This October 2001 *Institutional Plan* was originally prepared in the early

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I. Laboratory Director's Statement

II. Mission, Roles, and Strategic Objectives

C. Roles in Accomplishment of DOE Missions

Argonne has a contractual responsibility to serve DOE's four mission areas. In **Science** and in **Energy**, the Laboratory has a principal role. Its role in **Environmental Quality** is as a major contributor. It participates in specialized ways in the Department's **National Security** mission. The contract with DOE defines the Laboratory's science and technology goal as follows: "To perform forefront science and technology aligned

research to joint appointments, collaborations between individual investigators, and strategic alliances.

D. Strategic Context and Planning Assumptions

Argonne is one of DOE's nine major multiprogram national laboratories, and it is one of ten facilities affiliated with DOE's Office of Science. Like most DOE R&D sites, Argonne is contractor managed and operated. Argonne is unique among Office of Science laboratories in encompassing two widely separated campuses: the main site at Argonne-East in the Chicago suburbs and Argonne-West (with major facilities in Idaho).

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Argonne-East

by growing the best, most important programs and

III. Major Laboratory Initiatives

High-throughput approaches will be employed to study nanostructured materials, including the use of (1) highly parallel methods for their

2. Rare Isotope Accelerator

Access to new frontiers for research in nuclear physics is expected through the acceleration of beams of unstable nuclei (rare isotopes). Critical information previously impossible to obtain includes (1) cross sections for astrophysical

3. Functional Genomics

Recent developments in genome-scale DNA sequencing, high-throughput analytical tools, and computing technology have made feasible the genome-wide analysis of biomolecular function. Construction of complete functional maps of cellular behavior now appears to be achievable. The comprehensive characterization of biomolecular function has huge potential as a basis for developing new strategies for modulating cellular activities — capabilities essential for advancing environmental management, human health, and economic productivity.

To address this opportunity, Argonne proposes a major Laboratory initiative to undertake large-scale functional characterizations of macromolecules and macromolecular complexes, complicated structures sometimes characterized as "molecular machines." The goal is to develop complete functional maps of cellular behavior.

reflects anticipated expansion of computational and robotics capabilities and NIH funding to support sector development and operation of an experimental station (the GM/CA-CAT) at the APS. Increased resources for FY 2002-FY 2007 will support multiple Argonne research divisions working — in the areas of computation, engineering, and molecular biology — to determine the molecular structure and function of macromolecular complexes. DOE funding will be sought from DOE-BES (Energy Biosciences; KCKC

Scope

This initiative aims at developing and demonstrating an innovative advanced nuclear reactor and fuel cycle to ensure that large-scale nuclear power is a sustainable option for the long term. Argonne's Advanced Reactor Development initiative consists of (1) nuclear system R&D and design studies and (2) an Advanced Fuel Cycle Demonstration.

Argonne proposes to conduct nuclear system R&D and design studies. These studies will focus

IV. Science and Technology Strategic Plan

This chapter presents an overview of Argonne's strategic plan for research in science and technology. It begins by describing how Argonne's programs and initiatives support the

1. Science: Creating Ideas, Jobs, Products, and Industries for Tomorrow

GOAL: To contribute significantly to the science and technology base needed to accomplish DOE and other national technology development goals; to develop and operate national user facilities that support the advancement of U.S. science and technology; to develop innovative experimental concepts and instrumentation that support fundamental research in energy and matter; to assist in the training of undergraduate and graduate students in science and engineering.

Fundamental Science

- In the burgeoning field of nanoscience,

environmental acceptability of fission energy systems and that reduce their costs; to develop,

management of excess fissile materials and

missions, has been distilled by the Office of Science into four themes:

- Exploring Matter and Energy: Building

Goals and Objectives

The overall goals of the APS are (1) to increase beam availability, beam quality, and

b.

levels at 1,000

of metal ions with chelating agents and solvent molecules, by designing and characterizing new reagents for more effective separations, and by examining the physical

capable of generating X-rays, enabling ultrafast studies of the interaction of X-rays with atoms and molecules.

