NEPA REVIEW SCREENING FORM (NRSF) 3 Categorically Excluded Actions	Document ID #: DOE/CX-00244

I. Project Title:

Civil and Structural Suitability Analysis of the Fuels and Materials Examination Facility for Relicensing at the Department of Energy Hanford Site

II. Describe the proposed action, including location, time period over which proposed action will occur, project dimension *(e.g., acres displaced/disturbed, excavation length/depth)*, and area/location/number of buildings. Attach narratives, maps and drawings of proposed action. Describe existing environmental conditions and potential for environmental impacts from the proposed action. If the proposed action is not a project, describe the action or plan.

BACKGROUND

The U.S. Department of Energy (DOE), Hanford Field Office (HFO), manages approximately 580 square miles comprising the Hanford Site, which is located in southeastern Washington State along the Columbia River. Portions of the land and facilities are owned, operated, or otherwise administered by several federal, state, and local entities under a use permit, license, or other authorizing documentation issued by the DOE-HFO. Land use at the Hanford Site is governed by the "Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement" (HCP-EIS, DOE/EIS-0222-F, September 1999) and Record of Decision (ROD, 64 FR 61615). The HCP-EIS and ROD establish a map, designations, policies, and procedures for land use at the Hanford Site. Together these four elements create the Hanford Comprehensive Land Use Plan (CLUP). Under the CLUP, the Hanford Site 400 Area is designated for industrial use. As such, the 400 Area is suitable and desirable for activities including, but not limited to, reactor operations, rail, barge transport facilities, mining, manufacturing, food processing, assembly, warehousing, distribution operations, and related activities. Figure 1 shows the generalized land uses at the Hanford Site under the CLUP.

The 400 Area is home primarily to the Fast Flux Test Facility (FFTF), a DOE-owned, formerly operating 400-megawatt (thermal), liquid metal (sodium) cooled, nuclear research and test reactor located within the FFTF Property Protected Area (PPA) along with related support buildings, structures, and infrastructures. The original purpose of FFTF, although not a breeder reactor, was to develop and test advanced fuels and materials for the DOE Liquid Metal Fast Breeder Reactor (LMFBR) Program, with other missions subsequently pursued.

Numerous buildings, structures, and infrastructures were constructed in the 400 Area to support FFTF operations including the Fuels and Materials Examination Facility (FMEF). Construction of the FMEF was completed in 1984. However, the facility was never used in any kind of nuclear capacity. The FMEF was built to perform examinations of irradiated fuels and to fabricate fuel for the FFTF and the Clinch River LMFBR in Oak Ridge, Tennessee. In late 1993, DOE decided to discontinue operating the FFTF due to a lack of economically viable missions at that time and issued a shutdown (i.e., deactivation) order for the facility. When the DOE abandoned the LMFBR Program and shutdown the FFTF, the FMEF was also left without a mission and remains largely unused and vacant today. Since that time, and after various delays temporarily stopping the work, FFTF deactivation activities were completed and the facility was placed in a long-term, low-cost surveillance and maintenance condition in 2009.

The "Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington" [DOE/EIS-0391, 77 Federal Register (FR) 74472, December 2012] and ROD (78 FR 75913, December 2013) included evaluations of proposed actions and alternatives for the final decommissioning end state for FFTF and its support buildings, structures, and infrastructures located within the FFTF PPA; management of waste generated by the decommissioning process; and disposition of Hanford's inventory of radioactively contaminated bulk sodium. DOE decided to dismantle 45 above-grade buildings and structures within the FFTF PPA that are adjacent to the FFTF Reactor Containment Building. Buildings, structures, and infrastructures outside the FFTF PPA would not be affected including the FMEF and related facilities. Following dismantlement, all below-grade buildings and structures within the FFTF PPA would be stabilized with grout and covered by a modified Resource Conservation and Recovery Act (RCRA) Subtitle C barrier. Additional information regarding the proposed dismantlement and entombment of the FFTF may be found in DOE/EIS-0391. Figures 2, 3, and 4 provide a map and aerial photographs of the FFTF and FMEF located in the 400 Area of the Hanford Site.

The FMEF has been in a “cold and dark” surveillance and maintenance condition since 2009. Building systems such as cooling water, fire suppression, and chilled water were drained. Utilities such as power, water, and sewer were not air-gapped, but rather isolated and are in an unknown condition. For the past 16 years, the FMEF has been fully isolated with the exception of routine visual safety inspections, periodic escorted walk-throughs, and occasional military and Hanford Patrol training exercises on and around the perimeter of the building. The exterior of the FMEF was completed and building systems such as heating, ventilation, and air conditioning (HVAC); telecommunications; electrical; water; sewer; security; shipping and receiving; and transportation were installed. However, the hot cells and laboratories were never activated and no test examinations or LMFBR fuel production operations were ever performed. Consequently, the FMEF is uncontaminated and available to support other missions.

PROPOSED ACTION

DOE-HFO proposes to issue a license to Horizon Strata LLC (Horizon Strata) to investigate the suitability of the FMEF for repurposing to produce High-Assay Low-Enriched Uranium (HALEU) fuel for Advanced Small Modular Reactors (ASMRs). The current condition of the FMEF structures, infrastructures, systems, components, and equipment must be evaluated to support the suitability determination. The initial investigation work would be performed in stages and generally involve visual inspections, nondestructive testing, and destructive testing. The work would include geotechnical investigations of soil properties to evaluate the structural stability of building foundations.

HALEU, which is uranium enriched to contain between 5 and 20 weight percent Uranium-235, is produced and stored in the form of uranium hexafluoride gas to eventually be made into fuel for ASMRs. The U.S. currently lacks sufficient commercial HALEU production capabilities to support the planned deployment of ASMRs. Most ASMRs require HALEU fuel to achieve smaller designs, longer operating cycles, and increased efficiencies that produce more power per unit volume. DOE estimates the domestic demand for HALEU could reach 50 metric tons per year by 2035.

A secure domestic HALEU supply chain and HALEU deconversion services are needed. HALEU deconversion is a critical step in the fuel supply chain for ASMRs. It involves turning enriched uranium hexafluoride gas into oxide, metal, and other mineral forms usable as fuel for ASMRs. The deconverted material is stored until it is needed by fuel fabricators or other end users. Such activities would be consistent with the bipartisan Energy Act of 2020, which charges the Secretary of Energy with establishing and carrying out a program to support the development of HALEU for domestic research, development, demonstration, and commercial use.

This NEPA Review Screening Form (NRSF) determination supports the DOE-HFO issuance of a license to Horizon Strata to investigate the potential suitability of the FMEF for repurposing as a HALEU production facility. If determined suitable, then additional National Environmental Policy Act (NEPA) review would be required to address licensing, design, construction, operation, and decommissioning of the HALEU production facility. Additional NEPA review would likely involve the U.S. Nuclear Regulatory Commission (NRC) as the lead agency with DOE (DOE-HFO/DOE-Headquarters) as a cooperating agency. Although NEPA predecisional at this time, in accordance with DOE's NEPA Implementing Procedures (10 CFR 1021) the siting, construction, operation, and decommissioning of a uranium enrichment facility may require an Environmental Impact Statement (EIS), as determined by the DOE-HFO/DOE-Headquarters NEPA Compliance Officers.

The proposed actions addressed by this NRSF determination to issue Horizon Strata a license to determine the suitability of the FMEF for HALEU production include, but may not be limited to, the following activities:

VISUAL INSPECTIONS

The visual inspections are estimated to occur over a period of 2-3 days. Horizon Strata and its contractors would compile all information and assessments from the visual inspections and prepare a written report within 2-3 weeks after the onsite inspections. The evaluation would assess the current condition of the building with the intention that nonstructural items would eventually be replaced or refurbished.

