ONTARIO POWER GENERATION

Plan

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PNGS-A Detailed Decommissioning Plan Volume 1 - Outbuildings Removal

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Revision Summary

Revision Number	Date	Comments
R00	2024-12-02	Initial issue.

1.0 INTRODUCTION

This Detailed Decommissioning Plan (DDP) volume focuses on Planning Envelope A (PE-A) and includes the dismantling and removal of Outbuildings. Outbuildings refers to Systems, Structures or Components (SSCs) within the PNGS-A protected area, but not part of the main Powerhouse structure. Dismantling scope for this DDP submission is either for the full removal of the structure or just the internals (leaving the structure intact). Within 5 years of submission, the scope and contents of this volume will be reviewed and revised as required.

PE-A has been preliminarily sub-categorized into three groups based on the timing for when the specific outbuilding is anticipated to no longer be required for continued use and will be available for decommissioning:

- Group A-1: Post PNGS-A Shutdown: Outbuildings not required after PNGS-A shutdown.
- Group A-2: Post Separation of PNGS-A and PNGS-B: Outbuildings not required after common systems are separated along the AB Gate.
- Group A-3: Post Irradiated Fuel Bay Empty: Outbuildings not required after IFB-A & AIFB are emptied, drained and dried.

The Outbuildings included in the decommissioning plan for PNGS-A are detailed in Section 2.0. This information is current as of the development of this DDP, as decommissioning and operational needs evolve there may be adjustments made, which will be reflected in the next update of the DDP and PDP for PNGS. For a complete list of Outbuildings at PNGS-A, PNGS-B and NSS-PWMF, refer to ‘Pickering Site Overarching Document’ [R-19]

NOTE

As decommissioning planning and execution progresses, some outbuildings may be available earlier than originally contemplated in the preliminary sub-categorization. In these instances, approved OPG processes and procedures will be used to advance the work, including consultation with the CNSC as required.

In accordance with REGDOC-2.11.2 [R-1], any work activities that fall within PE-A, even if not explicitly detailed, will undergo all mandatory preparatory activities. This ensures comprehensive decommissioning planning and preparation as required by the regulatory framework.

2.0 GENERAL DESCRIPTION & BREAKDOWN OF PLANNING ENVELOPE A

This section includes a description of all the outbuildings that have been included in the scope for decommissioning of PNGS-A.

2.1 Planning Envelope A-1: Outbuildings not Required after PNGS-A Shutdown

2.1.1 #103 and #104 Scaffolding Shed Buildings

The scaffolding shed buildings are located south of the Service Wing and were used to store scaffolding and fibreglass insulation. The scaffolding sheds are temporary structures, consisting of light construction sheet metal/steel on pads.

Figure 1 Scaffold Shed Buildings

2.1.2 #123 Oil Tank Farm A

The Oil Tank Farm A contains 6 oil storage tanks located north of Powerhouse, between the U2 and U3 Transformers, near the U2 Demineralized Water Tank. The tank farm formed part of the turbine and generator lubricating and governing oil system.

Figure 2 Oil Tank Farm A

2.1.3 #7 Off Gas System Building

The purpose of the Off Gas Management System (OGMS) was to reduce the release of gaseous radioactive effluents from the station and to recover deuterium and heavy water. The Off Gas Building is located just south of the vacuum building and is connected to the Vacuum Building with an underground concrete service duct. The system was never put in service and was abandoned [R-2], and modifications of the High-Pressure Service Water (HPSW) lines were performed to remove some of the energy sources in the system. Tie-ins to station systems are still in place, including electrical, instrument and breathing air, service water, service air and nitrogen system.

Figure 3 Off Gas Management Building

2.1.4 #8 Old Water Treatment Plant

The Old Water Treatment Plant (OWTP) is located south of the Service Wing and is bordered by the Vacuum Building to the west and by the scaffold yard structures to the east. The building includes a ground floor level, a basement level, a mezzanine level above the ground floor, and an enclosed stairwell providing access between the floors.

Figure 4 Old Water Treatment Plant

2.1.5 Helium Storage Trailers and Hydrogen Skids

There are 2 Helium storage trailers used for bulk helium storage and 2 hydrogen skids used to store hydrogen bottles. Both skids have supporting steel structures, electrical and instrumentation connections, and at-grade concrete pads. They are located in the un-zoned area south of U1 & U2 and U3 & U4 respectively.

Figure 5 Hydrogen Skid

Figure 6 Helium Storage Trailer

2.1.6 #85 Sulzer-A

Sulzer A is a tall, narrow building on the south side of the Pickering Service Wing, sharing a common wall and entrance with Sulzer B. Originally an upgrading plant designed to process moderator water with high tritium content, Sulzer A separated mixtures of light and heavy water into products richer in one or the other through rectification. The equipment, primarily constructed of stainless steel except for the copper Sulzer-Packing in the column, includes legacy interfaces with Sulzer B that must be separated before dismantling.

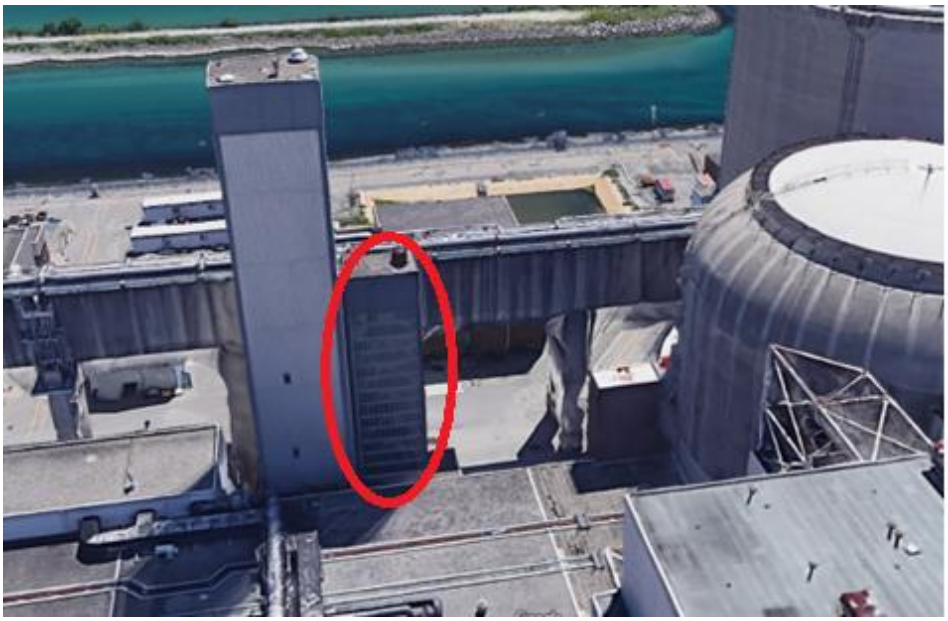

Figure 7 Sulzer A

2.2 Planning Envelope A-2: SSCs not Required after Common Systems are Separated Along the AB Gate

2.2.1 #56 Gas Bottle Storage Enclosure 'A'

The Gas Bottle Storage Enclosure 'A' is located north of PNGS-A screenhouse building, between the U2 and U3 Reactor buildings. The structure has an area of approximately 2,700 ft^2 (250.84 m^2) and a height of 18 ft (5.49 m). It is open at east wall for ventilation (wire mesh wall).

