Draft Environmental Assessment for Construction and Operation of a Radiological Work and Storage Building

KNOLLS ATOMIC POWER LABORATORY
KESSELRING SITE
WEST MILTON, NEW YORK

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Prepared by the

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COVER SHEET

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ABSTRACT:

This Environmental Assessment (EA) evaluates the potential environmental impacts of constructing and operating a new Radiological Work and Storage Building at the Knolls Atomic Power Laboratory Kesselring Site. A modernized Radiological Work and Storage Building would streamline radioactive material handling and storage operations, permit demolition of aging facilities, and accommodate efficient maintenance of existing nuclear reactors. No spent nuclear fuel would be handled or stored in any of the alternatives being considered. The EA provides a comparison of the Proposed Action to a Temporary Facility Alternative and a No Action Alternative. The potential environmental impacts associated with operations in the new facility or the alternatives is consistent with those already addressed in a previous Environmental Impact Statement associated with operations at the Kesselring Site. Previous analysis concluded that impacts to the environment would be small. The EA examines the project which includes construction and operation of a modernized building and demolition of an existing building to support construction. Public comments on this Draft EA must be received by April 6, 2012 to ensure their consideration in the preparation of the Final EA and determination of whether a Finding of No Significant Impact or Environmental Impact Statement is appropriate.

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SUMMARY

The U.S. Department of Energy Naval Nuclear Propulsion Program (NNPP) has prepared this Environmental Assessment to evaluate the potential environmental impacts from constructing and operating a new Radiological Work and Storage Building. The National Environmental Policy Act requires Federal agencies to analyze the potential environmental impacts (both positive and negative) of their proposed actions to assist them in making informed decisions. This Environmental Assessment has been prepared in accordance with the Council of Environmental Quality regulations for implementing the National Environmental Policy Act (40 CFR Parts 1500-1508) and the U.S. Department of Energy implementation procedures (10 CFR Part 1021).

The operation, maintenance, refueling, overhaul, and decommissioning of the prototype reactors results in low-level radioactive contamination of some support equipment and the generation of low-level radioactive waste. Additional modernized radiological work and storage space is needed to support maintenance on the operational nuclear prototypes at the Kesselring Site. No spent nuclear fuel will be handled or stored in the new Radiological Work and Storage Building or any of the alternatives being considered.

The Proposed Action demolishes Building 80C and constructs a modernized Radiological Work and Storage Building that would have a footprint of approximately 670-1,270 square meters (7,200-13,600 square feet). The new facility would be used for the preparation of equipment for maintenance operations, packaging of radiological waste for shipment, and temporary storage of radiologically controlled material. The facility would be built within an already developed portion of the Kesselring Site. The Radiological Work and Storage Building would be designed and constructed to meet stringent NNPP requirements to contain radioactivity and prevent the spread of radioactive contamination to workers, the public, and the environment. The proposed location of the Radiological Work and Storage Building allows for staging equipment for maintenance in parallel with moving equipment during prototype maintenance evolutions. The facility design would be a site-specific adaptation of radiological work facilities constructed at naval shipyards that perform similar work on nuclear-powered ships. The facility would be equipped with internal bridge cranes to support movement of equipment and material within the facility.

The Temporary Facility Alternative is to construct a temporary radiological work structure that is approximately 670-1,270 square meters (7,200-13,600 square feet). The temporary radiological work structure would be designed to meet stringent NNPP requirements for control of radioactive materials. Due to the temporary nature of the facility, internal cranes would not be provided and roof hatches may be limited. The temporary facility would result in an increased cost of $10-15 million and an approximate 2 month delay for the first planned maintenance period and similar future cost and delay impacts for other long range prototype maintenance activities.

Under the No Action Alternative, the NNPP would continue to use existing facilities at the Kesselring Site. The existing facilities require refurbishment and upgrade for use as a radiological work facility. This alternative does not fulfill the mission need due to the inadequate radiological work and storage space available to support prototype maintenance evolutions. The insufficient work and storage space would result in a minimum of 4 months of delays during prototype maintenance which results in an impact to the NNPP training plans in place to support the Navy's manning needs for nuclear-powered warships in support of the nation's defense. A delay of this magnitude would result in an additional cost of $20-30 million over the life of the prototype plants.

Based on the evaluations included herein, the environmental impacts that could result from the Proposed Action, Temporary Facility Alternative, or No Action Alternative would be small.

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Table of Contents

SECTION 1

INTRODUCTION

1.1 INTRODUCTION

The Department of Energy (DOE) Office of Naval Reactors, also known as the Naval Nuclear Propulsion Program (NNPP), has prepared this Environmental Assessment (EA) to assess the potential impacts associated with the construction and operation of a new Radiological Work and Storage Building at the DOE Kesselring Site near West Milton, New York.

1.2 BACKGROUND

The Kesselring Site is located in Saratoga County near West Milton, New York (see Figure 1-1). The Kesselring Site is an approximately 26 hectare (65 acre) developed area situated within an approximately 1,600 hectare (3,900 acre) federal reservation owned by the DOE (see Figure 1-2). The Kesselring Site is currently operated by the Bechtel Marine Propulsion Corporation under contract with the DOE.

The mission of the Kesselring Site is to train U.S. Navy personnel to operate and maintain naval nuclear propulsion plants for the U.S. Navy nuclear powered fleet of 11 aircraft carriers and 71 commissioned submarines. The Kesselring Site is also engaged in testing naval nuclear propulsion plant technology. Naval nuclear operators and officers have been trained at the naval nuclear propulsion prototype reactors at the Kesselring Site since 1959. In 1991, the S3G Prototype ceased operation as a result of the availability of more modern platforms that could meet the testing and training requirements of the NNPP. In 1996, the D1G prototype similarly ceased operation. An Environmental Impact Statement (EIS) assessing the impacts of decommissioning and dismantlement of the S3G and D1G Prototype reactor plant facilities was prepared and published in 1997 (Reference NNPP 1997). Consistent with the Record of Decision (ROD), dismantlement and removal of the S3G Prototype from the Kesselring Site was completed in 2006. Also consistent with the ROD, the D1G Prototype is in the process of being dismantled and removed. The Kesselring Site currently has two operational land-based pressurized-water naval nuclear propulsion plants. The MARF prototype was placed in service in 1976 and the S8G prototype was placed in service in 1979.

Key achievements at the Kesselring Site include testing of several generations of naval nuclear propulsion plants and training more than 46,000 nuclear plant operators and officers for the U.S. Navy. The training of naval nuclear operators and officers includes hands-on operation of a nuclear propulsion plant. Providing sufficient trained and certified nuclear operators and officers for the Navy to ensure sufficient staffing of nuclear-powered warships is vital to the Navy's ability to perform missions in support of national defense.

