

PART I – The Schedule

Section C

Description/Specifications/Work Statement

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C-1 Introduction

Battelle Memorial Institute, Pacific Northwest Division (the Contractor) shall, in accordance with the provisions of this Contract, accomplish the missions and programs assigned by DOE and manage and operate the Pacific Northwest National Laboratory (PNNL or the Laboratory).

PNNL is one of DOE's Office of Science (SC) multi-program national laboratories. The Laboratory is a Federally Funded Research and Development Center (FFRDC) established in accordance with the Federal Acquisition Regulation (FAR) Part 35 and operated under this management and operating (M&O) contract, as defined in FAR 17.6 and DOE Acquisition Regulation (DEAR) 917.6.

The Laboratory supports DOE's strategic themes in energy security, nuclear security, scientific discovery and innovation, environmental responsibility, and management excellence, in accomplishing the Department's mission. The Laboratory mission is to conduct basic and applied research and development (R&D) to advance scientific knowledge, the nation's energy resources, national security, environmental quality, and to strengthen educational foundations and national economic competitiveness. DOE programs are carried out in partnership with other DOE national laboratories, academia, government agencies, the international scientific community, and the private sector. The Contractor will seek to advance the frontiers of science and technology through broad interdisciplinary R&D programs that answer fundamental questions, solve technical problems (locally, regionally, nationally, and internationally), and support the development and application of technologies to address societal needs.

The Contractor has the responsibility for performance under the contract, including determining the specific methods for accomplishing the work effort, performing quality control, and assuming accountability for accomplishing the work under the contract to the benefit of the government. The Contractor shall conduct all work in a manner that optimizes productivity, and fully complies with all applicable laws, regulations, and terms and conditions of the Contract.

It is the Contractor's responsibility to develop and implement innovative approaches and adopt practices that foster continuous improvement in accomplishing the mission of the Laboratory. DOE expects the Contractor to employ effective and efficient management structures, systems, and operations that maintain high levels of quality, safety and security in accomplishing the work required under this contract, and that, to the extent practicable and appropriate, rely on national, commercial, and industrial standards that can be verified and certified by independent, nationally recognized experts and other independent reviewers.

C-2 Statement of Work

2.1 General

The Contractor shall furnish the necessary personnel, facilities, equipment, materials, supplies, and services (except those provided by the Government) to accomplish the statement of work. The statement of work under this Contract is comprehensive in that the Contractor is expected to perform all necessary technical, operational, and management functions to manage and operate PNNL and perform the DOE missions assigned to PNNL.

The Contractor is expected to evaluate and update annually as necessary the PNNL mission statement as part of the Office of Science Laboratory Planning process. The Contractor shall define a long-range vision for PNNL. The long-range vision shall include how the Contractor will steward the core capabilities assigned to it by the Office of Science, define a science strategy for the future with major initiatives, provide a vision for current or future User Facilities, outline a plan for Strategic Partnership Projects and use of laboratory resources, provide a laboratory vision from an infrastructure standpoint (Campus Strategy), identifying gaps to enable a mission ready core capabilities, a clear plan to address those gaps, major investments in campus facilities and grounds, how the Contractor will attract and retain talent, maintain cost control and will status those activities as part of the Laboratory Planning process.

2.2 Department of Energy Research and Development Mission

PNNL's research and development missions and programs support the overarching mission of the DOE through efforts in fundamental, energy and environmental sciences and technologies, and national security. PNNL shall provide highly skilled staff supporting scientific discovery and multi-disciplinary efforts to rapidly translate scientific discoveries into applications in physical, biological, computational, and environmental sciences, and operate scientific user facilities such as the Environmental Molecular Sciences Laboratory (EMSL). PNNL shall support the Department's Science and Technology mission to sustain and nurture the nation's science and technology enterprise, to support national goals in security, energy, environmental quality, human health and economic growth, and to provide a significant resource for scientists world-wide to engage with Laboratory staff in accelerating the nation's progress towards these goals.