Argonne's integrated program in the fundamental chemistry of radioactive waste is partly supported by the DOE Environmental Management Science Program. The Laboratory is uniquely qualified to undertake this program through its core capabilities in chemical separations science, heavy-elements chemistry, radiation chemistry, and theoretical chemistry, as well as through its facilities for research with radioactive materials (including the facility for actinide studies at the APS and the nuclear magnetic resonance facility designed for studying radioactive materials). This program of experimental and theoretical research is responding to a national need for greater fundamental knowledge NCE AND0 TD -0 iied to undek Tc53vEnolog for res

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IV. SCIENCE AND TECHNOLOGY STRATEGIC PLAN

Calorimeter fabrication began in FY 1999 and must be completed by late FY 2002, when

- Contribute importantly to the nation's enabling computing technologies by developing the software tools, distributed computing, visualization, and numerical libraries needed to solve the most challenging scientific problems.
-

IV. SCIENCE AND TECHNOLOGY STRATEGIC PLAN

ultimately, organismal behavior will require novel approaches to simulations of complex systems. In the 21st century, computation will come to dominate the biological sciences.

Vision

Argonne will move toward a leadership position in postgenomic biology by creating a model program for integrative analysis of the molecular machines of the cell. The Laboratory

- *Small-Angle X-ray Scattering.* The structure of gene products that cannot be crystallized will be analyzed by using small-angle X-ray diffraction from aqueous solution. Methods for predicting protein structure from solution scattering will be developed in coordination with bioinformatics analysis of existing protein structure databases.

- *Program for Combinatorial Biology*. A comprehensive, multitasked program in

crystallography, Argonne is building a major Laboratory initiative in Functional Genomics (Section III.A.3). Research on the structure, assembly, and operation of biomolecular machines is greatly expedited by the use of large-scale, high-throughput capabilities for analyzing intermolecular interactions and other biochemical and biophysical parameters of macromolecular complexes. This initiative will establish the resources needed for comprehensrldi-tudies of biomolecular machines, interface this effort with the Laboratory's ongoing work in structural genomics, and use the resulting capabilities to characterize the molecular machines critical to cellular processes in all organisms.

l. Biotechnology

Situation

Biotechnology research at Argonne is a multi-disciplinary, crosscutting effort that integrates diverse expertise and technologies through moleculari-tudies using unique research facilities. The focus is development and adaptation of technologies that can support new applications or innovative approaches to solving old problems.

Results could guide the development of highly specific pharmaceuticals.

Emergency Resuscitation. A joint research

Initiative: Biochips and DNA

Initiative: Biobased Products

Argonne conducts research for the Atmospheric Chemistry and Environmental Meteorology components of the DOE-BER Atmospheric Sciences Program and provides the lead scientist for Atmospheric Chemistry. The Laboratory participates in collaborative field campaigns that gather information on the sources and fates of oxidants and particulate matter in the lower atmosphere and on associated meteorological processes. Associated DOE research addresses numerous scientific challenges related to the effects of energy-related trace chemicals on local and regional air quality and on climate. The work at Argonne emphasizes dry air-surface exchange, which affects the budgets of chemicals in the lower atmosphere; chemical transformations leading to oxidant and particle formation; and physical processes that transport materials vertically and horizontally in the lower one or two kilometers of the atmosphere.

The central goal of Argonne's work in synchrotron-based environmental science is an atomic- and molecular-level understanding of structure and processes in environmental systems.

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MR-CAT, SRI-CAT, and GSECARS-CAT), as well as beam time at the National Synchrotron Light Source and the Stanford Synchrotron Radiation Laboratory. Substantially more access to APS beam time will clearly be required for the expanded scientific program envisioned in this initiative. Development of new beamline capabilities will be pursued through partnerships with other organizations having complementary research interests.

To meet the need for additional synchrotron environmental science capabilities, Argonne has formed a partnership with Brookhaven National Laboratory, the University of Chicago, the University of Illinois-Chicago, and the University of Notre Dame to establish a new collaborative access team at the APS that will be devoted to environmental research. This collaborative access

Objectives

Argonne's primary near-term objectives in support of science education and training are as follows:

- Continue to attract a large, diverse pool of highly qualified undergraduate students to research participation programs.
- Establish the Laboratory's educational user facility as a valuable and widely used resource providing hands-on laboratory experience for science teachers in the region; enhance classroom activities through use of the Internet.
- Foster student interest in science education and science careers through a variety of outreach efforts.
- Fruitfully integrate graduate students, post-doctoral fellows, and faculty into Laboratory research programs through internships and training activities.
- Provide training programs and technical assistance to a variety of international organizations.

