS

	<u>Page</u>
Part I BACKGROUND AND RESEARCH INTERESTS	4
Coastal and Hydraulics Laboratory	7
Environmental Laboratory	15
Geotechnical Laboratory	38
Structures Laboratory	41
Information Technology Laboratory	51
Part II PRE-PROPOSAL AND PROPOSAL EVALUATION	54
Part III PRE-PROPOSAL AND PROPOSAL PREPARATION	55
Introduction	55
General Information	55
Type of Contract	56
Contents of Pre-Proposal	56
Contents of Full Proposals	57

ATTACHMENTS

- DD Form 2222-2
- DD Form 2222-1
- Standard Form 1411
- Atch A Cost-Reimbursement - Educational/ Nonprofit Organizations
- Atch B Cost-Reimbursement - Commercial Organizations
- Atch C Fixed Price R&D
- Atch D Additional Representations and Certifications

PART I

BACKGROUND AND RESEARCH INTERESTS

BACKGROUND

The U.S. Army Engineer Waterways Experiment Station (WES) was established by Congress in 1929 after the disastrous Mississippi River flood of 1927. Over the years, the mission of the small hydraulics laboratory has been expanded to include a wide variety of disciplines under the auspices of a five laboratory complex. This makes WES the largest research facility within the Corps of Engineers. Permanent and wholly owned facilities are located at the 680 acre U.S. Army Engineer Waterways Experiment Station at Vicksburg, Mississippi and the 175 acre Field Research Facility at Duck, North Carolina.

Currently, over 2500 research projects are underway for 150 sponsors, the primary sponsors being the office of the Secretary of Defense and the Corps of Engineers (USACE). The following agencies were major sponsors of R&D at WES in FY 96: Defense Special Weapons Agency, U.S. Navy, U.S. Air Force, U.S. Marine Corps, the Environmental Protection Agency and the Federal Aviation Administration.

RESEARCH INTEREST OF THE RESEARCH LABORATORIES

The COASTAL AND HYDRAULICS LABORATORY was formed in FY 97 through the merger of two WES laboratories - the Hydraulics Laboratory (HL) and the Coastal Engineering Research Center (CERC). HL, formed in 1929, was the original "Waterways Experiment Station" while CERC was established by Public Law in 1963 as the direct successor to the Beach Erosion Board, which was created by Congress in 1930. The merger of these historically rich organizations has resulted in the formation of the largest water resources development research laboratory in the world with over 300 engineers, scientists, and support personnel. CHL has nationally and internationally recognized engineering and scientific expertise related to inland waterways and the estuarine and coastal zones. CHL has world class capabilities in prototype data collection, experimental research and numerical modeling and simulation of processes involving water levels, current, winds, waves and tides, and their interaction with sediments and structures. Specific and unique expertise exist in the engineering, hydrodynamics, sediment transport, dredging and dredged material disposal, physical processes associated with environmental analyses, groundwater modeling, military hydrology, harbor engineering, and riverbank and shore protection. CHL has the Tri-Service Reliance mission for Logistics-Over-the Shore (LOTS) for Sustainment Engineering. The Shore Protection Manual, which is internationally recognized as the "bible" of the coastal engineering profession, originally developed by CERC, is being updated and expanded into the Coastal Engineering Manual by CHL.

The ENVIRONMENTAL LABORATORY conducts research in all aspects of the interactions of human activities and natural events with the environment. Research areas include environmental aspects of dredging and dredged material disposal; water quality; hazardous waste site characterization, treatment and environmental restoration; environmental impact prediction, ecosystem simulation, assessment, and remediation; natural and cultural resources management, stewardship, and conservation; coastal ecology; aquatic plant control; and wetlands.

The GEOTECHNICAL LABORATORY performs research, investigations, and testing in many areas, including: soil mechanics, structural foundation design, slope stability, seepage analysis, military pavements, rock mechanics, engineering geology and geophysics, earthquake engineering, vehicle mobility, and trafficability. The laboratory is equipped to perform virtually any type of geotechnical testing, including centrifuge applications, needed to assist in these and other varied projects.

The STRUCTURES LABORATORY conducts scientific and engineering investigations and research and development projects in the fields of structural dynamics, survivability, weapons effects, earthquake engineering, earth dynamics, and construction materials. The projects include: design and analysis of structures to resist static and dynamic loading; defining effects produced by the detonation of explosives and the impact of high-velocity projectiles; development of useful applications of explosives; development of methods for fixed installation camouflage, concealment and deception; evaluation of properties, applications and behavior in service of construction materials, assemblages, and structures; and evaluation of the influence of properties of natural and man-made materials in the transmission of transient effects from explosions, impacts, and other energetic sources.

The INFORMATION TECHNOLOGY LABORATORY performs research in computer-aided engineering, interdisciplinary engineering areas, computer science, high performance computing, instrumentation systems, and in all aspects of information technology. Projects include computer-aided structural engineering, application of computer-aided design and drafting (CADD) and geographic information system (GIS) technology, 3-D structural stability, finite element method analysis of structures, engineering reliability, instrumentation systems design and development, relational database management, management information systems, information engineering, software engineering, groupware systems, information center concepts, telecommunications, scientific visualization (including virtual reality), office automation, graphic arts and publishing, library systems, and records management.

DEPARTMENT OF DEFENSE HIGH PERFORMANCE COMPUTING CENTER

The WES Information Technology Laboratory administers and operates on behalf of DoD a High Performance Computing (HPC) Center with a variety of advanced HPC systems which are configured to provide leading-edge computational performance, data storage capacity, network capabilities, and scientific visualization capabilities. A variety of languages and commercial software packages are available on these systems. The computational capabilities of the Center systems may, at the option of the Government, be made available to contractors. Proposals should include details on expected use of the DoD HPC Center systems.

SUMMARY

WES is a research and development complex with an international reputation. Some WES projects have world-wide significance while others are much smaller in scope. However, each project is in response to the special needs of the American people.

COASTAL AND HYDRAULICS LABORATORY

I. Introduction

Research is performed in the areas of hydraulic structures such as locks, dams, outlet works, control gates, stilling basins, spillways, channels, fish handling systems, and pumping stations, flood control channels; navigation channels; riverine and estuarine hydrodynamics and transport processes; groundwater; hydrology; dredging-related equipment; and on coastal problems related to shoreline protection; beach erosion; navigation; sedimentation; inlet stabilization; and construction, operation and maintenance of coastal structures (break-water, jetties, groins, seawalls, etc.). Major areas of interest include coastal hydrodynamics (wind waves, tides, currents, wind related water levels); coastal sedimentation (longshore transport, inlet sedimentation); coastal geology and geomorphology; design and stability of coastal structures; and interaction of structures and coastal processes. Other activities include descriptions of coastal processes; theoretical studies; numerical and physical model techniques; data collection and analysis techniques; development of laboratory and prototype instrumentation and equipment. The following sections contain information on these research areas and specific research thrusts.

II. Research Areas

A. Physical Processes in Estuaries (CHL-1)

1. The research program in estuarine physical processes deals with the hydrodynamic and transport characteristics of water bodies located between the sea and the upland limit of tidal effects. Research is directed toward knowledge that will improve field measurements and predictions of these processes.

2. Specific areas of required research include the following physical processes in estuaries and other tidal waters.

(a) The propagation of tides.

(b) Transport of salinity, mixing processes, stratified flows.

(c) Transport, erosion, and deposition of sediments, including settling velocity, aggregation of sediment, consolidation of sediment.

(d) Behavior and characteristics of sediment beds, including movement, consolidation, armoring, bonding, physical chemical characteristics, density, erodability.

(e) Flow between aquifers and surface waters.

3. Specific areas of required research include the following activities with respect to the physical processes listed.

(a) The effect of human activities, including dredging construction, vessel traffic, flow diversion, training, structures, and protective structures.

(b) Measurements of parameters that are indicative or descriptive of the processes listed in paragraph 2 by in-situ and remote methods in the lab and field.

(c) Prediction of processes listed in paragraph 2 by analytical methods, physical models, numerical models, and other techniques.

(d) Conceptual and mathematical descriptions of the processes listed in paragraph 2.

(e) Development of materials, equipment, and methods that potentially lead to applied research that would make human activities listed safer, more economical, or more effective. (Contact: Dr. Rob McAdory, 601-634-3057.)

B. Hydraulic Structures (CHL-2)

1. The research program in hydraulic structures is related to the hydraulic performance of locks, dams, outlet works, control gates, stilling basins, spillways, channels, bank protection, riprap stability, pumping plants and other hydraulic structures, and with physical and/or numerical model studies to predict and analyze the physical water quality aspects of water resources projects.

2. Specific areas of required research include the following:

(a) Physical and numerical hydraulic model investigations of a wide variety of hydraulic structures to verify proposed designs and develop more effective and economical designs.

(b) Analysis of model and prototype data and inspection of field installations to develop design criteria for hydraulic structures.

(c) Develop methods of correlating theoretical and experimental information with design methods used by the Corps of Engineers to improve existing procedures and provide material for inclusion in appropriate manuals.

(d) Develop physical and/or numerical models to predict and analyze the water quality aspects of water resources projects and design appropriate hydraulic structures to control water as well as

water quantity while satisfying the desired objectives.

(e) Conduct research and/or develop numerical codes to develop techniques for analyzing physical aspects of water quality in lakes and rivers through a better understanding of the hydrodynamics in density-stratified environments and for improving water quality within and downstream of density-stratified reservoirs and to investigate the ability of existing and proposed water resources projects to satisfy established water quality standards.

(f) Basic studies related to development of hydraulic design and operation guidance for hydraulic structures used in inland waterways for navigation and flood control purposes.

(g) Performance tests, both model and prototype, of hydraulic appurtenances to flood control and navigation dams such as spillways, outlet works, energy dissipators, and approach and exit channels, are conducted and/or analyzed to develop design guidance that will provide structures of maximum efficiency and reliability with minimum maintenance.

(h) Develop innovative methods to prepare and revise engineering manuals for hydraulic design of various hydraulic structures.

(i) Develop innovative methods to conduct training courses on design of various hydraulic structures.

(j) Develop innovative methods to prepare technical reports of all work conducted. (Contact: Dr. Phil Combs, 601-634-3344.)

C. Open Channel Flow and Sedimentation (CHL-3)

1. The Stable Flood Control Channel research project consists of basic studies related to development of hydraulic design guidance for designing modifications to natural stream channels to provide for local flood protection. Emphasis is placed on channel stability as well as channel flow capacity.

2. Specific areas of required research include the following:

(a) Studies related to the development of effective methods to analyze a natural stream's response to modifications made for flood control purposes.

(b) Studies applicable to development of streambank and streambed protection methods where channel instability exists.

(c) Studies applicable to development of sediment transport, local scour, and stream form relationships for a broad range of stream types, bed and bank materials, and meteorological and

hydrological conditions.

(d) Collection and analysis of data which aid in evaluating existing methods and/or developing new methods to analyze channel stability for the variety of channel flow conditions and stream types existing in natural stream systems. (Contact: Dr. Ron Copeland, 601-634-2623.)

D. Dredging Research (CHL-4)

Protection and enhancement of the environment associated with U.S. waterway infrastructure operation maintenance through dredging activities is a national priority. Dredging operations and environmental requirements of navigation projects are inseparable. Research is required to predict the time-dependent movement of noncontaminated sand and sand/silt mixtures of dredged materials placed in the nearshore zone, and all materials placed in the offshore region. The cost of dredging operations attributable to compliance with environmental windows that are determined to be over-restrictive, inconsistent, or technically unjustified can be reduced. More effective contaminated sediment characterization and management will reduce costs and enhance the reliability of methods associated with the assessment, dredging, placement, and control of sediments from navigation projects. Better instrumentation for dredge and site monitoring is required to implement automated dredge inspection and payment methods, and accurately monitor placement of contaminated materials. Emerging technologies regarding innovative equipment and processes should be expeditiously introduced into the dredging arena. Enhanced ecological risk management for dredging and disposal projects through technically sound approaches for characterizing, managing, and conducting risk-based evaluations are required for expanding options regarding both contaminated and noncontaminated dredged materials. (Contact: Mr. E. Clark McNair, 601-634-2070.)

E. Navigation Channel Design (CHL-5)

1. The research program in navigation channel design involves basic research to develop design guidance for the design of new channels and modifications of existing waterways. It involves identifying maneuvering requirements in restricted waterways that affect the channel dimensions, alignment, and location of appurtenances in the navigation channel under various environmental and vessel traffic conditions. It also involves identifying the stability of the channel, maintenance requirements and designing structures that reduce or eliminate the maintenance requirements. Finally, it involves quantifying the flow and pressure fields generated by a tow or ship passing through a waterway and the related impacts on the sediment resuspension in the channel, channel border, and side channel/backwater areas. Studies involve deep and shallow draft navigation channels and physical and mathe-

mathematical models. Human factors are included in research and project studies using a ship and tow simulator.

2. Specific areas of required research include the following:

(a) Physical model investigations of a wide variety of navigation channel configurations in many environments with different type vessels to verify proposed designs and to develop more efficient and safe designs and to lower environmental impacts.

(b) Development and enhancement of mathematical models of vessels, both ships and push-tows, for use on the simulator to add vessel types not available or to increase the accuracy with which the model reproduces the vessels response.

(c) Development of methods and modeling techniques to predict the currents and sediment transport characteristics of various channel designs and integrate this with the navigation model studies, including those generated by the vessel movement.

(d) Development of methods and modeling techniques to predict the currents and sediment transport characteristics of various channel designs and integrate this with the navigation model studies.

(e) Development of methods and techniques to prepare and display visual information for the pilot on the simulator projection system.

(f) Development of methods and measurement equipment, techniques for measuring scale model performance in physical model navigation studies.

(g) Development of methods and techniques for the analysis and evaluation of model results to optimize the channel design and to determine the level of safety, or conversely, risk involved with the various designs. (Contact: Mr. Dennis W. Webb, 601-634-2455.)

F. Computer-Aided Hydraulic Engineering (CHL-6)

The objective of this research program is to develop computer-aided design tools that can be used by hydraulic engineers in planning, design, construction, operation, and maintenance of navigation and flood control projects. The scope includes open channel and closed conduit flows, equipment, and structures.

(Contact: Dr. Nolan Raphelt, 601-634-2634 and Mr. W. H. McAnally, 601-634-3822)

G. Groundwater (CHL-7)

The groundwater modeling research program is structured to enhance understanding and predict capabilities, including the development of numerical codes, groundwater flows and contaminant

transport in both the saturated and unsaturated zones for both porous and fractured media. The goal of the program is the development of modeling techniques, including remedial alternative simulation, for optimal design and operation of the site cleanups. (Contact: Dr. Jeff P. Holland, 601-634-2644.)

H. Hydrology (CHL-8)

1. Research in this area primarily addresses military applications related to mobility, counter mobility and water supply.

2. Specific research involves the following areas:

- (a) Remote sensing and quantification of precipitation.
- (b) Development of spatially varying precipitation hydrology models.
- (c) Visualization of results for hydrology and dam break models.
- (d) Rapid procedures for flood forecasting.
- (e) GIS interfacing with existing and new hydrology models.
- (f) Groundwater surface water interaction processes.

(Contact: Dr. William D. Martin, 601-634-4157.)

I. H&H GIS/DATABASE DEVELOPMENT (CHL-9)

1. Research in this area is addresses the following areas:

- (a) Electronic Navigation Charting.
- (b) Integration of GIS/Database and H&H models.
- (c) Watershed management for erosion control.
- (d) Larger River System management for flood control navigation.
- (e) Visualization Techniques

(Contact: Dr. Nolan Raphelt, 601-634-2634.)

J. Hydrodynamics (CHL-10)

Research in shallow water wave estimation; forecasting and hindcasting of wind generated waves for oceanic to local regions; wave theory; statistical distribution of wave parameters; simulation

of spectral conditions in wave basins; nearshore currents; wave breaking; wave/current interaction; long and short waves in ports and harbors; tsunami modeling; wind generated currents; storm surge; tidal circulation; two- and three-dimensional numerical simulation models (including finite difference, finite element, and curvilinear coordinate techniques); coastal meteorology; explosion generated waves; ship response to waves; moored ship response; and turbulence. (Contact: Dr. Martin C. Miller, 601-634-3999.)

K. Coastal Processes, Coastal Inlets, and Navigation Channels (CHL-11)

Shoaling in inlets; stability of inlet channels; scour at structures; sediment transport modeling; numerical modeling of coastal regions; shoreline evolution modeling; storm erosion of beaches; wind and wave generated sediment transport; sediment budget analysis; wave forces/loads on gates (tainter, miter, etc.); and PC-, workstation-, and mainframe-based automated coastal engineering software (including relational and GIS data bases). (Contact: Mr. Thomas W. Richardson, 601-634-2019.)

L. Coastal Structure and Facility Design (CHL-12)

Development of functional and stability design criteria for coastal structures and facilities (breakwaters, seawalls, jetties, groins, harbors, marinas, etc.); wave runup, over-topping, refraction, diffraction, transmission, reflection, etc.; design of floating breakwaters; breakwater stability; application of spectral wave conditions to coastal engineering; stability of riprap to irregular wave attack; stability and functional design of overtopped rubble mound breakwaters; scale modeling of armor unit strength; analysis of structural data for floating breakwaters; investigation of numerical structural models for floating breakwaters; development of wave runup gage for rough and porous slopes; investigation of attenuation/mooring force models of floating breakwaters; development of materials and techniques to produce high quality break-water model armor units; analysis of wave runup overtopping, refraction, diffraction, transmission and/or reflection data on coastal structures and beaches and design of structures for Logistics-Over-The-Shore (LOTS) operations. (Contact: Mr. C. E. Chatham, Jr., 601-634-2460.)

M. Field and Laboratory Measurements, Data Collection, and Analysis (CHL-13)

Wave current, water level and wind measurement systems for laboratory and field cases; advanced data analysis (spectral and nonspectral) techniques; remote sensing techniques; bedload and suspended sediment transport; monitoring and evaluating technical and structural stability of coastal projects; field measurement of coastal processes; structural response instrumentation; bathymetric survey systems. (Contact: Mr. T. W. Richardson, 601-634-2019.)

N. Experimental Coastal Model Equipment, Operation and Analysis
(CHL-14)

Development of equipment and techniques for specialized model construction, experimental wave generation equipment, specialized data acquisition and analysis systems, advanced model operations techniques, and laboratory and scale effects in movable bed model studies. (Contact: Mr. C. E. Chatham, Jr., 601-634-2460.)

O. General Coastal Engineering, Coastal Geology, and Dredging Investigations (CHL-15)

Sand bypassing systems and equipment; beachfill design; coastal geology and geomorphology; functional design and evaluation of coastal works and coastal structures; littoral transport; coastal and offshore dredging studies; agitation dredging systems and equipment; physical monitoring of dredged material; physical processes in coastal wetlands; application of Geographic Information Systems; design of nearshore and offshore dredged material placement; evaluation of dredged material disposal sites; analysis of dredging operations management. (Contact: Mr. T. W. Richardson, 601-634-2019.)

ENVIRONMENTAL LABORATORY

INTRODUCTION

The Environmental Laboratory (EL) conducts R&D for the Corps of Engineers, other Department of Defense elements, and other Government agencies in the general areas of Clean-up and Conservation. Clean-up involves the development of technologies to improve site characterization, reduce the cost and time to remediate contaminated sites, and accurately assess and monitor the hazard associated with contamination. Areas of research include: (a) environmental sensing development, (b) hazardous waste site characterization and treatment, (c) sediment geochemistry and biological effects, and (d) water quality modeling.

Conservation deals with sustaining the natural and cultural resources entrusted to DoD for continued use through improving and developing tools and technologies which conserve, protect, and enhance natural and cultural resources and foster stewardship. Areas of research include: (a) environmental database development; (b) environmental impact prediction, assessment, and management; (c) environmental criteria for stream channel alteration; (d) natural resource management; (e) nonindigenous aquatic nuisance species management; (f) threatened and endangered species protection and management (g) water quality and ecological systems; (h) outdoor recreation; (i) cultural resources; and (j) ecosystem simulation.

CLEAN-UP

Environmental Sensing

I. Introduction

Current research is in the acquisition of information by remote sensor systems, the impact of the environment on imaging and other sensor systems, and advanced signal processing. Sensors using electromagnetic, seismic, and acoustic energy forms are of interest. In addition, work is conducted to determine terrain and other environmental effects on high-technology sensor systems. Sensor systems include optical and infrared millimeter wave (active and passive). Briefly described below are specific research areas.

II. Research Area

Sensing (EL-1)

This research includes the development of sensing, data processing and fusion, and display technologies for a variety of sensing applications. Emphasis is on concept development and

laboratory-scale tests (for data collection/concept demonstration purposes). Novel concepts for detection of buried objects (metallic and nonmetallic) such as unexploded ordnance, as well as subsurface sensing of hazardous materials are among the objectives. Special areas of interest include radar electromagnetic induction, laser polarimetry, and nuclear imaging. Fundamental measurements and models that define the parameters controlling the propagation of electromagnetic, seismic, and acoustic energy through various soil types are also of interest. (Contact: Dr. Ernesto R. Cespedes, 601-634-2655.)

Hazardous Waste Site Characterization and Treatment

I. Introduction

An extensive research and development program is being conducted by the Department of Defense to assist in the cleanup of contamination at military installations. The U.S. Army Engineer Waterways Experiment Station is developing technologies for characterizing, monitoring, and applying physical, chemical and biological treatment of toxic and hazardous waste in contaminated surface and ground waters and soils. The WES is also developing, evaluating, and verifying numerical models and guidance for solid waste disposal systems.

II. Research Areas

A. Innovative Technologies for Rapid Characterization and Monitoring of Hazardous Waste Sites (EL-2)

The WES, in coordination with the U.S. Army Environmental Center and other Tri-Service agencies, has developed the Site Characterization and Analysis Penetrometer System (SCAPS). The SCAPS is specially designed to conduct rapid site characterization/screening of installations for possible contamination. The SCAPS R&D Program is currently developing sensors for use with the cone penetrometer to detect contaminants such as petroleum, oil and lubricant products (for example, aviation fuels, diesel, gasoline), explosives compounds, volatile organic carbons (VOCs), heavy metals, and radionuclides. Additional areas of R&D include: advanced computational techniques for 3-D visualization of subsurface contamination; rapid data acquisition, analysis and interpretation; technologies to quantify levels of contamination; enhanced sampler technology development; contaminant monitor development for biological and chemical treatment assessment; and automated techniques for monitoring/assessing operational performance of remedial site cleanup operations. (Contact: Mr. John H. Ballard, 601-634-2446.)