Over the term of this Contract, the Contractor shall conduct a broad spectrum of research and development programs in DOE's science, national security, environmental quality, and energy missions as assigned by DOE. The Contractor shall make its government-funded scientific and technical research results broadly available to the public. The Contractor

shall also provide technical advice and guidance to DOE in support of policy development, program planning, and other DOE activities as requested by DOE, and shall bring forward recommendations for new research and development programs designed to achieve DOE mission goals.

In keeping with its overall role as a multi-program national laboratory, the specific research programs conducted and the overall mix of research at PNNL will change, as needed, over the Contract period with DOE's changing mission needs, advances in science and technology, and other drivers. This statement of work does not represent a commitment to, or imply funding for, specific projects or programs.

2.2.1 Science and Energy Mission Role

The Contractor shall deliver the fundamental scientific knowledge and discoveries to advance the frontiers defined by the DOE Office of Science core capabilities. The Contractor shall translate those discoveries into contributions to the DOE's Science & Energy Strategic Objectives of:

- Advancing the goals and objectives by supporting prudent development, deployment, and efficient use of "energy strategy" that also create new jobs and industries.
- Supporting a more economically competitive, environmentally responsible, secure and resilient U.S. energy infrastructure.
- Delivering the scientific discoveries and major scientific tools that transform our understanding of nature and strengthen the connection between advances in fundamental science and technology innovation.

2.2.2 National Security Mission Role

In the national security mission, the Contractor shall support DOE efforts to advance new measurement and analytical systems to transform nuclear and cyber security infrastructure, increase situational awareness and reduce the threat from weapons of mass effect. Contributions to mission include:

- Lowering the risk represented by weapons of mass destruction and other threats to our nation.
- Supporting other operational mission needs with research, policy support, and technology development and deployment, including but not limited to, defense energy and environmental programs,

cyber and data science, infrastructure resilience, chemical and biological forensics and airport security.

2.2.3 Environmental Management Mission Role

The Contractor shall provide science, technology, engineering and deployment support to DOE's effort to aggressively clean up the environmental legacy of nuclear weapons and civilian nuclear research and development programs, permanently dispose of the Nation's radioactive wastes. The Contractor shall provide science and technology contributions that substantially reduce the cost, time, and risk associated with DOE's cleanup, and enable site cleanup and closure decisions to have a sound, scientific basis.

2.3 FFRDC Research and Development Mission

The Secretary of Energy has authorized PNNL to operate as a Federally Funded Research and Development Center (FFRDC) established in accordance with Federal Acquisition Regulation Part 35 and operated under this management and operating (M&O) contract, as defined in FAR 17.6 and DEAR 917.6. DOE is committed to provide the appropriate use of PNNL assets for the benefit of other Federal agencies, private companies, universities, state and local institutions, and international entities within the limits set by DOE policy. The Contractor shall continue to use its multidisciplinary capabilities and apply its expertise to conduct research for the government and the private sector through Strategic Partnerships Program (SPP), Cooperative Research and Development Agreements (CRADAs) and Agreements to Commercialize Technology (ACT).

2.3.1. Strategic Partnerships Program (SPP)

The Contractor is expected to develop and maintain a strategic approach to managing the SPP portfolio to assist Federal agencies and non-Federal entities in accomplishing goals that may otherwise be unattainable and to avoid duplication of effort at Federal Facilities (access to highly specialized or unique facilities, services or technical expertise); increase research and development interactions to transfer technology originating at the laboratory to industry for further development or commercialization; and to maintain core capabilities and enhance the science and technology base at the laboratory. SPP work must be consistent with or complimentary to the missions of DOE and the Laboratory (to include the SC core capabilities).

2.3.2. Cooperative Research and Development Agreements (CRADAs)

The Contractor is expected to use CRADAs consistent with the terms of this Contract to facilitate the commercialization of technology, optimize resources, and protect the Government, the Contractor and the CRADA participant (s) involved.

2.3.3. Agreements to Commercialize Technology (ACT)

The Contractor may conduct privately-sponsored research at the Contractor's risk for third parties. In performing ACT work, the Contractor may use staff and other resources associated with this Contract for the purposes of conducting research and furthering the DOE technology transfer mission in accordance with the terms of this Contract.