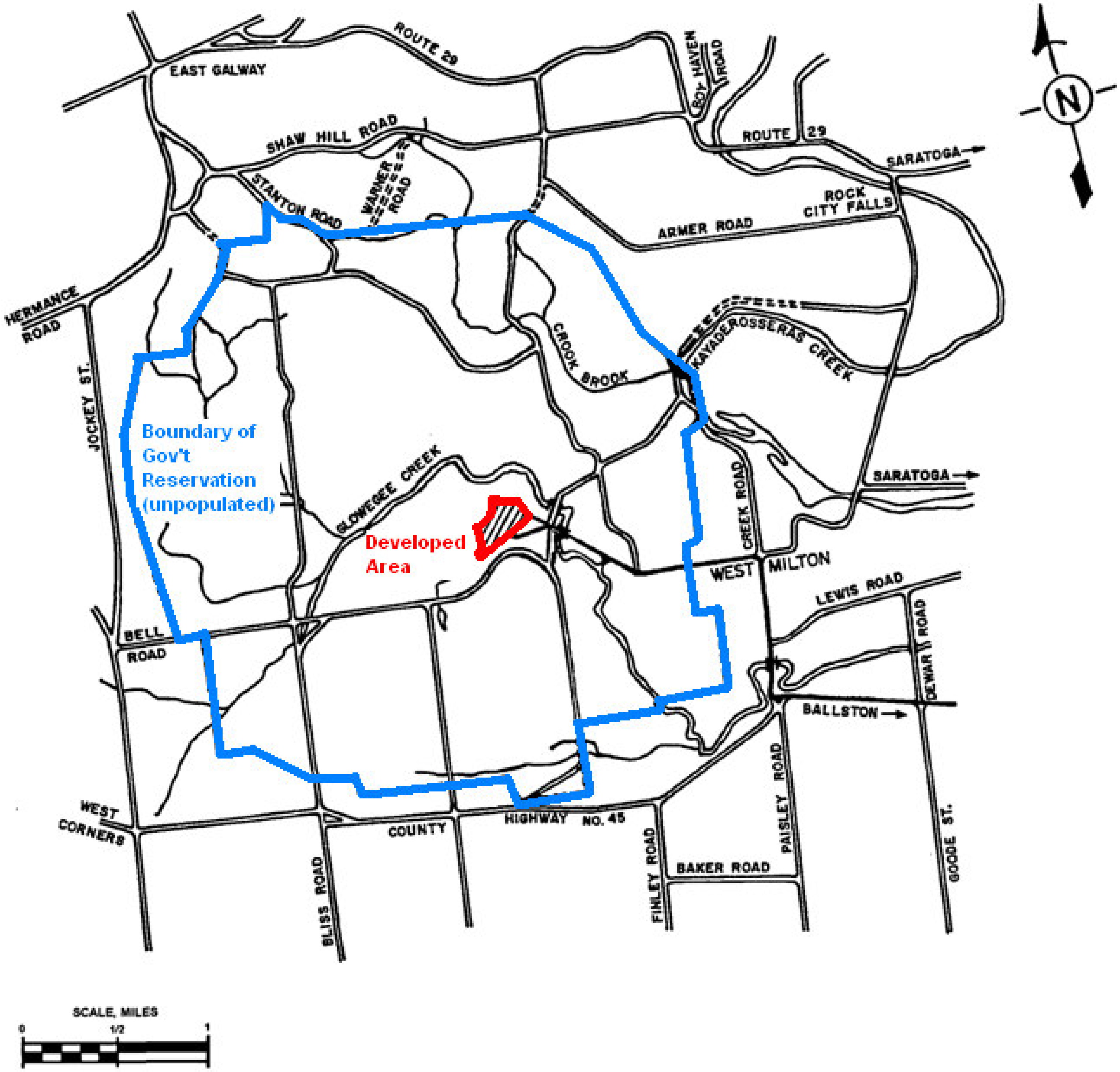

Figure 1-1: Kesselring Site Reservation Map

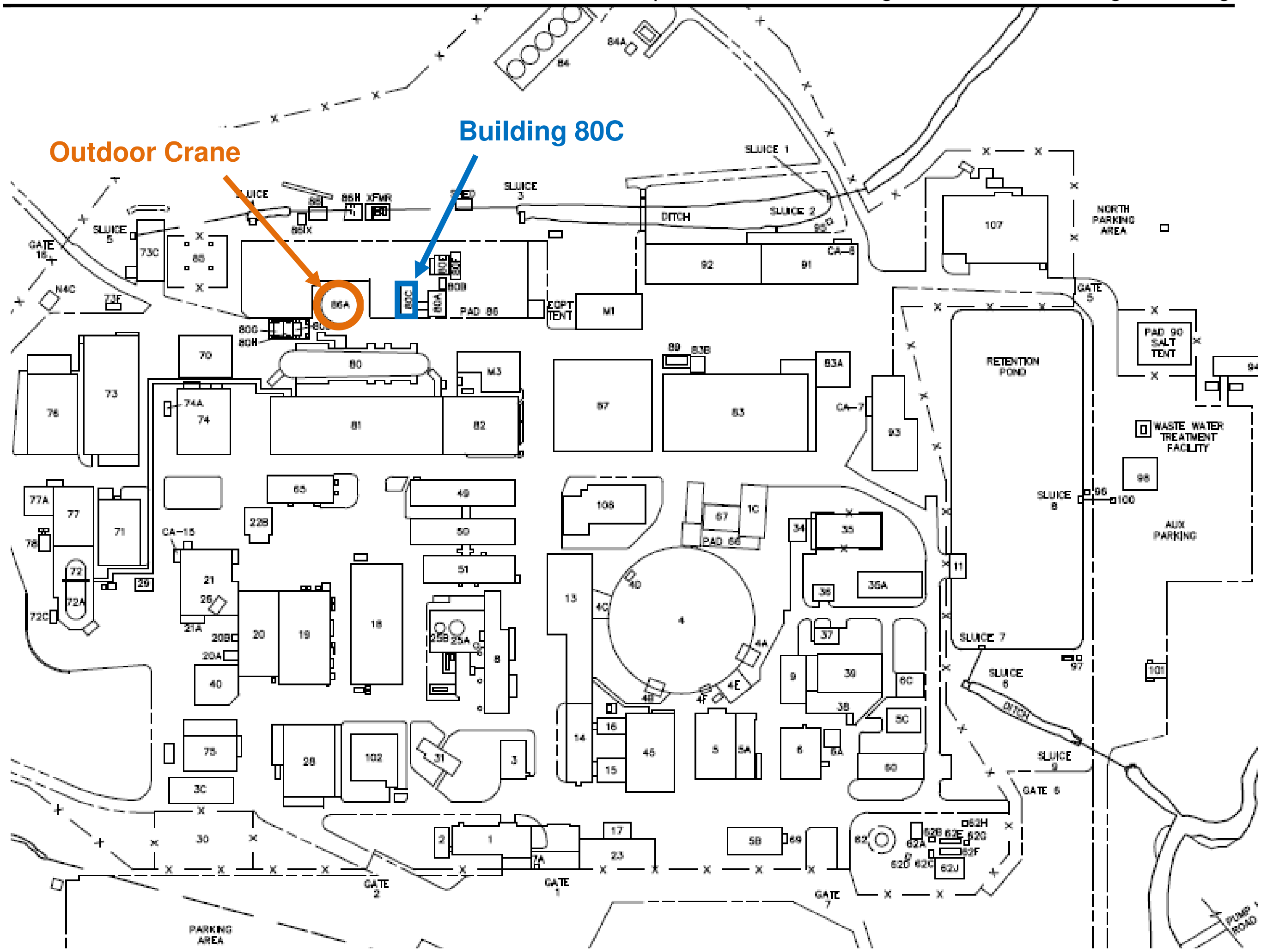

Figure 1-2: Developed Area of the Kesselring Site

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

The operation, maintenance, refueling, overhaul, and decommissioning of the prototype reactors results in low-level radioactive contamination of some support equipment and the generation of low-level radioactive waste (LLRW). These radioactive materials must be handled in facilities that are specifically designed to contain radioactivity and prevent the spread of radioactive contamination to workers, the public, and the environment. Additional modernized radiological work and storage space is needed to support required maintenance on the operational nuclear prototypes at the Kesselring Site. A shortfall has been identified between the available radiological work and storage space and the necessary space to support continued maintenance on the nuclear reactor prototypes. In addition, equipment with low levels of radioactive contamination will be serviced and prepared for use as part of prototype maintenance at the site. Upon completion of maintenance work, material and equipment will be packaged and shipped to other Federal facilities for use on nuclear powered ships. No spent nuclear fuel will be handled or stored in the new Radiological Work and Storage Building.

1.4 THE NAVAL NUCLEAR PROPULSION PROGRAM

The NNPP is a joint Department of Navy and DOE organization responsible for all matters pertaining to U.S. Navy nuclear propulsion, as set forth in Presidential Executive Order 12344, permanently enacted as Public Laws 98-525 (50 USC 2511) and 106-65 (50 USC 2406). The history and mission of the NNPP is a matter of public record. The NNPP began in 1948, resulted in the commissioning of the first nuclear-powered submarine in 1954, and continues today with a fleet of nuclear-powered submarines and aircraft carriers unmatched by any other nation in the world.

The NNPP's conservative design practices and stringent operating procedures have resulted in the demonstrated safety record of naval nuclear propulsion plants. NNPP reactors have accumulated over 6,300 reactor-years of operation and have steamed over 233 million kilometers (145 million miles). There has never been a reactor accident, nor any release of radioactivity that has had an adverse effect on human health or the quality of the environment. The U.S. Navy's nuclear-powered ships have an unparalleled record of safety, reliability, and environmental compliance.

Since radioactive material is an inherent by-product of the nuclear fission process, its control has been a central concern for the NNPP since its inception. Radiation levels and releases of radioactivity have historically been controlled well below levels allowed by national and international standards. All features of design, construction, operation, maintenance, and personnel selection, training, and qualification have been oriented toward minimizing environmental effects and ensuring the health and safety of workers, Navy crew members, and the public. Conservative reactor safety design has, from the beginning, been a hallmark of the NNPP.

1.5 PUBLIC PARTICIPATION

The NNPP published a Notice of Intent (NOI) to prepare this EA in the Federal Register on August 31, 2011 to solicit comments on the scope of the EA. A notification was also published in three newspapers in New York (The Saratogian, The Times Union, and The Daily Gazette). In addition, notifications were sent to federal, state, and local public officials. A summary of the comments received is included in Appendix A.

This EA has been prepared to evaluate the potential environmental impacts of the Proposed Action and alternatives to address the need discussed in Section 1.3. A draft of the EA is being made available for public comment to ensure that public concerns are appropriately considered in the evaluations. Following consideration of public comments, the NNPP will prepare a Final EA and determine whether a Finding of No Significant Impact is appropriate, or if the preparation of an EIS is required.

SECTION 2

DESCRIPTION AND EVALUATION OF ALTERNATIVES

The National Environmental Policy Act (NEPA) implementing regulations (40 CFR 1502.14 and 10 CFR 1021.321) require the evaluation of reasonable alternatives for a federal action, including a No Action Alternative. This section provides a detailed description of the Proposed Action, a Temporary Facility Alternative, and a No Action Alternative. A No Action Alternative is required to be evaluated even if it does not meet the purpose and need for the action to provide a baseline against which to compare other alternatives.

2.1 THE PROPOSED ACTION

The NNPP proposes to construct a new Radiological Work and Storage Building near the Kesselring Site operating prototypes within the envelope serviced by the outdoor crane, see Figure 2-1. The Radiological Work and Storage Building is expected to have a footprint of approximately 670-1,270 square meters (m^2) (7,200-13,600 square feet (ft^2)) and would be designed and constructed to meet stringent NNPP requirements for control of radioactive materials. Existing Building 80C (see Figure 1-2) would be demolished to remove this obsolete facility and to make room to construct the new Radiological Work and Storage Building. The proposed Radiological Work and Storage Building would be sited in this location to allow equipment to be moved from the Kesselring Site operating prototypes to the new facility by the outdoor crane. The proposed location of the Radiological Work and Storage Building allows for staging equipment for maintenance in parallel with moving equipment during prototype maintenance evolutions. This capability for parallel work would increase the efficiency associated with prototype maintenance and equipment preparation. The Radiological Work and Storage Building would also be constructed with two 20-ton internal cranes to permit efficient staging and movement of equipment and radioactive materials within the facility without use of the outdoor crane. The outdoor crane is also used for maintenance on the Kesselring Site operating prototypes and reliance on this crane for all equipment moves would likely impact Kesselring Site operating prototype maintenance efforts. The construction of a new Radiological Work and Storage Building will streamline maintenance evolutions and increase the amount of time the Kesselring Site operating prototypes are available for training Navy students. Delays during maintenance evolutions resulting from not constructing a new Radiological Work and Storage Building would result in an additional cost of $20-30 million over the life of the prototype plants and decrease prototype availability, affecting the number of sailors that are trained and made available to be deployed to the naval nuclear fleet in support of the nation’s defense.

The new Radiological Work and Storage Building would be used to work on radioactively contaminated equipment and components associated with naval nuclear propulsion plants. The design would be a site specific adaptation of radiological work facilities constructed at naval shipyards that perform similar work on nuclear-powered ships. Construction would be concrete and structural steel on a concrete slab foundation supported by columns or the equivalent. The radiologically controlled work area would support all aspects of maintenance and repair of the prototype’s radioactive components except that the facility would neither handle nor store spent nuclear fuel. The facility would be equipped with two bridge cranes to support movement of equipment and material within the facility. The radiological work area would include space for unpackaging and packaging radioactively contaminated equipment that would be used for maintenance work, preparation of equipment for use and post-use maintenance on radiologically controlled equipment. Radioactive waste would be packaged and stored in containers that would meet NNPP and Department of

Transportation (DOT) requirements pending complete characterization and accumulation of sufficient quantities to support off-site shipment to authorized disposal sites outside of New York.

