Osborne Submarine Construction Yard (SCY) EIS

CCRE4: Waste Management

Prepared for:

Australian Naval Infrastructure (ANI) & URPS

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Colby Phillips Advisory Pty Ltd

Level 1, 60 Hindmarsh Square

Adelaide, SA 5000

www.colbyphillips.com.au

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Executive Summary

This report presents information and advice to support the Environmental Impact Statement (EIS) for planning approval of the proposed nuclear powered submarine construction yard (SCY) project at Osborne, Adelaide:

- ***To ensure that waste generated, transported, or received as part of the development is managed in accordance with the waste hierarchy and in a manner that protects all environmental values.***

It includes (but is not limited to):

1. A preliminary inventory identifying and classifying the expected waste streams to be generated from the proposed project activities during its construction and operational phases.
2. Describing the proposed management for each waste stream against the waste management hierarchy.
3. Identifying potential waste service providers for waste streams to be managed.
4. Describing the requirements for management of radioactive waste from the project.
5. Providing a recommended framework and content for a waste management and minimisation plans for each phase of the project

Figure E-1 overleaf provides an overview of the different waste types that may be present during the project, recommended key management principles (for these waste types) and key regulatory compliance requirements. *Note: Not all waste types are present during each phase of the project, which will each have substantially different waste volumes and types, e.g., low level radioactive waste would only be present during operational phase, waste soils would only be produced in construction phase. See Table 3-1 in this report for expected waste inventory during each project phase and Table 3-2 and Table 3-3 for assessment of waste volumes for construction and operational phase, respectively.*