Issues and Strategies

For its university-level programs, Argonne plans special efforts to -rch Tw (Internet0 -13.2 -rator snternet.Tw (Is8.7342Tw (traivities throuatdelll broats

For more than a half century, Argonne has been a world leader in the development of nuclear energy. The Laboratory's staff has extensive expertise in the full range of disciplines associated with nuclear reactor technology, and a full complement of experimental facilities is in place, representing many hundreds of millions of dollars of national assets. Currently, Argonne's nuclear

b. Energy and Industrial Technologies

Situation

Argonne develops innovative, efficient, cost-effective nonnuclear energy technologies and industrial technologies. Emphasis is on advanced transportation (discussed separately in Section IV.B.2.c), "industries of the future"

research, domestic and international, will continue to focus on the following areas:

- *Vehicle Systems*. New vehicle systems promise to overcome the main limitations of conventional electric vehicles, namely range [illegible]

expected to enable the development of catalysts and other new transportation materials.

activities are staff who operated and maintained EBR-II over its 30 years of operation, staff who operated the hot cells (at the HFEF, FCF, and Analytical Laboratory), staff who provided technical and analytic support for operations and research programs at Argonne-West, and support staff in areas such as radiation protection, safeguards, and security. Closure of the EBR-II reactor requires most of the same capabilities as earlier activities.

various stages of development, with support from the DOE-EM Office of Science and Technology. Nevertheless, despite extensive cleanup efforts and this planning, many DOE waste streams associated with weapons production are expected to require treatment beyond the coming decade. In addition, many high-level wastes, spent nuclear fuel, materials associated with plutonium disposition, and other special nuclear materials are expected to remain problematic. Beyond 2006, new science and technology will be needed to address these long-term concerns at DOE sites; the national laboratories must play an essential role in the development, demonstration, and implementation of that science and technology.

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Scrap and Waste Facility. These wastes require additional characterization, segregation, treatment,

Idaho, and the national nuclear complex: (1) near-term management of wastes resulting from nuclear research conducted in earlier years at Argonne-West, (2) R&D to achieve nuclear energy and national security goals, and (3) R&D to achieve environmental technology goals. Special needs in each of these three areas require that DOE operate

IV. SCIENCE AND TECHNOLOGY STRATEGIC PLAN

D&D of a number of reactors and related facilities at the Laboratory is presently planned or is in progress. These facilities are prototypes of systems used commercially, and they therefore provide excellent test beds for the demonstration of D&D technologies under controlled laboratory

Issues and Strategies

Key to the development of Argonne's D&D Technology Program is formation of strategic alliances among national laboratories, utilities, universities, D&D contractors, and technology

Argonne's strategic planning for solving energy and environmental problems is driven by the following national needs:

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- Develop new approaches that enhance the security of the nation's oil, gas, and electricity infrastructure, as well as related U.S. capabilities in emergency services, resource supply, transportation, and urban systems.
- Focus the Laboratory's multidisciplinary assessments on issues of global climate change and the management and use of energy resources.
- Expand international activities that address global climate change and environmental

highly complex, nonlinear arena of energy and environmental issues.

Initiative: Science and Technology for Environmental Stewardship

Early in FY 2000, a reorganization of DOE-EM created within its Science and Technology component the Office of Long-Term Stewardship. In DOE's September 2000 R&D portfolio analysis for its Environmental Quality

This Nonproliferation Technologies initiative is strongly leveraged with core Argonne programs, including those in spent nuclear fuel treatment, nuclear waste, nonproliferation, and facility operations. Synergies have been particularly important in the areas of (1) nuclear material and waste characterization and (2) nuclear technology

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leading multilaboratory teams of experts in modeling and analyzing infrastructure interdependencies and protecting high-threat civilian interior infrastructures.