B. Innovative Technologies for Treating Hazardous Waste and Contaminated Surface and Ground Waters (EL-3)

Presently, WES is continuing to conduct research, develop technologies and apply strategies to treat complex organic- and metal-contaminated hazardous liquids, off-gases, soils sludges, sediments, and residuals from past disposal practices. Research is divided into two major categories: technologies for treating contaminated soils and sediments, and innovative technologies for treating contaminated surface and ground waters. Areas of R&D include: (1) physical and chemical technologies to minimize or reduce the quantity and toxicity of hazardous waste, (2) biological processes and methods to detoxify/destroy hazardous waste constituents, (3) techniques for in situ treatment of groundwater aquifers, (4) laboratory design criteria for and field implementation of piloting equipment for promising technologies, (5) computer-based techniques to assess operational performance of various treatment processes/systems and (6) improved analytical chemistry techniques and methodology to assess treatment technologies. (Contacts: Mr. Mark Bricka (metals), 601-634-3700; Ms. Beth Fleming (physical-chemical organics), 601-634-3943 and Mr. Lance Hansen (bioremediation), 601-634-3750, and Ms. Ann Strong (analytical chemistry methods), 601-634-2726).

C. Design, Evaluation, Verification and Modeling of Solid and Hazardous Wastes and Contaminated Sediments (EL-4)

Presently, WES is continuing to develop water balance and leachate models for solid waste disposal systems and dredged material disposal facilities. Additional work is needed to model innovative designs, nonsoil surface materials, cobbled surfaces, preferential flow through heterogeneous waste materials and other layers, and effects of complex mixtures of vegetation including trees. Similarly, additional work is needed to verify the existing models. (Contact: Dr. Paul R. Schroeder, 601-634-3709.)

Sediment Geochemistry and Biological Effects

I. Introduction

Potential adverse environmental impacts of disposal of contaminated sediments must be assessed prior to permitting operations. This includes the determination of the impacts that contaminated dredged materials exert on the environment prior to dredging.

II. Research Areas

A. Environmental Risk Assessment (EL-5)

Current research on the fate and effects of environmental contaminants occurs under the general paradigm of Environmental Risk Assessment. Specific studies fall into one or more of the following areas. (Contact: Dr. David Moore, 601-634-2910.)

(1) Hazard Identification. This is the process of showing causality i.e., a chemical or complex mixture can cause some adverse effect. If this causality can be demonstrated, the chemical is referred to as a "hazard." If there is no causal link, risk need not be quantified. Important target receptors are also identified by this stage (for example, humans, endangered species, ecologically or economically important species). Research is conducted to develop the technology for hazard identification and the establishment of causality.

(2) Effects Assessment. While Hazard Identification decides if a chemical or complex mixture is toxic, Effects Assessment determines the magnitude of the toxic response. This is accomplished via experimental research in which surrogate species are exposed to gradients (spatial, concentration, etc.) of the hazard in question, and biological effects are monitored over time. Biologically important endpoints measured include survival, growth, reproduction and population-level parameters. These endpoints must be accompanied by technically sound interpretive guidance. Results are expressed in dose-response or exposure-response relationships. Research is conducted to develop the necessary experimental/statistical designs, technically sound tests (for example, chronic sublethal sediment bioassays) and appropriate extrapolations (for example, high dose to low environmentally realistic exposures, surrogate test species to receptor of interest). Analysis of the uncertainty associated with these effects assessments is also conducted.

(3) Exposure Assessment. In Exposure Assessment, the magnitude, frequency and duration of contaminant exposure relative to the target receptor(s) are determined. This research is model-intensive, with both descriptive and quantitative models being used to evaluate pathways and routes. A pathway exist if the hazard travels between the initial source of contamination and the ultimate biological receptor. A route is how the chemical enters the receptor (for example, ingestion, inhalation, dermal absorption, bioaccumulation, trophic transfer). Analysis of the uncertainty associated with these exposure assessments is also conducted.

(4) Risk Characterization, Management, Communication, and Analysis. Outputs from the Effects Assessment and Exposure Assessment are joined in Risk Characterization to yield an estimate of risk. Research is conducted to determine the best ways to characterize risk both numerically and descriptively. Also, uncertainty

analysis is undertaken to identify the qualitatively and quantitative important sources of uncertainty. Techniques employed include error propagation, probability distributions, sensitivity analysis, Monte Carlo simulation and others.

Once environmental risk has been quantified, management action may be required. Research is conducted to develop management alternatives which range from no action to extensive (and expensive) remediation. Results of the Environmental Risk Assessment are weighed and balanced with other factors such as applicable laws and regulations, engineering feasibility, potential benefits, costs, economic impacts, and the socio-political decision environment. Risk Communication is a dialogue, not a monologue. It occurs at two levels: between the risk assessor and the risk manager, and between the risk manager and the public. Research is conducted to identify optimal procedures for communicating environmental risks, including an appreciation for the limits and uncertainties of the numerical results. Risk Analysis is a broad, inclusive term encompassing the processes of Risk Assessment, Risk Management, and Risk Communication as well as any field verification or monitoring activities. Field verification is a study or studies carried out to determine the accuracy of laboratory observations and predictions. Field monitoring (in the context of Risk Assessment) is undertaken to ensure that steps taken to manage the chemical risks were successful. Field research studies are carried out for both verification and monitoring purposes.

(5) Technology Transfer: Develop and analyze technology transfer concepts; analyze target audiences for technical information; test innovative methods of transferring dredging research results and technology to supplement conventional technology transfer. Included may be such items as interactive CD-ROM and PC technology applied to training and general information transfer; technology applications of electronic media using the Internet; and innovative public information systems/products. The DOER Research Program audiences include Corps of Engineers and the Department of Defense; Congress and other Federal, State, and local agencies; port and transportation authorities; universities; environmentalists and other public interest groups; and the general public. (Contact: Elke Briuer, 601-634-2349)

B. Sediment Water Interactions (EL-6)

Current research encompasses a wide range of investigations designed to increase understanding of sediment-water interactions. Emphasis is on conduct of investigations for determining the impacts that sediment/soil properties have on sorption and transformation of explosives and release of semi-volatile contaminants to the atmosphere. Factors responsible for sorption and transformation of explosives include redox potential, pH, and the geochemical characteristics of the soil or sediment. Factors affecting the release of semivolatile contaminants from soil or sediment to the atmosphere

include relative humidity, wind speed, contaminant concentration, moisture content, porosity, and organic carbon content. Research is also conducted on colloidal system contaminant transport, accelerated sediment oxidation, and the role of solution chemistry in contaminant partitioning between sediment and water. (Contact: Dr. J. M. Brannon, 601-634-3725.)

Biodegradation of Contaminants: Studies in the biodegradation area emphasize destruction of organic contaminants for remediation purposes. Emphasis is on (1) delineating biodegradative pathways; (2) determining intermediate and final products and by-products; (3) assessing the role of environmental factors in regulating the pathways utilized and the rate and extent of destruction of the parent compound; (4) determining the survival and activity of microorganisms added to soils, sediments, and biotreatment systems; and (5) enhancing biodegradation to obtain the maximum destruction of organic contaminants within a soil, sediment, or treatment system. (Contacts: Dr. Herb Fredrickson, 601/634-3716; and Dr. Douglas Gunnison, 601/634-3873.)

C. Techniques for Contaminated Dredged Material Disposal and Treatment (EL-7)

Specific areas of required or anticipated research include the following:

(1) Application of innovative techniques, equipment, and control measures for dredging, transport, and placement of contaminated sediments. (Contact: Mr. Daniel E. Averett, 601-634-3959.)

(2) Development of cost-efficient technologies for control-treatment of contaminated dredged material, including assessment of physical/chemical processing technologies for application to contaminated dredged material slurries, supernatant, and leachate; techniques for evaluating the processing technologies; methods for site evaluation; and techniques for evaluating cost-effectiveness. (Contact: Mr. Tommy E. Myers, 601-634-3939.)

(3) Development or enhancement of computer models to be included in the ADDAMS to evaluate the environmental impacts of dredged material disposal. Evaluations include water quality impacts of initial release in open water, effluent discharge, runoff and leachate, benthic impacts, plant and animal uptake, and volatilization. (Contact: Dr. Paul R. Schroeder, 601-634-3709.)

(4) Development and/or application of new or improved environmental chemistry methodologies to assess contaminant concentrations of dredged material focusing on cost-effectiveness, quality assurance, and lower detection limits. (Contact: Ms. Ann Strong, 601-634-2726.)

Water Quality Modeling

I. Introduction

The Corps of Engineers is involved in research to develop water quality models for riverine, reservoir, wetland, coastal, and marine surface and groundwater. Current research encompasses a wide range of environmental issues. Emphasis is on short- and long-term field and laboratory investigations to improve the techniques for evaluating water quality and developing water quality management guidelines.

II. Research Area

Numerical Water Quality and Contaminant Modeling (EL-8)

This area of research involves development and application of water quality models for watersheds and receiving waters (riverine, reservoir, wetland, estuarine and coastal) and ground-water contaminant transport/fate models. Emphasis is on formulation of the appropriate chemical and biological algorithms for simulating water quality. Areas of need also include: collection and assemblage of data for model evaluation; development or improvement of interactive bed sediment/water column algorithms; review, development, and application of toxicant transport and fate models; development of models for watershed runoff quality; development of models for evaluating groundwater remediation involving multiphase, multicomponent contaminant transport; development of special numerical solution schemes; and development of software to enhance model utility and ease of application. (Contact: Dr. Mark Dortch, 601-634-3517.)

CONSERVATION

Environmental Database Development

I. Introduction

Engineers, scientists and managers require well organized, easily accessible environmental natural resources databases to make sound conservation and stewardship decisions. Research in this area addresses techniques to effectively characterize, quantify and analyze the spatial and temporal components of the environment at various resolutions.

II. Research Areas

A. Geospatial Environmental Database Development (EL-9)

This research area is concerned with techniques for developing holistic, geographically referenced environmental databases at a wide range of spatial and temporal resolutions. Holistic environmental

databases integrate quantitative characterizations of the hydrosphere, biosphere, geosphere, and atmosphere. Spatial resolutions range from the characterization of regional watersheds to the characterization of the internal canopy conditions for individual trees. Temporal resolutions range from decades to minutes. The research includes investigations onsite and remote techniques for characterizing and monitoring single environmental factors such as vegetation height, density and biomass; soil moisture content; and water quality parameters. The research includes investigations on techniques for collecting, quantifying, integrating, storing and accessing geospatial and statistical data. (Contacts: Mr. Wade West, 601-634-2232, and Dr. Rose Kress, 601-634-3665.)

B. Geospatial Data Analysis Techniques (EL-10)

This research area is concerned with developing methods to include the spatial and temporal properties of environmental factors in all aspects of environmental stewardship. It includes development of geospatial statistical measures and quantitative indices for use in numerical modeling, impact assessment, risk assessment and management trade-off analysis. It includes techniques for quantitative regional characterization of the natural resource base. The research investigates methods for modeling spatial patterns of environmental conditions over time. (Contacts: Mr. Wade West, 601-634-2232, and Dr. Rose Kress, 601-634-3665.)

Environmental Impact Prediction, Assessment, and Management

I. Introduction

This research program addresses environmental impact prediction, assessment, and remediation and is intended to provide Corps, Army, and other field operating elements with techniques and methodologies for environmental assessments and EIS preparation, guidance on selecting appropriate planning, design, construction, and operation alternatives, and implementation of the planning function pursuant to NEPA and other legislation and guidance. Specific objectives include:

(a) Developing, verifying, and demonstrating practical prediction and assessment techniques including applying and refining habitat-based evaluation methods, evaluating mitigation measures, developing streamlined frameworks for environmental monitoring, applying ecosystem simulation principles to environmental analysis, and estimating future habitat quality.

(b) Documenting and quantifying environmental effects associated with various types of Corps, Army, and other activities. Research has included the effects of aquatic habitat modification on anadromous fishes, the effects of selective clearing and snagging on instream habitat, and the benefits of channel modification for

aquatic habitat in reservoir tailwaters and local flood control channels.

(c) Developing and demonstrating design, construction, and management alternatives that will minimize adverse effects and protect natural and cultural resources. Research has included techniques for managing wildlife habitats, preserving archeological sites, and stabilizing eroding shorelines.

(d) Developing design and operational techniques to control potential adverse environmental effects of dredging and dredged material disposal operations. Included in these efforts are resuspension and release of contaminants by dredging, long-term sizing of disposal facilities, subaqueous disposal, capping, and dewatering. Many of the procedures developed are being programmed as computer models under the framework of a family of programs called the Automated Dredging and Disposal Alternatives Management System (ADDAMS) for personal computers.

II. Research Areas

A. Biotechnical Shore Stabilization (EL-11)

Biotechnical (sometimes called bioengineering) shore stabilization is the use of a combination of live vegetation and structural materials (for example, breakwaters, geotextiles, erosion control fabrics/mats, building materials) for erosion control of shores. Shores of particular interest are those of streams, lakes, or dredged material deposits and subject to erosion from waves, surface runoff, and wind. Research is needed to determine the causes and amounts of erosion and to identify and assess cost-effective biotechnical erosion control methods. Studies may include, but are not limited to, identifying, developing, and cultivating appropriate flood-tolerant plants and varieties or cultivars and cost-effective installation procedures of biotechnical techniques. (Contact: Mr. Hollis H. Allen, 601-634-3845).

B. Freshwater Fishery Investigations (EL-12)

This research is concerned with the development and application of methods for fish population and habitat assessment. Ongoing research covers a range of topics concerned with fish resource inventory, migration and movement, age and growth, reproduction, and aquatic habitat classification and assessment. Proposals in all fish resource areas are invited, particularly those concerned with the development or application of improved fish sampling and analysis methods using recent technological advancements. (Contact: Dr. K. Jack Killgore, 601-634-3397.)

C. Freshwater Macroinvertebrate Investigations (EL-13)

This research addresses the development and application of methods for assessing the environmental effects of Corps of Engineers activities by analysis of macroinvertebrate populations and communities. Studies involve laboratory evaluation of behavior and physical condition, or field studies that involve secondary production or the determination of selected biotic indices (such as species richness, diversity, evenness, relative species abundance, etc.) of naturally occurring mollusc, chironomid, or oligochaete communities. (Contact: Dr. Andrew C. Miller, 601-634-2141.)

D. Mitigation (EL-14)

An avoidance, minimization, and/or compensation process is required for impacts from water resources projects on ecological resources (fish, wildlife, habitat, or installation activities). Planning and implementing mitigation is a complex process, and new ideas that contribute to success of mitigation are invited. Subjects such as Best Management Practices for avoiding or minimizing impacts, planning for mitigation based on impact analysis, incremental analysis to justify mitigation, mitigation banking, future predictions, and mitigation for indirect or cumulative impacts are included. (Contact: Dr. Jean O'Neil, 601-634-3641.)

E. Instream Flow Requirements for Aquatic Biota (EL-15)

Research focuses on development and application of fish habitat assessment methods. Currently, the most widely used system, the Physical Habitat Simulation System (PHABSIM), is being used to assess the effects of reservoir operations on downstream fish habitat. Research is needed to better quantify the relationships for fish preference and flow conditions, as well as habitat requirements for aquatic invertebrates. Verification studies of these models will be required as development continues. The assessment method must be able to evaluate the impacts of a variety of reservoir operations such as base load or peaking hydropower releases. (Contact: Dr. John Nestler, 601-634-3870.)

F. Behavioral and Structural Fish Barriers (EL-16)

Entrapment of fish at Corps hydropower projects may result in passage of fish through turbines with attendant death or injury from impact with runner blades, pressure changes, or shear forces. Evaluations of a number of behaviorally based technologies and structural barrier designs conducted under laboratory and field conditions have yielded results that are generally inconsistent. Consequently, there currently exists no consistent guidelines for selection of appropriate technology for site-specific applications at Corps dams. Research is required to relate effectiveness of different technologies to size and species of fish, dam design,

operations, season, and other site-specific conditions. The information produced by this research will be used to develop specifications and guidelines for fish protection technologies at Corps dams to reduce entrainment and mortality. This effort may involve literature synthesis, laboratory research, design and fabrication of prototype systems, or field studies. (Contact: Dr. John Nestler, 601-634-3870.)

G. Fish Guidance and Bypass Systems (EL-17)

CE water resource activities may result in blockage of historical fish migration routes through waterways. These blockages, with associated fragmentation of habitats, may have severe impacts on anadromous and catadromous fish populations. A variety of bypass system technologies are available to guide fish around dams. However, many of these systems operate at reduced efficiencies because they damage fish, fish are unable to locate entrances to the systems, or because fish become disoriented and "fall back" after an initial successful passage. Research is required to better understand the hydraulic and behavioral characteristics of fish bypass systems, including the use of behavioral technologies to guide fishes towards these systems and to successfully orient them within the system. (Contact: Dr. John M. Nestler, 601/634-3870.)

H. Coastal Ecology (EL-18)

Research topics in coastal ecology include multidisciplinary investigations of the environmental impacts of engineering activities in the coastal zone, such as dredging, dredged material disposal, and construction of coastal structures (e.g., jetties, breakwaters, groins, seawalls, marinas). Emphasis is placed on improved technologies for assessment, protection, and management of fish and shellfish resources and their habitats. Of particular relevance are proposals dealing with endangered species (e.g., sea turtles, marine mammals), beneficial uses of dredged material and habitat restoration in the coastal zone (e.g., marsh, oyster reef or mudflat creation), and application of population dynamics and ecological models for impact prediction and assessment at population/community/ecosystem/watershed levels. Other areas of interest include effects of beach nourishment and use of offshore borrow areas, seasonal restrictions on dredging and disposal operations, artificial reef technologies, and cumulative impact determination and mitigation techniques. (Contact: Dr. Doug Clarke, 601-634-3770).

I. Techniques for Designing, Operating and Managing Dredged Material Disposal Facilities and Beneficial Use Projects (EL-19)

(1) Refinement and verification of techniques for designing, operating, and managing dredged material disposal areas.

(2) Development of a computerized economic database for costs associated with dredging sediments; disposing of dredged material; and constructing, rehabilitating, and operating and managing dredged material disposal areas.

(3) Development and refinement of computer models for dredged material management and beneficial use to be included in the ADDAMS. (Contact: Dr. Paul R. Schroeder, 601-634-3709.)

Environmental Criteria for Stream Channel Alteration Projects

I. Introduction

The Corps of Engineers is involved in alteration of stream channels for flood control, navigation, channel stabilization, and stream relocation. Modifications to channels include removal of snags and vegetation, channel alignment (straightening), channel enlargement, construction of levees, streambank protection, and grade control. The Corps is also involved in regulating and furnishing technical assistance to States in regard to other types of channel alterations such as gravel mining. Work at the Waterways Experiment Station and elsewhere has generated environmental design criteria for stream channel alterations to improve the net effect of these projects. Examples of environmental design features include low-flow channels, combinations of structure and vegetation, management of cutoff bendways and other backwater areas, and recreational trails.

II. Research Areas

A. Riparian and Instream Habitat Restoration (EL-20)

Current research includes formulating guidelines for stream restoration and environmental enhancement of flood control projects. Among the general issues addressed are, instream and riparian habitat assessment; benefits of habitat improvement, structures and techniques; impacts of vegetation on flow conveyance, channel stability, and sediment transport; construction practices; and monitoring and maintenance. Proposals are invited in these general areas and related efforts. In addition, specific needs include the following: (1) Techniques to quantify habitat and other environmental benefits of restoration efforts, (2) Algorithms that account for momentum losses at vegetated floodplain/channel interfaces, (3) Data supporting evaluations of the hydraulic impacts of instream structures, (4) Case studies of monitoring and maintenance plans, and (5) Development and refinement of related computerized databases and models. (Contact: Dr. J. Craig Fischenich, 601-634-3449.)

B. Assessing Benefits of Channel Modifications (EL-21)

Dams and local flood control structures may degrade aquatic habitat conditions in tailwaters and streams. In some cases, habitat degradation can be eliminated, stabilized or reversed through channel modification for aquatic habitat (for example, construction of low-cost, low-head weirs to create pools) with minimal changes in dam operation or flood channel design. However, there are no widely accepted methods available to incrementally relate instream aquatic habitat value, channel modifications, and instream flows to allow trade-off analysis between cost, design, and habitat benefits. It is desirable to modify existing instream flow methods or develop new methods that will allow incremental assessment of habitat values, alternative flows, and different channel designs. This work may involve data collection, analysis, interpretation, and software development. (Contact: Dr. John Nestler, 601-634-3870.)

Natural Resource Management

I. Introduction

As a part of its mission responsibilities, the Corps of Engineers must maintain and manage millions of acres of land, much of it surrounding over 700 water resource development projects throughout the United States. This includes fish and wildlife habitat sites, specific communities such as riparian zones and wetlands, and recreation sites. Technology needed for managing and enhancing these facilities includes research areas that involve endangered species, waterfowl, riparian zone management, range and turfgrass management, insect pest management, and the general stewardship of these natural resources. Developed technology is provided to Corps Civil Works projects as well as military installations and other cooperating Federal agencies.

II. Research Areas

A. Natural Resources Stewardship (EL-22)

(1) Integrated Natural Resources Management. Research includes biological diversity, holistic ecology, and the stewardship and management of habitat-related natural resources at Corps water resource projects and military installations. Emphasis is on integrated natural resources management, which includes the analysis of human-related activities on biological resources and the effects of biological resources on other resources. Current research includes integrated ecosystem management, analysis of impacts to natural landscapes and their components, habitat delineation and analysis, and program development for natural resources management. Related components to complete stewardship include management of information and databases. The work involves literature synthesis, field studies, data analysis, and report preparation. (Contact: Mr. Hollis H. Allen, 601-634-3845.)

(2) Riparian Zone Management. Research addresses riparian habitat assessment, restoration, and management for natural resources stewardship on Civil Works lands and Department of Defense military installations. Emphasis is on the development of methods and technical guidelines appropriate for managing riparian zones and associated habitats on multiple-use lands. This also includes research on transition areas between riparian areas and other systems. Research includes literature searches, field investigations, restoration projects, data analysis, and development of reports and management action plans. Priorities will depend on regional needs, as determined by study sponsors (that is, Corps districts/sponsors and military installations). (Contact: Mr. Chester O. Martin, 601-634-3958.)