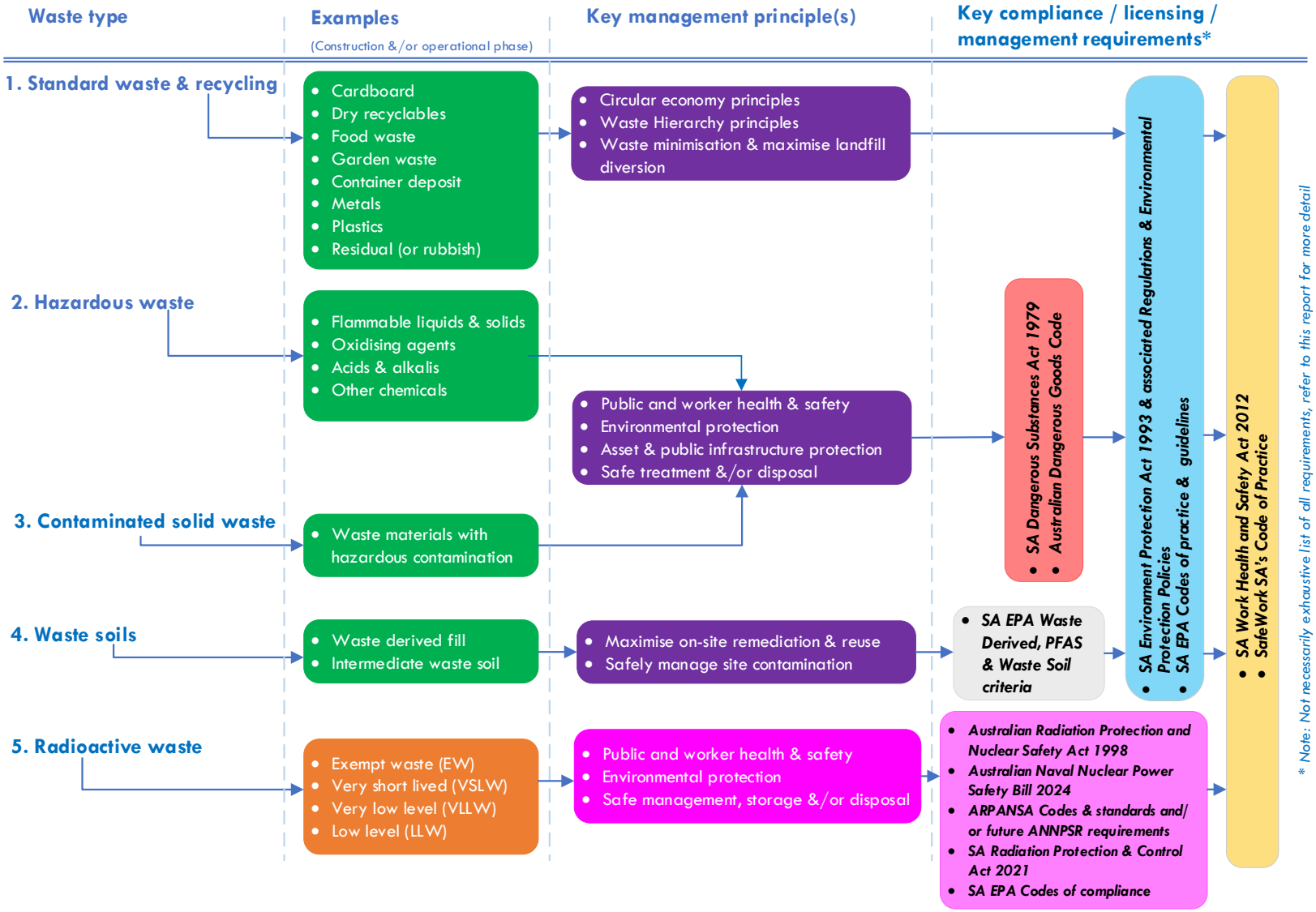

Figure E-1 – Overview of waste types expected during SCY project, recommended key management principles and key compliance requirements. *Note: Not all waste types are present during each phase of the project, e.g., low level radioactive waste would only be present during operational phase, waste soils would only be produced in construction phase. See Table 3-1 in this report for expected waste inventory during each project phase. For radioactive waste, future compliance requirements will include any under the recently enacted Australian Naval Nuclear Power Safety Act 2023 and Australian Naval Nuclear Power Safety Regulator (ANNSPR) established under this Act.*

Contents

1 Introduction

1.1 Context

Australian Naval Infrastructure (ANI) is planning a submarine construction yard (or SCY) at Osborne, Adelaide, for the Australian Government's SSN-AUKUS submarine project.

- At least $2 billion could be invested in infrastructure over the next 10 years to build the SCY facility[1].
- Submarine construction would commence by 2030 and (at least) five (5) SSN-AUKUS submarines would be completed over a period of about 25 years [1].

The Minister for Planning has declared the AUKUS SCY at Osborne as an impact assessed development under section 108 (1)(c) of the Planning, Development, and Infrastructure Act 2016 (PDI Act), which requires the preparation of an Environmental Impact Statement (EIS).

To support the EIS, information has been sought on waste generated, transported, or received as part of the development is managed in accordance with the waste hierarchy and in a manner that protects all environmental values.

This report provides this information based on the project data available at current time.

1.2 Scope of assessment

Table 1-1 overleaf gives the information requested to support the project EIS. In summary, this information sought includes (but is not limited to):

- Assessment of expected waste streams, including radioactive waste management, to be generated from the proposed project activities during the construction and operation of the development.
- How these waste streams would or should be managed against waste hierarchy, including how they may be stored, how would transport them, and where disposal may happen.
- Future planning that should occur during future project design development, construction, and operational phases to ensure that waste management is properly planned and successfully achieves this goal and is safely undertaken to protect the public and environment.

1.3 Presentation

This report is presented as follows.

Section 2 – Project information & assumptions	Summarises available project information or assumptions made to support this advice.
Section 3 – Assessment of waste streams	Identifies and assesses potential waste streams, including for radioactive waste management.
Section 4 – Waste management advice	Advice on how these waste streams should be managed against the waste hierarchy, including on-site storage, transport and/or disposal
Section 5 – Recommended project waste management planning	Recommended next steps for planning waste management during the project including content for waste management plans to be prepared for both construction and operational phases.

[1] Work to commence on the Submarine Construction Yard, Osborne, South Australia | | Australian Submarine Agency (asa.gov.au)

Table 1-1 – Scope of Assessment requested to support the EIS

CCRE4	**Waste Management**	**To ensure that waste generated, transported, or received as part of the development is managed in accordance with the waste hierarchy and in a manner that protects all environmental values**	– Identify, quantify, and classify all the expected waste streams to be generated from the proposed project activities during the construction, operation, rehabilitation, and decommissioning phases of the development – Assess and describe the proposed management measures for each waste stream against the waste management hierarchy, namely: avoid and reduce waste generation, reuse, recycle, recover energy and other resources, treatment, and disposal. This includes the generation, storage, and transport of waste. – Provide a required framework and content for a future waste management and minimisation plan (for demolition, construction and operation where relevant), detailing the sources of waste, the location of waste storage (including separation of waste streams, such as recyclables, hard waste and e-waste) and disposal facilities on the site or development -related sites (e.g. laydowns) and provide details of how these facilities will be serviced, including the need for licensing, permits or approvals to support proposed offsite or onsite waste management practices – To support planning of logistics and industry capability, identify potential waste service providers, including any potential requirement for waste streams to be managed by licensed service providers interstate. – Describe the method of storage of the radioactive waste from all relevant components of the proposal during ongoing operations. – Describe the method of disposal of radioactive waste from all relevant components of the proposal after operations are completed.