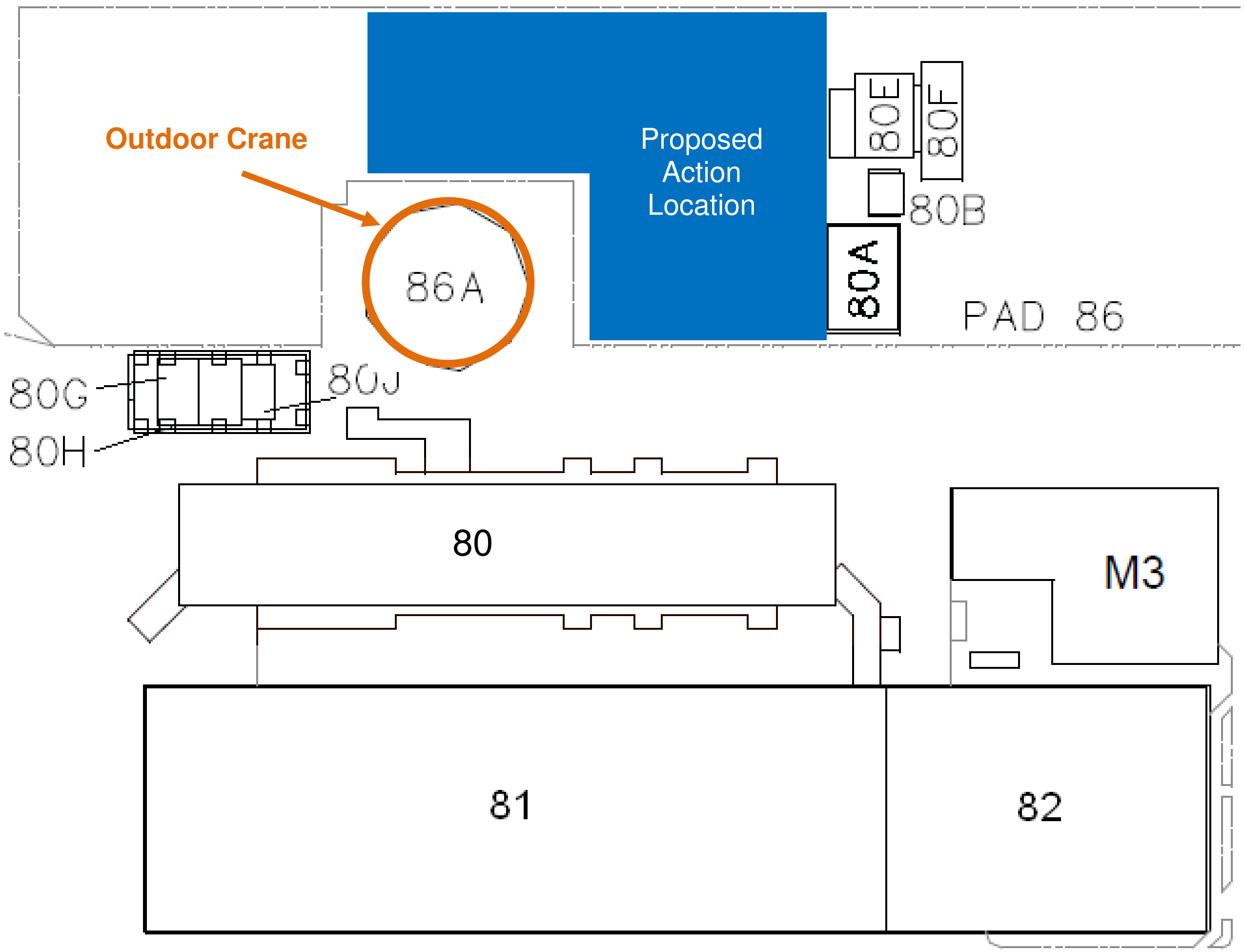

Figure 2-1: Location of Proposed Action

The Radiological Work and Storage Building would be designed to meet stringent NNPP standards for radiological facilities. It would also incorporate applicable features in accordance with security requirements, as well as local, New York State, and Federal building codes.

The NNPP has set stringent standards for the construction of facilities that will be used to handle or store radioactive materials. These standards prevent the spread of radioactive contamination within the facilities or to the environment, minimize exposure to personnel within the facilities, ensure that exposure to personnel outside the facilities is negligible, and minimize the effort required to decontaminate and decommission the facilities. All aspects of facility construction and future modifications are engineered.

Standard design features for NNPP radiological facilities have been developed to minimize the potential risk to the environment, the general public, and workers, including:

- ***Impermeable Floors, Walls and Liquid Containment Curbs in Radiological Work Areas***
  The floors consist of a heavy structural concrete slab topped with an impermeable surface that eliminates the possibility of migration of liquid through the floor into the underlying soils. No underground piping is permitted in or under the floors. Wherever liquids are handled, containment curbs or basins are provided to contain the largest potential spill. All floors, walls, and ceilings are smooth, free of crevices, and sealed to aid in decontamination, if necessary. Walls and roofs are tightly constructed and sealed to minimize the sources of air leakage. Doors and windows are made as leak tight as possible. All entrances to the building are ramped or sealed, where practicable, to prevent any potential inadvertent loss of contaminated liquids.

- ***Radiation Shielding***
  The facilities are designed so that all exterior areas and interior non-radiological support areas have radiation levels so low that monitoring personnel for radiation exposure is not required. This is achieved by the use of radiation shielding integral to the permanent walls of the facilities as well as by the use of portable shielding as work conditions dictate.

- ***Mixed Waste is Segregated and Stored in a Dedicated Storage Area***
  Mixed waste (waste that is both radiologically contaminated and chemically hazardous) is segregated into containers that hold similar (chemically compatible) wastes.

- ***Filtered Exhaust Air***
  Exhaust systems that service radiological work facilities are designed and operated to ensure the control of potential sources of airborne radioactivity. Air systems include high efficiency particulate air (HEPA) filters that have been demonstrated to be at least 99.95 percent efficient at removing particles of a size comparable to cigarette smoke from the exhaust air. The system would be designed to ensure that the radiological work spaces would be maintained at a negative pressure with respect to the outside atmosphere so all uncontrolled air movement would be into the facility rather than out of the building.

Existing Building 80C would be demolished to make room for the construction of the Radiological Work and Storage Building. Equipment within Building 80C would be surveyed for radiological contamination and then reused elsewhere at the Kesselring Site, as appropriate, or disposed of in accordance with NNPP, Environmental Protection Agency (EPA), and New York State requirements. Once the equipment is removed, Building 80C would be surveyed using highly sensitive instruments. Where necessary, simple, proven NNPP cleanup methods would be used to remediate areas of residual radioactivity. The building would also be surveyed for hazardous materials such as asbestos, lead-based paint, and polychlorinated biphenyls. The building will be disposed of appropriately in accordance with applicable requirements following detailed surveys and analysis of the sample data. An estimated 209 cubic meters (273 cubic yards) of demolition waste would be generated. This waste would be sampled and evaluated for radioactive and hazardous contamination prior to being transported off-site to an approved disposal facility.

Due to facility design and the control of radioactivity during operation, NNPP facilities have been decommissioned with no significant residual environmental impact. Within the past several decades, three shipyards involved in naval nuclear work have been successfully radiologically deactivated and closed. Also, one naval nuclear prototype site has been decommissioned and returned to the public for unrestricted use.

The successful radiological deactivation and closure of these sites demonstrates the stringent control over radioactivity exercised by the NNPP from its inception is successful in preventing significant radiological contamination of the environment.

2.2 TEMPORARY FACILITY ALTERNATIVE

The NNPP identified one reasonable alternative to the Proposed Action that could meet the mission need. This alternative would construct a Temporary Radiological Work Structure for use during peak periods of maintenance. In lieu of a permanent building, a Temporary Radiological Work Structure would be constructed near the Kesselring Site operating prototypes. The Temporary Radiological Work Structure would also occupy an approximate 670-1,270 m^2 (7,200-13,600 ft^2) footprint. A footprint would be selected that would allow it to be located within the envelope of the outdoor crane without demolishing Building 80C, see Figure 2-2. The Temporary Radiological Work Structure would be designed to meet stringent NNPP requirements for control of radioactive materials. To meet stringent NNPP radiological control requirements for protection of the environment, the facility would have impermeable materials for the floors and walls, utilize temporary ventilation systems to control potential sources of airborne radioactivity and utilize temporary shielding surrounding the building to ensure individuals maintain exposure “As Low As Reasonably Achievable.” Following completion of work, the temporary facility would be dismantled and placed into storage. The facility would be available to support future maintenance activities after reassembly and recertification.

Due to the temporary nature of the facility, in-house cranes would not be provided and roof hatches may be limited. This would reduce parallel operation efficiency gains and cost savings associated with the Proposed Action. The estimated impact of lost efficiency is a two month delay to the first planned maintenance activity and results in an increase in the cost of the maintenance period of approximately $10-15 million. Additionally, the use of a Temporary Radiological Work Structure would also result in repetitive costs to build, certify, disassemble, and store components for the temporary facility. Each subsequent use would also have the same inherent loss of efficiency and resulting increased cost to the maintenance period.

A temporary facility could meet the maintenance needs of the operating prototypes. The temporary facility would result in an increased cost of $10-15 million and a delay of approximately two months for the first planned maintenance period and similar future cost impacts for other long range prototype maintenance activities. This alternative would result in an increased cost to the NNPP and impact NNPP training plans in place to support the Navy’s manning needs for nuclear-powered warships.