Figure 8 Gas Bottle Storage Enclosure

2.2.2 #57 SDSE Instrument Room 1-2 and #58 SDSE Instrument Room 3-4

The SDSE Instrument Rooms (IRs) are unitized instrument rooms and are situated south of the U2 and U3 reactor buildings, under and attached to the pressure relief duct at ground level. They house the trip logic and the instrumentation of the Shutdown System Enhancement (SDSE).

Figure 9 SDSE Instrument Room 1-2

Figure 10 SDSE Instrument Room 3-4

2.2.3 Standby Power System (#3A, #57, #66A, #4A)

The standby power system at PNGS-A comprises six standalone Orenda jet engines, each coupled to a generator capable of supplying adequate electrical power for safety and safety support systems, Figure 11. Each unit includes a drive, a generator, and a control cubicle housing the equipment.

Fuel oil for these generators is stored in two large outdoor tanks within a lined containment berm equipped with foam fire protection Figure 12. Fuel is delivered to the generators' day tanks via fuel forwarding pumps—two per standby generator—located in a fuel oil pumphouse south of the generators.

The pumphouse Figure 13 contains two separate rooms: one housing the pumps, motors, strainers, and filters protected by CO_2 fire suppression, and another holding the electrical and control panels for the pumps and fire suppression systems.

Figure 11 PNGS-A Standby Generators

Figure 12 PNGS-A Standby Generator Oil Tanks

Figure 13 Standby Generator Pumphouse

2.3 Planning Envelope A-3: SSCs not Required after IFB-A & AIFB are Emptied, Drained and Dried

2.3.1 #14A Heavy Water Upgrading Plant

Figure 14 Heavy Water Upgrading Plant

The heavy water upgrading plant houses process equipment, product handling and storage facilities; it also provides space for laboratory facilities, process control room, electrical switchgear room, locker room, record, and file storage space, change room and sanitary facilities for the personnel. The heavy water upgrading plant is located north-west of U4 and was used to manage the upgrading of the Primary Heat Transport (PHT) and other low-tritium heavy water received from U1 to U8.

2.3.2 #14B Heavy Water UPPA Upgrading Towers

Figure 15 Heavy Water UPPA Upgrading Towers

The Heavy Water Upgrader installation is a vacuum distillation plant that was used to upgrade low isotopic, low curie, Heat Transport D2O to reactor grade make up. It is located towards the northwest corner of the protected area and serviced both PNGS-A and PNGS-B needs. The original five upgrading towers known as "UPP A" have been under safe storage for several decades and upgrading duties have been transferred to "UPP B" which continues to meet the station's upgrading requirements. Associated with the UPP towers are the common feed and storage tanks, vacuum systems, head, and bottom product tanks, reboilers, evaporators and coolers as well as their associated support system.

2.3.3 #14C UPP Expansion Feed Storage Area

The UPP expansion feed storage area previously received and processed downgraded heavy water. The downgraded heavy water from the UPP expansion feed storage area was then routed to the UPP B expansion area for upgrading. The UPP B expansion areas are no longer used for heavy water separating. The various pumps, vacuums, heat exchangers and other equipment originally used for upgrading heavy water have been removed or are out of service.

2.3.4 #14D UPP Expansion Area, UPP Area

The UPP Expansion area was built around 2007 timeframe and was used to house the Heat Transport water that came from dewatering U2 and U3 and is now emptied. It consists of four 100 Mg stainless steel tanks located inside the UPP building. These tanks complete with

nitrogen cover gas, heating, monitoring and annunciation, transfer piping and pumps are housed inside a dyke capable of handling up to 110% of each tank's capacity.

2.3.5 #5A PNGS-A Screenhouse

Figure 16 PNGS-A Screenhouse

The Screenhouse currently serves all four PNGS-A units and is located to the south of the Powerhouse Complex. The building is divided into two sections separated by a concrete block wall. The north portion includes three rooms: the Chlorine Room, Chlorinator Room, and an Eyewash/Shower Room. The south portion consists of a large open space that includes the Screen Area and the Pump Area. The Pump Area occupies the north portion of the space with its finished floor level at a lower elevation than the Screen Area to the south, which houses the traveling screens and other filtration equipment used for intake water for the Powerhouse Complex.

The interior walls and exposed structures of the Screenhouse are concrete and steel paneling, painted or unfinished. The ceiling finish consists of steel structural members and metal decking. Floor finishes mostly consist of concrete or metal grating.

2.3.6 #68 Demineralized Water Tanks

Figure 17 Demineralized Water Tank

Demineralized water is normally required throughout the plant for use in systems where normally strained service water is not suitable. The major load on the system is the condensate feedwater makeup to the boilers. Demineralized water is piped into the power plant from a treatment facility located outside the protected area. This water is then stored in eight large 500,000 gal. tanks, one per unit, connected to a common distribution header. In turn these tanks feed their respective loads and the common make up pumps that supply water to a head tank (one head tank per unit pair) for distribution to smaller loads such as battery rooms, laboratories, Irradiated Fuel Bay (IFB) makeup water, chemical feed tanks and head tanks for the Biological, End shield and Recirculation cooling systems.

3.0 CURRENT STATUS

The DDP for Planning Envelope A encompasses the comprehensive assessment and planning for decommissioning of out buildings at OPG's PNGS-A facility. In preparation for the upcoming decommissioning activities, scoping surveys and Hazardous Building Material Assessments (HBMAs) are currently in progress. They will be completed in accordance with OPG's NMS prior to completing the work.

This projected start date aligns with the decommissioning timeline discussed in the Program Overview DDP [R-3] and is contingent upon securing the necessary authorizations from regulatory bodies to ensure compliance with all applicable safety and environmental regulations.

4.0 DECOMMISSIONING WORK PACKAGES AND SAFETY ASSESSMENT

The PE-A scope is broken down into several work packages detailed below. Work package development is ongoing and will progress into work plans to support execution of the work. The development of work packages will follow the established procedures detailed in the work package management section of Program Overview DDP [R-3].