2 Available project information

2.1 Project status

Design development for the SCY has commenced but is still at initial stages.

- There is not yet a full description available of activities that will be undertaken during the project, nor types and/or quantities of potential waste expected to be generated.
- Consequently, it is necessary to review project information available, consider what these project activities would or might be, to identify what potential waste streams could be generated during construction and/or operational phases.
- This high-level and preliminary information is presented in following sections and was used to assess potential waste streams from the project and advise on how they should be managed (in line with the waste hierarchy).

2.2 Relevant project data

2.2.1 General project information

The following publicly available data gives useful some general information on scope and scale of planned SCY project.

- At least $2 billion could be invested in South Australian infrastructure for the SCY project[2].
- The Australian Government intends to start building its first SSN-AUKUS submarine at the SCY site by the end of this decade or 2030[2].
- The first SSN-AUKUS submarine built could be delivered in the early 2040s[3].
- Australia could build up to five SSN-AUKUS submarines at the SCY.

[2] See: Osborne Submarine Construction Yard | Australian Submarine Agency (asa.gov.au)

[3] See: Nuclear-powered Submarine Program – Defence SA

2.2.2 Other project data

The following gives an overview of the SCY at Osborne based on other project information available.

- The project would cover a substantial site area on the Northeastern corner of the Lefevre Peninsula.
- There could be at multiple different buildings or structures across this site, not including other proposed road and transport infrastructure built for the project.
- At high level, these building and structures would or could be expected to include (but may not be limited to):
    - Single or multi-level office buildings,
    - On-site accommodation facilities (including leisure and catering),
    - Manufacturing buildings and workshops,
    - Storage Warehouses,
    - Docks,
    - Covered submarine assembly area including launch area,
    - Car Park areas – External open and/or multi-level covered structures (for personnel parking and fleet vehicles),
    - Utility Buildings – For plant including back-up generators, communication, and data systems.
    - Ancillary facilities (e.g., health)
    - Fuel storage tanks,
    - External yards for storage (including materials and waste),
    - Specialised buildings, yards and storage areas for nuclear related activities,
    - Security fencing and gates,
    - Landscaped and recreational areas for personnel, and
    - Roads and transport infrastructure (including for public transport access).
- These areas would need to be built and then operated and maintained after.
- Some of these structures would or could have specialised design needs or house activities to meet specific defence, security, and submarine construction requirements.
- The expected site construction program would commence in 2025 and complete within 10 years.

2.3 Expected or potential project activities

2.3.1 Construction Phase

The construction phase of the SCY is expected to involve the following activities at the site. It should be noted that these activities would not happen across the entire site at once and may occur progressively in different parts of the site over the expected 10-year construction program.