Visual inspections would be performed to evaluate the stability of the building by observing structural cracking, differential settlement of foundations, and other applicable parameters. The mechanical, electrical, plumbing, piping, and HVAC equipment would be evaluated to determine the condition of the equipment and status of electrical, gas, and hydronic systems (i.e., water and steam) serving the equipment. The condition of electrical equipment and panels; connections and terminations; and service voltage, phase, and amperage capacity would be determined. The condition of piping and valves would be investigated including the status of hangers and supports. The status of manways, underground vaults, and other access capabilities would be established. The impacts of relative humidity on ductwork liners and insulation, and the integrity of piping systems due to oxidation of valves, gaskets, and filter media would be evaluated. The availability of new heating and refrigeration elements for mechanical equipment would be determined. Utility connections would be investigated using borescopes or other applicable methods. The building exterior would be investigated to determine the condition of external walls and foundations.

NONDESTRUCTIVE TESTING (NDT)

Based on the visual inspection report, Horizon Strata and its contractors would develop work packages for NDT to be performed. Sampling is expected to take approximately 1 week to collect needed information, not including advanced planning for area access and sample capture. Horizon Strata and its contractors would compile all information and assessments from the NDT and prepare a written report within 2-3 weeks after the onsite testing.

Work packages would include, but may not be limited to, radiological monitoring to determine background radiation levels and establish a baseline for background radiation. Hazardous materials would be classified for asbestos and lead contained in paint, waterproofing, adhesives, and insulation. The buildings would be evaluated for water related damage including sampling for mold and mildew, water damage inspections, and pest evaluations. Operational testing of existing equipment would be performed to determine the status of currently installed equipment including air duct leakage testing. An analysis of concrete would be performed including, but not limited to, rebound hammer testing, ultrasonic pulse velocity testing, ground penetrating radar surveys, and infrared thermography inspections. An analysis and testing of mechanical, electrical, and plumbing equipment would be performed including ultrasonic pulse velocity testing, infrared thermography inspections, vibration testing, oil analysis, and motor current analysis. Three-dimensional scanning of the building would be performed to verify the presence of structural elements.

DESTRUCTIVE TESTING (DT)

Based on the visual inspection report and available documentation, Horizon Strata and its contractors would develop work packages for DT to be performed. This activity would likely need to occur concurrently with NDT. Horizon Strata anticipates the work would take approximately 1 month to plan and 1 week to execute. Horizon Strata and its contractors would compile all information and assessments from DT and prepare a written report within 2-3 weeks after the testing. The quantity and types of DT would be based on the availability of existing building design drawings and original construction documentation, as well as the visual condition assessment and NDT test results.

If existing documentation is lacking or inadequate, a test plan would be prepared and executed by Horizon Strata and its contractors in coordination with a materials testing subcontractor to determine the structural stability and integrity of the FMEF. Proposed DT would include, but may not be limited to, the following:

Concrete core samples would be obtained and tested to determine physical strength and composition of building materials. Up to 70 core samples would be taken to establish 95 percent confidence of anticipated concrete member types. The basis for the 70 core samples is 9 cores for each of 7 different member types including columns, footings, walls, wall footings, first floor slab, and mezzanine slab. An additional 7 core allowance would be provided for spot testing of visual defects. The test methods would include, but may be limited to, concrete core collection and testing (ASTM C42 and ASTM C8223), compressive strength test (ASTM C39), tensile strength test (ASTM C496), flexural test (ASTM C78), petrographic examination (ASTM C457 and C856) including carbonation depth test (ISO 1920-12) and alkali-silica reaction [ASTM C457 and C856; and if recommended by the petrographer, uranyl acetate gel fluorescence test (ASTM C856 annex) and density measurements (ASTM C642)].

Concrete samples would be obtained for chemical and material property testing. Up to 50 powder samples or drill holes are estimated for chemical and permeability testing and core samples from physical testing would be utilized for appropriate tests. The basis for the samples is a nominal allowance to investigate signs of distress or defects. If there are no visual signs of defects or distress, then no samples would be required. Test methods would include, but not be limited to, concrete powder samples (ASTM C1152 for chemical analysis), chloride content (ASTM C1218), sulfate attack test (ASTM C1012), moisture content (ASTM F2170 or ASTM D3017), and permeability test (ASTM C1202 or ASTM C187).

Steel assembly tests including steel members, bolts, plates, rebar, and other components would be performed to determine material properties. Up to 150 steel coupon samples would be obtained. The basis for the steel samples is 5 samples per member type including rebar samples for columns, footings, walls, wall footings, first floor slab, and mezzanine slab. Steel samples would be obtained for up to 8 member shapes, 30 samples for seismic force resisting elements, and 6 samples for two assumed bolt types. Test methods would include, but may not be limited to, tensile strength and percent elongation (ASTM A370), chemical composition (ASTM A751), and mechanical properties of bolts (ASTM F606 and F606M).

The following destructive testing of mechanical equipment would be performed to verify conditions. Corrosion testing would be performed to simulate the corrosion spreading rate for existing piping that has been exposed to hydrogen. Residual stress testing would be performed to test pipe performance under constant stress after initial crack or failure has occurred. A section of the ductwork and insulation assembly would be cut to visually determine the status of the insulation and ductwork materials. A section of a pipe and insulation assembly would be cut to visually determine the status of the insulation and pipe materials. Visual observation may lead to other unique and specific tests necessary to evaluate the mechanical equipment. Load testing is not anticipated to be required, but may be performed if needed.

Destructive testing would be completed onsite and samples would be sent to an offsite laboratory for analysis. It is possible to have a mobile laboratory to complete additional testing onsite. However, offsite testing would still be required for certain tests with samples being returned to the site, as follows: onsite samples and testing only (ASTM C42, ASTM C823, and ASTM F2170 or ASTM D3017); potential mobile lab testing (ASTM C39, ASTM C496, and ASTM C78); and offsite testing (ASTM C457, ASTM C856, ASTM C642, ASTM C1152, ASTM C1218, ASTM C1012, ASTM C1202 or C1876, ASTM A370, ASTM A751, and ASTM F606).

Horizon Strata would prepare a subcontract with a geotechnical services provider to characterize the site soil conditions if an existing geotechnical report for the building site is unavailable or inadequate. Horizon Strata would provide an interpretive report. Up to 12 borings located outside the existing building or inside the existing building are anticipated, as access permits. Three additional soil resistivity tests would be performed. The following parameters would be required to determine the structural capabilities of the building including allowable ground bearing pressure, modulus of subgrade reaction, sliding resistance, settlement, lateral earth pressures, ground water, soil resistivity, and chemical analysis. Geotechnical testing would include, but may not be limited to, site characterization (ASTM D420), standard penetration tests (ASTM D1586), cohesive soil thin-walled tube samples (ASTM D1587), cone penetration tests (ASTM D3441 and D5778), compression tests of cohesive soil (ASTM D2166), moisture content (ASTM D2216), description and identification of soils (ASTM D2488), classification of soils (ASTM D2487), soil resistivity (ASTM G57), plate load tests (ASTM D1196), sulfate ion tests (ASTM D516), and chloride ion tests (ASTM D512).

Generally speaking, Horizon Strata assumes that everything nonstructural (i.e., most mechanical, electrical, and plumbing equipment; finishes; etc.) must be repaired, replaced, or refurbished. It would be important to confirm the structural integrity of the building and its suitability for being returned to service in a condition that can pass inspections by the DOE (DOE-Headquarters and DOE-HFO), Nuclear Regulatory Commission (NRC), State of Washington (Departments of Health and Ecology), or other applicable federal, state, or local agencies.

GENERAL FMEF DESCRIPTION

The FMEF was designed and constructed as a major addition in the growing complex of facilities dedicated to breeder reactor technology development at the DOE's Hanford Site. The FMEF was intended to play a vital role in the development of advanced reactor fuels and materials. The following is a description of the FMEF as originally designed and constructed. However, the actual configuration of structures, infrastructures, systems, components, and equipment may vary today as a result of facility shutdown and placement in a "cold and dark" status. The proposed action would allow Horizon Strata and its contractors to enter the FMEF to evaluate the suitability of structures, infrastructures, systems, components, and equipment for repurposing to support potential HALEU production activities.