(3) Tools for Natural and Cultural Resources at Multiple Scales. Management of resources in today's climate requires an awareness of scale and context of those resources. Issues ranging from genetic diversity to watershed or landscape planning are relevant to management decisions. Planners, regulators, and land managers must be able to use existing tools (decision-support systems, models, databases, procedures, etc.) and to adapt new tools to their needs. Although the general processes of resource inventory, impact assessment, and management or mitigation will remain applicable, those activities may be conducted in a different context or at more scales than before. Work under this announcement would supply tools for natural and cultural resources management in an ecosystem or holistic context. (Contact: Dr. L. Jean O'Neil, 601-634-3641.)

B. Wildlife Resource Management (EL-23)

The U.S. Army Engineer Waterways Experiment Station is developing user information for Department of Defense (DoD) personnel involved in the administration, planning, and operation of wildlife management programs and activities. The emphasis is to provide technology transfer on biologically sound, technically reliable, and cost-effective wildlife-related management strategies appropriate for Civil Works projects and DoD installations. The major product is the "U.S. Army Corps of Engineers Wildlife Resources Management Manual." Reports for the manual are arranged in nine chapters. Reports are currently needed on wildlife species, management techniques, and plant materials. Reports are primarily extensive literature reviews on a particular subject, which results in the presentation of appropriate information in a comprehensive and readable style; the basic format is established in the reports completed to date. Proposals should identify a specific section (or sections) to be prepared and should include an outline and description of topics to be developed for the report. Other tasks in this work area include habitat assessments, population surveys, and development of management plans. (Contact: Mr. Chester O. Martin, 601-634-3958.)

C. Endangered Species (EL-24)

This effort involves studies of endangered and threatened species on Department of Defense and other Federal agency lands. Tasks would include site-specific surveys, habitat analysis, and development of management plans for species of concern. Individual studies would involve literature searches and synthesis of information, field investigations, data analysis, coordination with Federal and state agencies and conservation organizations, and preparation of endangered species survey reports and management guidelines. Management recommendations will be specific to the region of study. Species of concern will vary, depending on requests from Civil Works projects and military installations. (Contact: Mr. Chester O. Martin, 601-634-3958.)

D. Waterfowl Resources (EL-25)

Investigations include studies on waterfowl biology and habitat management on Civil Works projects and Department of Defense military installations. Emphasis is on waterfowl habitat assessment, population surveys, and development of stewardship and management plans for various waterfowl habitat management programs. Current studies involve developing management plans for various habitat management practices such as moist-soil systems, greentree subimpoundments, and created ponds. The effort would include literature reviews, field investigations, data analysis, development of techniques and management guidelines, and preparation of technical reports. (Contact: Dr. K. C. Jensen, 601-634-3047.)

E. Wetlands (EL-26)

Wetlands research, especially as it pertains to wetlands restoration and development, has been occurring as an ongoing activity of the Corps of Engineers for the past two decades, primarily as a secondary or minor objective of navigation or flood control objectives. WES has been at the forefront in developing the technology that allowed this important wetlands work to take place, has developed a number of these wetlands, and has developed long-term monitoring methodologies to document the progress and ecological succession of these wetlands. In addition, WES has developed methodologies for delineating and evaluating wetlands on a national basis that have become the mandatory wetlands regulatory framework for Federal agencies. This research is expected to continue as part of a series of wetlands task areas. Research task areas outlined below will be conducted both in-house at WES, with other agencies, or will be contracted. Studies must be short term due to funding and time constraints, and must address one or more of the research tasks. (Contact: Dr. Russell F. Theriot, 601-634-2733.)

(1) Critical Processes of Wetlands. To examine the basic physical, chemical, and biological processes that cause wetlands to provide important functions, and to relate those processes and functions to other aspects of wetlands work in the Corps of Engineers. (Contact: Mr. Ellis Clairain, 601-634-3774.)

(2) Wetlands Delineation and Evaluation. Objectives of this task are to examine technical assumptions in the 1987 "Corps of Engineers Wetland Delineation Manual" and to develop techniques to assess wetland functions. The first objective will be accomplished through a combination of field and laboratory studies to examine hydrology/vegetation/soil relationships, morphological development of hydric soils, and physiological response of vegetation to soil saturation in relation to the growing season. The second objective will also be accomplished through field and laboratory studies. Efforts will focus on model development employing the Hydrogeomorphic Approach to Assessment of Wetland Functions (HGM) and implementation of basic research to test assumption in the HGM models. Both national and regional models will be developed using regional experts and published literature. HGM models will be field tested and assumptions examined using field studies to ascertain physical, chemical, and biotic wetland characteristics associated with different wetland functions and wetland types. (Contact: Mr. Ellis Clairain, 601-634-3774.)

(3) Wetlands Restoration, Protection and Creation. To study existing wetlands restoration, protection and creation sites built from dredged material, for compensatory mitigation, and for other non-regulatory purposes such as shoreline stabilization and erosion control. To test wetlands techniques and further refine those techniques to be applicable for the broad range of wetlands projects encompassed within Corps of Engineers activities, including addressing erosion and subsidence on a large scale. To test guidelines for wetlands restoration, protection and creation that can be used for mitigation, O&M, general construction, and other Corps of Engineers projects, and that will also find use by permit applicants as they mitigate for lost wetlands. To test and verify the Corps wetlands engineering handbook. (Contact: Dr. Morris Mauney, [e-mail mauneym@ex1.wes.army.mil] 601-634-2733.)

Nonindigenous Aquatic Nuisance Species Management

I. Introduction

In a 1993 report, the U.S. Congress, Office of Technology Assessment estimated that non-indigenous pest species have resulted in US losses of millions to perhaps billions of dollars annually.

They reported documented losses of \$97 billion between 1906-1991. When environmental conditions are favorable, non-indigenous species, such as hydrilla (*Hydrilla verticillata*) and the zebra mussel (*Dreissena polymorpha*), become established and disrupt the aquatic environment and economy of infested areas.

The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (Public Law 101-646) and the River Harbor Act of 1958; (Public Law 85-500) as amended, direct the Corps of Engineers to develop environmentally sound control methods to prevent, monitor, and control introductions of non-indigenous aquatic nuisance species.

II. Research Areas

A. Aquatic Plant Control (EL-27)

Aquatic plant research for the management of non-indigenous aquatic plant species in navigable waters, tributary streams, connecting channels, and other allied waters is a continuing activity of the Corps of Engineers. The research thrust is to reduce non-indigenous plant populations to non-problem levels, enhancing and/or replacing these non-indigenous species with indigenous species as more beneficial and productive aquatic habitat. Currently, research is focused on developing effective economical, and environmentally compatible technologies for managing two emerging problem aquatic plants, hydrilla and Eurasian watermilfoil. Areas of technology development include advanced management strategies and applications, techniques for establishing desirable aquatic vegetation, and computer-based systems for aquatic plant management planning. (Contact: Dr. John Barko, 601-634-3654.)

(1) Aquatic Plant Ecology. Current ecological research on both nonindigenous nuisance-forming plants and desirable native aquatic plant species is needed; including plant propagule ecology, modes of spread, methods of propagation and restoration (particularly desirable native species). In addition, research evaluating the effectiveness of aquatic plant management techniques and their impact on the ecology of aquatic habitats is desired. Development and evaluation of aquatic plant community quantification techniques is needed to support both research and operational needs. In addition, the development of PC-based simulation models of plant growth or effectiveness of management techniques are desired. Expansion of these models to include spatial distribution to 2-D and 3-D graphical displays to enhance management planning and implementation are also sought. (Contact: Dr. John D. Madsen, 601-634-4631.)

(2) Techniques for Assessing Aquatic Plant-Infested Environments. Current techniques for quantitatively sampling and mapping aquatic plant-infested environments are highly labor intensive and only provide a low-resolution picture of environments

that exhibit a high degree of spatial variability. High-resolution automated and semi-automated techniques are needed. Research area has focused on remote sensing techniques such as use of airborne scanners and state-of-the-art hydroacoustic equipment. Future research will focus on developing theoretically feasible measurement systems into devices which may be employed by operational aquatic plant managers. (Contacts: Dr. Rose Kress, 601-634-3665, and Mr. Bruce M. Sabol, 601-634-2297.)

(3) Biological Control Methods for Aquatic Plants. Current research involves biological control of problem aquatic macrophytes using microorganisms, aquatic invertebrates and vertebrates. The objective is to develop an operational capability for biological agents to control aquatic plants. Research topics of interest include specificity and ecology of microflora of aquatic macrophytes, stimulants and attractants of invertebrates impacting aquatic macrophytes, and revegetation with desirable aquatic plants for the inhibition or prevention of problem plant species. (Contact: Dr. Alfred F. Cofrancesco, 601-634-3182.)

(4) Chemical Control Methods for Aquatic Plants. A need exists for development of aquatic plant management methods which utilize both herbicides and plant growth regulators to control or maintain plant populations below nuisance levels. Research is needed on the physiological weak points in the growth cycle of nuisance aquatic plants for application of control measures, herbicide delivery systems (water-dispersible granules, emulsifiable concentrations, flowable suspensions, etc.) to deliver the active ingredient to the target plant, and field evaluations of the effects of aquatic herbicides and plant growth regulators on nuisance species. Evaluation of the effects of chemical control on plant growth, flowering/seed production and reproductive structures is also needed. (Contact: Dr. Kurt Getsinger, 601-634-2498.)

(5) Aquatic Plant Establishment and Succession. The creation of new submersed aquatic plant habitats by reservoir and waterway construction provides an ideal environment for the establishment of weedy submersed plants. These species are well adapted for colonizing new and/or disturbed substrates. Given time, ecological succession may lead to the development of more desirable plant communities composed of native vegetation. However, man-induced disturbances to the system maintain the aquatic environment in an ecologically immature state, favoring reestablishment of problematic weedy species. Proposals should examine methods establishing native aquatic plants or altering the species composition of submersed aquatic plant communities to minimize the growth of exotic weedy species and encourage the growth of more desirable nonproblem vegetation. (Contact: Dr. R. Michael Smart, 972-436-2215.)

(6) Relationships Between Fish and Aquatic Plants. Aquatic plant control methods are developed to be environmentally compatible, regardless of the situation and/or the control method being implemented. Aquatic plants, though problems to water uses, provide habitat for fisheries and organisms that support fish populations. Currently, there is insufficient data for developing the relationships between fish and aquatic plants that are needed to dictate the degree of control of the plants without destroying the habitat, thus ensuring compatibility. (Contact: Dr. Jack Killgore, 601-634-3397.)

B. Zebra Mussel Control (EL-28)

The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 specified that the Assistant Secretary of the Army, Civil Works, will develop a program of research, technology development, and demonstration for the environmentally sound control of zebra mussels in and around public facilities.

Control strategies suitable for large waterways will be based primarily on physical rather than chemical methods to ensure that native biota and potable water supplies will not be negatively affected. Ongoing and planned studies consist of the following: analysis of the biology and physiology of zebra mussels; investigation of physical condition, habitat requirements, and size demography of naturally occurring populations of zebra mussels; and evaluation of the tolerance of zebra mussels to desiccation, elevated temperatures, and anoxia and other controls. In addition to biological studies, considerable effort will be devoted to modifying existing operation, maintenance or design features of structural components of the facility. Interest exist for all public facilities along waterways and includes water intake plants, navigation locks, gated dams, outlet works, pumping plants, and drainage structures. (Contact: Dr. Ed Theriot, 601-634-2678.)

Water Quality and Ecological Systems

I. Introduction

The Corps of Engineers is involved in research to develop water quality and ecological system models for riverine, reservoir, wetland, coastal and marine surface and groundwater. Current research encompasses a wide range of environmental issues. Emphasis is on short- and long-term field and laboratory investigations to improve the techniques for evaluating water quality and developing water quality management guidelines. The research also emphasizes the development of biological models for terrestrial, lacustrine, palustrine, estuarine and coastal environments to assist in evaluating potential effects of natural and man-made alterations.

II. Research Areas

A. Limnological Investigations and Water Quality Management (EL-29)

Current research encompasses a wide range of investigations designed to increase the Corps' understanding of important limnological processes influencing tailwater, reservoir, wetland and coastal quality. Emphasis is on both short- and long-term field and laboratory investigations, the development of improved techniques for evaluating water quality conditions, formulation of sample design methodologies, and development of improved water quality management guidelines. Research is also conducted in the area of simplified techniques for the description and prediction of water quality conditions and problems and watershed management. Integrated methods for water quality management are developed and evaluated. Proposals for research categories are invited. (Contact: Dr. Robert Kennedy, 601-634-3659.)

B. Ecological Modeling (EL-30)

Research into the development and application of a variety of biological models for terrestrial, lacustrine, palustrine, estuarine, and coastal habitats. This research involves the use of traditional population and community dynamics models as well as spatially explicit, structured-population and individual oriented models for addressing a wide variety of biological problems. Research is also ongoing for the integration of physical and biological models spanning different spatial and temporal scales. The integrated models can be utilized to analyze interrelations and dependence across trophic levels in a simulation mode and to determine the potential effects of alterations (natural and man-made perturbations) to the ecological system. (Contact: Dr. John W. Barko, 601-634-3654.)

Outdoor Recreation

I. Introduction

Research and development is conducted at the in support of outdoor recreation planning and management at 463 multipurpose reservoirs located in 43 states. These projects include 11.5 million acres of land and adjacent water and a total shoreline length over triple the coastline of the continental United States. The Corps of Engineers is the largest supplier of water-oriented outdoor recreation opportunities in the nation.

All aspects of public use of multi-purpose water resource development projects are considered in recreation research and development. The trend is, where feasible, to develop automated tools for use by the planner and manager in the interest of efficiency of operation. This objective is considered in the context of providing high quality recreation experiences for the visitors to these lakes in a safe and pleasant atmosphere. Some current examples of research thrust in this area follow.

II. Research Areas

A. Carrying Capacity (EL-31)

Ongoing research and technical support is currently concentrated on physical and social carrying capacity of lake water surface. Shoreline management aspects of this work addresses commercial marina development, public access for boating and related activities, and management of private use of public lands at approximately 100 projects. Land-based support facilities including boat launching ramps, parking, and pedestrian access are important features.

User Fees.

Support for camping and day-use recreation fees is offered through development and application of automated systems for registration of users, collection and analysis of trends data, and special feature capabilities including differential pricing, reservations, and credit card use. Automated systems are designed for on site use of personal computers.

Economic Impacts of Recreation Management.

Economic impacts of recreation-resource management and development of techniques for estimation of use beyond developed parks is currently in progress. Regional recreation demand models are also currently being developed.

Customer Satisfaction.

Methods for identification of needs and demands of the using public and for monitoring management to meet those expectations are currently in the development stages. (Contact: Mr. H. Roger Hamilton, 601-634-3724.)

B. Evaluation of Plant Growth Regulators for Turfgrass Management (EL-32)

Current research involves the use of plant growth-regulating compounds in grounds maintenance. The objectives are to evaluate current growth-regulating chemicals for their effects on various turfgrass species (both warm- and cool-season); determine the cost-

effectiveness of incorporating these products into grounds maintenance operations; and provide guidance on application techniques (including timing of application, chemical combinations, and rates) to achieve maximum growth-regulating benefits. Research topics of interest include identifying long- and short-term effects of plant growth-regulating chemicals on rooting, density, recuperative capacity, and disease susceptibility of various turf-grass species; methods to predict time of application on various turfgrass species (for example, growing degree day models); and effects of sequential and/or multiple application for season-long control of Southern turf species. (Contact: Dr. K. D. Getsinger, 601-634-2498.)

C. Insect Pest Management (EL-33)

Integrated control programs are being developed and tested for various aquatic (*Diptera*) and terrestrial (*Dictyoptera* and *Isoptera*) pest insects. Research should address the development of programs which utilize a multifaceted approach to control, including the use of biological pesticides as well as mechanical and cultural control practices. New and innovative approaches to control are being sought, especially those that utilize existing technologies incorporated into a working management program. (Contact: Dr. Alfred F. Cofrancesco, 601-634-3182.)

Cultural Resources

I. Introduction

As part of its mission responsibilities, the Corps of Engineers must maintain and manage millions of acres of land, much of it surrounding over 700 water resource development projects throughout the United States. This responsibility includes preservation of cultural and historical sites and resources. Technology that is developed for this purpose is provided to Corps Civil Works projects, as well as military installations and other cooperating Federal agencies.

II. Research Area

Preservation and Management of Cultural Resources (EL-34)

Archeological and historical sites are subject to a wide variety of detrimental impacts such as streambank and reservoir shoreline erosion, wind deflation, groundwater leaching, compaction, chemical contamination, animal burrowing, vehicular traffic, and vandalism. Additional research is needed to identify and evaluate site protection techniques and strategies for the Corps to consider in its construction and land management responsibilities. Through experimental research and field demonstration projects, the Corps continues to seek to develop guidance on preservation methodologies that will

preserve the integrity of sites and their contents, achieve compatibility of the methods with local environmental settings, permit monitoring of ongoing site status, and provide future scientific access to the sites. Research results should incorporate cost comparisons between various protection measures and evaluation of the potential side effects of the measures. Strategies for the transfer of technologies developed for site protection are also sought.

The need also exists for research in direct support of Cultural Resource Managers at Corps districts, Military installations, and other Federal agencies. Studies are under way to investigate problems associated with curation and with Native American consultation requirements. Other studies are focusing on information management tools, including the development of automated spatial and attributed databases for identifying, evaluating, and managing prehistoric and historic resources in both their regional context as well as site-specific situations. Current research also includes identification, evaluation, and stewardship of cultural resources as elements of wetland ecosystems and the application of nondestructive geophysical methods of site investigation, particularly when coordinated with GIS and GPS. The need exists for developing products to help cultural resource managers more efficiently meet all legal requirements for the above-mentioned areas. (Contact: Dr. Frederick L. Briuer, 601-634-4204.)

GEOTECHNICAL LABORATORY

I. Introduction

Research is performed by the Geotechnical Laboratory's four divisions in the areas of soil mechanics, rock mechanics, engineering geology, geophysics, earthquake engineering, seismology, pavements, expedient horizontal construction by engineer troops, expedient surfacing materials, and mobility of military vehicles. Only some of the areas of the laboratory's research responsibility are included in this announcement. The following sections more specifically describe those research areas in which pre-proposals will be considered.

II. Research Areas

A. Earthquake Engineering (GL-1)

Research areas of interest include the dynamic behavior of soil and rock; liquefaction of soils, including coarse-grained and fine-grained soils; in-situ testing to evaluate properties related to dynamic behavior; in-situ testing to evaluate susceptibility to liquefaction; methods of analysis of dynamic behavior of earth materials; methods of analysis of dynamic soil-structure interaction; risk-based and probability-based methods of analysis; seismic wave propagation in earth materials; seismically-induced settlements in soils; and remedial treatment of soils potentially susceptible to earthquake-induced instability or strength loss, computer visualization and dynamic simulation; site response analysis; and strong motion instrumentation. (Contact: Dr. M. E. Hynes, 601-634-2280.)

B. Geophysics (GL-2)

WES supports research in the development of land, air or waterborne geophysical methods to be used for characterization of hazardous waste sites, cavity/tunnel detection, detection and monitoring of seepage, non-destructive investigation of archeological sites, location of groundwater, detection of unexploded ordinance, analytical and data processing techniques, borehole surveys, crosshole seismic imaging, electromagnetic detection of anomalies, seismic surveys, subbottom profiling, acoustic impedance surveys, characterization of physical and mechanical properties of earth materials, and uses of microgravity. (Contact: Dr. M. E. Hynes, 601-634-2280.)

C. Mobility of Military Vehicle (GL-3)

The Mobility Systems Division program addresses engineering research on the performance of military vehicles operating cross-country, on-road, and in negotiating dry and wet obstacles in

worldwide terrains. This is a highly specialized technical area, involving engineering mechanics, vehicle dynamics, mathematics, statistics, computer specialties, geology, and soil mechanics.

1. Basic Mobility Research and Analysis

Research in this area includes developing fundamental relations between soil and vehicle running gear; improving criteria concerning the effects of vehicle vibration on human response; developing algorithms describing weather effects on terrain, multi-vehicle movements along road nets, stochastic processes describing influence of uncertainties of data elements and developing modeling and simulation capabilities for near real time assessments of mobility and counter-mobility for battlefield operations and operations other than war. (Contact: Dr. Bill Willoughby, 601-634-2447.)

D. Pavement Technology (GL-4)

Research is conducted in support of the Corps mission requiring the design and construction of Army and Air Force pavements, including airfields, worldwide and the military engineering function or operations of troops in the field as they relate to pavements and expedient surfacing. This involves the formulation of engineering criteria for the design, construction, evaluation, maintenance, and rehabilitation of permanent and expedient airfields, pavements, railroads and ports. Research areas of interest include improved design procedures, material characterization and evaluation, nondestructive testing, rapid repair of structures, expedient surfacing, aircraft and vehicular ground flotation, access/egress systems, gravel surfaced and non-surfaced areas, the use of geotextiles and geomembranes, grid confining systems, stabilization and dust control materials and techniques, and advanced binder systems. (Contact: Dr. David W. Pittman, 601-634-3304.)