Demolition	Clear site ready so construction can safely commence, which may include (but not be limited to): • Set up access points and security (i.e., fencing, gates, etc.), • Clear vegetation, • Remove existing structures and previous utility infrastructure (e.g., old transformers, gas pipes, water piping, above or underground tanks, etc.), • Identify and dispose of any hazardous materials still located or stored on site from past industrial activities (e.g., above / underground fuel storage tanks, containers or drums with chemicals, and plant and equipment), • Identify, excavate, and dispose of any previously contaminated soils, and • Reprocess above suitable demolished materials at site or third party external reprocessor(s) for reuse in future construction at site or other construction project(s).
Preliminary works *(or site preparation)*	Prepare the site for access and construction of buildings and other facilities and structures, which may include (but not be limited to): • Site grading to main levels, • Services installation including trenching, poles, laying conduits or pipes (which may include relocation of any existing services, conduits and/or corridors across the site), • Road base construction and construction phase paving (with recycled materials where feasible), • Cut and fill (with soil, rock and/or aggregate) to prepare final levels for buildings and/or (above or below ground) structures (again, using recycled materials where possible), and • Excavations for footings / piers and foundation installation for buildings and other structures.
Construction	Of buildings and other facilities and structures including (but not limited to): • Final site service excavations and conduits or pipework installed for supply into buildings and other facilities and structures (electricity, water, gas, sewer, comms), • Footings / piers and foundations laid / installed, • Building and other structure frames erected (steel frame / concrete slab, steel frame concrete tilt-up, timber) • Roofing, internal structural, and internal services installed (e.g., switchboards, conduits, piping &/or connections for electricity, water, gas, sewer, comms), • Utility and/or service plant and equipment &/or storages installed (e.g., HVAC, ventilation ducting, boilers, hot water, gas storage, water pumping & storage, etc.) • External windows, walls, facades installed, • Internal insulation, walls, ceilings, doors, glass, and other partitions, and electrical and comms and access points installed, • Surface treatments / finishes (water proofing, painting, tiling, wood panelling, other), • Base fit-out (cabinetry, kitchens, toilets), • Floors / coverings (e.g., timber, laminate, tiling, carpets, etc.), • Final fit-out (furniture, curtains, drapes, other furnishings), • Specialised workshop &/or laboratory fit outs (if industrial), • Manufacturing, laboratory, R&D plant, equipment & storages delivered and installed (if industrial) • Disposal of waste and recycling generated by the above.

2.3.2 Operational phase

The operational phase of the SCY is expected include the following activities at the site. Each of these activities could have their own range of potentially dangerous materials or hazardous substances, with some being the same or shared (e.g., cleaning and water treatment chemicals, fuels, pesticides, etc.) across these activities. *Note: These are potential activities based on hypothecation by Colby Phillips Advisory based on preliminary project information available, and there may be some differences once the final submarine manufacturing activity scope for the SCY site is confirmed (e.g., foundry operations may happen off-site, submarine weapons fit-out may happen elsewhere, etc.).*

Submarine manufacturing	Would involve a range of on-site manufacturing activities, much of general industrial nature, but other specialised for submarine manufacturing and associated defence work and could include areas for (but not limited to) the following. The presence of these activities could vary from building to building across the site. • Offices – Which would be similar those in office-only buildings. • Warehousing and storage - High level security and low-level security. • Dangerous goods storage(s) – Which may be located multiple areas inside and outside buildings and of different scales ranging from safety cabinets with small containers, rooms with larger containers and/or drums, and open, bunded or enclosed areas with tanks or larger bulk storages (including for gasses, liquids, solids and radioactive materials). • Metal shop – For forming / pressing, cutting, welding, of metals. • Foundry – For casting of specialised ferrous and/or non-ferrous components. • Electroplating – For metal coatings. • Other Surface coatings – Including other specialised methods like powder coating, vapor deposition and /or thermal spraying. • Paint shop – For painting of materials and/or components. • Plastics production / moulding area – For specialised production of plastic polymers and/or their casting, extrusion and/or 3D printing into components. • Electrical equipment manufacturing / assembly & testing. • Weapons systems manufacturing / assembly & testing including secure storage of these materials as needed. • Communications, sonar & radar systems manufacturing / assembly & testing. • Submarine battery storage & testing. • Other specialised manufacturing areas. • Specialised R&D areas & testing / analytical laboratories. • General workshop operations areas – which may include lathes, CNC, cutting, grinding machines and pre-assembly areas. • Secure area for storing, preparation and/or testing the submarine nuclear propulsion system before installation in the submarine. • Main submarine assembly & fit out area – where manufactured and/or prefabricated components would finally be assembled to form the submarine and fit it out. • Main submarine launch area – From where the submarine would be launched. • Vehicle, plant & equipment maintenance workshops – For maintaining and servicing vehicles and mobile plant. • Staff support areas – which could include: o Refectory(ies) and/or lunchrooms, o Toilets & changerooms, o On-site first-aid and medical facilities, o Training / simulation facilities / areas, and