The FMEF consists of a 98 feet high Process Building with an attached Mechanical Equipment Wing on the west side, and an Entry Wing across the south (or front) side of the building. The Mechanical Equipment Wing housed facility utilities and support equipment including water treatment equipment; air compressors; and HVAC equipment. The Entry Wing provided space for maintenance shops, spares and process inventory storage, and employee lunchroom and change areas. Strict control over personnel access into the Process Building was provided via a Security Guard Station and automated personnel access control portals. Necessary office space and administrative support areas were housed on the second floor of the Entry Wing.

The 175 feet wide by 270 feet long by 98 feet high Process Building provides over 188,000 square feet of operations space. Its 98 feet height above ground level makes it as tall as a seven story office building, but it also extends another 35 feet below ground. The building is divided into 6 operating floors, or levels, which are identified by their elevation relative to ground level and their primary function.

70 Feet Level

The topmost floor, at the 70 feet elevation, was called the Secure Automated Fabrication (SAF) Level. This area contained automated fabrication equipment capable of producing reactor fuel. Nuclear fuel material was to be received from a floor below via a dumbwaiter type conveyor system and fed into the automated process line to be formed into individual fuel pellets that were then to be inserted into stainless steel tubing to produce fuel pins. The operations on this level were to be performed using highly developed process controls to ensure that the required fuel purity and integrity requirements were satisfied. An Operations Control Center, located on a mezzanine at the 82 feet elevation, was provided to allow coordination of fuel supply activities and to provide accountability of nuclear fuel material.

42.5 Feet Level

The floor below, at the 42.5 feet elevation, was the Fuel Fabrication Level. Special test fuel and fuel pin assemblies were to be fabricated in this area. This level consisted of two separate operating areas; one was the low-gamma test pin fabrication and development area, and the other was the Unit Process Cell. The low-gamma section contained equipment for processing fuel powders having low-gamma radiation levels into fuel pellets and then into test fuel pins. Most of this work was to be performed in glove boxes to prevent contamination and to reduce exposure of employees to radioactive fuel material.

The Unit Process Cell was a highly shielded area for the future development of remote fabrication and maintenance equipment or for the production of high-gamma test pins. Radiation shielding was provided by thick concrete walls. The Unit Process Cell was not equipped at initial facility startup.

21.25 Feet Level

The Chemistry Level, at the 21.25 feet elevation, surrounds the upper portions of the Nondestructive Examination (NDE) Cell and the Decontamination Cell, which extend upward from the floor below. This level contained equipment capable of performing the complex chemical analyses of fuel material necessary to support fuel fabrication work. Much of the work in this area was to be performed in glove boxes to reduce personnel radiation exposures.

Also, located on this level, was an automated system for handling and storing Special Nuclear Material (SNM) such as the feed material for the fuel fabrication processes. The SNM Storage Vault was a shielded, secure vault used to automatically store SNM. The vault hardware consisted of a storage/retrieval machine, an industrial robot, a vertical reciprocating conveyor (VRC), a bar code reader, and a metric balance. All equipment was designed to be computer controlled with supervisory control provided from the Accountability Computer System. The vault was designed to be operated as a clean vault with an air atmosphere. Personnel access into the vault was through the Class V vault door. Material access into the vault was through the VRC door adjacent to the personnel door. The concrete used for the walls, ceiling, and floor surrounding the vault was normal density concrete, primarily for neutron shielding. All hardware listed above was installed and operationally demonstrated utilizing a Storage Interface Processor (SIP) computer.

The vault provided two 10 feet by 13 feet storage rack arrays each with 130 storage locations that each held one storage pallet. The two types of existing pallets were designed to hold the two different types of canisters. There were 120 six hole pallets and 138 two hole pallets located in the vault. The canisters that may be stored in the two hole pallets were the double-door SNM Transfer Canisters called "French Cans," which were compatible with the SAF Line. The canisters that could be stored in the six hole pallet were food pack can holders, which were unique to previous operations in the 308 Plutonium Fabrication Pilot Plant Building also located at the Hanford Site in the 300 Area (the 308 Building was demolished and removed as part of 300 Area site remediation efforts).

Entry Level

The Entry Level at zero elevation, or ground level, was the main operating floor of the NDE Cell, which also extends into the floors above and below it. The NDE Cell contained remotely operated equipment for the nondestructive examination of irradiated fuel assemblies and pins. Initial maintenance and decontamination of equipment was to be performed in the adjacent Decontamination Cell. Both of these cells were shielded by thick concrete walls with lead-glass windows. Operations inside the cells was to be accomplished using remotely operated manipulators.

The Shipping and Receiving Area on this level consisted of a high bay with a 75 ton overhead bridge crane used to transfer shielded shipping casks to the Entry Tunnel on the floor below. It also was designed to provide coverage of the two 30 inch penetrations in the roof to the Decontamination Cell. The crane was equipped with two auxiliary hoists. A 20 ton hoist was provided to transfer small casks between the Shipping and Receiving Area and the Fuel Fabrication Level (42.5 feet elevation). A second hoist (10 ton capacity) was provided to service the High-Gamma Receiving Area and the Unit Process Cell Transfer Lock on this level. Space was provided within the handling area for short-term storage of empty casks and shipping containers.

Crane access to the lower levels of the building was provided by four floor hatches on the west side of the handling area. The northernmost hatch (8 feet by 10 feet) provided access for movement of small casks, equipment, and materials into the area, which connected with the DE Cell transfer corridor. The three remaining hatches (10 feet by 10 feet each) provided access to the Suspect Equipment Repair Area, the Entry Tunnel, and the DE Cell level equipment corridor. The Shipping and Receiving Area included a liquid waste loadout station, a solid waste storage area, a truck lock, and a large high bay material handling area. Rail cars and trucks were to enter this part of the building for loading and unloading through a double door airlock. Only one of these doors were to be opened at any given time to prevent disturbing the precise air balance maintained in the building.

The Entry Level also contained the Facility Computer Room and the Operations Control Room, which were the focal points for controlling and integrating the various facility operations and examination activities. An inert gas system and building air exhaust equipment was also located on the Entry Level. Many of the cells in the FMEF were designed for an inert gas atmosphere (normally nitrogen) to eliminate any possibility of fire in the cells, and to preclude water or air reactions with the materials handled in the cells.

Minus 17.5 Feet Level

The Equipment Level, at the minus 17.5 feet elevation, contained a variety of plant support equipment including two separate electrical switchgear rooms, emergency air compressors, heating and ventilating system air supply equipment, NDE Cell inert atmosphere equipment, emergency batteries, analytical chemistry cell exhaust equipment, and building air filtering system components. Also included was the vacuum equipment, which serviced a Pneumatic Transfer System that was designed for use to rapidly transport small items between cells or areas of the building.

The plant support equipment was located in individual rooms surrounding the heavily shielded lower NDE Cell, the main portion of which was located on the floor above. The upper portions of the Hot Equipment Repair Area and the Suspect Equipment Repair Area extend upward from the floor below. The Hot Equipment Repair Area communicated with the Decontamination Cell on the floor above and included provisions for decontaminating and packaging in-cell equipment for disposal. The Suspect Equipment Repair Area was intended for use to repair, rebuild, or calibrate, in-cell equipment.

The Entry Tunnel on this level housed a large cask transporter, which was intended for use to transfer radioactive materials between the Shipping and Receiving Area and the Decontamination Cell or NDE Cell on the floor above. The transporter connected with the Shipping and Receiving Area via hatches in the floor, and with the decontamination and NDE areas through sealed ports in the floor of each cell. This level also contained the control room for the one megawatt (thermal) TRIGA reactor, which was a training, research, and isotope reactor manufactured by the General Atomics Corporation.

Minus 35 Feet Level

The DE Cell Level, at the minus 35 feet elevation, contained cells and equipment for destructive examination of fuels and materials samples. These cells were arranged in two parallel rows along a horizontal transfer corridor, which was intended for use to transfer equipment between individual cells. The transfers were to be accomplished using the Large Equipment Transfer System, which provided necessary radiation shielding and allowed the transfers to be made without disturbing the inert environment inside the cells. The DE Cell area was heavily shielded and work in the cells was intended to be performed using remotely operated equipment. The DE Level also housed equipment for removing sodium (the coolant used in the FFTF reactor) from fuel assemblies, liquid waste handling equipment, the TRIGA reactor, and film processing areas.