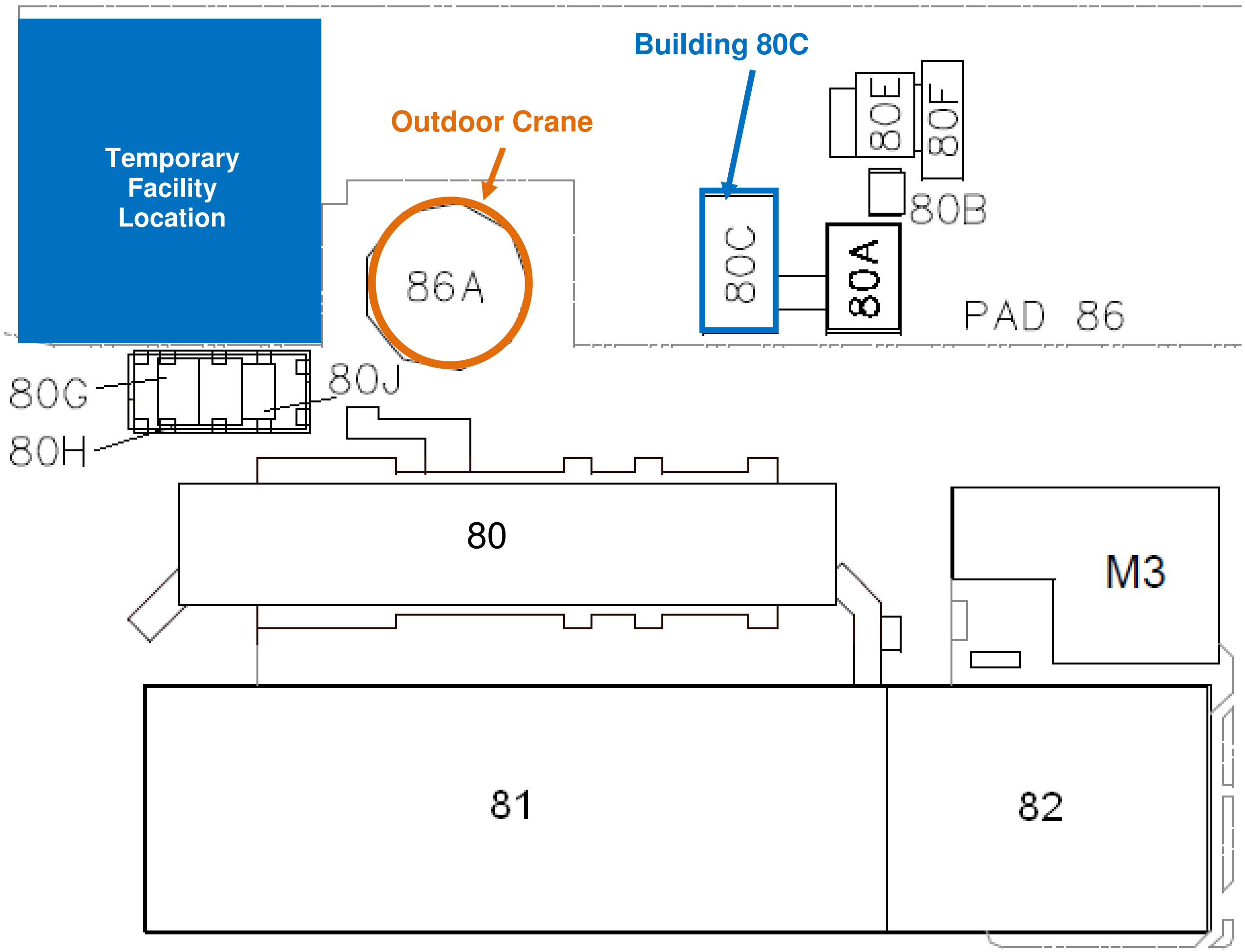

Figure 2-2: Location of Temporary Facility Alternative

2.3 NO ACTION ALTERNATIVE

In accordance with NEPA requirements, the NNPP evaluated a No Action Alternative. Under the No Action Alternative, the NPPP would continue to use existing facilities at the Kesselring Site even though this alternative would not fulfill the mission need. The Kesselring Site has some existing radiological work facilities which are small and not close to the Kesselring Site operating prototypes and the outdoor crane. Combined, all Kesselring Site existing facilities with the potential to be used for radiological work and storage have insufficient work and storage space to support planned maintenance activities required to ensure the continued efficient operation of the Kesselring Site operating prototype reactor plants. In addition, some existing facilities that have not been used for radiological work for several years would need to be refurbished and upgraded prior to being used for radiological work. The cost to refurbish and upgrade existing facilities is estimated to be approximately $4-5 million and would still result in inadequate radiological work and storage space. Using refurbished facilities throughout the Kesselring Site, vice a new centralized Radiological Work and Storage Building, would cause a minimum of 4 months of delay to completion of the first planned prototype maintenance period. A delay of this magnitude would result in an additional cost of $20-30 million over the life of the prototype plants. Future prototype maintenance activities would also be impacted by a loss of efficiency resulting in an overall cost increase. This alternative would result in an increased cost to the NNPP and impact NNPP training plans in place to support the Navy's manning needs for nuclear-powered warships. Even though this alternative does not meet the mission need, it is being carried forward to provide a basis for comparison to the other alternatives.

SECTION 3

AFFECTED ENVIRONMENT AND POTENTIAL ENVIRONMENTAL IMPACTS

3.1 KESSELRING SITE DESCRIPTION

Development of the Kesselring Site began in 1948 with Government acquisition of the 1,600 hectares (3,900 acres) of land near West Milton in Saratoga County, New York. Groundbreaking occurred in 1950, and construction of facilities began in 1951. The Kesselring Site is largely a forested area with two operating pressurized-water naval nuclear propulsion plants and support facilities, including administrative offices, machine shops, waste storage facilities, training facilities, equipment service buildings, chemistry laboratories, a boiler house, and cooling towers. Two other nuclear propulsion plants were permanently shut down and defueled during the 1990s; one has been dismantled, the other is undergoing dismantlement. Operations at the Kesselring Site have focused on naval nuclear propulsion plant training and testing since they began.

Most of the land surrounding the Kesselring Site is rural, although residential development has occurred. Regionally, the Kesselring Site lies within the moderately undulating transition zone between the Kayaderosseras Range of the Adirondack Mountains and the Hudson-Mohawk valley lowlands. Further information about the Kesselring Site's geology, hydrology, and demography is available in the Knolls Atomic Power Laboratory Environmental Monitoring Report (KAPL 2009) or the Kesselring Site Environmental Summary Report (KAPL 2008).

3.2 ENVIRONMENTAL IMPACTS RESULTING FROM RADIOLOGICAL WORK AND STORAGE BUILDING

3.2.1. NATURAL IMPACTS

3.2.1.1. Geology, Topography, and Soils

The geology, topography, and soils at the Kesselring Site are described in detail in the Knolls Atomic Power Laboratory Environmental Monitoring Report (KAPL 2009) and the Kesselring Site Environmental Summary Report (KAPL 2008). The location for the Proposed Action (see Figure 2-1) is paved with concrete and contains Building 80C.

ENVIRONMENTAL IMPACT: Facility demolition and construction associated with the Proposed Action would be within the already developed area of the Kesselring Site, see Figure 2-1. Building 80C would be demolished and some of the concrete would be removed to build the foundation for the new Radiological Work and Storage Building. The geology and topography at the Kesselring Site would not be affected by the Proposed Action because demolition and construction activities would not be to such an extent to change the underlying geology. To minimize temporary and small short-term soil impacts during demolition and construction activities, erosion and sedimentation control techniques would be used to stabilize soils. These techniques include, but are not limited to, installing silt fencing and sediment traps.

Under the Temporary Facility and No Action Alternative, no demolition or removal of concrete would occur. Existing conditions with respect to geology, topography, and soils would remain essentially unchanged resulting in no impacts to geology, topography, and soils.

3.2.1.2. Ecological Resources

Ecological resources include the terrestrial ecology, wetlands, aquatic ecology, and endangered and threatened species in the vicinity of the Kesselring Site. On April 8, 2011, the U.S. Fish and Wildlife Service's Section 7 Consultation website (http://www.fws.gov/northeast/nyfo/es/CountyLists/) was reviewed for a list of species and critical habitat that "may be present" within the project area. Based on the information provided on the website, one delisted species and two endangered species were identified: bald eagle (Haliaeetus leucocephalus), Indiana bat (Myotis sodalis), and Karner blue butterfly (Lycaeides melissa samuelis), respectively. Walk-throughs in the vicinity of the proposed and temporary alternative site locations were conducted and no nests were identified and the previously developed area of the Kesselring Site is not a typical habitat for the species in question.

ENVIRONMENTAL IMPACT: Ecological resources would not be affected, since none of the alternatives change the existing condition of the area with respect to its ecological resources. No additional land outside the already developed portion of the Kesselring Site would be disturbed. The wetlands that exist outside of the developed portion of the Kesselring Site would not be affected by any of the alternatives. Therefore, there would be no environmental impact on ecological resources associated with any of the alternatives.

3.2.1.3. Water Resources

The Kayaderosseras Creek Valley is the main aquifer in this area. Three small creeks drain the Kesselring Site: the Glowegee Creek, Crook Brook, and Hogback Brook. The major sources of potable water in the area are individual domestic wells. Further information about the Kesselring Site's hydrology is available in the Knolls Atomic Power Laboratory Environmental Monitoring Report (KAPL 2009) or the Kesselring Site Environmental Summary Report (KAPL 2008).

ENVIRONMENTAL IMPACT: Demolition and construction activities associated with the Radiological Work and Storage Building would be in the developed area of the Kesselring Site. Demolition and construction activities would be done in accordance with applicable federal, state, and local requirements. An erosion and sediment control plan including storm water management would be prepared and implemented in accordance with these requirements. The Radiological Work and Storage Building and Temporary Facility Alternative would be designed with an impermeable floor, thus no impact on water resources is expected during operations.

Under the No Action Alternative and Temporary Facility Alternative, no demolition or excavation would occur and existing conditions would not change. There would be no impact to the existing water resource conditions at the Kesselring Site.

3.2.2. MAN-MADE IMPACTS

3.2.2.1. Noise

The Kesselring Site is an industrial environment with operations 24 hours per day and 365 days per year, characterized by noise from trucks, automobiles, cranes, and engine or motor-powered equipment. The developed area of the Kesselring Site is nearly one mile from the site boundary.

ENVIRONMENTAL IMPACT: Noise in the developed area generated as a result of the demolition of the existing buildings, construction of a new Radiological Work and Storage Building or the operations in the facility would not be discerned beyond the site boundaries. Noise from demolition of existing facilities and construction of a Radiological Work and Storage Building would be temporary in impact. Additional mitigation measures (e.g. hearing protection, exclusion of unnecessary workers from the construction area during peak noise occurrences) would be implemented as needed. Construction activities would be intermittent and temporary in nature. Minimal environmental impact from noise would be associated with the Proposed Action.