E. Soil and Rock Mechanics (GL-5)

Research is needed to (a) develop improved methods for analyzing earth and rockfill dams and other water control structures for both static and earthquake-induced stresses; (b) improve the state of knowledge of physical and engineering properties of clay shales; earth-rock mixtures, granular filters, cohesive and noncohesive fine-grained soils susceptible to liquefaction, and soils susceptible to drastic volume changes (collapse, consolidation, swell); (c) develop rational analytical procedures and more reliable prediction of behavior of partially saturated soils; (d) determine the response of soils in situ to static and dynamic loading and unloading; (e) determine the susceptibility of earth dams to cracking, hydraulic fracturing, and internal erosion; (f) evaluate improved defensive design measures in use of materials, particularly in filter and transition zones and impervious barriers; (g) improve

procedures for monitoring and analysis of the performance of new and existing structures, particularly the use and interpretation of observations and from specialized instrumentation, and expedient systems for rapid inspection and evaluation of the integrity of dams; (h) improve the understanding of the aging processes in dams and in the influence of aging (particularly deterioration of safety-related features) on long-term maintenance and/or rehabilitation requirements for dams; (i) develop a better understanding of failure mechanisms to improve design of defensive measures, to provide information for remedial repairs, to assess potential damages resulting from failure, and to provide a basis for emergency actions; (j) develop a rational approach to the assessment of dam safety by application of risk-based analyses in all aspects of dam design, construction, and operation; (k) develop expedient remedial measures when hazardous conditions are identified and thus reduce the damages and catastrophic potential of dam failures; (l) develop methodology to evaluate forces exerted on structural elements by adjacent soil masses that result from long-term variation in soil properties; (m) develop improved methodology for design and construction procedures for shallow and deep foundations, including mats, footings, piers, and piles for buildings, hydraulic structures and waterfront structures; (n) large scale physical and numerical modeling of deep underground structures (tunnels, shafts, chambers, intersections); (o) predictions of rock mass dredgeability; (p) acoustic emission (micro-seismic) applications in geotechnical engineering; (q) geotechnical aspects of hazardous and low level radioactive waste disposal; (r) erosion of rock in unlined emergency spillways; (s) evaluation of rock for use as rip-rap; (t) grouting of soil and rock masses; (u) sliding stability of gravity structures, and (v) centrifuge modeling of structures founded on or in rock. Technology transfer activities (i.e. demonstration projects, workshops, seminars, etc.) are included in this requirement. (Contact: Mr. David Bennett, 601-634-3974.)

F. Engineering Geology (GL-6)

WES conducts a broad range of research in the field of engineering geology in support of federal or other government technical missions. Specific areas of interest within this field include: application of remote sensing to geologic and geomorphic assessments; geo-archeological investigations; applied and numerical geomorphic analysis; computer applications in geotechnical engineering; 3-D visualization systems; uses of geographic information systems; geohydrology in military and civil applications; geologic mapping; geologic applications of mathematical techniques and geostatistics; groundwater monitoring, including well installation and design; geologic application of groundwater models; integration of geological and geophysical subsurface exploration techniques; land-loss studies; remedial measures at groundwater contamination sites; seismic hazard characterization and evaluation; subsurface exploration methods (drilling and sampling techniques); test site selection; conceptual and geologic and hydrogeologic models. (Contact: Dr. Lillian Wakeley, 601-634-3215.)

STRUCTURES LABORATORY

The Structures Laboratory is responsible for planning and executing scientific and engineering research and development in the fields of structural design and performance of structures, weapons effects, earth dynamics, and concrete and other construction materials. It is the lead laboratory for the Department of Defense in work on Survivability and Protective Structures. The research areas are outlined below.

GEOMECHANICS AND EXPLOSION EFFECTS RESEARCH

The Structures Laboratory, WES, performs research on the behavior of earth and earth-structure systems subjected to intense transient loadings and the effects of explosions for application to military engineering. The research area also includes the measurement, processing, and analysis of seismic and acoustic signals to locate airborne and ground military targets and buried objects, and to characterize earth media. Research methods include laboratory-scale to large-scale field testing, and numerical modeling. (Contact: Mr. A. E. Jackson, 601-634-2291.)

Research Areas

I. Test Instrumentation Development (SL-1)

Recent advancements in precision-guided weapons have shifted the areas of concern for survivability/vulnerability assessment much closer to the explosion source. Consequently, transducer designs having the capability to record dynamic accelerations approaching one million g's and stress levels above 1.5 GPa are required. The instrument must be able to survive multi-directional shock waves and large transient displacements. Gage design includes the internal measurement system, shock isolation materials, packaging, and data transmission cable connection or electronics.

II. Explosives Design for Excavation, Structural Demolition, and Obstacle Creation (SL-2)

Current criteria for improved demolitions call for very significantly reduced manning levels, preparation times, and quantities of explosives to accomplish assigned missions. Cost effectiveness, versatility, and safety are also of great importance. Current efforts involve explosive technologies for the standoff creation and reduction of all types of battlefield obstacles, and the excavation of fighting positions. A prime consideration is the development of

more efficient means for the application of various types of explosives to targets of interest. In addition, modern materials and design principles used in typical target structures must be incorporated into future plans and guidelines demolitions. Typical missions of interest are road cratering, antitank ditching, bridge and tunnel demolition, and the breaching of walls, bunkers, levees, and dams.

III. Explosive Storage Safety (SL-3)

The military services must store large amounts of munitions, both for war reserves and for training purposes. New conceptual designs for components or systems of storage are needed which will reduce the likelihood of an accidental explosion of stored munitions, limit the propagation of an accidental explosion, or mitigate the safety hazards produced by an accidental explosion. In addition, test data and simulation techniques are needed to aid in the definition of the safety hazards from such explosions, and the mechanics of explosion propagation among munition stores. Obsolete munitions are often disposed of by deliberate, controlled detonation. Research is needed on new methods for safe, efficient, and environmentally sound methods for explosion disposal of a wide variety of munition types.

IV. Physical Simulation of Explosion Effects (SL-4)

The mechanical effects induced by nuclear detonations have been physically simulated using a variety of energy sources, but most frequently high-explosives. The high-explosive simulations have been performed at full and small (1/10 to 1/2) scale. The mechanical effects from conventional munitions and bare explosives have normally been performed at small scale using high explosives. These studies could benefit from improved (better fidelity, less expensive) simulators and simulation techniques. They could also enhance the development of test methodology for micro-scale (1/100 to 1/10) testing. Micro-scale test methodology includes the miniature high-fidelity energy sources, miniature sensors, advanced optical techniques, high-fidelity construction techniques for miniature structures, and theoretical developments in the scaling of material behavior.

V. Advanced Seismic and Acoustic Sensors, Measurements, Processing, Analysis, and Modeling (SL-5)

Research addresses seismic and acoustic sensing, processing, analysis, and modeling of ground and air targets using advanced ground-based sensor systems. This effort focuses on passive technology. Processing methods include array processing and other methods of calculating source direction, noise suppression, advanced adaptive processing, and signal classification and identification. Phenomena of interest include direct propagation within the same

medium and propagation across boundaries, such as geologic layers and the air/soil interface. Modeling involves phenomenology models of signal propagation. The objectives include sensing, detecting, and locating airborne and ground military targets and buried objects. Also included are medium characterization and classifying and identifying sources based on their acoustic and seismic signatures. (Sensor systems can include multiple sensors and electronic hardware that process or preprocess the signals at the sensor location.)

VI. Laboratory Tests and Constitutive Model Development for Geologic Materials (SL-6)

This research requires the formulation of mathematical constitutive models to simulate the mechanical behavior of geological materials and incorporation of models into application-oriented prediction/analysis techniques. Also of interest are the development of dynamic test equipment and techniques and experimental evaluation of geological material response to high-pressure transient loadings.

VII. Projectile Penetration (SL-7)

Theoretical and experimental studies of projectile stresses and trajectories due to impact and penetration into geologic and manmade targets and development of design criteria for shield systems. Includes development of equipment and diagnostic techniques to examine the response of targets to low and high velocity impact of penetrators, rods, etc.

VIII. Computational Structural Mechanics for DoD Applications (SL-8)

The efficient utilization of scalable computers will require fundamentally new concepts in computational mechanics algorithms. Research includes mathematical formulations and development of scalable computational mechanics algorithms in the areas of structural response, penetration, contact-impact, explosion, structure-medium interaction and interdisciplinary flow-thermal-structural interactions. Research area also includes development of computational models for new materials and composite construction (consisting of concrete, composite, and/or geologic materials) as well as the behavior and control of structures composed of such composite construction for military applications.

CONCRETE AND MATERIALS RESEARCH

Research on concrete and cement by the Corps of Engineers is predominantly related to current research programs or recognized needs. These include both military and civil applications. A major objective of the Army Civil Works Concrete Program is to investigate concrete mixtures and individual components of concrete, to determine

techniques to improve performance of both new and older concrete structures, and to evaluate new concrete materials and practices. Military expediency focuses additional attention on ease and speed of concrete placement, development of very high strength, and use of non-traditional, indigenous, and other special materials in concrete construction. (Contact: Dr. Paul Mlakar, 601-634-3251.)

Research Areas

IX. Concrete Materials (SL-9)

Aggregates comprise as much as 80 percent of the volume of concrete. Characteristics and behavior of various types of aggregates, and chemical and physical interaction among aggregates on other concrete components, are critical to overall concrete performance. Research areas include: nature of and potential for reactions between aggregates and alkalis; significance of and techniques for regulating aggregate moisture content; importance of aggregate shape and size distributions; and contribution to concrete durability. Optimizing the use of marginal natural aggregates, such as those with high clay contents of low structural integrity, also could be investigated, as could use of man-made aggregates such as recycled concrete and lightweight aggregates.

Use in concrete of by-products of other industrial processes, such as fly ash, silica fume, and ground granulated blast-furnace slag, is increasing with knowledge of the potential benefits to concrete properties. These uses contribute to solutions of industrial waste disposal problems, while enhancing potential for development of new types of concrete with properties tailored to special uses. Knowledge of the mechanisms by which these materials interact with cement, aggregates, and other concrete ingredients, is essential. Effects of these materials on concrete strength and durability is another area of particular research interest, as is use of cementitious materials other than portland cement, including some fly ashes. Additional research is needed, leading to establishment of optimum quantities of pozzolans and cement in concretes for general and special uses.

Specialized uses of concrete and increased demands on concrete performance have increased the importance of chemical admixtures such as water-reducers, set retarders, set accelerators, air-entraining admixtures, and foaming and defoaming agents. The mechanisms by which many of these admixtures function are virtually unknown.

Reinforcing in concrete is critical to concrete design and construction. Research areas include materials and methods of reinforcing, prevention of corrosion of reinforcing materials, and performance of reinforced concrete in severe environments (freezing and thawing, chloride penetration, and elevated-temperature environments).

Polymer concretes are being used both for restoration and new construction. Interaction among components of these composite materials, and the ranges of characteristics that could be achieved with different combinations of materials, are little known. Research areas include polymer-impregnated concrete, polymer or resin concrete, or polymer-portland-cement concrete.

Research is needed on means of formulating concretes to achieve specified performance, such as concretes with very high tensile or compressive strength, low shrinkage, rapid hardening, very low permeability, resistance to abrasion and erosion, shock-attenuating properties, ultra-light weight, ability to float indefinitely, or thermal insulation properties.

X. Concrete Properties and Analyses (SL-10)

New technologies continually are being developed for non-destructive testing of various materials. Development of new methods could lead to applications in analysis of properties and performance of concrete. Links must be developed between the sophisticated testing methods and the needs of concrete technology. New dielectric, piezoelectric, or ceramic composites, for example, may appropriately be used in new concrete test methods, if these links are made.

Many of the research areas outlined in the previous paragraphs are related to methods of testing and analysis of concrete. Consideration of aggregate quality and moisture content, use of other admixtures, all apply to analytical considerations. In addition, investigations are needed of new methods, and modifications to existing methods and apparatus for testing concrete materials and structures. This need derives partially from uses of new materials. Special use concretes and technologies such as placement of roller-compacted concrete also demand new testing technologies.

Thermal properties of concrete, and the heat generated during curing of mass concrete also are related to many of the above considerations. Understanding heat generation, and thermal and mechanical stresses, will require computer-assisted modeling of concrete performance.

Other research requirements in testing and analysis include:

A. Determine critical materials and procedures for minimizing cracking in concrete, and develop guidelines for predicting concrete performance. This includes developing criteria for predicting durability and longevity of concrete and grout.

B. Classification of chemical admixtures by chemical composition and mechanism of performance.

C. Development of methods of artificially accelerated curing of concrete, and new means of simulating real-world conditions and long times.

D. Development of innovative systems to construct concrete structures more economically.

E. Development of theoretical, computational, and experimental methods for effectively characterizing stress, strain, progressive damage, and fracture of engineering materials subjected to static and dynamic loads.

XI. Maintenance, Repair, and Rehabilitation of Concrete Structures (SL-11)

Assessment of remaining life, maintenance and minor remedial measures, repair and rehabilitation, and surveillance and monitoring are topics of interest. Structures of interest include concrete locks and dams and appurtenant concrete and steel structures (outlet works, retaining walls, gates, piles, bulkheads, tunnels, intakes, etc.).

XII. Other Areas of Research (SL-12)

Materials which are not actually components of concrete are important in some concrete applications. Basic research is needed on the properties and performance of such materials as: curing compounds, coatings, and overlays; epoxy resins, or other agents for improving bond between old and new concrete; waterstop materials for use in hydraulic structures, and methods of characterizing and testing such materials; grouts for injection underground in very fine fracture systems or porous media; organic and inorganic composites that are used in construction.

Grouts and concretes are being used at present for disposal of hazardous, toxic, and nuclear wastes. This use is likely to increase, and research is needed on optimum proportions for cement-based materials for waste-disposal technology. In addition, grouts and concretes will be important in disposal of both commercial and defense-related low-level and high-level radioactive wastes. Additional basic research is required on the behavior of cement-based materials in the probable geologic conditions of this disposal, and radioactive conditions.

STRUCTURES RESEARCH

Structures Laboratory conducts research involving development, testing, and evaluation of a broad class of structures to resist the effects of static and dynamic loads induced by the detonation of nuclear and conventional weapons, high-explosives, earthquakes, and other sources. It is also responsible for research in fixed installation camouflage, concealment, and deception. (Contact: Dr. Reed Mosher, 601-634-3956.)

XIII. Structures Research (Civil Works) (SL-13)

A. Research is needed to develop design and analysis methods for eliminating or reducing structural vibration of steel gates subject to flow conditions that have the potential to induce structural vibrations.

B. Part of the Earthquake Engineering Research Program supports the Corps' inventory of concrete dams in high seismic zones. Research is needed to develop validated nonlinear design and analysis tools for gravity and arch dams. The concrete may be placed with conventional techniques or with roller-compacting procedures. Also, research is needed in the area of ductility of lightly reinforced concrete members to evaluate existing intake towers during a maximum credible earthquake.

C. Research efforts exist in the general area of structural reliability and risk analysis for assessing sensitivity of structural design and analysis procedures, vulnerability of structures, and assessment of critical design parameters to develop appropriate load resistance factors.

D. Nonlinear and linear system identification research is needed for improving current vibration testing, data acquisition, data processing, and analysis techniques for determining linear and nonlinear dynamic and static response properties of structures and structural systems subjected to earthquakes, blast effects from mining (or other) operations, other transient random, harmonic dynamic loads, and static or pseudostatic loads.

E. Research is conducted to develop simplified and advanced computerized methods for soil-structure interaction (SSI) analysis. Potential investigations include Winkler and Pasternak methods, nonlinear finite element method and boundary elements. The SSI techniques are to be applied to shallow and deep foundations, wall, and U-frame structures.

F. Research is needed related to development of computer programs for design of hydraulic structures and related structures to support the Corps Civil Works mission. Such structures include miter gates, tainter gates, floodwalls, retaining walls, pile group, sheet piles, cellular cofferdams, culverts, and conduits.

XIV. Structures Research (Military) (SL-14)

A. Response of above-ground and shallow-buried structures to loads either from nuclear or conventional weapons. Specifically the prediction of the load and response to failure of above-ground and shallow-buried structures from nuclear weapons and internal and external detonations of conventional weapons. This effort will involve the following research:

1. Development of techniques to simulate loads on above-ground and mounded structures from conventional and nuclear weapons.

2. Development of design procedure for components in semihard and protected facilities to conventional weapons effects.

3. Analysis of structural loading and damage resulting from internal detonations.

B. Research on deeply based structures and hardened existing systems involving the following:

1. Development of comprehensive structural design for deeply-buried and surface-buried structures subjected to airblast-induced, and direct-induced ground shock from surface and shallow earth-penetrating nuclear and conventional weapons.

2. Formulation of computer models for soil-structure interaction and pre- and post-test analysis of structural response to include correlation and comparison with experimental data.

C. Research on surveillance and intrusion detection sensors involving the following: This program concerns research on the constraints of the environment on sensor systems used to detect intruders and along the perimeter of high-value military installations. Improved methods for rapid and accurate measurement of predetermined influential environmental parameters must be developed. Analytical techniques relating to specific, sensing phenomenologies and target/nontarget-generated signatures and signature wave interactions to variations in environmental characteristics are required. Of particular interest is the integration of multiple sensor systems (both detection-type and environmental/background monitoring transducers), which utilize various sensing phenomena for enhanced target detection and classification and increase nuisance and background signature rejection. Research studies are required in the determination of automated techniques for monitoring sensor system response and sensitivity to provide optimum and consistent performance as a function of time varying changes of influential environmental characteristics.

D. The CE is involved with research on the design of military facilities for protection from conventional and terrorist weapons. These efforts include the following research:

1. Prediction of the response of structural elements common to conventional or expedient construction to combined blast loads and fragment impact.

2. Methods of retrofitting conventional buildings to harden them to nearby detonations of blast/fragmentation weapons.

3. Development of innovative design of structural components, such as windows and doors, subject to high-explosive loads.

4. Development of analytical methods for predicting the effects of forced entry devices on structural components.

5. Development of innovative designs using lightweight materials for expedient protection of troops, weapons systems, and equipment from the effects of blast and fragmentation.

6. Development of micro-processor-based software/hardware and supporting documentation to aid in the assessment of structural survivability to the effects of conventional and advanced weapon systems. The software will address the integration of databases, weapons effects calculations, and operational factors associated with engineer survivability missions.

7. Development of a procedure to ensure robust codes, user-friendly interfaces, and supporting documentation for use in the testing and development of micro-processor-based survivability and structural assessment software/hardware.

XV. Multispectral Fixed Facility Camouflage Research (SL-15)

A. This research area involves all aspects of fixed facility camouflage, concealment, and deception (CCD). Fixed facilities include stationary and relocatable high value targets. The general goal is to directly and indirectly increase the survivability of US and Allied facilities and improve the US' and allies' counter-CCD capability against adversaries. Multispectral refers to those areas of the electromagnetic spectrum used by United States and potential adversaries in reconnaissance and surveillance and in attack platform target acquisition and detection. Major objectives include quantifying or otherwise evaluating CCD technology effectiveness; investigating materials and techniques for signature modification; developing decoy concepts, procedures, and applications; developing computer-based analytical procedures for simulating scenes; developing instrumentation for and the conduct of target/background signature measurements; assessing US and threat operations and sensor capabilities with both currently fielded and new design reconnaissance and surveillance and attack platform sensors and systems; developing applications for intelligence information for military missions; providing guidance to field commanders and information for RDTE community; and studies of the interaction of camouflage technology with other operational factors, particularly in determining operational supportability, costs and manpower, interoperability, and joint interoperability requirements. Possible research includes the following.

B. Quantify or otherwise evaluate CCD technology multispectral effectiveness. Quantification of the effectiveness of CCD for increasing survivability of selected facilities and assets against attacks. Emphasis is on manned tactical systems on fixed and rotary-winged platforms, involving the range of current and near-term planned weapons that are available for use by potential adversaries, including precision-guided weapons.

C. Investigate materials and techniques for signature modification. Signature measurements may be both ground-based and aerial and may include scale-model measurements for some radar bands. Calibrated measurements are preferred for typical fixed-facility target types and also backgrounds. Target types include thin-walled metal buildings, concrete structures, earth-covered facilities, and hardened and paved horizontal surfaces. Backgrounds include desert, forest, grass, bare soil, croplands, snow, etc. Signature manipulation materials and techniques include coatings, nets and screens, structural modifications and the use of energy-absorbing, reflecting or frequency and emissivity shifting materials.

D. Develop decoy concepts, procedures, and applications. Generation of concepts, materials, and techniques leading to the development of rapid deployment, low-to-high resolution decoys designed to emulate a target. The decoy design should consider the signature replication in the visual, thermal, and radar portions of the electromagnetic spectrum.

E. Develop computer-based analytical procedures for simulating scenes, particularly micro-processor-oriented models and systems that will become a part of an analytical camouflage design and evaluation. The goal is to support the implementation of a multispectral CCD Design Research Work Station with the capability to:

1. Generate target and background scenes using signature prediction models coupled with database look-up techniques,
2. insert new CCD plans into the scene,
3. predict target identification, and
4. evaluate sensors' performance.

F. Develop instrumentation for and conduct target/ background signature measurements. Procedures for target/scene characterization are required for all missions' "target" configurations. This includes the design and application of sensors, data gathering, and data analysis procedures applied to the target-in-scene situation. Such data and information are essential in the interpretation of the sensor and operations data and in other areas such as the calibration of models.

INFORMATION TECHNOLOGY LABORATORY

I. Introduction

The Information Technology Laboratory (ITL) performs research in computer-aided engineering, interdisciplinary engineering areas, computer science, and in all aspects of information technology. Projects include computer-aided structural engineering, application of computer-aided design and drafting (CADD) and geographic information systems (GIS) technology, 3-D structural stability, finite element method analysis, engineering reliability, relational data base management, management information systems, information engineering, software engineering, groupware systems, information center concepts, telecommunications, scientific visualization (including virtual reality), high performance computing/networking, office automation, graphic arts and publishing, library systems, and records management. (Contact: Mr. Timothy D. Ables, 601-634-3506.)

II. Research Areas

A. Computer-Aided Engineering (ITL-1)

Through the Computer-Aided Structural Engineering (CASE) Project, research is done in development of computer programs for design of structures utilized in the Corps Civil Works mission. Research is performed related to risk analysis, engineering reliability, and computer science techniques to enhance computational capabilities for solution of scientific and engineering problems. Computer graphics is studied extensively in areas of pre- and post-processors. Solid modeling techniques are being studied for 3-D structure representation. Accuracy of computational results is a matter of deep concern for many of the numerical procedures used by WES and other Corps offices. Innovations in numerical analysis are continuously investigated to save costs in computer time and ensure confidence in computation results, especially as applied to different size computers. Interface systems for electronic transfer of computer generated drawings between minicomputer- and microcomputer-based hardware are of concern. Military related work includes development of a rapid interactive 3D structural computer modeling system to aid in the analysis/design of structures with 3D dynamic and static loadings. Assessment of load capacity of structures involving incomplete data is also being investigated. (Contact: Mr. Wayne Jones, 601-634-3758.)