The TRIGA reactor provided a collimated neutron source for performing radiography of irradiated assemblies or pins, which were to be lowered into the adjacent Target Room from the NDE Cell above. An automated film loading system was intended for use to transport special film cassettes from the photography lab area and accurately position them in the Target Room where they would be exposed to the neutron beam generated by the TRIGA reactor.

The FMEF structure and safety-related equipment and systems were designed to withstand earthquakes, tornadoes, high winds, and volcanic ash fall events. The facility was designed and constructed in accordance with DOE Order 6430.1, "General Design Criteria"; DOE Order 5480.1A, "Environmental Protection, Safety, and Health Protection Program for DOE Operations"; and DOE Order 5480.4, "Environmental Protection, Safety, and Health Protection Standards." The building has been maintained and has never contained radioactive or hazardous materials.

Figures 5 through 13 provide a time-lapse photographic construction sequence of the FMEF. More detailed construction photographs are available in the Hanford Site Integrated Document Management System (IDMS).

GENERAL FMEF INFRASTRUCTURE SUPPORT SYSTEMS

The following provides a description of the general infrastructure support systems that serviced the FMEF.

Facility Elevators

There were four elevators located in the FMEF. Three of these were personnel elevators which served the Entry Level and the upper floors of the facility. The fourth was a freight elevator, which served all major elevations of the main process building. The freight elevator was approximately 14 feet wide by 14 feet deep by 10 feet high and was rated at 16,000 pounds.

Site and Facility Electrical Systems

The FMEF was connected to two 115kV electric power supply sources, each supplied from separate portions of the Bonneville Power Administration's power grid. This was transformed to supply power at 13.8kV to the main 400 Area substation. Conversion of this power to 480V for facility use occurred in two redundant transformer facilities located just north of the Process Building.

The FMEF was also provided with an emergency power generating system that was independent of all other area loads and included two 900kW gas turbine generators providing redundant power to vital loads. Fuel capacity was provided for 24 hours of continuous operation. The gas turbine generator fuel oil was stored in an underground tank at the northwest corner of the Process Building just north of the Mechanical Equipment Wing. The gas turbine generators, fuel tank, piping, pumps and associated support equipment were all seismically qualified for the Design Basis Earthquake. This system was located in the Emergency Equipment Wing, which was appended to the northwest corner of the Process Building.

An uninterruptible power system (UPS) was also provided. The system was composed of two 150kVA UPS systems with lead-calcium batteries capable of supplying power for 0.5 hour at full load. The supply systems for which continuous power was desirable or required as emergency generators needed 2 minutes to begin replacing normal power.

Instrumentation and Alarms

The Distributed Electronic Control System (DECS) performed the control, monitoring, and alarm functions required to operate the FMEF systems. All the functions could be performed from the operations control room on the Entry Level of the Process Building under normal operating conditions. Local systems control cabinets were provided at selected locations for the operation and monitoring of vital systems in the event of a failure in the control room equipment. The vital systems also had redundant local controllers. The operating staff could alter or adjust the mode of operation, the operating level, and the alarm points for the utility process systems from the operations control room. This feature was key lock protected. In addition to its process control and monitoring functions, the DECS monitored (for status only) other systems such as the electrical power distribution system.

DECS provided two alarm levels for all systems that it monitored. All alarm conditions were indicated visually on the DECS console. Priority 1 status was given to all safety and high economic consequence conditions (displayed in red), while all other conditions were considered operating parameter alarms (displayed in yellow). The Priority 1 alarms were accompanied by an audible annunciation. Functional requirements for the instrumentation and control system under normal conditions were: control the FMEF facility systems; monitor the system operating status; alarm the operating staff if any parameter exceeds a preset limit; log and record all alarms; record historical trend data for system parameters; and provide color graphic displays of the FMEF systems.

Site and Facility Water Supply Systems

The FMEF was connected to two water supply systems that both originated from 400 Area ground water wells. The site Sanitary Water System and the site Fire Water Supply System were combined in the 400 Area storage tank and main piping runs. The sanitary pumps were allowed to access only the upper portion of the storage tank while the fire protection pumps could access all water in the tank. The sanitary pumps provided system pressure during normal conditions. If the system use caused the pressure to drop below normal limits, the fire pumps automatically activated to maintain system pressure. The 400 Area main piping runs were designed as loops to allow isolation of any section with the rest of the loop remaining in service. Each main line take-off had one valve on each side of the take-off and one valve in the take-off. The piping for sanitary and fire protection was separate from the main line into each facility.

Site and Facility Sewer Systems

The FMEF had two sewer system connections, process waste and sanitary waste. These systems were connected to the common 400 Area systems that emptied into a sanitary drain field and a process waste percolation pond, respectively. Neither of these systems handled radioactive wastes.

Retention Liquid Waste System

This system was intended to provide for collection and transfer of all uncontaminated aqueous liquid waste generated in the facility that was not disposed of by the Sanitary Waste System. The discharges were normally expected to be clean but were suspect due to their potential for containing radioactive contamination. The liquid wastes came from janitor sinks, support shop sinks, floor drains, emergency shower and eyewash stations, fire water test drain, UPS room, film processing room sink (not installed), metallographic photo lab sink (not installed), TRIGA photo lab sink (not installed), photochemical makeup (not installed), and scanning electron microscope (not installed). The liquid waste from these sources flowed by gravity (or by sump pumps located on the Minus 35 Feet Level) to two 6,000 gallon retention waste tanks. Following an operator command to DECS, the collection tanks contents were recirculated with one of two redundant pumps. The tanks contents were manually sampled during the recirculation period. The tank's contents were then pumped following receipt of sample results (again by operator command through DECS) to either the Process Sewer System or the Radioactive Liquid Waste System. The second tank collected waste while the full tank was recirculated, sampled, and dispositioned.

Chilled Water System

The Chilled Water System for the HVAC was a closed-loop recirculating system that provided chilled water to all the HVAC in duct cooling coils and fan coil units in the Process Building and Mechanical Equipment Wing. Chilled water was pumped by two 50 percent capacity circulating pumps to the cooling coils throughout the facility. The water picked up heat at the coils and returned to three 33 percent capacity centrifugal chillers piped in parallel. Each chiller could provide 350 tons of cooling and was capable of unloading to 10 percent of full capacity. The circulating pumps had a flow rate of 1800 gallons per minute. The Chilled Water System was a constant flow system. The cooling coils were individually controlled by thermostatically operated three-way valves. A chemical mixing tank was piped in parallel to the pumps to provide a means of introducing water treatment chemicals to the system. A compression tank with inert gas blanketing was connected to the air separator for system water expansion, located just upstream from the pumps. This prevented cavitation of the pumps by providing a net positive suction head. Process water was provided to the system for make-up. The system contained instrumentation for pressure and temperature monitoring.

Chilled Brine System

The Chilled Brine System was a closed-loop recirculating system that was designed to provide cooling for the facility hot cells. Its functions were deferred and its use was changed to provide Entry Wing and Fuel Assembly Area HVAC cooling. A 50 percent aqueous ethylene glycol solution was pumped by two 50 percent capacity circulating pumps to the Entry Wing and Fuel Assembly Area HVAC units. A third 50 percent capacity circulating pump was on standby and would automatically come on-line if one of the operating pumps stopped. The chiller package was a 150 ton built-up system that included three 50 percent capacity reciprocating compressors, two 100 percent capacity condensers, and two 100 percent capacity evaporators. The compressors were controlled so that each unit would start automatically when the required cooling temperature was attained. The compressors could be unloaded to 33 percent of full capacity. The Chilled Brine System was a constant pressure system. Heat exchangers were individually controlled with automatically operated two-way valves. The chiller package, pumps, and tanks were located in the Mechanical Equipment Wing. The chemical mixing tank was piped in parallel to the pumps to provide a means of introducing ethylene glycol and water treatment chemicals into the system, as required. For system coolant expansion a compression tank with inert gas blanketing was connected to the air separator, which was located just upstream from the pumps. Process water was provided to the system for make-up. The system contained instrumentation for pressure and temperature monitoring.