Noise impacts during construction of the Temporary Faciliity Alternative would be localized and minor, similar to construction noise from the Proposed Action. Under the No Action Alternative, existing conditions would remain essentially unchanged.

Noise from maintenance operations with the Proposed Action, Temporary Facility Alternative, or No Action Alternative, would be similar to noise from current operations. The proposed activities would be located adjacent to the area currently used for maintenance operations. Noise resulting from the Proposed Action would remain comparable to the No Action Alternative or Temporary Facility Alternative.

3.2.2.2. Air Quality

The principal sources of industrial gaseous effluents are the Kesselring Site steam generating boilers which use Number 2 fuel oil to fire the boilers. Combustion gases from the boilers are released through two elevated exhaust stacks. These boilers are in a separate facility and would be unaffected by the Proposed Action or Alternatives. Details of the non-radiological air quality and radiological air quality impacts from operations at the Kesselring Site are provided in the Knolls Atomic Power Laboratory Environmental Monitoring Report (KAPL 2009).

Exhaust systems that service radiological work facilities are designed and operated to ensure the control of potential sources of airborne radioactivity. These air systems include high efficiency particulate air (HEPA) filters that have been demonstrated to be at least 99.95 percent efficient at removing particles of a size comparable to cigarette smoke from the exhaust air. The Radiological Work and Storage Building system would be designed to ensure that the radiological work spaces would be maintained at a negative pressure with respect to the outside atmosphere so all uncontrolled air movement would be into the facility rather than out of the building.

ENVIRONMENTAL IMPACT: Due to the short duration of demolition and construction activities, ambient air quality is not expected to be impacted significantly. The effect of the Proposed Action and Temporary Facility Alternative on the local air quality would be minimal and temporary during construction. Air quality at the facility may be temporarily impacted during demolition and construction, but is not expected to change the designation of the area with respect to National Ambient Air Quality Standards (NAAQS). There would be no impact on local air quality from the No Action Alternative.

Relative to existing conditions and operations at the Kesselring Site, no significant impacts to air quality would be attributed to demolition prior to, construction of, or operations in the Radiological Work and Storage Building. Operations within the building would have no impact on non-radiological ambient air quality and would not be expected to cause either radiological or non-radiological air quality impacts to exceed state or Federal standards, or to significantly affect air quality in any other respect at the Kesselring Site. For the Proposed Action, the No Action Alternative, and the Temporary Facility Alternative, air emissions at the Kesselring Site would remain essentially unchanged due to the design and operating requirements of the HEPA filtered ventilation systems.

3.2.2.3. Greenhouse Gas Emissions

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. On February 18, 2010, the Council on Environmental Quality (CEQ) released *NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. This guidance suggests that proposed federal actions that would reasonably be anticipated to emit 25,000 metric tons or more of equivalent carbon dioxide GHG emissions should be evaluated by quantitative and qualitative assessments. While not a specific threshold of significance, this guidance suggests that this be considered a minimum level for consideration in NEPA documentation.

ENVIRONMENTAL IMPACT: Under any of the actions, there would be minor emissions of carbon dioxide due to construction traffic and equipment and heating additional area; however, these actions would not be reasonably expected to generate more than a small fraction of the 25,000 metric ton threshold suggested by the CEQ. Therefore, GHGs are not further analyzed in this EA.

3.2.2.4. Land Use

The Kesselring Site is mostly a wooded site with a small area developed for industrial operations. As confirmed by on-site and off-site monitoring programs, Kesselring Site operations do not have an adverse affect on human health and the quality of the environment (KAPL 2009).

ENVIRONMENTAL IMPACT: Land use at the Kesselring Site would be the same for the No Action Alternative, Temporary Facility Alternative, and the Proposed Action. The Temporary Facility and Radiological Work and Storage Building would be located within the already developed area. Use of the land would be substantially unchanged. Similarly, land use outside the Kesselring Site is not expected to be affected by the No Action Alternative, Temporary Facility Alternative, or the Proposed Action. Existing environmental conditions would persist. For the Proposed Action, the existing conditions would remain unchanged and comparable to the No Action Alternative or Temporary Facility Alternative. Minimal environmental impact on land use would be associated with implementation of the Proposed Action.

3.2.2.5. Cultural Resources

No buildings being considered for demolition are currently listed as Historic Properties in the National Register of Historic Places. Building 80C was constructed in the late 1980’s and was used for radiological work and storage in support of prototype maintenance.

ENVIRONMENTAL IMPACT: There are no historic properties affected by the Proposed Action. The new facility would be constructed in the previously developed industrial area of the Kesselring Site and would not adversely impact any building potentially eligible for inclusion in the National Register of Historic Places. Under the No Action Alternative, existing conditions would remain unchanged. The Temporary Facility Alternative would be located within the developed area of the Kesselring Site and therefore would not adversely impact eligibility for inclusion in the National Register of Historic Places. No adverse impacts to cultural resources associated with the demolition or construction of a new facility are expected.

3.2.2.6. Socioeconomics and Environmental Justice

Kesselring Site staffing in 2011 is estimated at approximately 950 civilian personnel (including subcontractors) and 1,350 U.S. Navy personnel. Based on the 2010 U.S. Census Bureau data, the population in the area surrounding the Kesselring Site is approximately 480,000 people. This includes populations from Fulton, Montgomery, Saratoga, and Schenectady, counties.

ENVIRONMENTAL IMPACT: With implementation of the Proposed Action, creation of temporary construction jobs and expenditures for materials and equipment would occur to support construction of the Radiological Work and Storage Building. The demolition of the existing facilities would be completed using a subcontractor. This increase in jobs and expenditures would result in beneficial impacts to the local and regional economy. However, no permanent increase or decrease in jobs would be expected to result from implementation of the Proposed Action. Since construction of a new building would be of short duration with a small increase in the workforce compared to the surrounding area employment levels, there would be a minor socioeconomic benefit associated with the Proposed Action.

A small temporary increase in work force or subcontractors may also occur during construction and disassembly of the Temporary Facility Alternative. The Temporary Facility Alternative would also result in a minor increase in expenditures during the construction and disassembly periods. For the No Action Alternative, the workforce would also have a small temporary increase in workforce during the facility refurbishment phase.

Since no significant impacts are expected, there would be no expected disproportionately high and adverse impacts to minority and low income populations as a result of initiating the Proposed Action or any of the considered alternatives.There is no expected impact on children as a result of any of the alternatives being considered.

3.2.2.7. Traffic and Transportation

There are more than 2,000 vehicles that travel to the Kesselring Site daily. There are approximately 50-60 shipments of low-level radioactive waste (LLRW) from the Kesselring Site per year.

ENVIRONMENTAL IMPACT: Vehicular traffic within the Kesselring Site would be expected to increase during the construction phase (by approximately 30 vehicles per day) associated with the Proposed Action. However, the traffic patterns and density of traffic on public streets would not change the traffic flux normally associated with operating the Kesselring Site. During demolition of Building 80C, there will be an estimated 16 shipments of LLRW demolition debris over a two year period. This represents approximately 10 percent of the total number of LLRW shipments from the Kesselring Site on a yearly basis. The effect of the Proposed Action on traffic and transportation would be minimal and temporary during construction of the new facility.

Under the Temporary Facility Alternative, the vehicular traffic would increase during the construction or disassembly time periods. Under the No Action Alternative, existing conditions would remain.

3.2.2.8. Aesthetic and Scenic Resources

The Kesselring Site includes a small developed industrial area within a mostly wooded site. The developed area of the Kesselring Site is not visible from off-site locations.

ENVIRONMENTAL IMPACT: Construction and operations of the Radiological Work and Storage Building and/or the Temporary Facility Alternative would be consistent with the current visual character of the Kesselring Site. Under the No Action Alternative, existing conditions would remain unchanged. Changes to aesthetic and scenic resources are not anticipated with the Proposed Action, No Action Alternative or Temporary Facility, and none of the alternatives would have an impact on the scenic vistas or physical aesthetics associated with the region.

3.2.2.9. Utilities and Energy

Existing site utility systems have sufficient capacity to support the utility requirements for the new facility or the Temporary Facility Alternative.

ENVIRONMENTAL IMPACT: Construction and operation of the Radiological Work and Storage Building would result in minor impacts on utility and energy systems. The Proposed Action would have little impact on the amount of energy and the usage of utilities at the Kesselring Site. With implementation of the Proposed Action, existing utility systems (electrical, steam, compressed air, telephone) would be available in the vicinity of the proposed facility with minor additions/modifications. The Proposed Action would be a permanent facility which would be more energy efficient than the Temporary Facility Alternative and would be replacing the less-energy efficient facility that would be demolished. Under the No Action Alternative, existing conditions would remain unchanged. Minimal environmental impact on utilities and energy resources would be associated with the implementation of the Proposed Action or Temporary Facility Alternative.

3.2.2.10. Non-Hazardous Waste

At the Kesselring Site, solid, non-hazardous waste is collected and transported to an approved and licensed commercial landfill. During 2009, approximately 1478 tons of non-hazardous, non-recycled, solid waste were generated from such waste streams as: construction and demolition debris, office and cafeteria trash, and classified paper (KAPL 2009). Recycling programs exist for metals, paper, cardboard, and other miscellaneous waste streams. In 2009, approximately 2190 tons of materials were recycled from the Kesselring Site (KAPL 2009). No solid wastes are disposed of on-site.

An extensive storm water and industrial waste water drain system exists at the Kesselring Site, which is regulated under a New York State Pollutant Discharge Elimination System permit. No changes to the permit are expected to be needed as a result of the Proposed Action, Temporary Facility Alternative, or No Action Alternative.

ENVIRONMENTAL IMPACT: Operations involving the handling of waste would not change with implementation of the Proposed Action. Waste, including waste from construction activities or demolition, has been managed at the Kesselring Site without having a significant impact on human health or the environment. Construction and operation of a new Radiological Work and Storage Building is expected to produce approximately 40 tons of non-hazardous waste. Waste would continue to be handled (i.e., contained, stored, transported, and disposed of) in accordance with state and federal regulations. Under the No Action Alternative and Temporary Facility Alternative, existing conditions would remain unchanged. No significant impacts to the environment would be expected with implementation of the Proposed Action.