The equipment and structures within planning Envelope A (PE-A) have been preliminarily grouped into work packages based on geographical location. The goal of each work package is to document the plan to remove all abandoned equipment and structures from the work area, and in some cases, to remove the building structure down to grade, and reach an interim end state. This includes any tanks, piping, pumps, cables, electrical equipment and instrumentation, control cabinets, HVAC systems, as well as roofs, walls, concrete pads, and foundations. All material and equipment are planned to be processed and removed for recycling or disposal as waste. The interim and final-end state objectives are set out in the Program Overview DDP Vol 0 [R-3].

4.1 Occupational Dose Assessment

Anticipated occupational dose assessments have been conducted by OPG's Responsible Health Physicist (RHP) for Planning Envelope A-1 and A-2. Based on historical surveys and available data, the SSCs within this planning envelope are expected to present minimal radiological hazards.

4.2 Decommissioning Safety Assessment

A decommissioning safety assessment has been performed in accordance with the methodology detailed in Program Overview DDP [R-3] for each work package scope to systematically identify potential hazards and evaluate associated risks. The identified hazards and their corresponding mitigation measures have been discussed in the Safety Assessment Report [R-18] and shown below.

Hazard Category	Hazard/Events Description	Mitigation Measures
Radiological	Potential tritiated exit signs	Characterize the material as needed, remove following OPG Radiation Protection Program [R-4].
	Direct radiation sources from residual water in system	Compliance with OPG Radiation Protection Program [R-4].
	Radioactive liquid spill	Compliance with OPG Radiation Protection Program [R-4] and adequate Safe Work Planning and Pre-Job Briefing [R-11].
	Loose beta-gamma contamination	Compliance with OPG Radiation Protection Program [R-4] and adequate Safe Work Planning and Pre-Job Briefing [R-11].

Hazard Category	Hazard/Events Description	Mitigation Measures
	Fixed contamination in system piping	Compliance with OPG Radiation Protection Program [R-4].
	Failure of radioactive work ventilation during cutting operation	Compliance with OPG Radiation Protection Program [R-4] and adequate Safe Work Planning and Pre-Job Briefing [R-11].
Environmental	Spills from residual oil in tanks and lines, during removal and due to incorrect capping/packaging during lifts and transport	Compliance with OPG's Environment Health and Safety Managed Systems Program [R-6] and adequate Safe Work Planning and Pre-Job Briefing [R-11]
Non-Radiological	Hot work hazards from cutting pipes and equipment	Compliance with OPG's Control of Ignition Sources And Hot Work Activities [R-20] and adequate Safe Work Planning and Pre-Job Briefing [R-11].
	Inadequately disconnected circuits from building power supply.	Adequate Safe Work Planning and Pre-Job Briefing [R-11]
	PCBs from lights	Compliance with OPG's Management of Designated Substances procedure [R-8]
	Asbestos in gaskets, tiles, and insulation	Compliance with OPG's Asbestos management procedure [R-7]
	Lead paint	Compliance with OPG's Management of Designated Substances procedure [R-8]
	Mercury in switches and light fixtures	Compliance with OPG's Management of Designated Substances procedure [R-8]
	Animal wastes, bird droppings	Compliance with OPG's Environment Health and Safety Managed Systems Program [R-6] and adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Working at heights	Compliance with OPG's Working at Heights procedure [R-9] and adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Inadequate illumination and ventilation in the work area	Compliance with OPG's Environment Health and Safety Managed Systems

Hazard Category	Hazard/Events Description	Mitigation Measures
		Program [R-6] and adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Degraded or degrading structures, systems, and components	Adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Falling objects	Compliance with OPG's Falling Material Control procedure [R-10] and adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Heavy equipment traffic	Adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Building Collapse	Adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Noise	Compliance with OPG's Environment Health and Safety Managed Systems Program [R-6]
	Dust	Compliance with OPG's Environment Health and Safety Managed Systems Program [R-6]
	Dangerous or faulty equipment	Adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Pinch points	Adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Confined space work	Compliance with OPG's Confined Space Procedures [R-12]
	Fire and explosion hazards from flammable materials and compressed gasses	Compliance with the Fire Protection Program [R-5] and adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Work area congestion, traffic, proximity to other work areas and facilities	Adequate Safe Work Planning and Pre-Job Briefing [R-11]
	Buried Services	Adequate Safe Work Planning and Pre-Job Briefing [R-11]
	PNGS-B Emergencies	Emergency Management plan [R-15]

Hazard Category	Hazard/Events Description	Mitigation Measures
Unexpected Event	Surveys find radiological material	Characterize the material as needed, cut out and remove following OPG Radiation Protection Program [R-4]
	Asbestos found in insulation or other building materials	Compliance with OPG's Asbestos management procedure [R-7]
	Building collapse	Adequate Safe Work Planning and Pre-Job Briefing [R-11]

Table 1 Hazard Assessment with Mitigation Measures

For any emergent work identified during the DDP implementation period, the existing Nuclear Management System (NMS) change control process will be utilized to evaluate whether the work falls within the existing safety assessment envelope. If the emergent work presents new or different hazards not previously considered, or if risk levels exceed those analyzed in the current safety assessment, an update to the DDP Safety Assessment will be required prior to proceeding with the work.

4.3 Decommissioning Work Packages

Table 2 summarizes the work packages for A-1 and A-2 and their associated equipment/structures. Additional details will be added for A-3 in a subsequent revision of this volume of the DDP as the timing for decommissioning advances.

Group	ID	Work Package Description	List of Buildings/ Equipment	Associated Equipment
A-1	1	Scaffolding Sheds	#104 Scaffolding shed and #103 Scaffolding shed	Lighting - Miscellaneous
				Building Electrical Services 120 V / 208 V AC - Miscellaneous
	2	Oil Tank Farm	#123 Oil tank farm A	Lube oil system
				Transformer oil system
	3	Off Gas Building	#7 Off Gas System Building	Lighting - Off Gas Building
				Building Electrical Services 120 V / 208 V AC - Main Ground Bus
				Radiation Protection Equipment - Fixed Area Radiation Monitors
				Inactive Drainage System - Inactive Drainage
				Inactive Drainage System - Roof Drainage
				Heating & Ventilation Systems - Off Gas System Building
				Communications - Public Address
				Communications - Telephone
	4	Old Water Treatment Plant	#8 Old Water Treatment Plant - Internals Only	Lighting – Water Treatment Building
				Building Electrical Services 120 V / 208 V AC – Water Treatment Building
				Electrical Auxiliary Systems – Main Ground Bus
				Communications - Public Address