Telecommunications and Alarm Systems

The FMEF general plant telephone system was an extension of the telephone system servicing the Hanford Reservation. It had a paging capability. A sound-powered telephone system was also provided with provisions for linking together several workstations to form a private hands-free communication network. The FMEF had access to the Hanford Emergency Radio Network through mobile radio units. Security alarm, fire alarm, evacuation alarm, and criticality alarm systems were compatible with and integrated into the 400 Area and Hanford alarm systems. These alarm systems would annunciate locally within the FMEF, in the facility control room, at the FMEF guard stations, and at the 400 Area control center. A local radiation alarm system provided audible and visual indication when predetermined levels of radiation or airborne contamination were exceeded in any occupied area of the facility. An oxygen deficiency alarm system was provided for those spaces that could be flooded with an inert gas or any area where oxygen concentrations could decrease below 19.5 percent.

An equipment alarm system monitored the essential processes and critical equipment throughout the facility. A central alarm and acknowledgement system in the control room was provided in addition to the local equipment alarms.

GENERAL FMEF ENGINEERING SPECIFICATIONS

Civil

The designated area for the FMEF was approximately six acres of land on a highly permeable sand and gravel type of soil. The building excavations were open cut with a slope of 1 to 1.5 maximum. Backfill was compacted to 100 percent of maximum density under the process building foundation slab as determined by ASTM D-1557. In other areas the backfill was compacted to 95 percent of maximum density. The finished grade was 6 inches below the finished floor elevation of the examination building and sloped away from the building at a maximum of 2 percent. The areas to be paved were first scarified to a depth of 12 inches and recompacted to 95 percent of maximum density.

There were no permanent drainage facilities provided since all runoff and roof drainage was assumed to quickly infiltrate and be absorbed by the sand and gravel type of soil. Grading design was such that no ponding conditions occurred in areas of pedestrian or vehicular traffic.

Site vehicular access was from an extension of the 400 Area road system and entered the site at two points with asphalt paved roadways. The roadways provided access to the fuel oil unloading area, water tank and pump house, cooling tower, delivery areas, and the cask unloading area. An 8 feet tall, No. 11 American Wire Gauge (AWG) security fence was mounted on metal posts set in concrete around the site perimeter. The fence materials conformed to Federal Specification RR-F-00191 F.

Exterior utilities serving the FMEF consisted of potable and fire water, sanitary and process sewers, and electrical power. The fire water loop surrounding the facility was cast iron pipe with mechanical joints and cement mortar lining. The potable water was supplied from the same pump house and water tank as the fire water. The sanitary sewer was constructed of 6 inch diameter, extra-strength clay or epoxy-lined asbestos cement pipe, while the process sewer was 6 inch diameter vitrified clay pipe. A new site electrical substation (451B) was constructed directly north of the process building.

Architectural

Shielded cells constructed from high-density reinforced concrete and lined with steel plate formed the core of the multilevel process building. The building shell surrounding the process cells was constructed of reinforced concrete. Space was provided near the cell complex for remote manipulation, materials transfer, waste storage and disposal, inert cell purification systems, and cell and facility exhaust systems. The remaining functions, such as shipping and receiving and mechanical and electrical services, were located adjacent to the cell complex.

Heat generation internal to the building made use of thermal insulation of the exterior walls unnecessary. Interior concrete walls to 12 feet above the floors were coated with epoxy paint for ease of cleaning and decontamination. Office and corridor floors not planned for heavy loading were covered with sheet vinyl. Other floors were finished with epoxy type floor surfacing.

All doors were the hollow-metal type. Where Class A fire openings were required, doors and frames had a three-hour rating. Roof assemblies were built of 20 year bondable-type over rigid insulation providing the required "U" factor (measure of thermal transmittance).

Structural

The process building design incorporated a conventional monolithic reinforced concrete foundation and frame. The structure was a bearing-wall-type building with a flat-slab system for the concrete floors. A 6 inch thick topping slab was poured over the precast tees for the roof of the high bay and loft areas. All other roof areas were framed using reinforced concrete flat slabs. Lateral loads generated by winds and earthquakes were distributed by diaphragm action of the floors and roofs to concrete shear walls.

The process building was designed to remain standing as a confinement structure during and after the maximum fire postulated within the structure, assuming complete loss of fire suppression systems. The walls had a minimum fire-resistance rating of one hour.

Mechanical

The HVAC system provided the total air supply, heating, cooling, exhaust and emergency generator ventilation functions for the air atmosphere portion of the facility. Outside air was supplied by fans drawing air across heating and cooling coils and an 80 percent efficiency roll filter and a 35 percent efficiency prefilter. The coils and filters were housed in two 50 percent capacity plenums. This system supplied filtered, tempered outside air to four ventilation zones. Pressure gradients were established between the various zones classified as clean to zones with increasingly greater contamination potential.

The majority of Zone II, III, and IV areas contained fan coil units which provided area cooling, heating, and air recirculation. Certain other Zone II, III, and IV areas utilized once through airflow conditioned by fan coil units. All Zone I areas (cells) utilized once through flow. Low-gamma SNM handling areas were served by a two stage high efficiency particulate air (HEPA) filtered recirculation system, which provided a minimum of eight filtered air changes per hour. Two 67 percent filter plenums and three 50 percent fans were included. All exhaust air from the facility (Zone I, II, III, and IV) passed through a minimum of two stages of HEPA filters before discharge to the atmosphere through the exhaust stack. Four 33 percent capacity HEPA filter plenums were provided with three 50 percent capacity exhaust fans serving the final exhaust system. Exhaust from Zone I areas passed through in-cell HEPA filters and then through the final two stage HEPA filter bank. Exhaust from Zone I glove boxes passed through one in-box HEPA filter stage and a second HEPA filter stage prior to the final HEPA filter bank.

An inert atmosphere system provided the inert gas environment for the nondestructive and destructive examination cells, analytical chemistry cells, unit process cell, and fuel pin cutting cell. Three separate subsystems (temperature control, pressure control, and purification) comprised the inert atmosphere system. Redundant equipment was provided in the various subsystems to ensure reliability. The system piping and ducting was welded or brazed, except for instrument or component connections. Flanges, sealed openings, and packed valve stems were all provided with double packing or seals with an inert gas buffer zone between. The temperature control subsystem provided gas flows to dissipate up to 7kW each of assembly decay heat in the storage pits. A 50 percent ethylene glycol in water mixture was used as the coolant to remove all heat generated within the cells. The temperature control subsystem heat exchangers were mechanically bonded, double-tube type with inert gas as a buffer between tubes. In the event of a failure of the coolant pumps and chillers, the heat exchangers could be switched to use facility cooling fluid directly.

The pressure control subsystem assured that possible cell leakage would flow in the direction of increasing contamination. Normal cell operating pressures were maintained at 2 inches water gauge. The destructive examination and analytical chemistry cell pressures were controlled by the once through inert gas supply and exhaust systems. A maximum flow rate of 1.42 cubic feet per minute could be exhausted from each destructive examination cell. Inert gas was exhausted from cells through seal pots filled with silicone oil that separated the inert gas from air and prevented back diffusion of air into the inert cells.

The inert atmosphere purification subsystem maintained both the oxygen and water content at 25 to 50 parts per million each. Oxygen was removed using a catalytic converter, which formed water with added hydrogen. The water vapor was removed in molecular sieve type dryers. The dryers were regenerated with reverse airflow while isolated from the rest of the subsystem. They were purged with inert gas after being regenerated.

The facility fire protection system was provided to detect, contain, and suppress fires. The primary fire suppression system was a wet-pipe sprinkler system installed in most parts of the facility. A Halon 1301 system and/or a carbon dioxide system was installed where a water sprinkler system would not be suitable. A fire alarm system of local energy type was provided to give early warning of fire by detection of heat or products of combustion. The facility design used components of fire resistant and noncombustible material wherever possible. Fire door assemblies were sliding, rolling, or hinged type with automatic closing and latching provisions. Each rated door assembly had Factory Mutual approval or the Underwriters Laboratory label for the appropriate service and duration.