Resour

V. Operations and Infrastructure Strategic Plan

This chapter's description of Argonne planning for operations and infrastructure is presented at two levels. The main body of the chapter comprises individual strategic plans for human resources; environment, safety, and health; site and facilities; safeguards and security, counterintelligence, export control, and nonproliferation; information management; communications, outreach, and community affairs; performance-based management; and productivity improvement and overhead cost reduction. The introductory discussion presents globally relevant

handled within INEEL as Waste Area Group 9 (WAG 9). For WAG 9, Argonne-West selected phytoremediation using specially selected plants to extract heavy metals and radionuclides from surface soil and water. The radionuclides and metals are concentrated in aboveground plant parts, which are harvested and removed from the site. Phytoremediation using both *Kochia scoparia* and willow plants has proven effective, and both of these parts of the cleanup project are aheaf4 013.9697

Strategies

Argonne regularly (1) evaluates its ES&H requirement documents to ensure that they reflect changing regulations, (2) implements the documented requirements, and (3) assesses various ES&H program elements to measure

The Laboratory's Condition Assessment Survey uses industry and DOE standards to evaluate systematically the condition of the Argonne-East physical plant. Assessments performed by outside specialists provide a credible, auditable basis for determining physical plant needs. Each facility or utility is surveyed every three to five years, and a life-cycle-based ten-year forecast of needs is developed. These assessments use standard cost estimating data, and needs are rated by using the Capital Asset Management Program scoring system.

and aged facilities, such as the numerous trailers

Argonne maintains a *List of Sensitive Technologies* that identifies unclassified sensitive programs, information, and technologies. Programs, information, and technologies can appear on this list for reasons associated with export control, designation as controlled

multigigabit-per-second range. Remote-access systems are being reengineered to allow secure

DOE offices are based on criteria specified in the

VI. Resource Projections

The resource projections in this chapter are considered a reasonable baseline for planning the desired future of the Laboratory and for addressing important contingencies, particularly those associated with increasingly stringent federal budgets. The projections do not necessarily represent the outcome that the Laboratory

Table VI.2 Laboratory Personnel Summary (in FTE)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007

Table VI.3 Funding by Assistant Secretarial Office (Cont.)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Table VI.8 — Environmental Management								
Operating	21.9	19.8	18.7	19.6	9.2	9.2	9.2	9.2
Capital Equipment								

Table VI.3 Funding by Assistant Secretarial Office (Cont.)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007

Table VI.3 Funding by Assistant Secretarial Office (Cont.)

Table VI.4 Science: Resources by Subprogram (Cont.)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007

VI. RESOURCE PROJECTIONS115

Table VI.6 Energy Efficiency and Renewable Energy: Resources by Subprogram
($ in millions BA, personnel in FTE)

FY 2000

Table VI.6 Energy Efficiency and Renewable Energy: Resources by Subprogram (Cont.)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007

Table VI.7 Fossil Energy: Resources by Subprogram ($ in millions BA, personnel in FTE)

Table VI.7 Fossil Energy: Resources by Subprogram (Cont.)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007

Table VI.12 Policy ($ in millions BA, personnel in FTE)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007

Table VI.17 Security and Emergency Operations: Resources by Subprogram
($ in millions BA, personnel in FTE)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007FS43

Table VI.19 Work for Others (WFO) Program (Cont.)

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007

Appendix A: The Argonne Profile from the *Strategic Laboratory Missions Plan*

The DOE Laboratory Operations Board in July 1996 issued the *Strategic Laboratory Missions Plan*

[redacted]

Table B.1 Argonne's Direct Collaborations with Other DOE Laboratories and Beyond (Cont.)

DOE Program	Argonne's R&D Partners — National Laboratories; Others

Table B.1 Argonne's Direct Collaborations with Other DOE Laboratories and Beyond (Cont.)

DOE Program	Argonne's R&D Partners — National Laboratories; Others	Total DOE Program Funding (FY 2001)

Table B.1 Argonne's Direct Collaborations with Other DOE Laboratories and Beyond (Cont.)

DOE Program	Argonne's R&D Partners — National Laboratories; Others	Total DOE Program Funding (FY 2001)	Joint Roles of DOE Laboratories

Table B.1 Argonne's Direct Collaborations with Other DOE Laboratories and Beyond (Cont.)