B. Information Technology (ITL-2)

Research and applied analysis are performed in optimization technology of Data Base Management Systems (DBMS) with special emphasis on technology surrounding the general fields of concurrent and other advanced access methods, innovative data structures and storage techniques, schema and sub-schema organization, overall

system performance analyzing installation-specific hardware/software interaction, and virtual simulation of DBMS models and data structures. Studies and evaluations are being conducted on state-of-the-art software engineering methodologies advocated by researchers in universities and industry. Investigations may be made on programming languages, experimental language extensions; design and implementation methodologies of operating systems; performance of computer systems, software systems, and programs; and advanced concepts in computer systems architecture that are potentially valuable to Corps offices. Studies are under way on Artificial Intelligence/Expert Systems in terms of their broadest definition; i.e., the use of computers to solve problems that previously could be solved only by the application of human intelligence. Techniques for applying mathematical modeling and/or digital simulation modeling to classes of problems and to specific problems is another area of interest. Research is being conducted in optimum design of microcomputer-based engineering workstations including components for voice recognition and synthesis, pattern recognition, digitizing, data base management systems, and computer graphics. Of extreme importance is research in all areas of telecommunications including voice, data, video, and satellite using state-of-the-art technology. (Contact: Dr. Windell Ingram, 601-634-2182.)

Research is planned in automation of media presentation including current and planned capabilities, considering areas such as report generation, file transfer editing, graphic arts, slide production, document layout, and printing. Electronic flow of report information through all necessary channels without hardcopy is especially of interest. Additional research is planned in other information technology areas such as scientific visualization, advanced topics in data, voice and video transmission using evolving communication systems, information center concepts, management and business automation, visual information, library science, and records management. The information explosion has led to the necessity for better technology using fourth or fifth generation methods. (Contact: Mr. Murray Huffman, 601-634-3661.)

C. Computer-Aided Design and Drafting/Geographical Information System Technologies (ITL-3)

Through the Tri-Service CADD/GIS Technology Center, research is performed to support the application of CADD (Computer-Aided Design and Drafting) and GIS (Geographic Information Systems) technologies in new and existing mission areas of the Army, Navy, and Air Force, and Corps of Engineers Civil Works Programs. CADD/GIS capability is being widely integrated in the planning, engineering, construction, and facility management responsibilities of the three Services. Due to the expanding development of computer methods to meet the demands of technological advancements, interfacing these methods with CADD/GIS platforms is especially crucial. As the usage of CADD/GIS evolves and expands, the need to integrate other existing

design and analysis computer tools, including relational data bases, spatial data analysis, automated cost estimating and specification generation, etc., with CADD/GIS systems and evaluating new CADD/GIS applications for use by the three Services are of primary interest. Applications would be expected to interface with a variety of CADD/GIS platforms including, UNIX-, Windows 95, Windows NT, and DOS systems used by the three Services. Other research could include productivity studies, scope and criteria requirements for new technology development, self-instructional training guides, pilot projects in technology usage, etc. (Contact: Mr. Harold Smith, 601-634-4190.)

D. Engineering Guidance Update (ITL-4)

To support the Civil Works Guidance Update Maintenance Program, methods, technology, and procedures are being developed for technology transfer of research products, analysis and design methods, and computer-aided engineering into state-of-the-art integrated engineering guidance for the Corps of Engineers Civil Works Program. State-of-the-art methods for electronic document, publishing, archiving, transmission, and retrieval using Standard Generalized Markup Language (SGML), multimedia, hypertext, CD-ROM, Internet and electronic publishing are being developed. (Contact: Mr. Chris Merrill, 601-634-3588.)

E. High Performance Computing (HPC) and Networking (ITL-5)

Through the Department of Defense (DoD) HPC Center at ITL, research is performed to support the application of advanced HPC systems and networking technologies to Science and Technology (S&T) research and development (R&D) efforts within DoD. Of special interest is the application of scaleable parallel architectures and associated algorithms to DoD S&T R&D applications; and also emerging network technologies and distributed storage methodologies which will permit transparent sharing of heterogeneous HPC systems located at WES and remotely throughout the DoD. (Contact: Mr. Bradley Comes, 601-634-3801.)

F. Instrumentation Systems Design and Development (ITL-6)

Through the Instrumentation Systems Development Division, research and development is conducted in the areas of high speed data acquisition, sensor design, virtual instrumentation and control systems, in support of interdisciplinary civil and military engineering projects. Specific areas of high interest involve high speed - high throughput data acquisition systems for test measurement, hardened data acquisition systems for application in high shock environments, sub-miniature transducers and fiber optic sensor design. Research is conducted in the fields of radar and microwave technology in nondestructive testing. Expert real-time control software and artificial neural network software applications are currently in development. (Contact: Dr. Ray Franco, 601-634-2538.)

PART II

REVIEW OF PRE-PROPOSALS AND EVALUATION OF PROPOSALS

A. Upon receipt of a pre-proposal (not to exceed 5 pages), the WES staff will perform an initial review of its scientific merit and potential contribution to the Army mission and also determine if funds are expected to be available for the effort. Offerors of pre-proposals of interest will be encouraged to submit a full proposal (in the format outlined in Part III) and these proposals will be evaluated in accordance with the criteria in paragraph B.

B. Proposals submitted in response to this BAA will be evaluated as received, using the following factors:

1. The overall scientific and/or technical merits of the proposal.
2. The potential contributions of the effort to the WES mission.
3. The offeror's capabilities, related experience, facilities, techniques, or unique combinations of these which are integral factors for achieving the proposal objectives.
4. The qualifications, capabilities, and experiences of the proposed principal investigator, team leader, and other key personnel who are critical to achievement of the proposal objectives.
5. The reasonableness and realism of proposed costs and fee if any, and the availability of funds.

C. Pre-proposals and proposals not considered to have sufficient scientific merit or relevance to the Army's needs or those in areas for which funds are not expected to be available may be declined without further review.

PART III

PRE-PROPOSAL AND PROPOSAL PREPARATION

SECTION 1 - INTRODUCTION

This part is intended to provide information needed in preparing research proposals for submission to WES.

Organizations or individuals interested in submitting research proposals to WES are encouraged to make preliminary inquiries as to the general need for the type of research effort contemplated before expending extensive effort in preparing a detailed research proposal or submitting proprietary information. Points of contact are listed with the specific research areas for each laboratory. The research proposal often represents a substantial investment of time and effort by the offeror, and it should present the proposed research effort in sufficient detail to allow WES to evaluate the scientific merit and relevance of the proposed research.

Pre-proposals and proposals must reference the code number for the specific research area.

SECTION 2 - GENERAL INFORMATION

A. DEFINITIONS:

Short Form Research Contract (SFRC). A simplified form of contracting described in Subpart 235.015-71 of the Defense Federal Acquisition Regulation Supplement (DFARS). As authorized by Reinvention Laboratory Initiative No. WESCT-94-07, this form may be used for all contracts awarded under this BAA, including fixed-price contracts and contracts with commercial organizations.

B: REPORT REQUIREMENTS:

The number and types of reports will be specified in the contractual document. The reports will be prepared and submitted in accordance with WES report procedures which will be provided the awardee.

C. PROPOSAL PREPARATION AND SUBMISSION:

In preparing pre-proposals and proposals it is important that the offeror keep in mind the characteristics of a suitable proposal acceptable for formal evaluation. It should include all the information specified in this announcement in order to avoid delays in evaluation.

Pre-proposals and full proposals should be mailed to:

Commander
U.S. Army Engineer Waterways Experiment Station
ATTN: CEWES-CT-Z
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Proposals should be submitted on DD Form 2222-1 and 2222-2 (Short Form Research Contract) as defined in paragraph A of this Section 2. Copies of these forms are included in this announcement.

SECTION 3 - TYPE OF CONTRACT

Selection of the type of contract is based upon various factors, such as the type of research to be performed, the contractor's experience in maintaining cost records, and the ability to break out and allocate proposed costs and performance of the work.

A document commonly used because of its flexibility in supporting research, is a cost-reimbursement type contract. This type contract permits reimbursement for actual costs incurred in accomplishment of research. It also permits some flexibility in the redirection of efforts due to recent research experiment results or changes in Army guidance.

Fixed-price contracts are used when the research projects costs can be estimated accurately, the services to be rendered are reasonably definite, and the amount of contract-furnished property, if any, is fixed.

Contracts awarded by WES will contain, where appropriate, detailed special provisions concerning patent rights, rights in technical data and computer software, reporting requirements, equal employment opportunity, etc.

SECTION 4 - CONTENTS OF PRE-PROPOSALS

Pre-proposals should be limited to five pages. Five copies are requested. The pre-proposal should contain the following:

1. A title descriptive of the research to be performed.
2. The name and address of the individual, company or educational institution making the pre-proposal.
3. The name and phone number of the principal investigator or senior researcher who would be in charge of the project.

4. The duration of the project.

5. The estimated labor cost, materials cost, burdens, and profit (if any).

6. One or more paragraphs describing the objective(s) of the proposed research to include statement of the working hypothesis to be proved or disproved, if appropriate.

7. One or more paragraph describing the approach to be taken in the course of the research. If experimental, it should include a description of the scope of the testing program; if analytical, it should include key assumptions to be made, the scientific basis for the analysis, and the numerical procedures to be used.

8. One or more paragraphs describing the potential military and/or civil payoffs that might ultimately derive from the proposed research to the Corps of Engineers.

9. A one-page curriculum vitae of the principal investigator.

SECTION 5 - CONTENTS OF FULL PROPOSALS

Proposals should be furnished in five copies and contain the following:

TECHNICAL

The technical portion of the proposal should contain the following:

1. A complete discussion stating the background and objectives of the proposed work, the approaches to be considered, the proposed level of effort, and the anticipated results/products.

2. The names, brief biographical information, experience, and a list of recent publications of the offeror's key personnel who will be involved in the research.

3. The names of the agencies to whom the proposal has also been submitted.

4. A brief description of offeror's organization.

COST

The cost portion of the proposal should contain a cost estimate for the proposed effort sufficiently detailed by element of cost for meaningful evaluation. The estimate should be broken down for each year of the proposed work and should include the following:

1. A complete breakdown of direct labor to include, by discipline or individual, hours or percentage of time and salary.
2. Fringe benefits rate and base.
3. An itemized list of equipment showing cost of each item.
4. Description and cost of expendable supplies.
5. Complete breakdown of travel to include air fare, per diem, rental car, etc.
6. Complete breakdown of any subcontracts.
7. Other direct costs (reproduction, computer, etc.).
8. Indirect cost rates and bases with an indication whether rates are fixed or provisional and the time frame to which they are applied.
9. Proposed fee, if any.

The offeror's cost proposal may be submitted on SF 1411 a copy of which is included in this announcement. In addition, offerors should furnish the name and telephone number of the cognizant audit agency if they have been audited.

ATTACHMENTS

**SHORT FORM RESEARCH CONTRACT
RESEARCH PROPOSAL COVER PAGE**

Form Approved
OMB No. 0704-0262
Expires Sept 30, 1995

Public reporting burden for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0262), Washington, DC 20503.
PLEASE DO NOT RETURN YOUR FORM TO EITHER OF THESE ADDRESSES.
SEND YOUR COMPLETED FORM TO THE PROCUREMENT OFFICIAL IDENTIFIED IN ITEM 1

DO NOT USE THIS BLOCK

DATE SUBMITTED

1. TO (Submit copies of proposal to)

a. NAME

b. ADDRESS (Street, City, State, Zip)

3. SCIENTIFIC FIELD

5. TITLE OF PROPOSAL

7. PROPOSED AMOUNT

\$

9. REQUESTED START DATE (YYMMDD)

11. PROPOSAL VALID UNTIL (Minimum 6 months)

2. FROM (Name and Address of Offeror)

a. NAME

b. ADDRESS (Street, City, State, Zip)

c. IDENTIFICATION NUMBER

4. TYPE OF ORGANIZATION (X one)

a. Educational Institution

b. Other nonprofit

c. Commercial *

6. PROPOSAL ALSO BEING SUBMITTED TO

8. REQUESTED DURATION

10. TYPE OF CONTRACT (X one)

a. Cost Plus Fixed Fee

b. Cost, No Fee

c. Cost Sharing

d. Fixed Price *

12. PRINCIPAL INVESTIGATOR(S)

a. Name

b. Department

c. Telephone Number

(1)

(2)

(3)

13. ADMINISTRATIVE REPRESENTATIVE AUTHORIZED TO CONDUCT NEGOTIATIONS

a. Name

b. Department

c. Telephone Number

(1)

(2)

14. OFFEROR'S STATEMENTS (See Page 2) (Write enclosures or page numbers in appropriate block. If page numbers, precede item(s) by "pg.")

a. Technical

(1) Title and abstract of proposed effort

(3) Discussion of background, objectives, approaches, and available facilities

(2) Statement of Work

(4) Names and brief biographical information of key personnel

b. Financial

(1) Cost estimate detailed by cost elements on SF 1411 or equivalent

(2) Type of support other than financial, if any, required of the Government, e.g., facilities, equipment, materials, or personnel resources

e. Administrative

(1) Statements, if applicable, regarding cost sharing, organizational conflicts of interest, status of security clearances, environmental impact, and previous or organizational experience in the field covered by the proposal

(2) Statement as to why it is necessary to acquire property, if any, with contract funds (See FAR 45.302)

15. AUTHORIZED REPRESENTATIVE

a. Typed Name

b. Signature

c. Title

d. Date Signed (YYMMDD)

SHORT FORM RESEARCH CONTRACT RESEARCH PROPOSAL
PAGE 2

16 OFFEROR'S STATEMENTS

a. USE AND DISCLOSURE OF DATA (X one)

- (1) The proposal shall not be duplicated, used, or disclosed outside the Government in whole or in part for any purpose (except that if a contract is awarded on the basis of this proposal, the terms of this contract shall control disclosure and use). This restriction does not limit the Government's right to use information contained in the proposal if it is obtainable from another source without restriction. All data contained in this proposal is subject to this restriction unless specifically excluded by the offeror. The proposal has been marked as prescribed in FAR 15.509.
- (2) Permission is hereby granted to evaluate this proposal in accordance with your normal procedures which may include evaluation by evaluators both within and outside the Government with the understanding that written agreement not to disclose this information shall not be required of or obtained from any such evaluators.

b. CONTRACT CLAUSES

By signature on Page 1 of this Proposal, the offeror authorizes award of a contract in accordance with the provisions of DFARS 35.70 and agrees to be bound by the contract clauses contained in ~~DFARS 52.235-7005~~, in effect on the effective date of the contract, or such other date as may be mutually agreed upon. Attachment A, B, or C as applicable.

c. REPRESENTATIONS AND CERTIFICATIONS (X one)

- (1) Representations and Certifications pertaining to Contingent Fee Representation and Agreement, Certification of Nonsegregated Facilities, Previous Contract Compliance Reports, Affirmative Action Compliance, and Clear Air and Water Certification, Organizational Conflicts of Interest, and Insurance Immunity From Tort Liability were furnished your office on (Enter date) _____ These representations and certifications remain valid and are appropriate for the subject proposal. No facility to be used for the proposed research has been the subject of a conviction under the Clean Air Act or the Federal Water Pollution Act.
- (2) The comprehensive Representations and Certifications as cited above have not been submitted. The attached Representations and Certifications have been developed in connection with the subject proposal and (X one)
- (a) should be used only in connection with the subject proposal.
- (b) may be used not only for the subject proposal but as a comprehensive submission for possible use with prospective proposals.

d. ADVANCE PAYMENTS (Applicable only to offerors with existing payment agreements with DOD)

Advance payments will be made for performance of this SFRC pursuant to the terms and conditions of the Advance Payment Pool Agreement dated (Enter date) _____ between the Department of (Enter name) _____ and the contractor, (Enter name) _____ The provisions of that Agreement are hereby incorporated by reference in this SFRC with the same force and effect as though fully set forth herein. If this SFRC is awarded by the Department that entered into the Advance Payment Pool Agreement with the Contractor, this SFRC shall be paid by (Enter name and address of paying officer designated by the agreement) _____ and deemed a "designated pool contract" for the purpose of said Agreement. If this SFRC contract is awarded by one of the other military departments or the Defense Logistics Agency, it will be deemed a "pool contract" for the purpose of said Agreement and, notwithstanding other provisions of this SFRC, all payments hereunder will be by check drawn payable to the dual payee, "Department of the (Enter name) _____ or (Enter name of contractor) _____" and forwarded to (Enter name and address of paying office designated by the Agreement.) _____ for appropriate disposition

**REPRESENTATIONS AND CERTIFICATIONS FROM OFFERORS
SUBMITTING PROPOSALS UNDER DFARS 35.70 (ALSO SEE ATTACHMENT D)**

1. CONTINGENT FEE REPRESENTATION AND AGREEMENT (APR 1984) (FAR 52.203-4) Applies to contracts of \$100,000 or more.

a. REPRESENTATION. The offeror represents that, except for full-time bona fide employees working solely for the offeror, the offeror (X one)

- (1) has (2) has not employed or retained any person or company to solicit or obtain this contract; and (X one)
- (3) has (4) has not paid or agreed to pay to any person or company employed or retained to solicit or obtain this contract any commission, percentage, brokerage, or other fee contingent upon or resulting from the award of this contract.

b. AGREEMENT. The offeror agrees to provide information relating to the above Representation as requested by the Contracting Officer and, when subparagraph 1a above is answered affirmatively, to promptly submit to the Contracting Officer

- (1) A completed Standard Form 119, Statement of Contingent or Other Fees, (SF 119); or
- (2) A signed statement indicating that SF 119 was previously submitted to the same contracting office, including the date and applicable solicitation or contract number, and representing that the prior SF 119 applies to this offer or quotation.

2. CERTIFICATION OF NONSEGREGATED FACILITIES (APR 1984) (FAR 52.222-21) Applies to contracts of \$100,000 or more.

a. The offeror (X one)

- (1) does (2) does not maintain or provide to its employees any segregated facilities, and (X one)
- (3) will (4) will not permit any of its employees to perform their service at any location under its control where segregated facilities are maintained. It is agreed that a breach of this certification is a violation of the Equal Opportunity clause in this contract. It is further agreed that identical certificates will be obtained from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provision of the Equal Opportunity clause; that such certifications will be maintained in the Offeror's files; and that the notice required by FAR 52.222-21(c) (3) will be forwarded to such proposed subcontractors.

3. PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (APR 1984) (FAR 52.222-22)

a. The offeror (X one)

- (1) has (2) has not participated in a previous contract or subcontract subject either to the Equal Opportunity clause listed in FAR 52.222-26, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114.

b. The offeror (X one)

- (1) has (2) has not filed all compliance reports. Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

4. AFFIRMATIVE ACTION COMPLIANCE (APR 1984) (FAR 52.222-25)

a. The offeror represents that it (X one)

- (1) has developed and has on file or
- (2) has not developed and does not have on file at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2), or
- (3) has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

a. There are no known organizational conflicts of interest.

b. Information is provided as an appendix concerning potential or real organizational conflict of interest.

6. CLEAN AIR AND WATER CERTIFICATION (APR 1984) (FAR 52.223-1) Applies to contracts of \$100,000.00 or more.

a. The offeror certifies that:

(1) Any facility to be used in the performance of this proposed contract (X one)

(a) is (b) is not listed on the Environmental Protection Agency List of Violating Facilities;

(2) The offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the Environmental Protection Agency, indicating that any facility that the Offeror proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and

(3) The offeror will include a certification substantially the same as this certification, including this paragraph (6a(3)), in every nonexempt subcontract.

7. INSURANCE - IMMUNITY FROM TORT LIABILITY (APR 1984) (FAR 52.228-7) Applies to cost-reimbursement type contracts only.

a. The offeror (X one)

(1) does (2) does not claim immunity to tort liability as a state or charitable institution under (X one)

(a) Alternate I (Partial Immunity) (b) Alternate II (Total Immunity)

8. OFFEROR INFORMATION

a. TYPED NAME OF CONTRACTOR

b. TYPED NAME OF CONTRACTOR REPRESENTATIVE

c. SIGNATURE OF CONTRACTOR REPRESENTATIVE

d. DATE SIGNED (YYMMDD)

CONTRACT PRICING PROPOSAL COVER SHEET
(Cost or Pricing Data Required)

1. SOLICITATION/CONTRACT/MODIFICATION NUMBER

OMB No.: 9000-0013
Expires: 09/30/98

Public reporting burden for this collection of information is estimated to average 4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the FAR Secretariat (VRS), Office of Federal Acquisition Policy, GSA, Washington, DC 20405.

2a. NAME OF OFFEROR			3a. NAME OF OFFEROR'S POINT OF CONTACT		3c. TELEPHONE	
2b. FIRST LINE ADDRESS			3b. TITLE OF OFFEROR'S POINT OF CONTACT		AREA CODE	NUMBER
2c. STREET ADDRESS			4. TYPE OF CONTRACT ACTION (Check)			
2d. CITY			2e. STATE		2f. ZIP CODE	
5. TYPE OF CONTRACT (Check)			a. NEW CONTRACT		d. LETTER CONTRACT	
<input type="checkbox"/> FFP <input type="checkbox"/> CPFF <input type="checkbox"/> CPIF <input type="checkbox"/> CPAF <input type="checkbox"/> FPI <input type="checkbox"/> OTHER (Specify)			b. CHANGE ORDER		e. UNPRICED ORDER	
			c. PRICE REVISION/ REDETERMINATION		f. OTHER (Specify)	
			6. PROPOSED COST (A + B = C)			
			A. COST		B. PROFIT/FEE	
					C. TOTAL	

7. PERFORMANCE

PLACE	a.		PERIOD	a.	
	b.			b.	