3.2.3. RADIOLOGICAL IMPACT OF KESSELRING SITE

The following discussions characterize the radiological impacts of Kesselring Site operations. This includes impacts due to both operating prototypes and operations related to radiological support facilities. The radiological impacts associated with the Kesselring Site were discussed and evaluated in detail in DOE/EIS-0274 (NNPP 1997) and the evaluations remain valid based on the mission of the Kesselring Site remaining consistent. The Knolls Atomic Power Laboratory Environmental Monitoring Report (KAPL 2009) details the environmental monitoring performed in the area surrounding the Kesselring Site and confirms the analysis previously performed indicating the environmental impact of the Kesselring Site is small. These analyses demonstrated that the radiological impacts are small. The conclusions reached in this previous EIS also apply to the radiological operations associated with the new Radiological Work and Storage Building.

3.2.3.1. Source of Radioactivity

Nearly all (99 percent) of the radioactive atoms in a nuclear reactor are found in two forms: (1) the uranium fuel itself or (2) fission products created by the nuclear chain reaction. The fuel in naval nuclear propulsion reactor cores is designed and built with high fuel integrity to retain this radioactivity. This high fuel integrity has been confirmed by operating experience and direct examination from spent cores. Such integrity is a necessity for sailors who live in the enclosed atmosphere of a nuclear-powered ship.

The remaining radioactive atoms present in a naval nuclear reactor are encountered in two forms. The majority of the remaining radioactive atoms (99.9 percent of the remaining 1 percent) are part of the metal of the reactor plant piping and components. These radioactive atoms are created by neutron activation of iron and alloying elements during operation of the reactor plant. The balance (0.1 percent of the remaining 1 percent) is in the form of radioactive corrosion and wear products originating from metal surfaces in contact with the reactor coolant. These corrosion and wear products are transported by the reactor coolant through the reactor core where they are activated by neutrons, and then deposited on piping system internal surfaces. Most of these corrosion products tightly adhere to piping system internal surfaces. The small amount that does not adhere is the source of potential radioactive contamination encountered during work on naval nuclear reactor plants. Stringent controls are used to keep this material contained when working on system internals. Low-level radioactive waste such as anti-contamination clothing, used gloves, bags and radioactively contaminated equipment will be handled and temporarily stored in the new facility.

Corrosion and wear products in naval nuclear reactor plants include the following radionuclides with half-lives of about 1 day or greater: tungsten-187, chromium-51, hafnium-181, iron-59, iron-55, nickel-63, niobium-95, zirconium-95, tantalum-182, manganese-54, cobalt-58, and cobalt-60. The predominant radionuclide is cobalt-60, which has a 5.2-year half-life and emits gamma radiation. Cobalt-60 also has the most restrictive concentration limit in water as listed by organizations that set radiological standards for these corrosion and wear radionuclides (10 CFR 20 and Reference EPA 1999). Therefore, cobalt-60 is the primary radionuclide of interest for naval nuclear propulsion plants.

3.2.3.2. Control of Radioactivity

Stringent radiological control practices are used in the NNPP. The effectiveness of these stringent radiological control practices has been proven and documented (NNPP 2011 and KAPL 2009). The following discussion outlines some of the NNPP’s practices for controlling radioactivity.

To provide a baseline for radiological information on radiological work facilities, radiation surveys of the building site, and analysis of soil and building construction material samples will be performed. After construction, a radiological survey of the building will be performed before any radiological work is allowed in the facility. The baseline data established by these surveys is retained to provide information needed for decommissioning the facility and returning it to its pre-radiological work condition.

3.2.3.2.1. Surface Contamination

Some of the most restrictive practices in the NNPP's radiological control program are those established for controlling radioactive contamination. The NNPP generally avoids the need for anti-contamination clothing by containing radioactivity whenever possible so personnel cannot come in contact with it. Another basic requirement of contamination control is monitoring all personnel leaving an area where radioactive contamination could possibly exist. This confirms that contamination has not been spread.

Work surfaces are designed to be easily cleaned (plastic or seamless sheet metal containments) to aid in fast and effective cleanup. Work surfaces are decontaminated during and after work to maintain positive contamination control. Frequent contamination surveys are conducted during work evolutions. Results of these surveys are reviewed by supervisory personnel to ensure that no abnormal conditions exist. The instruments used for these surveys are checked for operability against a radioactive source daily, and they are calibrated at least every twelve months.

3.2.3.2.2. Radioactive Liquid

Radioactive liquids transferred from the prototypes are placed in collection tanks and are processed at an existing processing facility. All liquid collection tanks used to store radioactivity are sealed by mechanical closures except for one penetration. This penetration vents any small pressure build-up caused by filling or draining and by atmospheric pressure or ambient temperature changes. A HEPA filter on the penetration ensures that airborne radioactivity is retained in the tanks. After processing the water to remove cobalt-60 and other particulate radioactivity, the water is returned to the prototypes for use or evaporated. This process has been proven effective at NNPP shipyards, operating bases, and other facilities.

The NNPP has performed comprehensive environmental monitoring of the Glowegee Creek. Water, fish, and sediment samples have been evaluated for the effects of site operations. Periodic monitoring continues to this day, with the results reported in the Knolls Atomic Power Laboratory Environmental Monitoring Report (KAPL 2009). There has been no detectable radioactivity due to site operations present in the creek sediment. Fish and water samples taken in the Glowegeee Creek, both upstream and downstream of the site outfalls, show only naturally occurring radionuclides (such as potassium-40) and no radionuclides attributable to site operations. The radioactivity discharged from Kesselring Site operations has resulted in no significant impact on the environment.

3.2.3.2.3. Airborne Radioactivity

Special controls are used in areas where radioactive corrosion and wear products could become airborne to prevent their release into the environment. Airborne radioactivity is controlled during maintenance so contamination is contained and respiratory equipment is not normally required. To prevent exposure of personnel to airborne radioactivity, and to prevent radioactivity from escaping to the atmosphere, work that might generate airborne contamination is performed inside sealed containments. These containments are ventilated to the atmosphere only through HEPA filters. Exhaust systems that service radiological work facilities are designed and operated to ensure the control of potential sources of airborne radioactivity. Exhaust systems include HEPA filters that are demonstrated to remove at least 99.95 percent of the particles of a size comparable to cigarette smoke from the exhaust air and are continuously monitored. From measured Kesselring Site exhaust system emissions, the annual airborne radioactivity concentration at the nearest Kesselring Site boundary currently averages less than 0.01 percent of that permitted for off-site areas based on applicable DOE guidelines and results in a dose less than 1 percent of the EPA standard (KAPL 2008). Airborne radioactivity surveys are performed regularly in radioactive work areas. If airborne radioactivity is detected in occupied areas, work that might be causing airborne radioactivity is immediately stopped, and the potential source is identified and contained.

The results of air particulate sampler (APS) monitoring show that the average concentration of radioactivity and the total radioactivity in the air released from NNPP radiological facilities are consistently lower than that measured in ambient air away from the monitored facilities. In other words, there is less radioactivity in the filtered air exhausted from an NNPP radiological work facility than was originally in the air brought into the facility. Releases from these work facilities cause minute levels of radiation exposure far below that allowed by the EPA (40 CFR 61). These results clearly demonstrate that the design features used in Kesselring Site radiological facilities are effective in preventing release of airborne radioactivity.

3.2.3.3. Radiological Control Practices

Besides the contamination control practices listed above, several other key radiological control practices used by the NNPP provide additional assurance that positive control of radioactivity is maintained. Among those NNPP-wide practices are the following:

- A radioactive materials accountability system is used to ensure that no radioactive material is lost or misplaced.
- All radioactive materials are specially packaged, sealed, and tagged with yellow and magenta tags bearing the standard radiation symbol and the measured radiation level. The use of yellow packaging material is reserved solely for radioactive material.
- Access to radiological facilities is controlled by trained radiological control personnel. In addition, all personnel entering radiological work and storage areas of the facilities are required to wear personnel monitoring devices.
- Only specially trained personnel are authorized to handle radioactive materials.
- Radiological surveys are conducted by qualified radiological control personnel inside and outside of facilities and prototypes where radiological materials are handled. This is a check to verify that the methods used to control radioactivity are effective.
- Written procedures are used to perform all radiological work. This not only ensures the work is carefully planned and documented, but also allows situation-specific radiological controls to be used. All written procedures are strictly adhered to word for word (i.e., verbatim compliance) in the NNPP. If this cannot be done, work is stopped until a change to the procedure is approved.
- Radioactive material or radioactive waste transported off-site is packaged and shipped per Department of Transportation (DOT) regulations by specially trained personnel.
- Technical problems encountered during radiological work are documented and corrected before work is allowed to continue.

3.2.3.3.1. Occupational Radiation Exposure

The NNPP invokes stringent controls on occupational radiation exposure. The NNPP's policy is to reduce to as low as reasonably achievable the exposure to personnel from ionizing radiation associated with naval nuclear propulsion plants. These stringent controls on occupational radiation exposure have been successful.

The current Federal annual occupational exposure limit of 5 rem established in 1994 came 27 years after the NNPP's annual exposure limit of 5 rem per year was established in 1967. (Until 1994, the Federal radiation exposure limit allowed an accumulation of exposure of 5 rem for each year of age beyond 18.) From 1968 to 1994, no civilian or military personnel in the NNPP exceeded its self-imposed 5 rem annual limit, and no one has exceeded that Federal limit since then. In fact, no NNPP personnel have exceeded 40 percent of the NNPP's annual limit between 1980 and 2010 (i.e. no personnel have exceeded 2 rem in any of the last 31 years). No civilian or military NNPP personnel have ever, in over 50 years of operation, exceeded the Federal lifetime limit.

The average occupational exposure of each person monitored at NNPP DOE facilities since 1958 for radiation associated with naval nuclear propulsion plants is 0.106 rem per year. For comparison, the amount of radiation exposure a typical person in the U.S. receives each year from natural background radiation is 0.3 rem. The lifetime accumulated exposure from radiation associated with NNPP DOE facilities to date for all personnel monitored has averaged less than 0.4 rem per person (NNPP 2011).

3.2.3.3.2. Radioactive Solid Waste Disposal

The amount of low-level radioactive solid waste generated during Kesselring Site prototype maintenance and facility operations is small in comparison to other waste generators. This waste includes radioactively contaminated rags, plastic bags, paper, filters, and scrap materials resulting from work in the prototypes and in support facilities. Liquids that cannot be processed for reuse are solidified and disposed as low-level radioactive waste. Low-level radioactive waste is packaged in DOT-approved containers, shielded if necessary, and accumulated in a controlled storage area until it can be shipped for disposal at an approved burial site.