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DOE Program

Table B.1 Argonne's Direct Collaborations with Other DOE Laboratories and Beyond (Cont.)

DOE Program	Argonne's R&D Partners — National Laboratories; Others	Total DOE Program Funding (FY

APPENDIX B: ARGONNE IN AN INTEGRATED DOE LABORATORG d1eIvTEMAP

Table B.1 Argonne's Direct Collaborations with Other DOE Laboratories and Beyond (Cont.)

DOE Program	Argonne's R&D Partners — National Laboratories; Others	Total DOE Program Funding (FY 2001)	Joint Roles of DOE Laboratories	Collaboration Highlights and Innovations
DEFENSE NUCLEAR NONPROLIFERATION				
International Nuclear Safety Program (not including the research-oriented International Nuclear Safety Center, discussed below). In cooperation with other Western industrialized				

A comprehensive study of degradation in the

most cost-effective technical approaches to environmental management. The Laboratory evaluates environmental quality systems for the Air Combat Command. For the Air Force Materiel Command, the Laboratory is developing innovative approaches to computer-assisted

objects intensively and is a sophisticated and comprehensive implementation of modern object-oriented theory. Initial development, pioneered by J-8 and Argonne, has already elicited interest and funding from the armed services and other DOD agencies.

Also for J-8, Argonne is pioneering the use of advanced information retrieval techniques in planning and decision support systems. Suc pioneered by

sites to develop techniques for the environmental characterization of contaminated installations in the continental United States. The research focuses on developing methodologies for characterizing groundwater pathways and contaminant plume configurations that will serve as models for other installations, thereby expediting the selection of remediation technologies and the cleanup or closure of bases at

the Center, including critical issues related to military munitions and environmental management of military ranges.

For the U.S. Army Defense Ammunition Center (USADAC), a part of the Operations Support Command (OSC), the Laboratory is developing a data system for hazardous waste characterization to support environmental compliance related to the destruction of munitions and explosives at Army installations and to the reuse and recycling of components. In related efforts,

2. Federal Emergency Management Agency

Argonne's support to the Federal Emergency Management Agency involves three major areas relating to accidental or deliberate releases of chemical, biological, and radiological materials: (1) analysis and evaluation of the capabilities of U.S. industry, nearby communities, and host states to respond to emergencies involving the materials; (2) R&D on guidance for emergency planning,

sampling, analytical, and computer data processing methods — to map the subsurface distribution of contaminants in soils and groundwater at former CCC/USDA grain storage sites. In addition, Argonne is conducting pilot

choose to subcontract to the national laboratories in the pursuit of new technology. (See Section S1.D.2.)

10. Department of the Interior

Argonne provides technical support on environmental issues to the Bureau of Land Management (BLM) of the Department of the

improving reliability in machining of ceramic valves for low-emission heavy-duty diesel engines.

•

• University of Illinois at Urbana-Champaign: Assistance in developing

Research Institute on technology for seismic isolation and for neutron computed tomography.

With Egypt's Cairo University, Argonne is investigating the hydrologic impacts of the Tushka Canal in southwest Egypt, which will divert Nile

S1-16

Supplement 2: Technology Transfer

2. Work for Others

Argonne conducts work for sponsors other than DOE — including industrial firms, universities, state and local governments, and other federal agencies — on a cost-reimbursable basis (i.e., Argonne does not contribute to the cost of the research). This WFO is discussed in more detail in Supplement 1.

3. Personnel Exchanges

Argonne exchanges scientific staff with industrial firms through a variety of mechanisms, including CRADAs and guest agreements.

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SUPPLEMENT 2: TECHNOLOGY TRANSFER

products benefit from smooth, uniform coverage

property when it is reported in scientific and trade publications and in technology transfer materials.

Royalty shares resulting from the licensing of Argonne technology are first disbursed to inventors and authors. The remainder of the royalties are returned to the Laboratory divisions from which the licensed technology originated, to be used for R&D and education, within policies set by the Laboratory in accordance with the *Prime Contract*.