2.4 University, Research Institutions, Industry and International Collaboration Efforts

DOE expects the Contractor to establish partnerships with Universities, Research Institutions, Industry, and International institutions. The purpose of these efforts will be to build on the scientific knowledge of the institution, create through collaboration efforts and solutions to scientific issues and develop technologies that can be placed into the commercial sector to benefit the Nation.

2.4.1 Cooperation with Universities and Other Research Institutions

The Contractor shall also manage and operate programs for cooperation with academic and nonprofit research institutions to integrate research and education in scientific and technical fields underlying DOE's programs, as well as facilitate strategic collaborations between PNNL and other research and educational institutions. Such cooperation with academic and nonprofit research institutions shall include but are not limited to:

- Joint appointments;
- Establishment and operation of joint graduate programs with domestic universities; and
- Joint programs and/or institutes with universities in priority areas of science

2.4.2 International Research Collaboration and Cooperation

In accordance with applicable policies, the Contractor shall maintain a broad program of international research collaboration in areas of research interest to the federal government. This collaboration will be both in areas where federal government has formal international cooperation agreements which assign the Contractor a specific role, as well as in areas of general interest to the federal governments' research programs.

2.4.3 Technology Transfer with Industry

The Contractor shall cooperate with industrial organizations to assist in increasing U.S. industrial competitiveness, by assisting in the application of science and technology. Such cooperation may include, when appropriate, an early transfer of information to industry by arranging for

the active participation by industrial representatives in PNNL's programs. Cooperation with industrial entities may include long-term strategic relationships aimed at commercialization of inventions or the improvement of industrial products. The Contractor may respond through appropriate mechanisms to specific near-term technological needs of industrial companies with special consideration given to working with small, small disadvantaged and women-owned businesses as well as regional and local companies through special assistance programs targeting such organizations. The Contractor is expected to develop productive relationships with regional and local companies. Cooperation may also include use by industrial organizations of Laboratory facilities and other assistance as may be authorized, in writing, by the Contracting Officer. The Contractor is also encouraged to engage in strategic collaborations with domestic industry that maintain PNNL capabilities and further small business development.

2.5 PNNL Regional and Community Involvement

The Contractor shall support local and regional economic development and apply existing Laboratory assets in the execution of such support. The Contractor shall also promote the institution within the local and regional communities.

The Contractor is expected to create opportunities to educate and train future generations of scientists, engineers, and innovators to support DOE's workforce development and science, technology, engineering and mathematics (STEM) education efforts.

2.6 Operating Envelope

The Contractor shall achieve assigned objectives in a manner that is safe, secure, legally and ethically sound, as well as fiscally responsible. The operating envelope for PNNL is limited to work authorized by DOE by individual project approvals or through letters of direction, using approved work locations, and conducted in accordance with the approved PNNL Integrated Safety Management System and Safeguards, Security Management Plan and Appendix H.

2.6.1 PNNL Work Locations and Expectations

PNNL facilities may include Government-owned or leased facilities as well as approved Contractor leased facilities at such other locations as may be approved by DOE for use under this Contract. Subject to mutual agreement, other facilities may be used in the performance of the work under this Contract (e.g., Contractor-owned or Contractor-leased facilities) as approved by the Contracting Officer Section J, Appendix H).

Research and development work performed outside approved work locations (i.e. off-site) shall be reviewed and assessed for hazards, risks, application of appropriate mitigating controls and, as necessary, briefing of PNSO personnel prior to the initiation of work.

In accordance with the *Operational Agreement between the Office of Science Pacific Northwest Site Office and the Office of Environmental Management Richland Operations Office (Operational Agreement)*, incorporated as Section J, Appendix F of this Contract, the Contractor shall operate designated DOE Office of Environmental Management (EM) facilities located on the Hanford Site in the 300 Area. The Contractor will maintain the resources and expertise required to support these activities.

The Contractor shall perform overall integrated planning, acquisition, upgrades, and management of Government-owned, leased, or controlled facilities and real property accountable to PNNL. The Contractor shall employ an integrated management approach for management and utilization of PNNL facilities and infrastructure to support mission.