8. List and reference the identification, quantity and total price proposed for each contract line item. A line item cost breakdown supporting this recap is required unless otherwise specified by the Contracting Officer. (Continue on reverse, and then on plain paper, if necessary. Use same headings.)

a. LINE ITEM NO.	b. IDENTIFICATION	c. QUANTITY	d. TOTAL PRICE	e. PROP. REF. PAGE

9. PROVIDE THE FOLLOWING (If available)

NAME OF CONTRACT ADMINISTRATION OFFICE			NAME OF AUDIT OFFICE		
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
TELEPHONE	AREA CODE	NUMBER	TELEPHONE	AREA CODE	NUMBER

10. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS WORK? (If "yes" identify)	11a. DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT? (If "Yes," complete Item 11B)	11b. TYPE OF FINANCING (Check one)
<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> ADVANCE PAYMENT <input type="checkbox"/> PROGRESS PAYMENTS <input type="checkbox"/> GUARANTEED LOANS
12. HAVE YOU BEEN AWARDED ANY CONTRACTS OR SUBCONTRACTS FOR THE SAME OR SIMILAR ITEMS WITHIN THE PAST 3 YEARS? (If "Yes," identify item(s), customer(s) and contract number(s) on reverse of form.)	13. IS THIS PROPOSAL CONSISTENT WITH YOUR ESTABLISHED ESTIMATING AND ACCOUNTING PRACTICES AND PROCEDURES AND FAR PART 31, COST PRINCIPLES? (If "no," explain on reverse of form)	
<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO	

14. COST ACCOUNTING STANDARDS BOARD (CASB) DATA (Public Law 91-379 as amended and FAR PART 30)

a. WILL THIS CONTRACT ACTION BE SUBJECT TO CASB REGULATIONS? (If "No," explain in proposal)	b. HAVE YOU SUBMITTED A CASB DISCLOSURE STATEMENT (CASB DS-1 or 2)? (If "Yes," specify in proposal the office to which submitted and if determined to be adequate)
<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO
c. HAVE YOU BEEN NOTIFIED THAT YOU ARE OR MAY BE IN NONCOMPLIANCE WITH YOUR DISCLOSURE STATEMENT OR COST ACCOUNTING STANDARDS? (If "Yes," explain in proposal)	d. IS ANY ASPECT OF THIS PROPOSAL INCONSISTENT WITH YOUR DISCLOSED PRACTICES OR APPLICABLE COST ACCOUNTING STANDARDS? (If "Yes," explain in proposal)
<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO

This proposal is submitted in response to the solicitation, contract, modification, etc., in Item 1 and reflects our estimates and/or actual costs as of this date and conforms with the instructions in FAR 15.804-6(b)(1), and Table 15-2. By submitting this proposal, the offeror, if selected for negotiation, grants the contracting officer and authorized representative(s) the right to examine, at any time before award, those records, which include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or any other form, or whether such supporting information is specifically referenced or included in the proposal as the basis for pricing, that will permit an adequate evaluation of the proposed price.

15. NAME OF OFFEROR (Type)	16. TITLE OF OFFEROR (Type)	16. NAME OF FIRM
17. SIGNATURE		18. DATE OF SUBMISSION

exceed \$100,000)

252.203-7000 STATUTORY PROHIBITIONS ON COMPENSATION TO FORMER DEPARTMENT OF DEFENSE EMPLOYEES (Applicable if contract is expected to exceed \$100,000)

252.203-7001 SPECIAL PROHIBITION ON EMPLOYMENT (Applicable if contract is expected to exceed \$100,000)

252.203-7002 DISPLAY OF DOD HOTLINE POSTER (Applicable if contract is expected to exceed \$5,000,000 except when performance will take place in a foreign country)

52.204-2 SECURITY REQUIREMENTS (Applicable if contract may require access to classified information)

*52.204-2 SECURITY REQUIREMENTS (**ALTERNATE I**) (Applicable if contract may require access to classified information)

52.204-4 PRINTING/COPYING DOUBLE-SIDED ON RECYCLED PAPER (Applicable if contract is expected to exceed \$100,000)

252.204-7000 DISCLOSURE OF INFORMATION (Applicable if contractor will have access to or generate unclassified information that may be sensitive and inappropriate for release to the public)

252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING

252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT

252.205-7000 PROVISION OF INFORMATION TO COOPERATIVE AGREEMENT HOLDERS (Applicable if contract is expected to exceed \$500,000)

52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (Applicable if contract is expected to exceed \$25,000)

252.209-7000 ACQUISITIONS FROM SUBCONTRACTORS SUBJECT TO ON-SITE INSPECTION UNDER THE INTERMEDIATE-RANGE NUCLEAR FORCES (INF) TREATY (Applicable if contract is expected to exceed \$100,000)

252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if contract is expected to exceed \$100,000)

252.209-7003 DISCLOSURE OF COMMERCIAL TRANSACTIONS WITH THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if contract is expected to exceed \$5,000,000)

252.209-7004 REPORTING OF COMMERCIAL TRANSACTIONS WITH THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if contract is expected to exceed \$5,000,000)

52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (Applicable if contract is a rated order)

52.215-2 AUDIT-NEGOTIATION (Applicable if contract is expected to exceed \$100,000)

52.215-22 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (Applicable if cost or pricing data is required)

52.215-23 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA-MODIFICATIONS (Applicable if cost or pricing data is required and if clause at 52.215-22 is not included)

52.215-24 SUBCONTRACTOR COST OR PRICING DATA (Applicable if clause at 52.215-22 is included)

52.215-25 SUBCONTRACTOR COST OR PRICING DATA-MODIFICATIONS (Applicable if clause at 52.215-23 is included)

52.215-26 INTEGRITY OF UNIT PRICES (Applicable if contract is expected to exceed \$100,000)

**52.215-30 FACILITIES CAPITAL COST OF MONEY (Applicable to contracts subject to FAR 31.2)

**52.215-31 WAIVER OF FACILITIES CAPITAL COST OF MONEY (Applicable if contractor does not propose facilities capital cost of money)

52.215-33 ORDER OF PRECEDENCE

252.215-7000 PRICING ADJUSTMENTS (Applicable if FAR 52.215-23, 24, or 25 applies)

252.215-7002 COST ESTIMATING SYSTEM REQUIREMENTS (Applicable if awarded on the basis of certified cost or pricing data)

*52.216-7 ALLOWABLE COST AND PAYMENT (In paragraph (a), delete "subpart 31.2 and substitute "subpart 31.3)

**52.216-7 ALLOWABLE COST AND PAYMENT (In paragraph (a), delete "subpart 31.2 and substitute "subpart 31.7)

52.216-8 FIXED FEE (Applicable if contract is a cost-plus-fixed-fee contract)

52.216-11 COST CONTRACT-NO FEE (**ALTERNATE I**)

*52.216-15 PREDETERMINED INDIRECT COST RATES

*252.216-7002 ALTERNATE (Applies when 52.216-15 is used and predetermined indirect cost rates are used)

52.219-8 UTILIZATION OF SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS CONCERNS (Applicable if contract is expected to exceed \$100,000)

52.219-9 SMALL BUSINESS AND DISADVANTAGED BUSINESS CONCERN SUBCONTRACTING PLAN (Applicable to all contracts that offer substantial subcontracting possibilities, contract is expected to exceed \$500,000 and clause at 52.219.8 is included)

52.219-16 LIQUIDATED DAMAGES-SMALL BUSINESS SUBCONTRACTING PLAN (Applicable if clause at 52.219-9 or its Alternate I is included)

252.219-7003 SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (Applicable if clause at 52.219-9 is included)

252.219-7005 INCENTIVE FOR SUBCONTRACTING WITH SMALL BUSINESSES, SMALL DISADVANTAGED BUSINESSES, HISTORICALLY BLACK COLLEGES AND UNIVERSITIES AND MINORITY INSTITUTIONS (Applicable if contract contains clause at 52.219.9)

52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES

52.222-2 PAYMENT FOR OVERTIME PREMIUMS (The word "zero" is inserted in the blank space indicated by an asterisk) (Applicable when contract is expected to exceed \$100,000)

52.222-3 CONVICT LABOR

52.222-26 EQUAL OPPORTUNITY (Add Alternate I as a special provision when applicable)

52.222-28 EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTS (Applicable if contract is expected to exceed \$1,000,000 and includes clauses 52.244-1, 52.244-2, or 52.244-3)

52.222-35 AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS (Applicable if contract is expected to

exceed \$10,000)

- 52.222-36 AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS
- 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND VETERANS OF VIETNAM ERA (Applicable if clause at 52.222-35 is included)
- 52.223-2 CLEAN AIR AND WATER (Applicable if conditions set forth in the preamble to clause are present)
- 52.223-6 DRUG-FREE WORKPLACE (Applicable if contract is expected to exceed \$100,000)
- 252.223-7004 DRUG-FREE WORK FORCE (Applicable if contract involves access to classified information or when Contracting Officer determines its necessity for reasons of national security or health and safety)
- 52.225-11 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES
- 252.225-7012 PREFERENCE FOR CERTAIN DOMESTIC COMMODITIES (Applicable if contract is expected to exceed \$100,000)
- 252.225-7026 REPORTING OF CONTRACT PERFORMANCE OUTSIDE THE UNITED STATES (Applicable when contract amount is expected to exceed \$500,000, including those modified to exceed \$500,000)
- 252.225-7031 SECONDARY ARAB BOYCOTT OF ISRAEL
- 52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN OWNED ECONOMIC ENTERPRISES (Applicable if clause at 52.219-9 is included)
- 52.227-1 AUTHORIZATION AND CONSENT (**ALTERNATE I**) (Applicable if contract is expected to exceed \$100,000)
- 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (Applicable if contract is expected to exceed \$100,000)
- 52.227-11 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (SHORT FORM) (Applicable if contractor is a small business concern or non-profit organization)
- *52.227-12 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (LONG FORM) (Applicable if contractor is other than a small business concern or non-profit organization)
- 52.227-14 RIGHTS IN DATA-GENERAL (Specify applicable alternate

in contract)

252.227-7013 RIGHTS IN TECHNICAL DATA-NONCOMMERCIAL ITEMS

252.227-7014 RIGHTS IN NONCOMMERCIAL COMPUTER SOFTWARE AND
NONCOMMERCIAL COMPUTER SOFTWARE DOCUMENTATION

252.227-7016 RIGHTS IN BID OR PROPOSAL INFORMATION

252.227-7017 IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR
DISCLOSURE RESTRICTIONS

252.227-7019 VALIDATION OF ASSERTED RESTRICTIONS-COMPUTER SOFTWARE

252.227-7028 TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY
DELIVERED TO THE GOVERNMENT

252.227-7030 TECHNICAL DATA-WITHHOLDING OF PAYMENT

252.227-7034 PATENTS-SUBCONTRACTS

252.227-7036 CERTIFICATION OF TECHNICAL DATA CONFORMITY

252.227-7037 VALIDATION OF RESTRICTIVE MARKINGS ON TECHNICAL DATA

252.227-7039 PATENTS-REPORTING OF SUBJECT INVENTIONS (Applicable if
clause at 52.227-11 is included)

52.228-7 INSURANCE-LIABILITY TO THIRD PERSONS

52.229-10 STATE OF NEW MEXICO GROSS RECEIPTS AND COMPENSATING
TAX (Applicable if contract will be performed in whole
or in part in New Mexico and tangible personal
property is acquired as a direct cost with title
passing directly to the U.S.)

52.230-2 COST ACCOUNTING STANDARDS (Applicable to other than
small business concerns unless contract is exempted
under 48 CFR or contract is subject to modified
coverage under 48 CFR)

52.230-3 DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING
PRACTICES (Applicable to other than small business
concerns when contract amount is over \$500,000 but
less than \$25,000,000 and the offeror certifies and is
eligible for and elects to use modified CAS coverage
(See 48 CFR, Chapter 99, Appendix B, FAR Looseleaf
Edition) Subpart 9903.201-2)

*52.230-5 COST ACCOUNTING STANDARDS-EDUCATIONAL INSTITUTIONS
(Applicable if conditions set forth in the preamble to
the clause are present)

52.230-6 ADMINISTRATION OF COST ACCOUNTING STANDARDS
(Applicable if clause at 52.230-2, 52.230-3, or
52.230-5 is included)

252.231-7000 SUPPLEMENTAL COST PRINCIPLES (Applicable to contracts
subject to FAR Subparts 31.1, 31.2, 31.6, or 31.7)

52.232-9 LIMITATION ON WITHHOLDING OF PAYMENTS

*52.232-17 INTEREST (Applicable if contract is expected to exceed
\$100,000)

52.232-20 LIMITATION OF COSTS (Applicable if contract is fully
funded)

52.232-22 LIMITATION OF FUNDS (Applicable if contract is
incrementally funded)

52.232-23 ASSIGNMENT OF CLAIMS

52.232-25 PROMPT PAYMENT

52.232-33 MANDATORY INFORMATION FOR ELECTRONIC FUNDS TRANSFER
PAYMENT

252.232-7006 REDUCTION OR SUSPENSION OF CONTRACT PAYMENTS UPON
FINDING OF FRAUD

52.233-1 DISPUTES

52.233-1 DISPUTES (**ALTERNATE I**) (Applicable if it is determined
under agency procedures that continued performance is
necessary pending resolution of any claim arising
under or relating to the contract)

52.233-2 SERVICE OF PROTEST (Applicable if contract is expected
to exceed \$100,000)

52.233-3 PROTEST AFTER AWARD (**ALTERNATE I**)

252.235-7004 OPTION TO EXTEND THE TERM OF THE CONTRACT

252.235-7005 CONTRACTOR-ACQUIRED PROPERTY

252.235-7006 TITLE TO CONTRACTOR-ACQUIRED PROPERTY (Applicable
to educational and non-profit organizations)

252.235-7007 ADVANCE PAYMENTS

252.235-7008 INSPECTION AND ACCEPTANCE

252.235-7009 RESTRICTION ON PRINTING

252.235-7010 ACKNOWLEDGEMENT OF SUPPORT AND DISCLAIMER

252.235-7011 FINAL SCIENTIFIC OR TECHNICAL REPORT

52.242-1 NOTICE OF INTENT TO DISALLOW COSTS

52.242-3 PENALTIES FOR UNALLOWABLE COSTS (Applicable if contract is expected to exceed \$500,000)

52.242-13 BANKRUPTCY (Applicable if the contract is expected to exceed \$100,000)

52.242-15 STOP WORK ORDER (**ALTERNATE I**)

252.242-7000 POSTAWARD CONFERENCE

52.243-2 CHANGES - COST-REIMBURSEMENT (**ALTERNATE V**)

52.244-2 SUBCONTRACTS (COST-REIMBURSEMENT AND LETTER CONTRACTS) (**ALTERNATE I**)

52.244-5 COMPETITION IN SUBCONTRACTING (Applicable if contract is expected to exceed \$100,000)

52.245-5 GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS) (**ALTERNATE I**)

252.245-7001 REPORTS OF GOVERNMENT PROPERTY (Applicable if one of the following is included: 52.245-2; 52.245-5; 52.245-7; 52.245-10; or 52.245-11)

52.246-8 INSPECTION OF RESEARCH AND DEVELOPMENT-COST-REIMBURSEMENT (Applicable when primary objective is delivery of end items other than designs, drawings, or reports)

52.246-8 INSPECTION OF RESEARCH AND DEVELOPMENT-COST-REIMBURSEMENT (**ALTERNATE I**) (Applicable when contract will be on a no-fee basis)

52.246-9 INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM) (Applicable if clause at 52.246-8 does not apply)

52.246-25 LIMITATION OF LIABILITY-SERVICES

252.246-7001 WARRANTY OF DATA

- 52.249-5 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT
(EDUCATIONAL AND OTHER NONPROFIT INSTITUTIONS)
(Applicable for research and development work with an
educational or nonprofit institution on a nonprofit or
no-fee basis)
- 252.249-7001 NOTIFICATION OF SUBSTANTIAL IMPACT ON EMPLOYMENT
(Applicable if contract is \$5,000,000 or more and
applicable to all contracts with subcontracts of
\$500,000 or more)
- 52.251-1 GOVERNMENT SUPPLY SOURCES (Applicable if contractor is
authorized to acquire supplies or services from a
Government supply source)
- 252.251-7000 ORDERING FROM GOVERNMENT SUPPLY SOURCES (Applicable if
clause at 52.251-1 is included)
- 52.253-1 COMPUTER GENERATED FORMS (Applicable if contractor
will be required to submit data on standard or
optional forms prescribed by this regulation and forms
prescribed by agency supplements)

ATTACHMENT B

COST-REIMBURSEMENT TYPE CONTRACTS WITH
COMMERCIAL ORGANIZATIONS

FAR/DFARS

52.252-2 CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

(End of clause)

252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE

52.202-1 DEFINITIONS (Applicable if contract is expected to exceed \$100,000)

52.203-3 GRATUITIES (Applicable if contract is expected to exceed \$100,000)

52.203-5 COVENANT AGAINST CONTINGENT FEES (Applicable if contract is expected to exceed \$100,000)

52.203-6 RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (Applicable if contract is expected to exceed \$100,000)

52.203-7 ANTI-KICKBACK PROCEDURES (Applicable if contract is expected to exceed \$100,000)

52.203-8 CANCELLATION, RECISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (Applicable if contract is expected to exceed \$100,000)

52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (Applicable if contract is expected to exceed \$100,000)

52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (Applicable if contract is expected to exceed \$100,000)

252.203-7000 STATUTORY PROHIBITIONS ON COMPENSATION TO FORMER DEPARTMENT OF DEFENSE EMPLOYEES (Applicable if contract is expected to exceed \$100,000)

252.203-7001 SPECIAL PROHIBITION ON EMPLOYMENT (Applicable if

contract is expected to exceed \$100,000)

252.203-7002 DISPLAY OF DOD HOTLINE POSTER (Applicable if contract is expected to exceed \$5,000,000 except when performance will take place in a foreign country)

52.204-2 SECURITY REQUIREMENTS (Applicable if contract may require access to classified information)

52.204-4 PRINTING/COPYING DOUBLE-SIDED ON RECYCLED PAPER (Applicable if contract is expected to exceed \$100,000)

252.204-7000 DISCLOSURE OF INFORMATION (Applicable if contractor will have access to or generate unclassified information that may be sensitive and inappropriate for release to the public)

252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING

252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT

252.205-7000 PROVISION OF INFORMATION TO COOPERATIVE AGREEMENT HOLDERS (Applicable if contract is expected to exceed \$500,000)

52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (Applicable if contract is expected to exceed \$25,000)

252.209-7000 ACQUISITION FROM SUBCONTRACTORS SUBJECT TO ON-SITE INSPECTION UNDER THE INTERMEDIATE-RANGE NUCLEAR FORCES (INF) TREATY (Applicable if contract is expected to exceed \$100,000)

252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if contract is expected to exceed \$100,000)

252.209-7003 DISCLOSURE OF COMMERCIAL TRANSACTIONS WITH THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if contract is expected to exceed \$5,000,000)

252.209-7004 REPORTING OF COMMERCIAL TRANSACTIONS WITH THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if contract is expected to exceed \$5,000,000)

52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS
(Applicable if contract is a rated order)

52.215-2 AUDIT-NEGOTIATION (Applicable if contract
is expected to exceed \$100,000)

52.215-22 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA
(Applicable if cost or pricing data is required)

52.215-23 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING
DATA-MODIFICATIONS (Applicable if cost or pricing
data is required and if clause at 52.215-22 is not
included)

52.215-24 SUBCONTRACTOR COST OR PRICING DATA (Applicable if
clause at 52.215-22 is included)

52.215-25 SUBCONTRACTOR COST OR PRICING DATA-MODIFICATIONS

52.215-26 INTEGRITY OF UNIT PRICES (Applicable if contract is
expected to exceed \$100,000)

52.215-30 FACILITIES CAPITAL COST OF MONEY (Applicable to
contracts subject to FAR 31.2)

52.215-31 WAIVER OF FACILITIES CAPITAL COST OF MONEY
(Applicable if contractor does not propose
facilities capital cost of money)

52.215-33 ORDER OF PRECEDENCE

52.215-40 NOTIFICATION OF OWNERSHIP CHANGES (Applicable to
contracts subject to FAR 31.2 or when certified
cost or pricing data will be required)

252.215-7000 PRICING ADJUSTMENTS (Applicable if FAR 52.215-23,
24, or 25 applies)

252.215-7002 COST ESTIMATING SYSTEM REQUIREMENTS (Applicable if
awarded on the basis of certified cost or pricing
data)

52.216-7 ALLOWABLE COST AND PAYMENT

52.216-8 FIXED FEE

52.216-11 COST CONTRACT-NO FEE

52.219-8 UTILIZATION OF SMALL, SMALL DISADVANTAGED AND
WOMEN-OWNED SMALL BUSINESS CONCERNS (Applicable if
contract is expected to exceed \$100,000)

- 52.219-9 SMALL BUSINESS AND DISADVANTAGED BUSINESS CONCERN
SUBCONTRACTING PLAN (Applicable to all contracts
that offer substantial subcontracting
possibilities, the contract is expected to exceed
\$500,000 and the clause at 52.219-8 is included)
- 52.219-16 LIQUIDATED DAMAGES-SMALL BUSINESS SUBCONTRACTING
PLAN (Applicable if the clause at 52.219-9 or its
Alternate I is included)
- 252.219-7003 SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS
SUBCONTRACTING PLAN (DOD CONTRACTS) (Applicable if
clause at 52.219-9 is included)
- 252.219-7005 INCENTIVE FOR SUBCONTRACTING WITH SMALL BUSINESSES,
SMALL DISADVANTAGED BUSINESSES, HISTORICALLY
BLACK COLLEGES AND UNIVERSITIES AND MINORITY
INSTITUTIONS (Applicable if contract contains
clause at 52.219-9)
- 52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES
- 52.222-2 PAYMENT FOR OVERTIME PREMIUMS (The word "zero" is
inserted in the blank space indicated by an
asterisk) (Applicable when contract is expected
to exceed \$100,000)
- 52.222-3 CONVICT LABOR
- 52.222-26 EQUAL OPPORTUNITY
- 52.222-28 EQUAL OPPORTUNITY PREAWARD CLEARANCE OF
SUBCONTRACTS (Applicable if contract is expected to
exceed \$1,000,000 and includes clauses 52.244-1,
52.244-2, or 52.244-3)
- 52.222-35 AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM
ERA VETERANS (Applicable if contract is expected to
exceed \$10,000)
- 52.222-36 AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS
- 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND
VETERANS OF VIETNAM ERA (Applicable if clause at
52.222-35 is included)
- 52.223-2 CLEAN AIR AND WATER (Applicable if conditions set
forth in preamble to clause are present)
- 52.223-6 DRUG-FREE WORKPLACE (Applicable if contract is
expected to exceed \$100,000)

252.223-7004 DRUG-FREE WORK FORCE (Applicable if contract involves access to classified information or when Contracting Officer determines its necessity for reasons of national security or health and safety)