2. Patenting and Licensing Highlights

As discussed in Section S2.A.5, the biochip CRADA executed in 1998 with Motorola and Packard Instruments Company concluded in FY 2001. Licenses of related inventions to the CRADA partners include provisions for substantial royalties. The Laboratory has a collaborative memorandum of understanding with

Argonne has developed technology to recover plastics from a variety of sources, including disassembled car parts, obsolete appliances, industrial scrap plastics, and consumer electronics. Argonne's unique "froth flotation" process separates homogeneous high-purity plastics from

SUPPLEMENT 2: TECHNOLOGY TRANSFER

Table S3.1 Replacement Value of Argonne Facilities (millions of FY 2000 dollars)

Facilities Type	Argonne-East	Argonne-West

considering restart of the reactor and addition of a

The original multiprogram facilities at Argonne-East, built primarily in the early 1950s, urgently require modernization if they are to perform future research missions effectively. Selective adaptation and modernization of high bay areas, as well as the addition of new high bays, are needed for new programs, most notably in the 360 area.

Argonne's paramount concern remains the continued viability and enhancement of safety and environmental performance — for buildings of all ages, for sitewide utilities, and for other infrastructure. Figure S3.4 provides historical

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Figure S3.4 Condition of Argonne-East Buildings, 1995-2001

Table S3.3 Proposed General Purpose Equipment Funding for Argonne-East ($ in millions BA)

FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07

facilities. Centralized ownership of facility management processes allows the Plant Facilities

and prioritized by representatives of all facility stakeholders, including programmatic organizations. This integration and prioritization process has been formalized and documented. It includes

fiber optic cables between most of its major buildings. This network is continuing to grow to meet increasing demand. Installation of fiber optic facilities by major long-distance carriers continues, to allow ever-improving communication with other scientific and educational institutions. Argonne also maintains national network connections such as ESnet (the DOE-Science network) and MREN (a high-speed test network in the Chicago metropolitan area). These external networks interface with local Laboratory networks and help to position Argonne as a major player in national and international networking initiatives.

Total replacement of the Argonne-East telecommunications system will soon be necessary. The Laboratory anticipates installing a fully integrated voice-data-video-wireless sitewide communications system that combines traditional PBX (private branch exchange) features with capabilities for data switching, video teleconferencing, wireless connectivity, and Internet access. This state-of-the-art system will support the communications requirements of the Laboratory's research programs for the next several years.

Scientific research increasingly requires access to advanced computing and computer

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performance. The building will replace leased off-

approximately in half and will provide better coverage at roadway intersections and in parking lots.

Multiprogram Computational Facility. This project will provide a computational center (40,000 square feet) as a focus for massively parallel computers and simulation technologies. In existing facilities, computers cannot be co-located with virtual-reality equipment in a way that adequately allows for expansion and reconfiguration.

Building 362 Asbestos Abatement. Asbestos-containing materials (ACMs) are present in numerous older buildings at Argonne-East. Damaged ACMs threaten building occupants and workers and must be repaired or removed; undamaged ACMs may be left undisturbed or sealed. This project will remove asbestos fireproofing materials now under floor decks and

general purpose support facilities. Examples are replacement of the central fire protection building (Building 333) and replacement of scattered, older

Argonne. Future science facilities for which

Table S3.4 Major Construction Projects[a] (Cont.)

TEC	FY 2000	FY 2001	FY 2002	FY

2SSite-Wide Ammunition System Review (SSAR) Modernization Program (SMP) Tranche 1 Tranche 2 Tranche 3 TD

Supplement 4: Other Charts and Tables

Table S4.2 Experimenters at Designated Argonne User Facilities — FY 2000

User Affiliation	Number of Individual Experimenters	Number of Organizations SUPPercers

Table S4.5 Total External Subcontracting and Procurement ($ in millions)

Source	FY 2000	FY 2001	FY 2002	FY 2003
Universities	6.7	6.8	6.9	7.0
All Other	103.3	103.2	103.1	103.0
Transfers to Other DOE Facilities	15.0	15.0	15.0	15.0
Total External Subcontracts and Procurement	125.0	125.0	125.0	125.0

Table S4.6 Procurement from Small or Disadvantaged Businesses ($ in millions)

Source	FY 2000	FY 2001	FY 2002	FY 2003
Procurements from Small or Disadvantaged Businesses	67.2	52.8	53.4	53.9
Percent of Annual Procurement	50.3	48.0	48.5	49.0