Group	ID	Work Package Description	List of Buildings/ Equipment	Associated Equipment
				Communications - Maintenance Communications
				Site Instrumentation - Radiological Equipment
				Inactive Drainage System - Yard Fire Protection
				Inactive Drainage System - Inactive Drainage
				Inactive Drainage System - Roof Drainage
				Heating & Ventilation Systems - Water Treatment Building
				Cranes and Hoists - Water Treatment Building
	5	Helium Trailers and Hydrogen Skids	He Trailers x2 and H2 Skids x2	He Trailers x2 and H2 Skids x2
	6	Sulzer-A	#85 Sulzer-A – Internals Only	Lighting D2O Upgrading Plant Sulzer Process and Controls - D2O Upgrading Tower
				Building Electrical Services 120 V / 208 V AC - D2O
				Upgrading Tower
				Electrical Auxiliary Systems – Main Ground Bus
				Communications - Public Address
				Communications - Telephone
				Radiation Protection Equipment - Hand and Foot Monitors, Whole Body Monitors, and Portal Monitors
				Fixed Contamination Monitors
				Fixed Gaseous Monitors
				Inactive Drainage System - Inactive Drainage
				Inactive Drainage System – Roof Drainage
				Heating & Ventilation Systems - Heating Steam

Group	ID	Work Package Description	List of Buildings/ Equipment	Associated Equipment
				Heating & Ventilation Systems - Chilled Water
				Heating & Ventilation Systems - D2O Upgrading Tower
A-2	1	Gas Bottle Storage Enclosure	#56 Gas Bottle Storage Enclosure 'A'	Lighting - Miscellaneous
				Building Electrical Services 120 V / 208 V AC – Miscellaneous
				Electrical Auxiliary Systems – Main Ground Bus
				Communications - Telephones
	2	SDSE Instrument Buildings	#57 SDSE Instrument Rooms 1-2 and #58 SDSE Instrument Rooms 3-4	Lighting – SDSE Instrument Rooms
				Building Electrical Services 120 V / 208 V AC - Vacuum Building, Ducts & Emergency Control Centres
				Electrical Auxiliary Systems – Main Ground Bus
				Communications - Telephone
				Communications – Maintenance Communications
				Light Water Systems Fire Detection and Alarms
				Heating & Ventilation Systems PNGS-A SDSE – SDSE Instrument Room HVAC
	3	Standby Power System	#3A PNGS-A Standby Generator, #66A Standby Generator oil tanks PNGSA and #4A Pumphouse	Standby Generators
				Governing System
				Excitation System
				Fuel Oil System
				Standby Generator Sets
				Governing System
				Excitation System
				Fuel Oil System

Group	ID	Work Package Description	List of Buildings/ Equipment	Associated Equipment
				Fuel Oil Waste Disposal
				Fuel Oil Waste Disposal

Table 2 Work Packages and Associated Equipment

NOTE

A standardized nomenclature system has been developed to uniquely identify and organize work packages throughout the decommissioning project. This system ensures consistent identification of work locations, groups, and sequences across all planning envelopes. For example, a Work Package ID of PE-A-1-1 is interpreted as follows:

- PE: Planning Envelope – Indicates that the work package is associated with a specific planning envelope within the decommissioning project.
- A: Planning Envelope A – Specifies the planning envelope to which the work package belongs.
- 1: Group 1 – Denotes the group or subcategory within the planning envelope, organizing work packages into manageable segments.
- 1: Work Package 1 – Identifies the sequence number of the work package within the group.

So, *PE-A-1-1 means*: Planning Envelope: A, Group: 1, Work Package: 1

4.3.1 Planning Envelope A-1: Outbuildings not Required after PNGS-A Shutdown

The buildings and equipment making up the scope of Group A-1 consist of buildings not required once PNGS-A has been shut down, including some equipment that is already out-of-service or abandoned. The pre-requisites for execution of these work packages are:

- Verification that buildings or equipment are not required to support PNGS-A stabilization or safe storage.
- Verification that buildings or equipment are not required to support planned PNGS operations, including PNGS-B, IFB, or D_2O storage at the time of removal.
- Verification that equipment/systems within the buildings have been end stated/separated and abandoned/retired.
- Confirmation of the As-Left condition and the work area has been turned over for decommissioning.

4.3.1.1 PE-A-1-1 Scaffolding Sheds

The #103 and #104 Scaffolding Shed Buildings currently have wooden beams in the ground as footings, with the structure built on top. The building is connected to the station electrical supply for lights and power outlets.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

The Scaffold Sheds are incorporated into the Protected Area open land Survey Units and is not assigned an individual MARSSIM Classification or Survey Units.

Radiological Scoping Survey: No scoping surveys have been completed for these structures.

Hazardous Materials Assessments: A hazardous building materials assessment (HBMA) identifies and evaluates the presence of hazardous materials in a building, such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). The following HBMAs were completed.

Building #	Building Name	Associated Work Package ID	Hazardous Material Identified
#103	Scaffold Shed	PE-A-1-1	Lead Paint, Metal in Paint, Mercury, Silica, PCBs
#104	Insulation Shed	PE-A-1-1	Lead Paint, Metal in Paint, Mercury, Silica, PCBs

Table 3 PE-A-1-1 Completed HBMAs

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]. Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The #103 and #104 Scaffolding Shed Buildings work package details the steps needed to remove the services from the buildings, demolish the structures including removing the building footing, and repairing the site for re-use. The following is a listing of all work to be completed as part of this work package:

- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards.
- Disconnect electrical supply and remove electrical components (lights, cables, outlets).
- Dismantle building structure to grade.
- Remove building footing below grade.
- Repair pavement to allow for re-use of the area, if required.

Work Package Closeout

Both buildings will be demolished down to grade per the interim end state described for PE-A [R-3].

4.3.1.2 PE-A-1-2 Oil Tank Farm "A"

The #123 Oil Tank Farm A work package includes associated piping, instrumentation, and electrical connections to the tanks.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

The Oil Tank Farm was not included in the HSA because all non-real site property and temporary structures such as project trailers, temporary buildings and enclosures are considered a part of the outdoors due to unrestricted movement of personnel, equipment and potentially the weather elements. In addition, outdoor storage tanks and other large equipment such as generators and transformers are also considered a part of the outdoors.

Radiological Scoping Survey: No scoping surveys have been completed for the oil tank farm.

Hazardous Materials Assessments: A hazardous materials assessment (HMA) is performed to identify and evaluate the presence of hazardous materials in an area/system, such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). No hazardous materials assessments have been completed for this area.

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]**.** Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The #123 Oil Tank Farm A work package details the steps needed to remove six oil storage tanks (three lube oil tanks and three transformer oil tanks), their concrete pad, and associated piping, instrumentation, and electrical connections. The following is a listing of all work to be completed as part of this work package:

- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards.