	○ Human resources support and/or guidance areas. • Utility areas and operations – which could include: ○ Switchboards and Grid electricity supply, plus on-site Solar PV and/or batteries, ○ Information Technology (IT) rooms / data centres, ○ HVAC, which may include cooling towers and chemical dosing systems, ○ Boiler / hot water plant, ○ Steam generation / boiler, ○ Water supply pump room, storage tanks, which may include chemical dosing, ○ High purity de-ionised water production, ○ Air compressors, ○ Fuel storage and bowsers and/or charging stations (for vehicles, mobile plant &/or equipment), and/or ○ Back-up gensets and their fuel storage tanks (for energy security). • Industrial waste and recycling disposal and storage areas – Secure and unsecure, including for: ○ Non-hazardous waste and recycling, e.g., rubbish, metals, cardboard, glass, food waste, hard waste, etc., ○ Medical / clinical waste, ○ Radioactive waste (exempt to low level), and ○ Other hazardous waste – from use of dangerous or hazardous gas, liquids and/or solids.
Offices	Which would largely be like those occurring in standard commercial or government offices elsewhere, including (but not limited to): • Computer and other electrical and electronic equipment, • Use of paper and stationery and digital media, • Staff facilities including kitchens, lunch / tea rooms, toilets, and End-of-Trip areas, • First-aid or medical treatment areas, • Cleaning – including: ○ Chemical storage, and ○ Waste and recycling disposal areas • Utilities – ○ Switchboards and Grid electricity supply, plus on-site Solar PV and/or batteries, ○ Information Technology (IT) rooms / data centres, ○ HVAC, which may include cooling towers and chemical dosing ○ Boiler /hot water plant, ○ Water supply pump room, storage tanks, which may include chemical dosing, and ○ Back-up genset(s) and fuel storage (for energy security).
Accommodation *(on-site)*	For workers and/or defence personnel, including (but not limited to): • Serviced and unserviced accommodation – some of which may include kitchens, • Utilities (to support this accommodation) – which may be like those needed by offices and outlined above, • Cleaning – which would may include chemical storage, waste, and recycling disposal areas, and even laundry facilities, and • Shared areas – which may include gyms, common eating and/or other recreational areas, landscaped gardens, etc.

Retail / commercial	To support the workforce and SCY operations, which may include (but not be limited to): • Hospitality (i.e., café), • Childcare centre, • Medical care, and • Leisure (e.g., gym).
Car parking	For workforce and /or SCY, security and/or defence fleet vehicles, which would include (but not be limited to): • Car parking in paved ground-level areas, basements and/or multi-storey buildings, and • Fuel storage and bowsers and/or charging stations (for security, SCY fleet and defence vehicles).
Security	Which would or could include: • Specialized offices in buildings across the site or stand-alone buildings at key access points or for main security administration, • Gates at access points, • Fencing and other structures or barriers to control site and/or secure building access, • Electronic active and passive monitoring and/or surveillance systems for the above, • Housing of dogs if used for patrolling, and • Small weapons and armoury storage.
Gardens & Landscaping	Across the site, which would or could include: • Lawns and gardens, • Water features, • Outside recreational / leisure areas for sport, playgrounds and / or BBQs / eating, • Walkways or running / cycling tracks (for access to and from and around the site), • Garden maintenance shed and storage (for on-site Garden staff offices, vehicles, equipment, chemicals, etc.), • External bunker areas – for storage of garden materials (e.g., soil, compost, mulch), and • Garden waste area – for storage of garden waste.

2.4 Other relevant advice or assessments

Colby Phillips Advisory has prepared other following separate advice to support the EIS process for the SCY project. These reports included assessments of waste streams likely to be produced by the project. The information in these other assessments has been used to inform this report.

- ***CCRE2: Greenhouse Gas Emissions*** (Colby Phillips Advisory, 2024a)
- ***HR4: Dangerous Substances*** (Colby Phillips Advisory, 2024b)

3 Assessment of waste streams

3.1 Overview

This section gives a preliminary assessment of waste streams during construction and operational phases of the project to support the following requested information:

- *Identify, quantify, and classify all the expected waste streams to be generated from the proposed project activities during the construction, operation, rehabilitation, and decommissioning phases of the development.*

3.2 Classification & presentation

3.2.1 Types of waste streams

The assessment of waste streams for the project was divided into the following categories which are illustrated in Figure 3-1 overleaf and further described with examples in Table 3-1 two pages over.