The Contractor shall employ facilities management practices that are integrated with mission assignments and business operations. The maintenance management program shall maintain facilities, equipment and materials in a manner that:

- promotes and improves operational safety, environmental protection and compliance, property preservation, and cost effectiveness;
- ensures protection of life and property from potential hazards, continuity and reliability of operations, and fulfillment of program requirements; and
- ensures the condition of the assets will be maintained or improved to meet the DOE mission.

The Contractor shall initiate and continually improve facility and waste management practices that implement the “Start Clean – Stay Clean” principles whereby research projects and facility operations are planned and executed so to leave no residual waste, contamination or liability at the end of each project. Sufficient project funds must be maintained to ensure full restoration, remediation, and waste disposition can be achieved prior to project completion.

For all non-federal facilities, DOE Site Office Manager approval must be obtained prior to 1) the use of any unsealed radioactive material (as defined in the DOE-approved PNNL Radiation Protection Program) that may potentially contaminate the structure or systems (e.g., ventilation) of a facility outside an engineered confinement barrier, or 2) any planned activity that may introduce residual contamination (e.g. beryllium, crystalline perchlorates, hexavalent chromium, nanoparticles, biological agents) that may potentially contaminate the structure or systems (e.g., ventilation) of a facility outside an engineered confinement

barrier. Radioactive sealed sources may be used in non-federal facilities or locations, as long as they meet the definitions and controls specified in the DOE-approved PNNL Radiation Protection Program.

For those facilities previously radiologically remediated or that have not been engaged in radiological work, the Contractor may not conduct radiological work without DOE Site Office Manager approval.

2.6.2 Hazards/Risks

The Contractor as part of its Integrated Safety Management System (ISM) will maintain a risk analysis system acceptable to DOE that addresses institutional/reputational, environment, safety, health or business risks and legacy considerations created by the acceptance of work under this Contract. All proposed work shall clearly identify risks and legacy considerations as part of the work authorization package along with justification for performing the work and controls that will be instituted to mitigate the risks and legacy considerations and where necessary the approvals required to initiate the work. Work will be conducted on the PNNL campus with protection of the public and environment in mind such that higher risk activities are conducted with the greatest buffer and separation practical.

The Contractor shall not conduct research with biological agents that exceed biosafety level II or involve Tier I select agents without prior DOE Site Office Manager approval. The Contractor will maintain individual facility chemical inventories below Threshold Planning Quantities. The Contractor will maintain radiological materials within authorized operating limits. The Contractor shall maintain business systems within compliance of applicable laws, regulations and directives.

DOE maintains its right to not authorize the proposed work based upon analysis of the hazards/risks and legacy considerations involved.

2.6.3 Security

The Contractor shall conduct work in a manner that protects sensitive unclassified information, classified information, special nuclear material, cyber systems and Government property, from sabotage, espionage, loss or theft. The Contractor shall obtain approval of safeguards and security plans from the cognizant security authority (i.e., Site Office Manager) which describes protective measures appropriate to the work being performed. Any significant changes or deviations from the approved safeguards and security plans require the cognizant security authority's review and approval.

C-3 Performance Expectations, Objectives, and Measures

3.1 Core Expectations

3.1.1 General

The relationship between DOE and its national laboratory management and operating contractors is designed to bring best practices for research and development to bear on the DOE's missions. Through application of these best practices, DOE seeks to assure programmatic and operational performance of today's research programs and the long-term quality, relevance, and productivity of the laboratories against tomorrow's needs. Accordingly, DOE has substantial expectations of the Contractor in the areas of: program delivery and mission accomplishment; laboratory stewardship; and laboratory operations and financial management.

3.1.2 Program Delivery and Mission Accomplishment Expectations

The Contractor is expected to provide effective planning, management, and execution of assigned research and development programs. The Contractor is expected to execute assigned programs so as to strive for the greatest possible impact on achieving DOE's mission objectives, to aggressively manage PNNL's science and technology capabilities and intellectual property to meet these objectives, and to bring forward innovative concepts and research proposals that are well-aligned with DOE missions. The Contractor shall propose work that is aligned with, and likely to advance, DOE's mission objectives, and that is well matched to Laboratory capabilities. The Contractor shall strive to meet the highest standards of scientific quality and productivity, "on-time, on budget, as-promised" delivery of program deliverables, and first-rate service to the research community through user facility operation.