52.225-11 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES

252.225-7012 PREFERENCE FOR CERTAIN DOMESTIC COMMODITIES (Applicable when contract is expected to exceed \$100,000)

252.225-7026 REPORTING OF CONTRACT PERFORMANCE OUTSIDE THE UNITED STATES (Applicable when contract amount is expected to exceed \$500,000, including those modified to exceed \$500,000)

252.225-7031 SECONDARY ARAB BOYCOTT OF ISRAEL

52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES (Applicable if clause at 52.219-9 is included)

52.227-1 AUTHORIZATION AND CONSENT (**ALTERNATE I**) (Applicable if contract is expected to exceed \$100,000)

52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (Applicable if contract is expected to exceed \$100,000)

52.227-11 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (SHORT FORM) (Applicable if contractor is a small business concern or non-profit organization)

52.227-12 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (LONG FORM) (Applicable if contractor is other than a small business concern or non-profit organization)

52.227-14 RIGHTS IN DATA-GENERAL (Specify applicable alternate in contract)

252.227-7013 RIGHTS IN TECHNICAL DATA-NONCOMMERCIAL ITEMS

252.227-7014 RIGHTS IN NONCOMMERCIAL COMPUTER SOFTWARE AND NONCOMMERCIAL COMPUTER SOFTWARE DOCUMENTATION

252.227-7016 RIGHTS IN BID OR PROPOSAL INFORMATION

252.227-7017 IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR DISCLOSURE RESTRICTIONS

252.227-7019 VALIDATION OF ASSERTED RESTRICTIONS-COMPUTER

SOFTWARE

- 252.227-7028 TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT
- 252.227-7030 TECHNICAL DATA-WITHHOLDING OF PAYMENT
- 252.227-7034 PATENTS-SUBCONTRACTS
- 252.227-7036 CERTIFICATION OF TECHNICAL DATA CONFORMITY
- 252.227-7037 VALIDATION OF RESTRICTIVE MARKINGS ON TECHNICAL DATA
- 252.227-7039 PATENTS-REPORTING OF SUBJECT INVENTIONS (Applicable if clause at 52.227-11 is included)
- 52.228-7 INSURANCE-LIABILITY TO THIRD PERSONS
- 52.229-10 STATE OF NEW MEXICO GROSS RECEIPTS AND COMPENSATING TAX (Applicable if contract will be performed in whole or in part in New Mexico and tangible personal property is acquired as a direct cost with title passing directly to the U.S.)
- 52.230-2 COST ACCOUNTING STANDARDS (Applicable to other than small business concerns unless contract is exempted under 48 CFR part 9904 (FAR Appendix) or contract is subject to modified coverage under 48 CFR)
- 52.230-3 DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES (Applicable to other than small business concerns when contract amount is over \$500,000 but then \$25,000,000 and the offeror certifies and eligible for and elects to use modified CAS (See 48 CFR 9903.201-2 (FAR Appendix), Appendix B, FAR Edition) Subpart 9903.201-2) less
is
coverage
Chapter 99,
Looseleaf
- 52.230-6 ADMINISTRATION OF COST ACCOUNTING STANDARDS (Applicable if clause at 52.230-2 or 52.230-3 is included)
- 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (Applicable to contracts subject to FAR Subparts 31.1, 31.2, 31.6, or 31.7)
- 52.232-9 LIMITATION ON WITHHOLDING OF PAYMENTS
- 52.232-17 INTEREST (Applicable if contract is expected to exceed \$100,000)

52.232-20 LIMITATION OF COSTS (Applicable if contract is fully funded)

52.232-22 LIMITATION OF FUNDS (Applicable if contract is incrementally funded)

52.232-23 ASSIGNMENT OF CLAIMS

52.232-25 PROMPT PAYMENT

52.232-33 MANDATORY INFORMATION FOR ELECTRONIC FUNDS TRANSFER PAYMENT

252.232-7006 REDUCTION OR SUSPENSION OF CONTRACT PAYMENTS UPON FINDING OF FRAUD

52.233-1 DISPUTES

52.233-1 DISPUTES (**ALTERNATE I**) (Applicable if it is determined under agency procedures that continued performance is necessary pending resolution of any claim arising under or relating to the contract)

52.233-2 SERVICE OF PROTEST (Applicable if contract is expected to exceed \$100,000)

52.233-3 PROTEST AFTER AWARD (**ALTERNATE I**)

252.235-7004 OPTION TO EXTEND THE TERM OF THE CONTRACT

252.235-7005 CONTRACTOR-ACQUIRED PROPERTY

252.235-7007 ADVANCE PAYMENTS

252.235-7008 INSPECTION AND ACCEPTANCE

252.235-7009 RESTRICTION ON PRINTING

252.235-7010 ACKNOWLEDGEMENT OF SUPPORT AND DISCLAIMER

252.235-7011 FINAL SCIENTIFIC OR TECHNICAL REPORT

52.242-1 NOTICE OF INTENT TO DISALLOW COSTS

52.242-3 PENALTIES FOR UNALLOWABLE COSTS (Applicable if contract is expected to exceed \$500,000)

52.242-13 BANKRUPTCY (Applicable if contract is expected to exceed \$100,000)

52.242-15 STOP-WORK ORDER (**ALTERNATE I**)

252.242-7000 POSTAWARD CONFERENCE

52.243-2 CHANGES - COST-REIMBURSEMENT (**ALTERNATE V**)

52.244-2 SUBCONTRACTS (COST-REIMBURSEMENT AND LETTER CONTRACTS) (**ALTERNATE I**)

52.244-5 COMPETITION IN SUBCONTRACTING (Applicable if contract is expected to exceed \$100,000)

52.245-5 GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME-AND MATERIAL, OR LABOR-HOUR CONTRACTS)

252.245-7001 REPORTS OF GOVERNMENT PROPERTY (Applicable if one of the following is included: 52.245-2; 52.245-5; 52.245-7; 52.245-10; or 52.245-11)

52.246-8 INSPECTION OF RESEARCH AND DEVELOPMENT-COST REIMBURSEMENT (Applicable when primary objective is the delivery of end items other than designs, drawings, or reports)

52.246-8 INSPECTION OF RESEARCH AND DEVELOPMENT-COST REIMBURSEMENT (**ALTERNATE I**) (Applicable when contract will be on a no-fee basis)

52.246-9 INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM) (Applicable if clause at 52.246-8 does not apply)

52.246-25 LIMITATION OF LIABILITY-SERVICES

252.246-7001 WARRANTY OF DATA

52.249-6 TERMINATION (COST-REIMBURSEMENT)

52.249-14 EXCUSABLE DELAYS

252.249-7001 NOTIFICATION OF SUBSTANTIAL IMPACT ON EMPLOYMENT (Applicable if contract is \$5,000,000 or more and applicable to all contracts with subcontracts of \$500,000 or more)

52.251-1 GOVERNMENT SUPPLY SOURCES (Applicable if contractor is authorized to acquire supplies or services from a Government supply source)

252.251-7000 ORDERING FROM GOVERNMENT SUPPLY SOURCES (Applicable if clause at 52.251-1 is included)

52.253-1 COMPUTER GENERATED FORMS (Applicable if contractor

will be required to submit data on standard or optional forms prescribed by this regulation and forms prescribed by agency supplements)

ATTACHMENT C
FIXED PRICE RESEARCH AND DEVELOPMENT
CONTRACT CLAUSES
FAR/DFARS

52.252-2 CLAUSES INCORPORATED BY REFERENCE (JUN 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

(End of clause)

252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE

52.202-1 DEFINITIONS (Applicable if contract is expected to exceed \$100,000)

52.203-3 GRATUITIES

52.203-5 COVENANT AGAINST CONTINGENT FEES (Applicable if contract is expected to exceed \$100,000)

52.203-6 RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (Applicable if contract is expected to exceed \$100,000)

52.203-7 ANTI-KICKBACK PROCEDURES (Applicable if contract is expected to exceed \$100,000)

52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (Applicable if contract is expected to exceed \$100,000)

52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (Applicable if contract is expected to exceed \$100,000)

252.203-7000 STATUTORY PROHIBITIONS ON COMPENSATION TO FORMER DEPARTMENT OF DEFENSE EMPLOYEES (Applicable if contract is expected to exceed \$100,000)

252.203-7001 SPECIAL PROHIBITION ON EMPLOYMENT (Applicable if contract is expected to exceed \$100,000)

252.203-7002 DISPLAY OF DOD HOTLINE POSTER (Applicable if contract is expected to exceed \$5,000,000 except when performance will take place in a foreign country)

52.204-2 SECURITY REQUIREMENTS (Applicable if contract may

require access to classified information)

52.204-4 PRINTING/COPYING DOUBLE-SIDED ON RECYCLED PAPER

252.204-7000 DISCLOSURE OF INFORMATION (Applicable if contractor will have access to or generate unclassified information that may be sensitive and inappropriate for release to the public)

252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING

252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT

252.205-7000 PROVISION OF INFORMATION TO COOPERATIVE AGREEMENT HOLDERS (Applicable if contract is expected to exceed \$500,000)

52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (Applicable if contract is expected to exceed \$25,000)

252.209-7000 ACQUISITION FROM SUBCONTRACTORS SUBJECT TO ON-SITE INSPECTION UNDER THE INTERMEDIATE RANGE NUCLEAR FORCES (INF) TREATY (Applicable if contract is expected to exceed \$100,000)

252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if the contract is expected to exceed \$100,000)

252.209-7003 DISCLOSURE OF COMMERCIAL TRANSACTIONS WITH THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if contract is expected to exceed \$5,000,000)

252.209-7004 REPORTING OF COMMERCIAL TRANSACTIONS WITH THE GOVERNMENT OF A TERRORIST COUNTRY (Applicable if contract is expected to exceed \$5,000,000)

52.211-11 LIQUIDATED DAMAGES-SUPPLIES, SERVICES, OR RESEARCH AND DEVELOPMENT

52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (Applicable if contract is a rated order)

52.215-2 AUDIT-NEGOTIATION (Applicable if contract is expected to exceed \$100,000)

52.215-22 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA

(Applicable if cost or pricing data is required)

- 52.215-23 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA -MODIFICATIONS (Applicable if cost or pricing data is required and if clause at 52.215-22 is not included)
- 52.215-24 SUBCONTRACTOR COST OR PRICING DATA (Applicable if clause at 52.215-23 is included)
- 52.215-25 SUBCONTRACTOR COST OR PRICING DATA-MODIFICATIONS (Applicable if clause at 52.215-23 is included)
- 52.215-26 INTEGRITY OF UNIT PRICE (Applicable if contract is expected to exceed \$100,000)
- 52.215-27 TERMINATION OF DEFINED BENEFIT PENSION PLANS (Applicable if certified cost and pricing data are required and cost determinations are subject to FAR Subpart 31.2)
- 52.215-30 FACILITIES CAPITAL COST OF MONEY (Applicable to contracts that are subject to FAR 31.2)
- 52.215-31 WAIVER OF FACILITIES CAPITAL COST OF MONEY (Applicable to commercial organizations if the contractor does not propose facilities capital cost of money)
- 52.215-33 ORDER OF PRECEDENCE
- 52.215-39 REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS OTHER THAN PENSIONS (PRB) (Applicable to contracts subject to FAR 31.2 or when certified cost or pricing data will be required)
- 52.215-40 NOTIFICATION OF OWNERSHIP CHANGES (Applicable to contracts subject to FAR 31.2 or when certified cost or pricing data will be required)
- 252.215-7000 PRICING ADJUSTMENTS (Applicable if clause at 52.215-23, 52.215-24, or 52.215-25 is included)
- 252.215-7002 COST ESTIMATING SYSTEM REQUIREMENTS (Applicable if awarded on the basis of certified cost or pricing data)
- 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS CONCERNS (Applicable if contract is expected to exceed \$100,000)
- 52.219-9 SMALL BUSINESS AND DISADVANTAGED BUSINESS CONCERN SUBCONTRACTING PLAN (Applicable to all contracts that offer substantial subcontracting possibilities, contract is expected to exceed \$500,000)

and clause at 52.219-8 is included)

- 52.219-16 LIQUIDATED DAMAGES-SMALL BUSINESS SUBCONTRACTING PLAN (Applicable if clause at 52.219-9 or its Alternate I is included)
- 252.219-7003 SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (Applicable if clause at 52.219-9 is included)
- 252.219-7005 INCENTIVE FOR SUBCONTRACTING WITH SMALL BUSINESSES, SMALL DISADVANTAGED BUSINESSES, HISTORICALLY BLACK COLLEGES AND UNIVERSITIES AND MINORITY INSTITUTIONS (Applicable if contract contains the clause at 52.219-9)
- 52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES
- 52.222-3 CONVICT LABOR
- 52.222-21 CERTIFICATION OF NONSEGREGATED FACILITIES
- 52.222-24 PREAWARD ON-SITE EQUAL OPPORTUNITY COMPLIANCE REVIEW (Applicable if contract includes the clause at 52.222-26 and amount is expected to exceed \$1,000,000)
- 52.222-26 EQUAL OPPORTUNITY (Add Alternate I as a special provision when applicable)
- 52.222-28 EQUAL OPPORTUNITY PREAWARD CLEARANCE OF SUBCONTRACTS (Applicable if contract is expected to exceed \$1,000,000 and includes clauses 52.244-1, 52.244-2, or 52.244-3)
- 52.222-35 AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS (Applicable if contract is expected to exceed \$10,000)
- 52.222-36 AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS
- 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA (Applicable if clause at 52.222-35 is included)
- 52.223-2 CLEAN AIR AND WATER (Applicable if conditions set forth in the preamble to clause are present)
- 52.223-6 DRUG-FREE WORKPLACE (Applicable if contract is expected to exceed \$100,000)
- 252.223-7004 DRUG-FREE WORK FORCE (Applicable if contract involves access to classified information or when Contracting Officer determines its necessity for reasons of national security or health and

safety)

52.225-11 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES

52.225-14 INCONSISTENCY BETWEEN ENGLISH VERSION AND TRANSLATION OF CONTRACT (Applicable whenever translation into another language is anticipated)

252.225-7012 PREFERENCE FOR CERTAIN DOMESTIC COMMODITIES (Applicable if contract is expected to exceed \$100,000)

252.225-7026 REPORTING OF CONTRACT PERFORMANCE OUTSIDE THE UNITED STATES (Applicable when contract amount is expected to exceed \$500,000, including those modified to exceed \$500,000)

252.225-7031 SECONDARY ARAB BOYCOTT OF ISRAEL

52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN OWNED ECONOMIC ENTERPRISES (Applicable if clause at 52.219-9 is included)

52.227-1 AUTHORIZATION AND CONSENT (**ALTERNATE I**) (Applicable if contract is expected to exceed \$100,000)

52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (Applicable if contract is expected to exceed \$100,000)

52.227-10 FILING OF PATENT APPLICATIONS - CLASSIFIED SUBJECT MATTER (Applicable if the nature of the work or classified subject matter involved in the work might result in a patent application containing classified subject matter)

52.227-11 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (SHORT FORM) (Applicable if contractor is a small business concern or non-profit organization)

52.227-12 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (LONG FORM) (Applicable if contractor is other than a small business concern or non-profit organization)

52.227-14 RIGHTS IN DATA-GENERAL (Specify applicable alternate in contract)

252.227-7013 RIGHTS IN TECHNICAL DATA-NONCOMMERCIAL ITEMS

252.227-7014 RIGHTS IN NONCOMMERCIAL COMPUTER SOFTWARE AND NONCOMMERCIAL COMPUTER SOFTWARE DOCUMENTATION

252.227-7016 RIGHTS IN BID OR PROPOSAL INFORMATION

252.227-7017 IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR DISCLOSURE RESTRICTIONS

252.227-7019 VALIDATION OF ASSERTED RESTRICTIONS-COMPUTER SOFTWARE

252.227-7020 RIGHTS IN SPECIAL WORKS

252.227-7028 TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT

252.227-7030 TECHNICAL DATA-WITHHOLDING OF PAYMENT

252.227-7034 PATENTS-SUBCONTRACTS

252.227-7036 CERTIFICATION OF TECHNICAL DATA CONFORMITY

252.227-7037 VALIDATION OF RESTRICTIVE MARKINGS ON TECHNICAL DATA

252.227-7039 PATENTS-REPORTING OF SUBJECT INVENTIONS (Applicable if clause at 52.227-11 is included)

52.228-5 INSURANCE-WORK ON A GOVERNMENT INSTALLATION (Applicable if contract is expected to exceed \$100,000, and more than a small amount of work on a government installation)

52.229-3 FEDERAL, STATE, AND LOCAL TAXES (Applicable to contracts expected to exceed \$100,000)

52.230-2 COST ACCOUNTING STANDARDS (Applicable to other than small business concerns unless contract is exempted under 48 CFR or contract is subject to modified coverage under 48 CFR)

52.230-3 DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES (Applicable to other than small business concerns when contract amount is over \$500,000 but less than \$25,000,000 and offeror certifies and is eligible for and elects to use modified CAS coverage. (See 48 CFR, Chapter 99, Appendix B, FAR Looseleaf Edition) Subpart 9903.201-2)

52.230-6 ADMINISTRATION OF COST ACCOUNTING STANDARDS

252.231-7000 SUPPLEMENTAL COST PRINCIPLES (Applicable to contracts subject to FAR Subparts 31.1, 31.2, 31.6, or 31.7)

252.231-7001 PENALTIES FOR UNALLOWABLE COSTS (Applicable if contract is expected to exceed \$100,000 and contains Clauses 52.216-7, 52.216-13, 52.216-16, and 52.216-17)

52.232-2 PAYMENTS UNDER FIXED-PRICE RESEARCH AND DEVELOPMENT CONTRACTS

52.232-9 LIMITATION ON WITHHOLDING OF PAYMENTS

52.232-16 PROGRESS PAYMENTS (Applicable if government will provide progress payments based on costs)

52.232-16 PROGRESS PAYMENTS (**ALTERNATE I**) (Applicable if contractor is a small business concern and government will provide progress payments based on costs)

52.232-17 INTEREST (Applicable to contracts expected to exceed \$100,000)

52.232-23 ASSIGNMENT OF CLAIMS

52.232-25 PROMPT PAYMENT

252.232-7004 DOD PROGRESS PAYMENT RATES (Use if 52.232-16 or its alternate is used)

252.232-7006 REDUCTION OR SUSPENSION OF CONTRACT PAYMENTS UPON FINDING OF FRAUD

252.232-7007 LIMITATION OF GOVERNMENT'S OBLIGATION (Applicable if an incrementally funded fixed-price contract is expected)

52.233-1 DISPUTES

52.233-1 DISPUTES (**ALTERNATE I**)

52.233-2 SERVICE OF PROTEST (Applicable if contract is expected to exceed \$100,000)

52.233-3 PROTEST AFTER AWARD

252.235-7004 OPTION TO EXTEND THE TERM OF THE CONTRACT

252.235-7005 CONTRACTOR-ACQUIRED PROPERTY

252.235-7006 TITLE TO CONTRACTOR-ACQUIRED PROPERTY (Applicable to educational and non-profit organizations)

252.235-7007 ADVANCE PAYMENTS

252.235-7008 INSPECTION AND ACCEPTANCE

252.235-7009 RESTRICTION ON PRINTING

252.235-7010 ACKNOWLEDGMENT OF SUPPORT AND DISCLAIMER

252.235-7011 FINAL SCIENTIFIC OR TECHNICAL REPORT

52.242-13 BANKRUPTCY (Applicable if contract is expected to exceed \$100,000)

52.242-15 STOP-WORK ORDER

252.242-7000 POSTAWARD CONFERENCE

252.242-7001 CERTIFICATION OF INDIRECT COSTS

52.243-1 CHANGES-FIXED-PRICE (**ALTERNATE V**)

52.243-6 CHANGE ORDER ACCOUNTING

252.243-7001 PRICING OF CONTRACT MODIFICATIONS

52.244-1 SUBCONTRACTS (FIXED-PRICE CONTRACTS) (Applicable if contract is expected to exceed \$500,000)

52.244-5 COMPETITION IN SUBCONTRACTING (Applicable if contract is expected to exceed \$100,000)

52.245-2 GOVERNMENT PROPERTY (FIXED PRICE CONTRACTS)

52.245-2 GOVERNMENT PROPERTY (FIXED PRICE CONTRACTS) (**ALTERNATE II**) (Applicable to non-profit institutions of higher education and non-profit organizations whose primary purpose is the conduct of scientific research)

52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (Applicable if acquisition cost of all furnished government property is \$100,000 or less, unless contract is with an educational or nonprofit organization)

52.245-9 USE AND CHARGES

52.245-18 SPECIAL TEST EQUIPMENT (Applicable if contractor will acquire or fabricate special test equipment but exact identification is unknown)

52.245-19 GOVERNMENT PROPERTY FURNISHED "AS IS" (Applicable when government production and research property is to be furnished "As Is")

252.245-7001 REPORTS OF GOVERNMENT PROPERTY (Applicable if clauses 52.245-2, 5, 7, 10 or 11 are used)

- 52.246-7 INSPECTION OF RESEARCH AND DEVELOPMENT-FIXED-PRICE (Applicable if contract is expected to exceed \$100,000 and when the primary objective of the contract is the delivery of end items other than designs, drawings, or reports unless 52.246-9 is more appropriate)
- 52.246-9 INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM) (Applicable if clause at 52.246-7 does not apply)
- 52.246-16 RESPONSIBILITY FOR SUPPLIES (Applicable if contract is expected to exceed \$100,000)
- 52.246-23 LIMITATION OF LIABILITY (Applicable if contract is expected to exceed \$100,000 and subject to requirements of subpart 46.8 and contract does not require the delivery of high-value items)
- 52.246-24 LIMITATION OF LIABILITY HIGH-VALUE ITEMS (Applicable if contract is expected to exceed \$100,000 and is subject to requirements of subpart 46.8 and if contract requires the delivery of high-value items)
- 52.246-24 LIMITATION OF LIABILITY HIGH-VALUE ITEMS (**ALTERNATE I**) (Applicable if contract is expected to exceed \$100,000 and if it requires delivery of both high-value and other end items)
- 252.246-7001 WARRANTY OF DATA
- 252.246-7001 WARRANTY OF DATA (**ALTERNATE II**) (Applicable when extended liability is desired)
- 52.249-1 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SHORT FORM) (Applicable if contract is expected to be \$100,000 or less, and unless the contract is for research and development work with an educational institution or nonprofit institution on a no-profit basis)
- 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (Applicable if contract is expected to exceed \$100,000 unless the contract is for research and development with an educational or nonprofit institution on a no-profit basis)
- 52.249-5 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (EDUCATIONAL AND OTHER NONPROFIT INSTITUTIONS) (Applicable for research and development work with an educational or nonprofit institution on a nonprofit or no-fee basis)

- 252.249-7001 NOTIFICATION OF SUBSTANTIAL IMPACT ON EMPLOYMENT
(Applicable if contract is expected to exceed \$5,000,000
and applicable to all contracts with subcontracts of
\$500,000 or more)
- 52.249-9 DEFAULT (FIXED-PRICE RESEARCH AND DEVELOPMENT)
(Applicable unless contract is with an educational or
non-profit institution on a no-profit basis, and if
contract is expected to exceed \$100,000)
- 52.251-1 GOVERNMENT SUPPLY SOURCES (Applicable if contractor is
authorized to acquire supplies or services from a
government supply source)
- 252.251-7000 ORDERING FROM GOVERNMENT SUPPLY SOURCES (Applicable if
clause at 52.251-1 is included)
- 52.253-1 COMPUTER GENERATED FORMS (Applicable if contractor will
be required to submit data on standard or optional forms
prescribed by this regulation and forms prescribed by
agency supplements)

ATTACHMENT D

ADDITIONAL REPRESENTATIONS AND CERTIFICATIONS FROM OFFERORS

FAR/DFARS

CERTIFICATION, SIGNATURE

IF THE PERSON SIGNING THIS CONTRACT/OFFER IS OTHER THAN THE SECRETARY-TREASURER, VICE-PRESIDENT, OR PRESIDENT OF THE ORGANIZATION, AND THE AMOUNT OF THE CONTRACT/OFFER IS IN EXCESS OF \$100,000.00, THE FOLLOWING CERTIFICATE MUST BE COMPLETED:

I, _____, certify that I am secretary of the organization named as contractor herein; that _____, who signed this contract on behalf of the contractor, was then _____ of said organization; that said contract was duly signed for and on behalf of said organization by authority of its governing body and is within the scope of its power.