1. ***Standard waste & recycling*** *– that does not contain hazardous and/or radioactive waste*
2. ***Hazardous waste*** *– which is dangerous to environment and human health*
3. ***Contaminated solid waste*** *– has hazardous waste contamination but still okay for landfill disposal*
4. ***Waste soils –*** *from excavation that is not contaminated and can be safe for reuse as a construction fill*
5. ***Radioactive waste*** *– which has radionuclides in it and requires special classification and management for storage and disposal.*

Table 3-1 also indicates for each project phase whether these waste categories are likely to be present or not and (qualitatively) to what extent, i.e.,

- ***Construction phase*** – Would be expected to generate:
  - Large volumes of demolition wastes including masonry, concrete, steel, and waste soils,
  - Construction wastes including building material off-cuts and packaging waste, which may be source separated (e.g., cardboard, plastics by polymer, timber, plasterboard) or mixed (e.g. dry waste), and
  - Some potentially hazardous wastes from:
    - Demolition – if hazardous substances are present on at site, e.g., asbestos, electrical equipment, chemicals, contaminated soils, etc.),
    - Construction – from residues of hazardous substances used for building (e.g., pesticides, paints, adhesives, etc.).
  - Some contaminated soils if present at the site (which may not yet be known).
- ***Operational phase*** – Would be expected to generate:
  - Standard commercial-type wastes (e.g., cardboard, paper, recyclable containers, food waste) and industrial type waste (metals, plastics, etc.),
  - Industrial and submarine manufacturing-specific wastes (e.g., ferrous and/or non-ferrous metals, plastics, glass, industrial e-waste),
  - Diverse range of hazardous wastes from hazardous chemicals used at site for submarine-manufacturing (e.g., acids, alkalis, oxidising agents, batteries, etc.),
  - Small volumes of low level solid and liquid radioactive waste, mainly from equipment and protective equipment used to monitor and manage radioactive materials or testing at site, and
  - Minor volumes of building material type waste (e.g., from maintenance activities).