Radioactive liquid waste generated within the facility was capable of being collected in waste tanks at the lowest facility level. Two tanks of 6,000 gallon capacity each were contained in a below floor level pit having an extra volume of 8,000 gallons. This provided for capacity to contain the volume of a 20,000 gallon tank car should a leak develop. Radioactive liquids would normally be filtered at their source. Additional filtration was provided at the discharge point of the tanks. The components of the radioactive liquid waste system were stainless steel.

Electrical

Four power supply systems were provided including preferred power, alternate power, emergency power, and an uninterrupted power supply. The preferred and alternate power was provided by a new electrical substation (451B), which reduced the 115kV supplies to 13.8kV. Power from these two sources was delivered to FMEF via two underground feeders to two separately located 13.8kV/480V facility substations. Each substation contained two 13.8kV interrupter switches, two 1500kVA transformers, and 480V main secondary circuit breakers. Two sets of three-phase underground ducts from each of the facility substations delivered 480V service to the process building. Within the building the 480V service to the power was delivered by plug-in type busways. Circuits derived from the busways were protected with molded-case type circuit breakers with thermal magnetic trip elements.

Emergency power was generated with two gas-turbine driven generator sets rated at 500kW, 0.8F, 480V, three-phase, 60Hz. This rating was sufficient for the designated vital emergency loads if one machine fails to start, and included a 25 percent reserve capacity for future loads. Selected essential loads were connected to the emergency power supply system through two transfer switches. The determination of the emergency loads was based upon the need for public and personnel safety, fission product decay heat removal, and the maintenance and integrity of the complex.

An uninterruptible power supply provided continuous alternating current (AC) electric power to those systems where power loss must be minimized, such as radiation alarms, security system alarms, etc. The system consisted of an inverter, storage batteries, battery charger, and voltage regulating transformer. If normal AC power was lost, the battery charger ceased to operate and instantly the storage battery current would reverse supplying power to the inverter in order to sustain the AC load without interruption. This system was sized to supply power for approximately three hours.

CULTURAL AND ECOLOGICAL RESOURCE REVIEWS

Cultural Resources

The National Historic Preservation Act (NHPA) of 1966 directs federal agencies to assume responsibility for all cultural resources under their jurisdiction. Section 110 of NHPA requires agencies to survey the lands under their control and evaluate all historic properties for eligibility for the National Register of Historic Places (NRHP). Section 106 of NHPA (54 USC 306108) requires agencies to consider the effects of their actions on properties listed or eligible for listing in the NRHP. The implementing regulations for NHPA require agencies to consult with the State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), and regional Native American Tribes to ensure that all potentially significant cultural resources have been adequately identified, evaluated, and considered in planning for a proposed undertaking. Actions may proceed only after comments have been received and taken into account. A Memorandum of Agreement (MOA) may be developed between the DOE-HFO, SHPO, ACHP, and regional Native American Tribes to resolve adverse effects of the undertaking on cultural/historic resources, as appropriate.

Following a review of existing management practices, the DOE initiated a new strategy that moved from project-by-project, building-by-building considerations to the development of a historic buildings programmatic agreement among the DOE, the ACHP, and the SHPO for the maintenance, deactivation, alteration, and demolition of the built environment on the Hanford Site (DOE/RL-96-77). This Programmatic Agreement provides a streamlined framework that directs the management of all Manhattan Project and Cold War Era properties on the Hanford Site and guarantees that preservation efforts are expedited while ensuring that cleanup and other activities are not delayed. The ACHP has defined the term mitigation as "actions that limit or compensate for the damage an undertaking does to historic properties." Documentation of buildings and structures through drawings, photographs, and/or histories is included within the listing of typical mitigation measures. Preservation in-place and salvage of information are other options.

The Hanford Site Manhattan Project and Cold War Era Historic District Treatment Plan (DOE/RL-97-56), required under Stipulation IV of the Programmatic Agreement, directs the production of a multi-level report which chronicles the unique history of the Hanford Site, its technology, and the people who worked here. The FMEF and related buildings contribute to the Historic District with no individual documentation required.

A cultural resources review would be performed by the DOE-HFO Cultural and Historic Resources Program (CHRP) to evaluate the proposed action discussed herein against the Programmatic Agreement and Treatment Plan. If any ground disturbing activities are required, then additional cultural resources review may be required to obtain the necessary cultural resources clearance.

Ecological Resources

The Hanford Site Biological Resources Management Plan (BRMP, DOE/RL-96-32, Rev. 2) is the primary implementation document for managing and protecting natural resources on the Hanford Site consistent with the Hanford Site CLUP. The BRMP ranks wildlife species and habitats based on the level of concern for each resource (Levels 0-5). Level 0 resources consist of non-native plants and animals (unless otherwise listed at a higher level), non-vegetated areas, and industrial areas. Management goals and actions for Level 0 resources are limited to those needed for regulatory compliance, such as compliance with the Migratory Bird Treaty Act (MBTA), and no compensatory mitigation is required. Level 1 resources include individual common native plant and wildlife species, upland stands of non-native plants, and abandoned agricultural fields. Impacts should be avoided or minimized if possible, but there are no compensatory mitigation requirements for impacts to Level 1 resources. For Level 2, 3, and 4 resources, compensatory mitigation is required if the total project impact after avoidance, minimization, and onsite rectification is greater than 1.2 acres. Habitat replacement ratios for BRMP resource Levels 2, 3, and 4 are 1:1, 3:1, and 5:1 (respectively). Level 5 resources are considered irreplaceable as there is no practical way to replace or restore the habitat if lost; therefore, compensatory mitigation is determined on a case-by-case basis.

The FMEF and surrounding area is industrial, gravel covered surfaces with little to no ecological value. This area would likely be considered a Level 0 resource with no compensatory mitigation required other than regulatory compliance with the MBTA.

There is always the potential for birds to nest within the project area on the ground, on buildings, or on equipment. The nesting season at the Hanford Site is typically from mid-March to mid-July. The active nests (containing eggs or young) of migratory birds are protected by the MBTA. The MBTA makes it illegal for people to "take" migratory birds, their eggs, feathers, or nests. Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof. Personnel working on this project would be instructed to watch for nesting birds. If any nesting birds (if not a nest, a pair of birds of the same species or a single bird that will not leave the area when disturbed) are encountered or suspected, or bird defensive behaviors (flying at workers, refusal to leave area, strident vocalizations) are observed within the project area, then project management would contact DOE-HFO Ecological Compliance to evaluate the situation.

A nesting bird survey is required if the project is to begin ground disturbing activities or any outdoor work during the nesting season as discussed herein. An ecological resources review would be conducted by DOE-HFO Ecological Compliance prior to performing ground disturbing activities or any outdoor work during the nesting season. Ground disturbing activities and outdoor work during the bird nesting season are not authorized until project staff has obtained a copy of survey results and adhere to any mitigation measures identified therein.

CONCLUSIONS

The proposed action for DOE-HFO to issue a license to Horizon Strata to investigate the potential suitability of the FMEF for HALEU production at the Hanford Site would have coverage under several categorical exclusions identified in DOE's NEPA Implementing Procedures (10 CFR 1021, Subpart D, Appendix B). If determined suitable, subsequent efforts to repurpose the FMEF for HALEU production through design, construction, operation, and decommissioning activities would require separate NEPA review and determination by the DOE-HFO/DOE-Headquarters NEPA Compliance Officers. In accordance with DOE’s NEPA Implementing Procedures (10 CFR 1021), the siting, construction, operation, and decommissioning of uranium enrichment facilities may require preparation of an Environmental Impact Statement (EIS), as determined by the DOE-HFO/DOE-Headquarters NEPA Compliance Officers. The U.S. Nuclear Regulatory Commission would likely be the lead agency for preparing an EIS with the DOE (DOE-HFO/DOE-Headquarters) as a cooperating agency.