3.1.3 Operating Principles

The Contractor is accountable for providing reasonable assurance to the DOE that PNNL's system of management controls when properly implemented provides an effective and efficient means of meeting all applicable requirements while accomplishing assigned missions.

To provide reasonable assurance, the Contractor must identify, monitor, and address existing and/or emerging risks important to the accomplishment of PNNL's mission and Contract requirements.

Laboratory management is to provide and report in a timely manner performance data to Governance processes, which ultimately provide assurance to DOE.

The Contractor will be responsible for penalties and fines arising from work conducted by Contractor staff which is not consistent with work authorization clause(s) of the Contract which outline the scope of work the Contractor may appropriately perform under this Contract. DOE shall not be liable for special, consequential, or incidental damages attributed to such actions.

3.1.4 Laboratory Stewardship Expectations

The Contractor is expected to be an active partner with DOE in assuring that PNNL is renewed and enhanced to meet future mission needs. Within the constraints of available resources and other Contract requirements, the Contractor, in partnership with DOE, shall:

- (a) Maintain a Laboratory vision and long-term strategic plan to meet anticipated DOE and national needs.
- (b) Attract, develop, and retain an outstanding work force, with the skills and capabilities to meet DOE's evolving mission needs.
- (c) Renew and enhance research facilities and equipment so that PNNL remains mission ready and is well-positioned to meet future DOE needs.
- (d) Build and maintain a financially viable portfolio of research programs that generates the resources required to renew and enhance Laboratory research capabilities over time.
- (e) Maintain a positive relationship with the broader research community, to enhance the intellectual vitality and research relevance of PNNL, and to bring the best possible capabilities to bear on DOE mission needs through collaborative relationships with the research community.
- (f) Build a positive, supportive relationship founded on openness and trust with the community and region in which PNNL is located.

3.1.5 Operational and Financial Management Expectations

The Contractor is expected to effectively and efficiently manage and operate PNNL through management practices designed to

enable research. The Contractor shall assure the protection and proper maintenance of DOE research and information assets, the health and safety of staff, the public, and the environment. The Contractor is also to develop and deploy management systems and practices that are compliant, efficient and enhance research productivity and mission accomplishment.

3.1.6 Expectations for Program and Project Management for the Acquisition of Capital Assets

DOE's Project Management Principles apply to all capital asset projects using a tailored approach as defined or approved by the sponsoring project office. This includes General Plant Projects (GPPs) and Institutional General Plant Projects (IGPPs) as defined in DOE Order 430.1B. The Contractor is expected to provide for:

- a. Line management accountability
- b. Sound, disciplined, up-front project planning.
- c. Well-defined and documented project requirements.
- d. Development and implementation of sound acquisition strategies that incorporate effective risk handling mechanisms.
- e. Well-defined and managed project scope and risk-based Performance Baselines (PBs) and stable funding profiles that support original cost baseline execution.
- f. Development of reliable and accurate cost estimates using appropriate cost methodologies and databases.
- g. Properly resourced and appropriately skilled project staffs.
- h. Effective implementation of all management systems supporting the project (e.g., quality assurance, integrated safety management, risk management, change control, performance management, and contract management).
- i. Early integration of safety into the design process.
- j. Effective communication among all project stakeholders.
- k. Utilization of peer reviews throughout the life of a project to appropriately assess and make course corrections.
- l. Process to achieve operational readiness is defined early in the project for Hazard Category 1, 2, and 3 nuclear facilities.

For all capital asset projects with a Total Project Cost (TPC) equal to or greater than \$50 million, the Contractor shall comply with the

requirements as set forth in DOE Order 413.3B Contractor Requirements Document (CRD). [M1140]

3.1.7 Sustainable Practices for the Institution

The Contractor shall assist DOE through direct participation and other support in achieving DOE's energy efficiency goals and objectives in electricity, water, and thermal consumption, conservation, and savings.

3.2 Performance Objectives and Measures

The performance objectives and measures of this contract are stated in the annual Performance Evaluation and Measurement Plan for the Management and Operations of the Pacific Northwest National Laboratory.