SECRETARY

52.203-2 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985)
(Applicable to firm-fixed price contracts expected to exceed \$100,000)

(a) The offeror certifies that--

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered;

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory--

(1) Is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or

(2)(i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above

[insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization);

(ii) As an authorized agent, does certify that the principals named in subdivision (b) (2) (i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.

(c) If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

(End of provision)

52.203-11 CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO
INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991)
(Applicable if the contract is expected to
exceed \$100,000)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989,

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the

extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

(End of provision)

52.204-3 TAXPAYER IDENTIFICATION (JUN 1997)

(a) Definitions.

"Common parent," as used in this solicitation provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Corporate status," as used in this solicitation provision, means a designation as to whether the offeror is a corporate entity, an unincorporated entity (e.g., sole proprietorship or partnership), or a corporation providing medical and health care services.

"Taxpayer Identification Number (TIN)," as used in this solicitation provision, means the number required by the IRS to be used by the offeror in reporting income tax and other returns.

(b) All offerors are required to submit the information required in paragraphs (c) through (e) of this solicitation provision in order to comply with reporting requirements of 26 U.S.C. 6041, 6041A,

and 6050M and implementing regulations issued by the Internal Revenue Service (IRS). If the resulting contract is subject to reporting requirements described in FAR 4.903, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) Taxpayer Identification Number (TIN).

TIN: _____.

TIN has been applied for.

TIN is not required because:

Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the U.S. and does not have an office or place of business or fiscal paying agent in the U.S.;

Offeror is an agency or instrumentality of a foreign government:

Offeror is an agency or instrumentality of a Federal, state, or local government;

Other. State basis.

(d) Corporate Status.

Corporation providing medical and health care services, or engaged in billing and collecting of payments for such services;

Other corporate entity;

Not a corporate entity;

Sole proprietorship

Partnership

Hospital or extended care facility described in 26 CFR 501(c)(3) that is exempt from taxation under 26 CFR 501(a).

(e) Common Parent.

Offeror is not owned or controlled by common parent as defined in paragraph (a) of this provision.

Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

52.204-5 WOMEN-OWNED BUSINESS (OCT 1995) (Applicable if contract is expected to exceed \$100,000)

(a) Representation. The offeror represents that it ____ is, ____ is not a women-owned business concern.

(b) Definition. "Women-owned business concern," as used in this provision, means a concern which is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(End of provision)

252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (DEC 1991)

(a) The Offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter CAGE before the number.

(b) If the Offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Services Center (DLSC). The Contracting Officer will --

(1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;

(2) Complete section A and forward the form to DLSC; and

(3) Notify the Contractor of its assigned CAGE code.

(c) Do not delay submission of the offer pending receipt of a CAGE code.

(End of provision)

52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (MARCH 1996)
(Applicable if contract is expected to exceed \$100,000)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that--

(i) The Offeror and/or any of its Principals--

(A) Have ___ are not ___ presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have ___ have not ___, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are ___ are not ___ presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(B) of this provision.

(ii) The Offeror has ___ has not ___, within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER SECTION 1001, TITLE 18, UNITED STATES CODE.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this

provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE
GOVERNMENT OF A TERRORIST COUNTRY (SEP 1994)
(Applicable if contract is expected to
exceed \$100,000)

(a) Definitions.

As used in this provision-

(1) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A) of the Export Administration Act of 1979 (50 U.S.C. app. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for acts of international terrorism. As of the date of this provision, terrorist countries include: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means -

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

(ii) Holding a management position in the firm, such as a director or officer;

(iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm-

(iv) Ownership of 10 ten percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v) Holding 50 percent or more of the indebtedness of a firm.

(b) Prohibition on award. In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary, unless a waiver is granted by the Secretary of Defense.

(c) Disclosure. If the government of a terrorist country has a significant interest in the Offeror or a subsidiary of the Offeror, the Offeror shall disclose such interest in an attachment to its offer. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include-

(1) Identification of each government holding a significant interest; and

(2) A description of the significant interest held by each government.

(End of provision)

252.209-7002 DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT (SEP 1994) (Applicable if access to proscribed information is necessary for performance)
contract

(a) Definitions.

As used in this provision -

(1) "Effectively owned or controlled" means that a foreign government or any entity controlled by a foreign government has the power, either directly or indirectly, whether exercised or exercisable, to control the election, appointment, or tenure of the offeror's officers or a majority of the Offeror's board of directors by any means, e.g., ownership, contract, or operation of law (or equivalent power for unincorporated organizations).

(2) "Entity controlled by a foreign government"-

(i) Means-

(A) Any domestic or foreign organization or corporation that is effectively owned or controlled by a foreign government; or

(B) Any individual acting on behalf of a foreign government.

(ii) Does not include an organization or corporation that is owned, but is not controlled, either directly or indirectly, by a foreign government if the ownership of that organization or corporation by that foreign government was effective before October 23, 1992.

(3) "Foreign government" includes the state and the government of any country (other than the United States and its possessions and trust territories) as well as any political subdivision, agency, or instrumentality thereof.

(4) "Proscribed information" means -

(i) Top Secret information;

(ii) Communications Security (COMSEC) information, except classified keys used to operate secure telephone units (STU IIIS);

(iii) Restricted Data as defined in the U.S. Atomic Energy Act of 1954, as amended;

(iv) Special Access Program (SAP) information; or

(v) Sensitive Compartmented Information (SCI).

(b) Prohibition on award.

No contract under a national security program may be awarded to an entity controlled by a foreign government if that entity requires access to proscribed information to perform the contract, unless the Secretary of Defense or a designee has waived application of 10 U.S.C. 2536(a).

(c) Disclosure.

The Offeror shall disclose any interest a foreign government has in the Offeror when that interest constitutes control by a foreign government as defined in this provision. If the Offeror is a subsidiary, it shall also disclose any reportable interest a foreign government has in any entity that owns or controls the subsidiary, including reportable interest concerning the Offeror's immediate parent, intermediate parents, and the ultimate parent. Use separate paper as needed, and provide the information in the following format:

Offeror's Point of Contact for Questions about Disclosure (Name and Phone Number with Country Code, City Code and Area Code, as applicable)

Name and Address of Offeror

Name and Address of Entity Controlled by a Foreign Government

Description of Interest, Ownership Percentage, and Identification of Foreign Government

(End of provision)

52.211-14 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be _____ DX rated order; _____ DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation. (Contracting Officer check appropriate box.)

(End of provision)

52.215-6 TYPE OF BUSINESS ORGANIZATION (JUL 1987)

The offeror or quoter, by checking the applicable box, represents that--

(a) It operates as _____ a corporation incorporated under the laws of the State of _____, _____ an individual, _____ a partnership, _____ a nonprofit organization, or _____ a joint venture.

(b) If the offeror or quoter is a foreign entity, it operates as _____ an individual, _____ a partnership, _____ a nonprofit organization, _____ a joint venture, or _____ a corporation, registered for business in _____.
(country)

(End of provision)

52.215-11 AUTHORIZED NEGOTIATORS (APR 1984)

The offeror or quoter represents that the following persons are authorized to negotiate on its behalf with the Government in connection with this request for proposals or quotations: (list names, titles, and telephone numbers of the authorized negotiators).

(End of provision)

52.215-12 RESTRICTION ON DISCLOSURE AND USE OF DATA (APR 1984)

Offerors or quoters who include in their proposals or quotations

data that they do not want disclosed to the public for any purpose or used by the Government except for evaluation purposes, shall-

(a) Mark the title page with the following legend:

"This proposal or quotation includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed-in whole or in part-for any purpose other than to evaluate this proposal or quotation. If, however, a contract is awarded to this offeror or quoter as a result of-or in connection with-the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets (insert numbers or other identification of sheets);" and

(b) Mark each sheet of data it wishes to restrict with the following legend:

"Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation."

(End of provision)

52.215-20 PLACE OF PERFORMANCE (APR 1984)

(a) The offeror or quoter, in the performance of any contract resulting from this solicitation, [] intends, [] does not intend (check applicable block) to use one or more plants or facilities located at a different address from the address of the offeror or quoter as indicated in this proposal or quotation.

(b) If the offeror or quoter checks "intends" in paragraph (a) above, it shall insert in the spaces provided below the required information:

Place of Performance
(Street, Address, City,
County, State, Zip Code)

Name and Address of Owner
and Operator of the Plant or
Facility if Other than Offeror
or Quoter

(End of provision)
(R 3-501(b) Sec K (viii))

52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (JAN 1997)

(a)(1) The standard industrial classification (SIC) code for this

acquisition is _____(insert SIC code).

(2) The small business size standard is _____
(insert size standard).

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representation. (1) The offeror represents as part of its offer that it [] is, [] is not a small business concern.

(2) (Complete only if offeror represented itself as a small business concern in block (b)(1) of this section.) The offeror represents as part of its offer that it [] is, [] is not a small disadvantaged business concern.

(3) (Complete only if offeror represented itself as a small business concern in block (b)(1) of this section.) The offeror represents as part of its offer that it [] is, [] is not a women-owned small business concern.

(c) Definitions. "Joint venture," for purposes of a small disadvantaged business (SDB) set-aside or price evaluation preference (as prescribed at 13 CFR 124.321), is a concern that is owned and controlled by one or more socially and economically disadvantaged individuals entering into a joint venture agreement with one or more business concerns and is considered to be affiliated for size purposes with such other concerns (s). The combined annual receipts or employees of the concerns entering into the joint venture must meet the applicable size standard corresponding to the SIC code designated for the contract. The majority of the venture's earnings must accrue directly to the socially and economically disadvantaged individuals in the SDB concern(s) in the joint venture. The percentage of the ownership involvement in a joint venture by disadvantaged individuals must be at least 51 percent.

"Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

"Small disadvantaged business concern," as used in this provision, means a small business concern that (1) is at least 51 percent unconditionally owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business

having at least 51 percent of its stock unconditionally owned by one or more socially and economically disadvantaged individuals, and (2) has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one or more of these entities, which has its management and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and which meets the requirements of 13 CFR Part 124.

"Women-owned small business concern," as used in this provision, means a small business concern--

(1) Which is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Notice. (1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small or small disadvantaged business concern in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

(i) Be punished by imposition of a fine, imprisonment, or both;

(ii) Be subject to administrative remedies; including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

252.219-7000 SMALL DISADVANTAGED BUSINESS CONCERN REPRESENTATION (DoD CONTRACTS) (JUNE 1997)

(a) Definition. "Small disadvantaged business concern," as used in this provision, means a small business concern, owned and controlled

by individuals who are both socially and economically disadvantaged, as defined by the Small Business Administration at 13 CFR Part 124, the majority of earnings of which directly accrue to such individuals. This term also means a small business concern owned and controlled by an economically disadvantaged Indian tribe or Native Hawaiian organization which meets the requirements of 13 CFR 124.112 or 13 CFR 124.113, respectively. In general, 13 CFR Part 124 describes a small disadvantaged business concern as a small business concern --

(1) Which is at least 51 percent unconditionally owned by one or more socially and economically disadvantaged individuals; or

(2) In the case of any publicly owned business, at least 51 percent of the voting stock is unconditionally owned by one or more socially and economically disadvantaged individuals; and

(3) Whose management and daily business operations are controlled by one or more such individuals.

(b) Representations. Check the category in which your ownership falls --

_____ Subcontinent Asian (Asian-Indian) American (U.S. citizen with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal)

_____ Asian-Pacific American (U.S. citizen with origins from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, U.S. Trust Territory of the Pacific Islands (Republic of Palau), the Northern Mariana Islands, Laos, Kampuchea (Cambodia), Taiwan, Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Republic of the Marshall Islands, or the Federated States of Micronesia, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru)

_____ Black American (U.S. citizen)

_____ Hispanic American (U.S. citizen with origins from South America, Central America, Mexico, Cuba, the Dominican Republic, Puerto Rico, Spain, or Portugal)

_____ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians, including Indian tribes or Native Hawaiian organizations)

_____ Individual/concern, other than one of the preceding, currently certified for participation in the Minority Small Business and Capital Ownership Development Program under Section 8(a) of the Small Business Act

_____ Other

(c) Complete the following --

(1)The offeror is_____ is not _____a small disadvantaged business concern.

(2)The Small Business Administration (SBA) has_____has not _____made a determination concerning the offeror's status as a small disadvantaged business concern. If the SBA has made a determination, the date of the determination was_____and the offeror --

_____Was found by SBA to be socially and economically disadvantaged and no circumstances have changed to vary that determination.

_____Was found by SBA not to be socially and economically disadvantaged but circumstances which caused the determination have changed.

(d) Penalties and Remedies. Anyone who misrepresents the status of a concern as a small disadvantaged business for the purpose of securing a contract or subcontract shall --

(1)Be punished by imposition of a fine, imprisonment, or both;

(2)Be subject to administrative remedies, including suspension and debarment; and

(3)Be ineligible for participation in programs conducted under authority of the Small Business Act.

(End of provision)

52.222-22 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS
(APR 1984) (Applicable if the contract contains clause
at 52.222-26, EQUAL OPPORTUNITY)

The offeror represents that--

(a) It _____ has, _____ has not, participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114;

(b) It _____ has, _____ has not, filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(END OF PROVISION)
(R 7-2003.14(b)(1)(B)1973 APR)

52.222-24 PREAWARD ON-SITE EQUAL OPPORTUNITY COMPLIANCE REVIEW
 (APR 1984) (Applicable if the contract contains clause at
 52.222-26, EQUAL OPPORTUNITY and is expected to exceed
 \$1,000,000

An award in the amount of \$1 million or more will not be made under this solicitation unless the offeror and each of its known first-tier subcontractors (to whom it intends to award a subcontract of \$1 million or more) are found, on the basis of a compliance review, to be able to comply with the provisions of the Equal Opportunity clause of this solicitation.

(End of provision)

52.223-1 CLEAN AIR AND WATER CERTIFICATION (APR 1984) (Applicable
if
 contract contains the clause at 52.223-2, CLEAN AIR AND
 WATER)

The Offeror certifies that--

(a) Any facility to be used in the performance of this proposed contract is _____, is not _____ listed on the Environmental Protection Agency (EPA) List of Violating Facilities;

(b) The Offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the EPA, indicating that any facility that the Offeror proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and

(c) The Offeror will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract.

(END OF PROVISION)

252.225-7000 BUY AMERICAN ACT-- BALANCE OF PAYMENTS PROGRAM
 CERTIFICATE (DEC 1991)

(a) Definitions. Domestic end product, qualifying country, qualifying country end product, and qualifying country end product have the meanings given in the Buy American Act and Balance of Payments Program clause of this solicitation.

(b) Evaluation. Offers will be evaluated by giving preference to domestic end products and qualifying country end products over nonqualifying country end products.

(c) Certifications.

(1) The Offeror certifies that --

(i) Each end product, except those listed in paragraphs (c) (2) or (3) of this clause, is a domestic end product; and

(ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

(2) The Offeror certifies that the following end products are qualifying country end products:

Qualifying Country End Products

Line item No.	Country of origin
---------------	-------------------

(List only qualifying country end products.)

(3) The Offeror certifies that the following end products are nonqualifying country end products:

Nonqualifying Country End Products

Line item No.	Country of origin (If known)
---------------	---------------------------------

(End of provision)

52.226-2 HISTORICALLY BLACK COLLEGE OR UNIVERSITY AND
MINORITY INSTITUTION
REPRESENTATION (MAY 1997)

(a) Definitions. As used in this provision--

"Historically Black College or University" means an institution determined by the Secretary of Education to meet the requirements of 34 CFR 608.2. For the Department of Defense, the National Aeronautics and Space Administration, and the Coast Guard, the term also includes any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

"Minority Institution" means an institution of higher education meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1135d-5(3)) which, for the purpose of this

provision, includes a Hispanic-serving institution of higher education as defined in Section 316(b)(1) of the Act (20 U.S.C. 1059c(b)(1)).

(b) Representation. The offeror represents that it--

[] is [] is not a Historically Black College or University;

[] is [] is not a Minority Institution.

(End of provision)

52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (APR 1996)(Applicable if proposed contract subject to CAS as specified in 48 CFR. If award is to educational institution prior to July 1, 1997, uses basic provision with **Alternate I.**)

Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by Roman numerals I through III.

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201-2(c)(5) or 9903.201-2(c)(6), respectively.

I. DISCLOSURE STATEMENT-COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of \$500,000 resulting from this solicitation, except contracts in which the price negotiated is based on (1) established catalog or market prices of commercial items sold in substantial quantities to the general public, or (2) prices set by law or regulation, will be subject to the requirements of the Cost Accounting Standards Board (48 CFR, Chapter 99), except for those contracts which are exempt as specified in 48 CFR 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR, Chapter 99, must as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offerors proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

CAUTION: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) Check the appropriate box below:

____ (1) Certificate of Concurrent Submission of Disclosure Statement.

The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows: (i) original and one copy to the cognizant Administrative Contracting Officer (ACO), or cognizant Federal agency official authorized to act in that capacity (Federal official), as applicable, and (ii) one copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CASB DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal official and/or from the loose-leaf version of the Federal Acquisition Regulation.)

Date of Disclosure Statement: _____

Name and Address of Cognizant ACO or Federal Official where filed: _____

The offeror further certifies that practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

____ (2) Certificate of Previously Submitted Disclosure Statement.

The offeror hereby certifies that the required Disclosure Statement was filed as follows:

Date of Disclosure Statement: _____

Name and Address of Cognizant ACO or Federal Official where filed: _____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable Disclosure Statement.

(3) Certificate of Monetary Exemption.

The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling more than \$25 million (of which at least one award exceeded \$1 million) in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

____ (4) Certificate of Interim Exemption.

The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with 48 CFR 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting officer, in the form specified under subparagraphs (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

CAUTION: Offerors currently required to disclose because they were awarded a CAS-covered prime contract or subcontract of \$25 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. COST ACCOUNTING STANDARDS-ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of 48 CFR 9903.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Standards clause.

____ The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than \$25 million in awards of CAS-covered prime contracts and subcontracts, or the offeror did not receive a single CAS-covered award exceeding \$1 million. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting

Officer immediately.

CAUTION: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of \$25 million or more if, during its current cost accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of \$25 million or more.

III. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

_____ YES _____ NO

(End of provision)

Alternate I (APR 1996). As prescribed in 30.201-3(b), add the following subparagraph (c)(5) to Part I of the basic provision:

(5) Certificate of Disclosure Statement Due Date by Educational Institution. If the offeror is an educational institution that, under the transition provisions of 48 CFR 9903.201-1(f), is or will be required to submit a Disclosure Statement after receipt of this award, the offeror hereby certifies that (check one and complete):

(i) A Disclosure Statement Filing Due Date of _____ has been established with the cognizant Federal Agency.

(ii) Disclosure Statement will be submitted within 6-month period ending _____ months after receipt of this award.

Name and address of Cognizant ACO or Federal Official Where Discharge Statement is to be Filed

52.242-4 CERTIFICATION OF FINAL INDIRECT COSTS (JAN 1997)

(a) The Contractor shall--

(1) Certify any proposal to establish or modify final indirect cost rates;

(2) Use the format in paragraph (c) of this clause to certify; and

(3) Have the certificate signed by an individual of the Contractor's organization at a level no lower than a vice president or chief financial officer of the business segment of the Contractor that submits the proposal.

(b) Failure by the Contractor to submit a signed certificate, as described in this clause, may result in final indirect costs at rates unilaterally established by the Contracting Officer.

(c) The certificate of final indirect costs shall read as follows:

CERTIFICATE OF FINAL INDIRECT COSTS

This is to certify that I have reviewed this proposal to establish final indirect cost rates and to the best of my knowledge and belief:

1. All costs included in this proposal _____(identify proposal and date) to establish final indirect cost rates for _____(identify period covered by rate) are allowable in accordance with the cost principles of the Federal Acquisition Regulation (FAR) and its supplements applicable to the contracts to which the final indirect cost rates will apply; and

2. This proposal does not include any costs which are expressly unallowable under applicable cost principles of the FAR or its supplements.

Firm: _____

Signature: _____

Name of Certifying Official: _____

Title: _____

Date of Execution: _____

(End of clause)