The following 10 CFR 1021, Subpart D, Appendix B, Categorical Exclusions (CXs) would be applied to the proposed action to issue a license to Horizon Strata to determine the suitability of the FMEF for potential HALEU production:

CX B1.24, "Property Transfers" - This CX provides for the transfer, lease, disposition, or acquisition of interests in personal property (including, but not limited to, equipment and materials) or real property (including, but not limited to, permanent structures and land), provided that under reasonably foreseeable uses: (1) there would be no potential for release of substances at a level, or in a form, that could pose a threat to public health or the environment and (2) the covered actions would not have the potential to cause a significant change in impacts from before the transfer, lease, disposition, or acquisition of interests.

CX B3.1, "Site Characterization and Environmental Monitoring" - This CX provides for site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure of characterization and monitoring devices; and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA, RCRA, Atomic Energy Act, or other applicable authority. Specific activities include, but are not limited to:

a) Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing;

b) Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools);

c) Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells;

d) Aquifer and underground reservoir response testing;

e) Installation and operation of ambient air monitoring equipment;

f) Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck or mobile scale equipment, and modification, use, and plugging of boreholes);

g) Sampling and characterization of water effluents, air emissions, or solid waste streams;

h) Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources);

i) Sampling of flora or fauna; and

j) Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7.

NEPA is an inherently federal government function and all determinations must be made by, and be traceable to, DOE personnel responsible for NEPA compliance (i.e., DOE-HFO NEPA Compliance Officer, DOE-HFO Field Office Manager, or DOE-Headquarters NEPA Compliance Officer). Any changes to the proposed action described herein may require additional review and approval by the DOE-HFO or DOE-Headquarters NEPA Compliance Officers.

III. Existing Evaluations *(Provide with NRSF to DOE NCO)*:

Maps:

Figure 1 – Generalized Comprehensive Land Use Plan Map for the Hanford Site

NEPA REVIEW SCREENING FORM 3

Categorically Excluded Actions (Continued)

Document ID #: DOE/CX-00244

Maps:

Figure 2 - Location of FFTF, FMEF, and Related Facilities - Hanford Site 400 Area

Figure 3 - Aerial View of FMEF and FFTF - Hanford Site 400 Area

Figure 4 - Aerial View of FMEF and Related Facilities – Hanford Site 400 Area

Figure 5 – Initial Clearing and Grubbing of FMEF Construction Site – Hanford Site 400 Area

Figure 6 - FMEF Excavation for Minus 35 Feet and Minus 17.5 Feet Elevation Structures – Hanford Site 400 Area

Figure 7 - FMEF Minus 35 Feet Destructive Examination Cell Level – Hanford Site 400 Area

Figure 8 – FMEF Minus 17.5 Feet Equipment Level – Hanford Site 400 Area

Figure 9 - FMEF Entry Level, 21.25 Feet Chemistry Level, and 42.5 Feet Fuel Fabrication Level – Hanford Site 400 Area

Figure 10 – FMEF Entry Level, 21.25 Feet Chemistry Level, 42.5 Feet Fuel Fabrication Level, and 70 Feet Secure Automated Fabrication Level – Hanford Site 400 Area

Figure 11 – FMEF with Former Office Building (Removed) in Foreground – Hanford Site 400 Area

Figure 12 – FMEF Nearing Completion with Construction of Maintenance Shop Underway – Hanford Site 400 Area

Figure 13 - Completed FMEF with Perimeter Intrusion Detection and Assessment System (PIDAS) in Foreground and FFTF and Maintenance and Storage Facility (MASF) in Background – Hanford Site 400 Area

Other Attachments:

N/A

IV. List Applicable CX(s) from Appendix B to Subpart D of 10 CFR 1021:

B1.24, "Property Transfers" and B3.1, "Site Characterization and Environmental Monitoring"

V. Integral Elements and Extraordinary Circumstances ***(See 10 CFR 1021, Subpart D, B. Conditions that are Integral Elements of the Class of Actions in Appendix B; and 10 CFR 1021.410(b)(2) under Application of Categorical Exclusions)***	**Yes**	**No**
Are there extraordinary circumstances that may affect the significance of the environmental effects of the proposed action? If yes, describe them.	○	◉
Is the proposed action connected to other actions with potentially significant impacts, or that could result in cumulatively significant impacts? If yes, describe them.	○	◉
Would the proposed action threaten a violation of applicable statutory, regulatory, or permit requirements related to the environment, safety, health, or similar requirements of DOE or Executive Orders?	○	◉
Would the proposed action require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities?	○	◉
Would the proposed action disturb hazardous substances, pollutants, contaminants, or natural gas products already in the environment such that there might be uncontrolled or unpermitted releases?	○	◉
Would the proposed action have the potential to cause significant impacts on environmentally sensitive resources? See examples in Appendix B(4) to Subpart D of 10 CFR 1021.	○	◉
Would the proposed action involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, such that the action is not contained or confined in a manner designed, operated, and conducted in accordance with applicable requirements to prevent unauthorized release into the environment?	○	◉

If "No" to all questions above, complete Section VI, and provide NRSF and any attachments to DOE NCO for review.
If "Yes" to any of the questions above, contact DOE NCO for additional NEPA review.

VI. Responsible Organization's Signatures:

NEPA REVIEW SCREENING FORM 3 **Categorically Excluded Actions** (Continued)	**Document ID #:** DOE/CX-00244

Initiator:

Jerry W. Cammann, HMIS NEPA SME	JERRY CAMMANN (Affiliate) Digitally signed by JERRY CAMMANN (Affiliate) Date: 2025.04.16 11:25:14 -07'00'
Print First and Last Name	*Signature / Date*

Cognizant Program/Project Representative:

Tashina R. Jasso, DOE-HFO/SSD	Tashina Jasso Digitally signed by TASHINA JASSO Date: 2025.04.16 12:56:07 -07'00'
Print First and Last Name	*Signature / Date*

VII. DOE NEPA Compliance Officer Approval/Determination:

Based on my review of information conveyed to me concerning the proposed action, the proposed action fits within the specified CX(s): ☒ Yes ☐ No

Douglas H. Chapin, DOE-HFO/NCO	Douglas H. Chapin Digitally signed by DOUGLAS CHAPIN Date: 2025.04.17 06:37:01 -07'00'
Print First and Last Name	*Signature / Date*

NCO Comments *(Note: If comments are added, then this field must be filled out prior to entering the electronic signature in VII.*