- Cut and cap oil lines running to/from the tanks.
- Disconnect electrical supply and remove electrical components.
- Dismantle and remove oil lines.
- Remove oil tanks and supports.
- Remove concrete pad and backfill to grade.
- Repair ground/pavement to allow for re-use of the area, if required.

Work Package Closeout

The oil tank farm will be removed down to grade and backfilled as required per the interim end state described for PE-A [R-3].

4.3.1.3 PE-A-1-3 Off Gas Building

The #7 Off Gas System Building houses the OGMS, which was designed to reduce the release of gaseous radioactive effluents and recover deuterium and heavy water. The building is a concrete and brick construction with 2-3ft. thick concrete walls. Equipment includes:

- Charcoal delay tanks,
- Guard beds,
- Water removal skids,
- Diaphragm compressor skids,
- Water-ring compressor skids,
- Refrigeration units,
- Off-gas control panel, and
- Analyser panel.

The OGMS was never commissioned or put into service. Support system interfaces including electrical, instrument and breathing air, service water, service air and nitrogen have been tied into station systems and will require end-stating and disconnection prior to dismantling.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

The Off-Gas Building is divided into 3 elevations for a total of 7 Survey Units with a preliminary MARSSIM Classification of 1.

MARSSIM Class 1 indicates potential areas impacted with concentrations of residual radioactivity that may exceed the preliminary clearance levels.

Radiological Scoping Survey: Radiological scoping surveys have been completed for the Off-Gas System Building, with results summarized:

Building #	Building Name	Associated Work Package ID	Results
#7	Off-Gas System Building	PE-A-1-3	Confirmed no contamination likely present

Table 4 PE-A-1-3 Scoping Surveys

Hazardous Materials Assessments: A hazardous building materials assessment (HBMA) is performed to identify and evaluate the presence of hazardous materials in an area/system, such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). The following HBMA was completed.

Building #	Building Name	Associated Work Package ID	Hazardous Material Identified
#7	Off Gas System Building	PE-A-1-3	Lead Paint, Metal in Paint, Mercury, Asbestos, Silica, PCBs, Mould

Table 5 PE-A-1-3 HBMAs

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]. Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The #7 Off Gas System Building work package details the steps needed to decommission the OGMS and associated equipment while preserving the building structure for potential future use. The following is a listing of all work to be completed as part of this work package:

- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards, including potential mold.
- Isolate and disconnect the off-gas equipment.
- Remove or redirect building services, if required.
- Remove off-gas equipment and components.

- Leave the building floor and structure in a safe state.

Work Package Closeout

The internal components and equipment will be removed while maintaining the building envelope and services for potential repurposing, per the interim end state described for PE-A [R-3].

4.3.1.4 PE-A-1-4 Old Water Treatment Plant

The major equipment within the #8 Old Water Treatment Plant includes:

- Densator tanks,
- Ionexer Exchangers,
- Anexer Exchangers,
- Catexer Exchangers,
- Purifiers,
- Associated feeders, pumps, agitators, piping,
- Sampling and monitoring equipment, and
- Control panels.

The facility has been shut down for several decades, but some energized equipment remains, including an active de-chlorination system required to service the Pickering site.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

The Old Water Treatment Plant is divided into 1 Survey Unit with a preliminary MARSSIM Classification of 3.

MARSSIM Class 3 indicates potential impacted areas that are not expected to contain any radioactive contamination or are expected to contain radioactive contamination at levels that are a small fraction of the preliminary clearance levels.

The HSA identified that the settling pond associated with the old water treatment plant is still utilized, and it may contain some chemical contaminants. Water was pumped from the old water treatment plant to the settling pond. Additionally, the HSA identified that there may have been a lime spill at one time, during the 1980s.

Radiological Scoping Survey: No scoping surveys have been completed for these structures.

Hazardous Materials Assessments: A hazardous materials assessment (HBMA) is performed to identify and evaluate the presence of hazardous materials in an area/system,

such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). No hazardous materials assessments have been completed for this area.

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]. Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The #8 Old Water Treatment Plant work package details the steps needed to remove abandoned water treatment equipment while maintaining active de-chlorination systems that currently service the Pickering site. The following is a listing of all work to be completed as part of this work package:

- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards.
- Perform vessel inspection to confirm if there is any content (resin, sand, charcoal).
- Erect live equipment barriers to protect in-service sodium meta-bisulfate addition equipment and sampling systems.
- Isolate and disconnect abandoned water treatment equipment.
- Remove water treatment system tanks, valves, pumps, pipes, etc.
- Remove associated panels, instruments, cables, while retaining building services.
- Leave the building floor and structure in a safe state.

Work Package Closeout

The abandoned internal components and equipment will be removed while maintaining the building envelope and services for potential repurposing, per the interim end state described for PE-A [R-3].

4.3.1.5 PE-A-1-5 Helium Trailers and Hydrogen Skids

The tanks on the Helium Storage Trailers and Hydrogen Skids are planned to be removed during stabilization, leaving the supporting structures and pads for decommissioning.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

The Helium Trailers and Hydrogen Skids were not included in the HSA because all non-real site property and temporary structures such as project trailers, temporary buildings and enclosures are considered a part of the outdoors due to unrestricted movement of personnel, equipment and potentially the weather elements. In addition, outdoor storage tanks and other large equipment such as generators and transformers are also considered a part of the outdoors.

Radiological Scoping Survey: No scoping surveys have been completed for these structures/systems.

Hazardous Materials Assessments: A hazardous materials assessment (HMA) is performed to identify and evaluate the presence of hazardous materials in an area/system, such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). No hazardous materials assessments have been completed for this area.

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]. Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The Helium Storage Trailers and Hydrogen Skids work package details the steps needed to remove the supporting structures and pads following the planned removal of tanks during stabilization. The following is a listing of all work to be completed as part of this work package:

- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards.

- Disconnect electrical supply and remove electrical components and instruments.
- Dismantle metal structures.
- Remove the concrete plinths down to grade.
- Complete any repairs required to allow for re-use of the area.

Work Package Closeout

- The remaining steel structures, electrical components, instruments, and concrete plinths will be removed down to grade, per the interim end state described for PE-A [R-3].

4.3.1.6 PE-A-1-6 Sulzer A (Contaminated)

The #85 Sulzer-A facility has been shut down for several decades, but residual contamination should be considered as no steam cleaning of the systems was completed.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

The Sulzer A Building (Referred to as D2O Upgrading Tower A in the HSA) is divided into 1 Survey Unit with a preliminary MARSSIM Classification of 1.

MARSSIM Class 1 indicates potential areas impacted with concentrations of residual radioactivity that may exceed the preliminary clearance levels.

The HSA identified that elevated H-3 levels exist in the general area of the Upgrading Plant.