During 2009, approximately 481.8 cubic meters (630 cubic yards) of low-level radioactive waste was shipped from the Kesselring Site for disposal. The shipments of low-level radioactive solid wastes were made by authorized common carriers to disposal sites located outside of New York State (KAPL 2009). Each year, the Kesselring Site makes, on average, about 50-60 radioactive material shipments, which is a small part of the nearly 3 million shipments of radioactive materials made annually in the United States. The amount of radioactive waste generated by Kesselring Site operations is a small fraction of the NNPP total.

3.2.3.3.3. Mixed Hazardous and Radioactive Waste

Hazardous waste is waste that poses a potential threat to human health or the environment if not properly managed. These substances can be toxic, corrosive, ignitable, or chemically reactive (note that this does not include radioactive substances regulated under the Atomic Energy Act). Radioactive waste is a waste that contains radionuclides regulated under the Atomic Energy Act. Mixed waste generated as a result of NNPP activities is a mixture of chemically hazardous waste and low-level radioactive waste. Within the NNPP, concerted efforts are taken to prevent commingling radioactive and chemically hazardous substances to minimize the potential for generation of mixed waste. Examples of these efforts include avoiding the use of hazardous solvents, lead-based paints, and lead shielding in disposal containers. In 2009, there were 4 shipments from the Kesselring Site totaling 9.65 tons of various mixed wastes sent to treatment and disposal facilities (KAPL 2009). Mixed waste generated as a result of NNPP activities at the Kesselring Site is stored in accordance with federal and New York hazardous waste regulations. Limited treatment allowed by generators of hazardous waste is performed on some mixed wastes. This treatment is performed in accordance with federal and New York regulations. Mixed wastes are stored on-site pending off-site shipments for treatment and disposal. Detailed characterization of NNPP mixed waste has been accomplished using sampling and extensive process knowledge, and has confirmed that the waste is suitable for safe storage until it is shipped off site for treatment and disposal.

3.2.3.3.4. Radioactive Material Transportation

Only specially trained and designated people, who are knowledgeable in shipping regulations, are permitted to authorize shipments of radioactive material. Special transportation services, such as signature security service or sealed shipping vehicles are used to transport radioactive material. These services ensure point-to-point control and traceability are maintained from shipper to receiver.

Shipments of radioactive material in the NNPP are made per regulations of the DOT, DOE, and Nuclear Regulatory Commission. These regulations ensure shipments of radioactive material are controlled to protect the environment and the health and safety of the general public, regardless of the route or mode of transportation taken.

Shipments of radioactive material associated with naval nuclear propulsion plants have not resulted in any measurable release of radioactivity to the environment. There have never been any significant accidents involving a release of radioactive material during shipment of NNPP radioactive waste. Based on the type and number of shipments made, the collective annual radiation does to the public along the transportation routes, including transportation workers, was less than one person-rem. This is less than 0.001 percent of the dose received by the same population from natural background radiation (KAPL 2009). There are approximately 50-60 shipments of low-level radioactive waste from the Kesselring Site per year.

3.2.3.4. Radiological Environmental Monitoring Program

To provide additional assurance that procedures used by the NNPP to control radioactivity are adequate to protect the environment, the NNPP conducts environmental monitoring at the Kesselring Site. In 2009, the Kesselring Site participated in a Quality Assessment Program administered by a commercial laboratory which validated the accuracy of the Kesselring Site environmental monitoring results. Periodic audits are also conducted that examine the effluent and environmental monitoring programs to ensure compliance with all KAPL procedures and applicable Federal and State regulations (KAPL 2009).

3.2.3.4.1. Air Monitoring

Naval nuclear reactors and their support facilities are designed to ensure that discharges of radioactivity are well below EPA regulatory limits (40 CFR 61) in airborne exhausts. The air exhausted from all radiological work facilities is continuously sampled for particulate radioactivity. Based on the emissions monitoring results, the average annual radioactivity concentration at the nearest Kesselring Site boundary was less than 0.01 percent of the DOE derived concentration guide for effluent release to unrestricted areas for the mixture of radionuclides present (KAPL 2009).

3.2.3.4.2. Perimeter Monitoring

Ambient radiation levels are measured using sensitive thermoluminescent dosimeters continuously posted at locations outside of the boundaries of areas where radiological work is performed. Dosimeters are also posted at locations away from radiological work areas to measure background radiation levels from natural radioactivity. The results show that NNPP activities have had no distinguishable effect on normal background radiation levels at the perimeter of the Kesselring Site.

3.2.3.4.3. Water Monitoring

The radiological environmental monitoring program at the Kesselring Site includes the collection of fish upstream and downstream of discharge locations to the Glowegee Creek and the collection of quarterly samples of Glowegee Creek water and sediment at five locations. Three samples of sediment and one composite water sample are collected quarterly for radioanalysis across the creek at five locations (KAPL 2009). Water, fish, and sediment samples have been evaluated for the effects of site operations, with the results reported in the Knolls Atomic Power Laboratory Environmental Monitoring Report (KAPL 2009). There has been no detectable radioactivity due to site operations present in the creek sediment. Fish and water samples taken in the Glowegeee Creek, both upstream and downstream of the site outfalls, show only naturally occurring radionuclides (such as potassium-40) and no radionuclides attributable to site operations. Kesselring Site operations has resulted in no significant impact on the environment.

3.2.3.4.4. Results of Environmental Monitoring

KAPL issues a periodic report that describes the NNPP's policies and practices regarding such issues as disposal of radioactive liquid, transportation and disposal of radioactive materials and solid wastes, and monitoring of the environment to determine the effect of nuclear-powered prototype operations. This report (KAPL 2009) is provided to Congress and cognizant federal, state, and local officials. This report concludes that operation of the Kesselring Site prototypes has no significant radiological environmental effect and no adverse impact on the health and safety of the public.

Radiation exposures from Kesselring Site operations are too small to be measured and must be estimated. Techniques that conservatively estimate potential exposures consider exposure pathways that include fishing, boating, and swimming in the Glowegee Creek, using the creek water for drinking and irrigation, breathing, and consuming regional animal and vegetable farm products. The most recent assessment for 2009 shows that the maximum potential radiation exposure to any member of the public was less than 0.0001 rem (0.1 millirem) for the entire year (KAPL 2009). This is about one twentieth of the exposure that a person would receive from cosmic radiation during a single cross-country airplane flight. It is conservatively estimated that the total accumulated radiation exposure to a member of the public living continuously next to the Kesselring Site during the entire time the facility has been operating (since 1954) would not exceed 0.013 rem. This is less than the exposure an average person actually receives in about three weeks from natural radiation sources. The risk to a person of latent fatal cancer from exposure to 0.013 rem can be estimated by multiplying 0.013 rem times 0.00055 latent fatal cancers per rem. This equals a risk to an individual of 7×10^{-6} that he or she might develop fatal cancer due to radioactivity released from the Kesselring Site, or 1 chance in about 150,000 of that individual dying of cancer from Kesselring Site operations due to living continuously next to the Federal reservation boundary since 1954.

Table 3-1 provides excerpted information from the Report on Occupational Radiation Exposure From Naval Reactors' Department of Energy Facilities (NNPP 2011). Table 3-1 compares the risk of cancer due to radiation from Naval Reactor's Department of Energy Facilities to other occupational and everyday risks.

Table 3-1: Risk comparisons

Occupation/Risk	Lifetime Risk (Percent)
Occupation: Mining, Quarrying	2.0
Occupation: Agriculture	2.1
Occupation: Construction	1.5
Occupation: Services	0.2
Occupation: Manufacturing	0.2
Tobacco	11.1
Poor diet/Lack of Exercise	10.7
Accidents (all)	2.7
Firearms	1.5
Motor vehicle accident	1.2
Accidental Poisoning	0.39
Drowning	0.09
Cancer: Radiation Exposure Associated with Naval Reactors' Department of Energy Facilities	0.04

3.3 OTHER NEPA CONSIDERATIONS FOR THE RADIOLOGICAL WORK AND STORAGE BUILDING

3.3.1. RADIOLOGICAL FACILITY ACCIDENTS

In addition to normal operations, the potential environmental impacts from hypothetical accidents in the radiological work and storage facility were evaluated. Two accidents were assessed: a drop of a radioactively-contaminated component and a fire. These accidents were assessed by comparing the potential accident conditions in the radiological work and storage facility with accident conditions previously evaluated for dismantlement of the S3G and D1G reactor plants (NNPP 1997).

For the component drop accident, the level of contamination available for release from the most highly contaminated component is about 60 percent higher than that previously analyzed. Accordingly, the associated dose to the individual worker would be 133 millirem and the dose to the maximally exposed off-site individual would be 18 millirem. The corresponding annual risk of a fatal cancer from these exposures is insignificant (3.24×10^{-10} and 5.35×10^{-11}, respectively).

For the hypothetical facility fire, the source term used in the previous evaluation would also be appropriate for the radiological work and storage facility. The associated doses and annual risk to the indidivual worker and maximally exposed off-site individual would be significantly less than that for the component drop accident discussed above.

The environmental impacts of intentional destructive acts (i.e., sabotage or terrorism) on operations in the Radiological Work and Storage Building were considered. The risks and consequences of an intentional destructive act would have results consistent with the facility accidents discussed above.

3.3.2. CUMULATIVE IMPACTS

Cumulative impacts result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

ENVIRONMENTAL IMPACT: The Proposed Action and Temporary Facility Alternative would be implemented in an area of industrial development. The Proposed Action involves the demolition of an existing building and construction of a building in its place. Existing facilities would be used for the No Action Alternative. Other projects at the Kesselring Site during the proposed timeframe include construction of a new office building and a new training building, as well as routine infrastructure refurbishment (e.g., parking lot repaving). Since these projects would all occur in the previously developed industrial area and are comparable in extent and intensity to historical site operations, no significant cumulative impacts would be expected as a result of the Proposed Action.

SECTION 4

GLOSSARY AND ACRONYMS

4.1 GLOSSARY

Half-Life – The time required for a radioactive substance to lose 50 percent of its activity by decay.

Low Level Radioactive Waste – Radioactive waste that is not high level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in Section 11e(2) of the Atomic Energy Act of 1954, amended), or naturally occurring radioactive material.