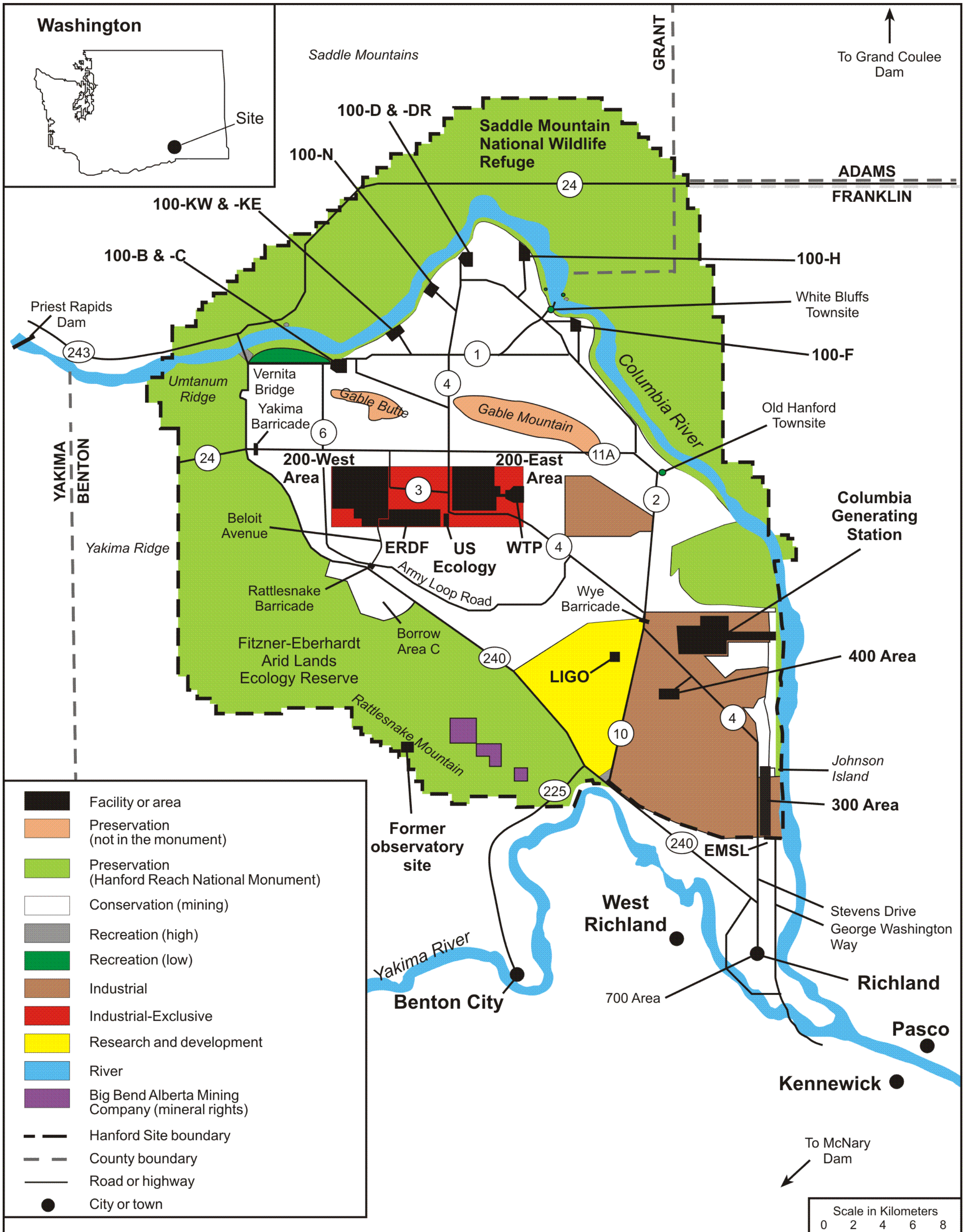
ATTACHMENT

DOE/CX-00244

Civil and Structural Suitability Analysis of the Fuels and Materials Examination Facility for Relicensing at the Department of Energy Hanford Site

14 pages, including this page

Figure 1 – Generalized Comprehensive Land Use Plan Map for the Hanford Site



Key: EMSL=Environmental and Molecular Sciences Laboratory; ERDF=Environmental Restoration Disposal Facility; LIGO=Laser Interferometer Gravitational-Wave Observatory; WTP=Waste Treatment Plant.

Source: Modified from DOE 1999a:3-18; 2000a:3-89.

Figure 2 – Location of FFTF, FMEF, and Related Facilities - Hanford Site 400 Area

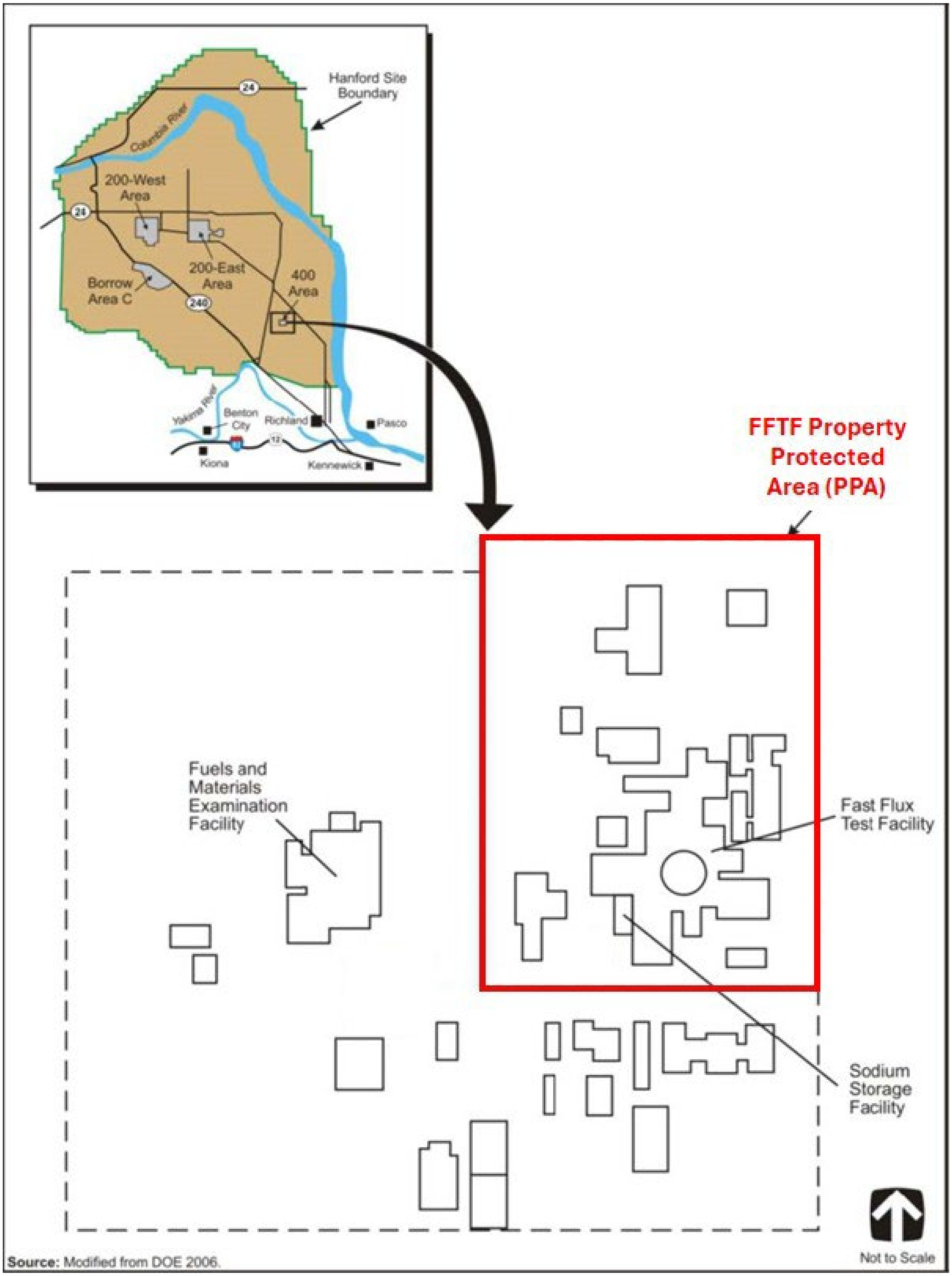


Figure 3 - Aerial View of FMEF and FFTF - Hanford Site 400 Area

Figure 4 - Aerial View of FMEF and Related Facilities – Hanford Site 400 Area

Figure 5 – Initial Clearing and Grubbing of FMEF Construction Site – Hanford Site 400 Area

Figure 6 - FMEF Excavation for Minus 35 Feet and Minus 17.5 Feet Elevation Structures – Hanford Site 400 Area

Figure 7 - FMEF Minus 35 Feet Destructive Examination Cell Level – Hanford Site 400 Area

Figure 8 – FMEF Minus 17.5 Feet Equipment Level – Hanford Site 400 Area

Figure 9 - FMEF Entry Level, 21.25 Feet Chemistry Level, and 42.5 Feet Fuel Fabrication Level – Hanford Site 400 Area

Figure 10 – FMEF Entry Level, 21.25 Feet Chemistry Level, 42.5 Feet Fuel Fabrication Level, and 70 Feet Secure Automated Fabrication Level – Hanford Site 400 Area

Figure 11 – FMEF with Former Office Building (Removed) in Foreground – Hanford Site 400 Area

Figure 12 – FMEF Nearing Completion with Construction of Maintenance Shop Underway – Hanford Site 400 Area

Figure 13 - Completed FMEF with Perimeter Intrusion Detection and Assessment System (PIDAS) in Foreground and FFTF and Maintenance and Storage Facility (MASF) in Background – Hanford Site 400 Area