Radiological Scoping Survey: No scoping surveys have been completed for this structure/system.

Hazardous Materials Assessments: A hazardous materials assessment (HBMA) is performed to identify and evaluate the presence of hazardous materials in a building, such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). No hazardous materials assessments have been completed for this structure.

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]. Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The #85 Sulzer-A work package details the steps needed to remove contaminated equipment and systems. The following is a listing of all work to be completed as part of this work package:

- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards.

- Perform vessel inspection to confirm if there is any content.
- Identify & protect live systems and equipment.
- Isolate and disconnect upgrader equipment.
- Perform asbestos remediation.
- Prepare crane footprint and place crane.
- Remove roof structure.
- Remove tower and auxiliary equipment.
- Repair the building floor and structure, and install temporary supports and roof, as required to leave it in a safe state.

Work Package Closeout

The abandoned internal components and equipment will be removed while maintaining the structure of the building for repurposing, per the interim end state described for PE-A [R-3].

4.3.2 Planning Envelope A-2: SSCs not Required after Common Systems are Separated Along the AB Gate

The buildings and equipment making up the scope of Group A-2 consist of buildings not required once PNGS-A has been shut down, including some equipment that is already out-of-service or abandoned. The pre-requisites for execution of these work packages are:

- Buildings or equipment are not required to support PNGS-A stabilization or safe storage.
- Buildings or equipment are not required to support PNGS operations, including PNGS-B, IFB, or D_2O storage at the time of removal.
- Equipment/systems within the buildings have been end stated/separated and abandoned/retired.
- The As-Left condition has been verified and the work area has been turned over for decommissioning.

4.3.2.1 PE-A-2-1 Gas Bottle Storage Enclosure

Below are some added characteristics of the #56 Gas Bottle Storage Enclosure 'A':

- Area: approximately 2,700 ft^2 (250.84 m^2).
- Height: 18 ft (5.49 m).
- Double walls made of metal cladding with insulation in between.
- Built on existing pavement.
- Open east wall for ventilation (wire mesh wall).
- Connected to station electrical supply for lights and power outlets.

The gas bottles will be removed prior to the start of decommissioning.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

The Gas Bottle Storage Enclosure is incorporated into the Protected Area open land Survey Units and is not assigned an individual MARSSIM Classification or Survey Units.

Radiological Scoping Survey: No scoping surveys have been completed for these structures.

Hazardous Materials Assessments: A hazardous materials assessment (HMA) is performed to identify and evaluate the presence of hazardous materials in an area/system, such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). The following HMA was completed.

Building #	Building Name	Associated Work Package ID	Hazardous Material Identified
#56	Gas Bottle Storage Enclosure	PE-A-1-3	Lead Paint, Metal in Paint, Asbestos, Silica, PCBs

Table 6 PE-A-2-1 HBMAs

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]. Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are

deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The #56 Gas Bottle Storage Enclosure 'A' work package details the steps needed to remove the metal structure following the removal of gas bottles prior to decommissioning. The following is a listing of all work to be completed as part of this work package:

- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards.
- Disconnect electrical supply and remove electrical components (lights, cables, outlets).
- Dismantle building structure to grade.
- Remove building pad/footing to grade.
- Repair pavement to allow for re-use of the area, if required.

Work Package Closeout

- The building will be demolished down to grade per the interim end state described for PE-A [R-3].

4.3.2.2 PE-A-2-2 SDSE Instrument Buildings

The two SDS Instrument Rooms (IRs), #57 SDSE Instrument Room 1-2 and #58 SDSE Instrument Room 3-4, have the following characteristics:

- Self-contained structures.
- House instruments and electronics associated with the shutdown system SDSE.
- Complete with air conditioning and ventilation systems.

The IRs will become obsolete once the reactor units are defueled.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

SDSE Instrument Rooms 1-2 and SDSE Instrument Rooms 3-4 are each divided into 1 Survey Unit with a preliminary MARSSIM Classification of 2.

MARSSIM Class 2 indicates potential impacted areas where concentrations of residual radioactivity are not expected to exceed the preliminary clearance levels.

Radiological Scoping Survey: Scoping surveys have not been completed for these structures.

Hazardous Materials Assessments: A hazardous materials assessment (HMA) is performed to identify and evaluate the presence of hazardous materials in a building, such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). No hazardous materials assessments have been completed for this structure.

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]. Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The #57 SDSE Instrument Room 1-2 and #58 SDSE Instrument Room 3-4 work package details the steps needed to remove these self-contained structures that house shutdown system SDSE instruments and electronics. The following is a listing of all work to be completed as part of this work package:

- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards.
- Establish any protection or supports necessary to safeguard the PRD and it's support columns.
- Disconnect electrical supply and remove electrical components and instruments.
- Remove or redirect building services, if required.
- Disconnect and remove building HVAC and other systems.
- Dismantle building structure.
- Remove building pad down to grade.
- Repair ground/pavement to allow for re-use of the area, if required.

Work Package Closeout

- The SDSE instrument rooms will be removed, including all associated electronics, leaving only the building pad at grade, per the interim end state described for PE-A [R-3].

4.3.2.3 PE-A-2-3 Standby Power System

The Standby Power System (#3A, #57, #66A, #4A) consists of standby generators, oil tanks, and pumphouse.

Scoping and Characterization

A Historical Site Assessment (HSA) has been completed for PNGS. The HSA documents construction activities, historical operations, current use of the site, and potential, likely, and known sources of radioactive material and hazardous constituents. The HSA identifies the suspected or known contaminants, the site buildings and areas that are known or most likely to be impacted and the media most likely to be contaminated.

The Standby Power System is divided into 1 Survey Unit with a preliminary MARSSIM Classification of 3.

MARSSIM Class 3 indicates potential impacted areas that are not expected to contain any radioactive contamination or are expected to contain radioactive contamination at levels that are a small fraction of the preliminary clearance levels.

The HSA identified that in the early 1990s, the area was used as temporary storage for radioactive waste, indicating the potential for contamination. Additionally, the HSA identified several oil leak events related to Standby Generators at Pickering A. The area was remediated under project # 13-40474 following these events, and there should be minimal conventional contamination remaining.

Radiological Scoping Survey: No scoping surveys have been completed for these structures.

Hazardous Materials Assessments: A hazardous materials assessment (HMA) is performed to identify and evaluate the presence of hazardous materials in an area/system, such as asbestos, lead, mold, and polychlorinated biphenyls (PCBs). No hazardous materials assessments have been completed for this area.