Naval Nuclear Propulsion Program – A joint program of the Department of Energy and the Department of the Navy that has its objective the design and development of improved U.S. Navy nuclear propulsion plants having high reliability, maximum simplicity, and optimum fuel life for installation in ships ranging in size from small submarines to large combatant surface ships.

Radiation – Energy in the form of waves (rays) or particles emitted from the nuclei of unstable atoms during decay (disintegration).

Radiation Shielding – Materials placed around a radioactive source to reduce radiation levels and protect personnel; usually concrete, water, or lead.

Radioactive Waste – Equipment and materials that are radioactive and for which there is no further use.

Rem – Rem (Roentgen Equivalent Man) is a unit of measure used to indicate the amount of radiation exposure a person receives.

4.2 ACRONYMS

ALARA	As Low as Reasonably Achievable
APS	Air Particulate Sampling
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DEQ	Department of Environmental Quality
DOE	U.S. Department of Energy
DOE-EM	U.S. Department of Energy Division of Environmental Management
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gases
HEPA	High Efficiency Particulate Air
KAPL	Knolls Atomic Power Laboratory
LLRW	Low-Level Radioactive Waste
NAAQS	National Ambient Air Quality Standard

NEPA	National Environmental Policy Act
NNPP	Naval Nuclear Propulsion Program
NOA	Notice of Availability
NOI	Notice of Intent
NRC	Nuclear Regulatory Commission
ROD	Record of Decision
SPRU	Separations Process Research Unit

SECTION 5

REFERENCES

EPA 1999; Environmental Protection Agency Federal Guidance Report No. 13, September 1999

Department of Energy (DOE) 2010; Radiological Contamination Event During Separations Project Research Building H2 Demolition

KAPL 2008; KAPL-4863; Knolls Atomic Power Laboratory Kesselring Site Environmental Summary Report, August 2008

KAPL 2009; KAPL-4866; Knolls Atomic Power Laboratory Environmental Monitoring Report, Calendar Year 2009

NNPP 1997; DOE/EIS-0274; Final Environmental Impact Statement: Disposal of the S3G and D1G Prototype Reactor Plants, November 1997

NNPP 2011; Report NT-11-3; Occupational Radiation Exposure from Naval Reactors' Department of Energy Facilities, May 2011

The above references are available at the Saratoga Springs Public Library and the Schenectady County Library (Niskayuna branch). DOE/EIS-0274 (NNPP 1997) is also available at www.NNPP-NEPA.us.

SECTION 6

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Ms. Lynn Winterberger, Environmental Engineer
New York State Department of Environmental Conservation
RCRA Permitting Remedial Bureau E
Division of Environmental Remediation
625 Broadway, 9th Floor
Albany, New York 12233-7017

Mr. James Coutant
New York State Department of Environmental Conservation
Region 5 – Regional Air Engineer
232 Golf Course Road
Warrensburg, New York 12885-0220

7.3 Local Officials and Agencies

Mr. Daniel Lewza, Supervisor
Town of Milton
503 Geyser Road
Ballston Spa, New York 12020

Mr. George J. Hargrave, Supervisor
Town of Galway
Town Hall
P.O. Box 219
Galway, New York 12074

Ms. Patti Southworth, Supervisor
Town of Ballston
Ballston Town Hall
323 Charlton Road
Ballston Spa, New York 12020

The Honorable Scott Johnson
Mayor of Saratoga Springs
City Hall
474 Broadway
Saratoga Springs, New York 12866

The Honorable John P. Romano
Mayor of Ballston Spa
66 Front Street
Ballston Spa, New York 12020

Mr. Paul Lent, Director
Saratoga County Office of Emergency Services
25 West High Street
Ballston Spa, New York 12020

Mr. George M. Hodgson, Jr., Director
Environmental Management Services Saratoga County
Facilities Building
50 West High Street
Ballston Spa, New York 12020

Mr. Peter Balet, Chairperson
Environmental Management Council Saratoga County
50 West High Street
Ballston Spa, New York 12020

7.4 Reading Rooms

Saratoga Springs Public Library
Schenectady County Library (Niskayuna Branch)

7.5 Other Interested Parties

Shirley Shultz, Saratoga Springs Resident
David H. Spingarn, Saratoga Springs Resident
Barbara K. Thomas, Ballston Spa Resident
Jim Tower, Saratoga Springs Resident
Robert H. Van Meter, Saratoga Springs Resident

APPENDIX A

PUBLIC COMMENTS TO THE NOTICE OF INTENT

A.1 BACKGROUND

On August 31, 2011, the Department of Energy Office of Naval Reactors, also known as the Naval Nuclear Propulsion Program (NNPP) published a Notice of Intent (NOI) to prepare an Environmental Assessment (EA) for a Radiological Work and Storage Building at the Knolls Atomic Power Laboratory Kesselring Site in the Federal Register. The NNPP also published a notice in selected newspapers in the Capital District of New York (The Saratogian, Times Union, Daily Gazette). A website (www.NNPP-NEPA.us) was established posting the NOI for public availability. Finally, the NNPP sent copies of the NOI to selected federal agencies, state agencies, and local officials.

The NOI invited public comments on environmental issues and concerns relative to the NOI and the scope of the EA, on or before September 30, 2011. Comments were accepted by letter, by phone, and by e-mail. A total of five comments were received.

A.2 CONSIDERATION OF PUBLIC COMMENTS IN THE ENVIRONMENTAL ASSESSMENT

Five public comments were received during the comment period. One of the comments was regarding the scope of the EA. Table A-1 provides a summary of the comments received. This table includes the name of the commenter, the organization of the commenter, and a summary of the comment and how it was considered in the preparation of the EA.

Table A-1: Public Comments Received Regarding the Notice of Intent

#	Method Received	Commenter	Organization	Summary of Comment	Comment Disposition
1	Email	Robert H. Van Meter	Saratoga Springs Resident	The individual opposes the new construction based on an understanding that KAPL has been fined significantly by the Department of Energy for infractions associated with improper handling of radioactive materials by KAPL.	The event cited did not involve the NNPP or its contractors. A discussion of the event at the Separations Process Research Unit is provided in Section A.3 below.

#	Method Received	Commenter	Organization	Summary of Comment	Comment Disposition
2	Email	Jim Tower	Saratoga Springs Resident	Individual is opposed to the proposal and feels that reduction of wastes should be the focus of all efforts.	The NNPP applies waste minimization techniques to operations, especially operations involving radioactive material. A detailed discussion of NNPP radiological control practices, including waste minimization is provided in Section 3.2.3.
3	Email	Shirley Shultz	Saratoga Springs Resident	Individual is concerned with having low levels of radioactivity stored or transported in the area. Individual read the September 19, 2011 article in the Saratogian and thinks the topic should be presented to the public in the future because a short amount of time was given for public comment.	A detailed discussion of NNPP radiological control practices including storage and transportation of radioactive waste is provided in Sections 2.1 and 3.2.3. This Draft EA is being made available for public review and comment for 30 days. Public comments on the Draft EA will be considered in the preparation of the Final EA and determination of whether a Finding of No Significant Impact or Environmental Impact Statement is appropriate.

#	Method Received	Commenter	Organization	Summary of Comment	Comment Disposition
4	Email	Barbara K. Thomas	Ballston Spa Resident	Individual requests that the EA address the potential for: Contamination of ground water, contamination of Crook's Brook, contamination of Glowegee Creek, transport of radiation to the Kayaderosseras Creek and Saratoga Lake, potential for contaminated soil to become airborne or be transported off-site accidentally, potential health risks to personnel at the site and living in the surrounding area, the record of site operations, and the estimate of time the materials will be stored on-site.	A detailed discussion of NNPP radiological control practices and the results of routine environmental monitoring are provided in Section 3.2. Extensive monitoring has shown that NNPP operation of naval nuclear prototypes and radiological support facilities has no significant radiological environmental effect, and no adverse impact on the health and safety of the public.
5	U.S. Mail	David H. Spingarn	Saratoga Springs Resident	Individual requests that the new facility be safe to ensure the area is protected for future generations.	The new facility will be designed in accordance with stringent NNPP requirements for radiological facilities to ensure the safety of personnel and the environment as described in Sections 2.1 and 3.2.3.

A.3 September 2010 Spread of Radioactivity from SPRU Demolition Work

The Separations Process Research Unit (SPRU) at the Knolls Atomic Power Laboratory Knolls Site in Schenectady, New York performed non-Naval Reactors Program laboratory testing of radionuclide separation processes used in production at the Atomic Energy Commission's Hanford Site in Washington and at the Savannah River Plant in South Carolina. This work began in 1948 and was initially conducted under the direction of the Atomic Energy Commission. Following completion of this research in 1953, remediation of related work areas and waste products began; most of the clean-up work was completed by 1965. Areas requiring additional remediation have been maintained in protective layup pending final remediation. The DOE Division of Environmental Management (DOE-EM) began remediation work in the former SPRU facilities and areas in 2007. This event did not occur at the Kesselring Site. The event occurred on DOE-EM managed areas at the Knolls Atomic Power Laboratory Site in Schenectady, NY.

In September of 2010, demolition work at the SPRU adjacent to the Knolls Atomic Power Laboratory Knolls Site by a contractor under the authority and purview of DOE-EM resulted in a spread of low-level radioactivity onto the Knolls Site. A DOE Type B Accident Investigation found that the DOE-EM contractor did not adequately characterize or control the radiological hazard associated with the SPRU demolition work and did not implement an effective work control process. Knolls Atomic Power Laboratory personnel conducted a two month effort to decontaminate or stabilize the 9,662 m^2 (104,000 ft^2) of Knolls Laboratory property contaminated by the SPRU demolition work. No Knolls Laboratory personnel (including subcontractors who were working on Knolls Laboratory property at the time of the event) were contaminated as a result of the event. Internal monitoring of personnel who were present in the contaminated area at the time of the event and those who participated in the clean-up efforts found no detectable internal contamination. The low-levels of radioactivity deposited on the ground and on Knolls Site property did not result in measurable increases in external or internal radiation exposure to personnel. On September 2, 2011, DOE issued a Preliminary Notice of Violation to Washington Group International, Inc. (WGI) and proposed a $421,500 civil penalty in response to the September 2010 radiological contamination. For more information on the event, consult the DOE investigation report publicly available at http://www.spru.energy.gov (NNPP 2011).