Outstanding Activities: Outstanding scoping surveys will be performed following the guidance discussed in the Program Overview DDP [R-3]. Any remaining gaps and uncertainty observed will have tailored mitigation plans developed as required. These activities are deliberately scheduled to coincide with the timing of execution utilizing a graded approach based-on complexity of the Work Package. Once completed, the reports will be filed in accordance with the records retention arrangements detailed in the Program Overview DDP [R-3].

Stepwise Technical Approach

The Standby Power System work package details the steps needed to remove the standby generators, oil tanks, pumphouse, and all associated piping, electrical systems, supports, and structures. The following is a listing of all work to be completed as part of this work package:

- Establish construction work area including standby generators, oil tanks, containment berm, and pumphouse.
- Conduct a sweep of the work area to locate and disposition buried services.
- Complete characterization of the work area to identify and document any unexpected radiological and chemical or toxic hazards.
- Remediate any identified hazards.
- Cut and cap oil lines running to/from the oil tanks.
- Disconnect oil tank electrical supply and remove electrical components.
- Remove oil lines piping and components.
- Disconnect oil tank fire suppression system and remove components.
- Remove oil tanks and associated civil components (supports, stairs, etc.).
- Remove containment berm and lining and backfill to grade.
- Remove or redirect pumphouse building services, if required.
- Disconnect pumphouse electrical supply and remove electrical components and instruments.
- Disconnect and remove pumphouse mechanical systems and piping.
- Disconnect any remaining services, including fire suppression, building HVAC, lighting, etc.
- Dismantle building structure to grade.
- Remove building pad down to grade.
- Cut and cap any remaining oil lines to the standby generators.
- Disconnect electrical supply.
- Dismantle and remove standby generators, cubicles, and associated equipment as per the detailed work package.
- Remove concrete pad down to grade.
- Final backfill, grading, and landscaping, as required for safe re-use of the area.

Work Package Closeout

- The standby power system will be removed down to grade and backfilled as required per the interim end state described for PE-A [R-3].

5.0 WASTE MANAGEMENT

5.1 Waste Management Plan

Most of the systems and structures within PE-A are not expected to be radiologically contaminated, except for the Sulzer A plant which is anticipated to generate LLW. Therefore, plans will be in place to manage both conventional, including hazardous, and radioactive waste. These preliminary waste classifications were arrived at based on expert knowledge of the system/structures' function, as well as a study of past incidents in the area that may have resulted in contamination. Further scoping and surveys will be completed to verify expected waste characteristics in accordance with the characterization strategy outlined in the Program Overview DDP [R-3].

Table 7 shows the estimated waste volumes associated with the decommissioning activities planned for PE-A.

Waste Stream	Conventional (m^3)	LLW (m^3)
Concrete	2,070	-
Metal	9,870	453
Hazardous	198	-

Table 7 Planning Envelope A Waste Volume Estimates

5.1.1 Waste Pathways

5.1.1.1 Conventional Waste

As can be seen in the table above, much of the waste generated is expected to be conventional waste and as such, dedicated in-situ laydown areas will be setup for Planning Envelope A activities. Refer to the Program Overview DDP [R-3] for further pathway details.

5.1.1.2 Conventional Hazardous Waste

Hazardous Waste is expected to be generated during decommissioning activities related to Volume 1 activities. Of the HBMAs completed to date, hazards identified include asbestos, lead, mercury, silica, and mould. Hazardous Building Material Assessments and sampling will be used to verify hazards prior to any dismantling activities in accordance with NMS. Refer to the Program Overview DDP [R-3] for further pathway details.

5.1.1.3 Radiological Waste

According to the Table 7, a relatively small amount of LLW is expected to be generated during the dismantling activities related to the Sulzer A Plant. Radiological Waste is not expected during the dismantling of the outbuildings, however, due to the location of the outbuildings it is possible small amounts of contamination will be discovered during characterization or demolition activities. Refer to the Program Overview DDP [R-3] for further pathway details

6.0 REFERENCES

[R-1] OPG, Decommissioning, REGDOC-2.11.2

[R-2] OPG, Off Gas Management System PNGS-A & B –Abandon System In-Place, P-CORR-00531-00693

[R-3] OPG, Detailed Decommissioning Plan – Program Overview, NA44-PLAN-00960-00004

[R-4] OPG, Radiation Protection Program, N-PROG-RA-0013

[R-5] OPG, Fire Protection, N-PROG-RA-00012

[R-6] OPG, Environment Health and Safety Managed Systems Program, OPG-PROG-0005

[R-7] OPG, Management of Asbestos-Containing Material, OPG-PROC-0124

[R-8] OPG, Management of Designated Substances Other Than Asbestos, OPG-PROC-0125

[R-9] OPG, Working at Heights, OPG-PROC-0137

[R-10] OPG, Falling Material Control, OPG-PROC-0136

[R-11] OPG, Safe Work Planning and Pre-Job Briefing, OPG-PROC-0129

[R-12] OPG, Confined Space Management, OPG-PROC-0122

[R-13] OPG, Spill Management, OPG-STD-0152

[R-14] OPG, Maintenance of Equipment Containing Hydrogen, N-STD-RA-0022

[R-15] OPG, Ontario Power Generation Emergency Management Program, OPG-PROG-0030

[R-16] OPG, Work Protection, N-PROG-MA-0015

[R-17] OPG, Hoisting and Rigging, N-STD-MA-0018

[R-18] OPG, Integrated Decommissioning Safety Assessment, NA44-REP-00960-00431

[R-19] OPG, Pickering Site Overarching Document, P-PLAN-00960-00008

[R-20] OPG, Control of Ignition Sources And Hot Work Activities, N-PROC-RA-0057

7.0 ACRONYMS

Acronym	Definition
AIFB	Auxiliary Irradiated Fuel Bay
ALARA	As Low As Reasonably Achievable
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
DDP	Detailed Decommissioning Plan
HPSW	High Pressure Service Water
IFB	Irradiated Fuel Bay
IFB-A	Irradiated Fuel Bay for Pickering A
ILW	Intermediate Level Waste
IR	Instrument Room
LLW	Low Level Waste
NMS	Nuclear Management System
OGMS	Off Gas Management System
OPG	Ontario Power Generation
PDP	Preliminary Decommissioning Plan
PE	Planning Envelope
PHT	Primary Heat Transport
PNGS	Pickering Nuclear Generating Station
PNGS-A	Pickering Nuclear Generating Station A
PNGS-B	Pickering Nuclear Generating Station B
PRD	Pressure Relief Duct
RAB	Reactor Auxiliary Building
REGDOC	Regulatory Document
RP	Radiation Protection

Acronym	Definition
SDSE	Shutdown System Enhancement
SSC	System, Structure, or Component
U1	Unit 1
U2	Unit 2
U3	Unit 3
U4	Unit 4
U5	Unit 5
U8	Unit 8
UPP	Upgrading Plant Pickering
UPPA	Upgrading Plant Pickering A
WMP	Waste Management Plan

Appendix A: Verification Matrix

REG DOC 2.11.2 Section 7.1.1	Requirement Description	CSA N294:19 App C.1	CSA Requirement Description	DDP Section Reference
Bullet 1	A description of, and diagram showing, the areas, components and structures to be decommissioned, grouped, where appropriate, into logical decommissioning planning envelopes	A)	A description of, and diagram showing, the areas, components, and structures to be decommissioned, grouped where appropriate into logical decommissioning planning envelopes	Section 2.0
Bullet 2	The operational history, including incidents or accidents that could affect decommissioning	B)	The operational history, including incidents or accidents that could affect decommissioning	See the Program Overview DDP [R-3]
Bullet 3	The storage with surveillance stage, as applicable, and requirements of the: functional building services monitoring and surveillance activities inspection activities usage boundaries during storage with surveillance	C)	The SWS stage and requirements: functional building services; monitoring and surveillance activities; inspection activities; and usage boundaries during SWS;	See the Program Overview DDP [R-3]
Bullet 4	The final radiological, physical and chemical end-state objectives, and interim end-state objectives, as applicable	D)	The final radiological, physical, and chemical end-state objectives. Where more than one DDP is required in a phased program, interim end-state objectives and monitoring programs for deferral periods shall be provided for each detailed plan.	See the Program Overview DDP [R-3]
Bullet 5	A description of the requirements for any institutional controls	E)	A description of the requirements for long-term institutional controls	See the Program Overview DDP [R-3]

REG DOC 2.11.2 Section 7.1.1	Requirement Description	CSA N294:19 App C.1	CSA Requirement Description	DDP Section Reference
Bullet 6	Comprehensive and systematic survey results of radiological and other potentially hazardous conditions, including identification and description of the remaining significant gaps or uncertainties in the measurement or prediction of such conditions	F)	Comprehensive and systematic survey results of radiological and other potentially hazardous conditions, including identification and description of the remaining significant gaps or uncertainties in the measurement or prediction of such conditions	Section 4.3
Bullet 7	A decommissioning strategy for each planning envelope that highlights any significant changes from the strategy identified in the PDP	G)	A decommissioning strategy for each planning envelope that highlights any significant changes from the strategy in the PDP	See the Program Overview DDP [R-3]
Bullet 8	A description of the decommissioning work packages, including: a step-wise technical approach the nature and source of potential significant risks to workers, the public and the environment (including estimates of doses), as well as species at risk, the procedures or technologies proposed to mitigate risks the quantities, characteristics and disposition methods of waste.	H)	A description of the decommissioning work packages, including: a step-wise technical approach; the nature and source of potential significant risks to workers, the public, and the environment (including estimates of doses) as well as species at risk; procedures or technologies proposed to mitigate risks; and quantities, characteristics, and disposition methods of all wastes;	Section 4.3

REG DOC 2.11.2 Section 7.1.1	Requirement Description	CSA N294:19 App C.1	CSA Requirement Description	DDP Section Reference
Bullet 9	A schedule of the execution of decommissioning activities showing: the start date of the proposed execution of decommissioning activities the approximate duration and sequence of work packages (and periods of storage with surveillance, if applicable) the anticipated date of completion of decommissioning activities	I)	A schedule showing the proposed start date; the approximate duration and sequence of work packages (and periods of SWS, if applicable); and the anticipated completion date;	See the Program Overview DDP [R-3]
Bullet 10	A waste management plan	J)	A waste management plan	Section 5.1
Bullet 11	A characterization of potential environmental effects and the measures to be employed to mitigate and monitor these effects	K)	A characterization of potential environmental effects and the measures that will be employed to mitigate and monitor the effects	See the Program Overview DDP [R-3]
Bullet 12	A conservative cost estimate (based on the work packages), as described in REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*, for labour, materials, equipment, waste management, environmental assessment, monitoring and administration (e.g., training, safety, licensing, project management, government and public liaison)	L)	An itemized conservative cost estimate	See the Program Overview DDP [R-3]
Bullet 13	Financial guarantee arrangements	M)	Financial guarantee arrangements	See the Program Overview DDP [R-3]

REG DOC 2.11.2 Section 7.1.1	Requirement Description	CSA N294:19 App C.1	CSA Requirement Description	DDP Section Reference
Bullet 14	A summary report of any public and Indigenous consultations undertaken in preparing the plan, including issues raised and how they were considered and dispositioned	N)	A summary report of any public and Indigenous engagement undertaken in preparing the plan, including issues raised and how they were considered and dispositioned	See the Program Overview DDP [R-3]
Bullet 15	The project management structure	O)	The project management structure	See the Program Overview DDP [R-3]
Bullet 16	Applicable programs (e.g., management system, emergency response, site security, radiation protection, environmental protection, fire, and personnel training) (Note: this includes programs applicable during storage with surveillance and decommissioning)	P)	Applicable programs (e.g., management system, emergency response, site security, radiation protection, environmental protection and monitoring, fire protection, personnel training)	See the Program Overview DDP [R-3]
Bullet 17	A human factors program that includes: human factors analysis training provisions use of contractors procedural development ergonomic issues	Q)	A human factors program that includes human factors analysis; training provisions; use of contractors; procedural development; and ergonomic issues;	See the Program Overview DDP [R-3]
Bullet 18	Conventional occupational health and safety issues and associated training and protection programs	R)	Conventional occupational health and safety issues and associated training and protection programs;	See the Program Overview DDP [R-3]
Bullet 19	A list of federal and provincial regulatory agencies involved in the project	S)	AHJs involved in the project;	See the Program Overview DDP [R-3]

REG DOC 2.11.2 Section 7.1.1	Requirement Description	CSA N294:19 App C.1	CSA Requirement Description	DDP Section Reference
Bullet 20	The final survey program with interpretation criteria	T)	The final survey program with interpretation criteria	See the Program Overview DDP [R-3]
Bullet 21	The operating and decommissioning records that will be retained, and the method of retention	U)	The operating and decommissioning records required for long-term retention and the method of retention	See the Program Overview DDP [R-3]
Bullet 22	A table of contents for the final end-state report, outlining the topics to be covered	V)	A table of contents for the final end-state report that outlines the topics to be covered	See the Program Overview DDP [R-3]
Bullet 23	Operational experience and lessons learned from the decommissioning of similar nuclear facilities	W)	Operational experience and lessons learned of the decommissioning of similar nuclear facilities.	See the Program Overview DDP [R-3]
Bullet 24	Criticality safety assessment, as required, and planned actions involving fissile material	N/A	N/A	See the Program Overview DDP [R-3]