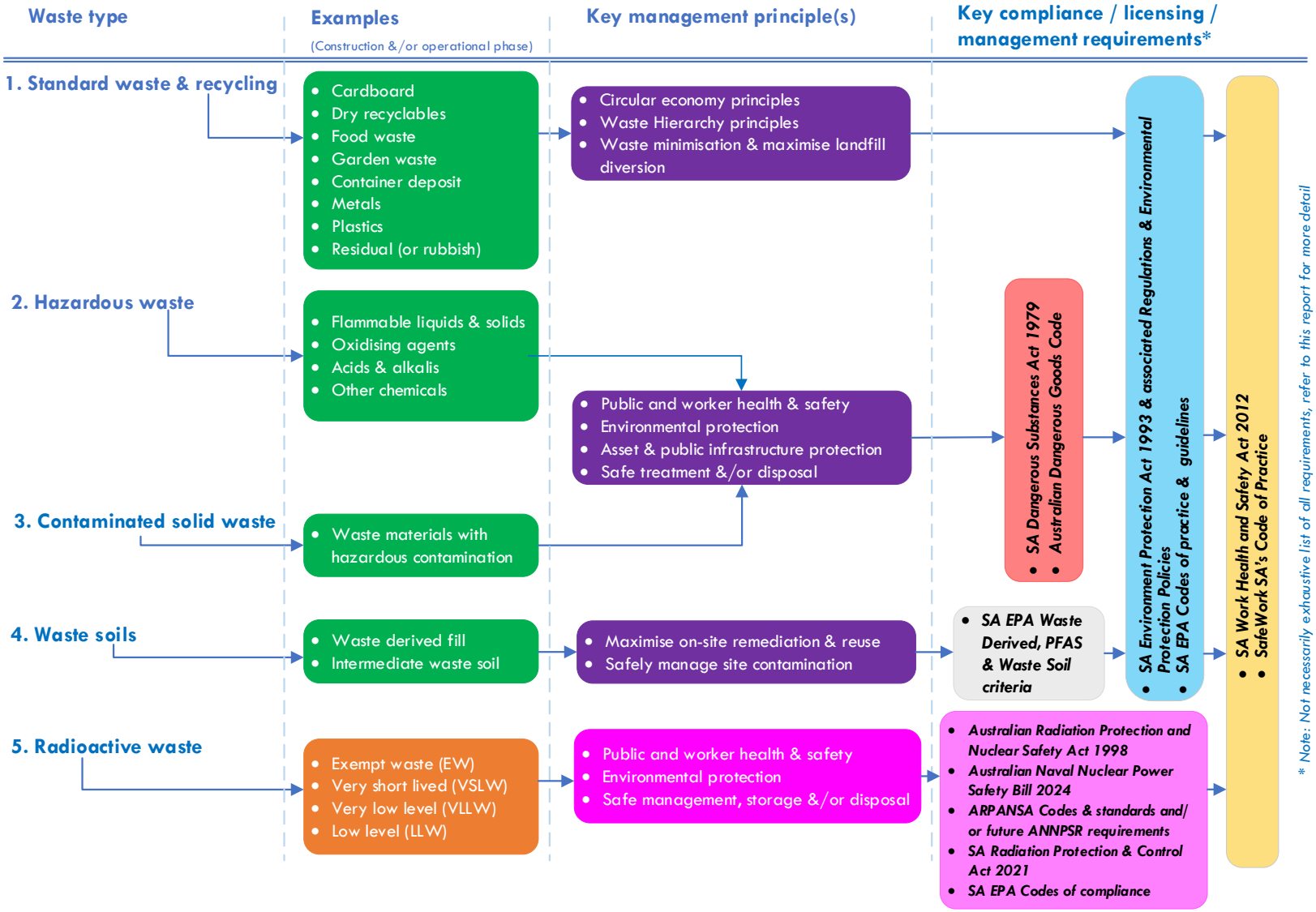

Figure 3-1 – Overview of waste types expected during SCY project, recommended key management principles and key compliance requirements. *Note: Not all waste types are present during each phase of the project, e.g., low level radioactive waste would only be present during operational phase, waste soils would only be produced in construction phase. See Table 3-1 in this report for expected waste inventory during each project phase. For radioactive waste, future compliance requirements will include any under the recently enacted Australian Naval Nuclear Power Safety Act 2023 and Australian Naval Nuclear Power Safety Regulator (ANNSPR) established under this Act.*

Table 3-1 – Categories of waste classification. *Project phase indication: ● – Present in significant or larger volumes, ○ – May be present in lesser volumes and/or minor contributor.*

Category	Description / definition	Examples (but not limited to)	Project Phase	
			Construction	Operational
1. ***Standard waste & recycling***	– Waste materials per definition of waste in *South Australia Environment Protection (EPA) Act 1993* (South Australian Government, 2024)) that do not contain hazardous or radioactive waste. – Can or should be able to be managed and disposed of by conventional waste and recycling methods and practices, including to landfill if not being reused or recycled, to protect the environment and public health.	Masonry, cardboard, paper, plastics, metals, recyclable containers, food waste, garden waste	●	●
2. Hazardous waste	– Waste materials that contain hazardous waste, which is defined by the *South Australia Environment Protection (Waste to Resources) Policy (W2REPP) 2010* (South Australian Government, 2021) as: o Listed waste specified in Schedule 1 Part B of the *EPA Act 1993*, o Having a characteristic described in schedule A list 2 of the *National Environment Protection (Movement of controlled waste between States and Territories) Measure 2012* (Australian Government, 2012).	Chemical waste, batteries, compressed gas cylinders, E-waste, other dangerous goods, medical waste, etc.	○	●
3. Contaminated solid waste	– Which may be contaminated but still be able to be (directly) disposed to a landfill if it meets the certain waste criteria: o Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil (SA EPA, 2010), and o Landfill disposal criteria for PFAS-contaminated waste (SA EPA, 2020)	Standard waste & recycling materials contaminated by residual hazardous waste material	○	●
4. Waste soils	– Which may be contaminated but still be able to be used as fill on construction sites if it meets certain waste criteria: o *Contaminated soils* – which require treatment or remediation before reuse if they do not meet certain safety criteria (as noted Figure 3-1), and o *Waste Fill* – which can be used for construction fill (and/or landfill cover too) if they do meet certain safety criteria, and	Excavated soils from construction phase (or brought in from other construction sites)	●	
5. Radioactive waste	– That contain radionuclides and require special consideration to ensure safe disposal depending on their radioactive hazard risk and availability of suitable with disposal facility or option per: o South Australian Environment Protection Authority (SA EPA) relevant codes of practice and guidelines for radiation licensing (see: Codes of Compliance | EPA) under the *Radiation Protection and Control Act 2021* (South Australian Government, 2021) and its sub-ordinate legislation, and o Classification of radioactive waste *viz.* Australian Radiation Protection and Nuclear Safety Agency (ARPANSA codes of practice for radioactive waste management (see: Codes and standards | ARPANSA), i.e., Exempt through to Low Level. *Note: Intermediate Level and High-level radioactive waste are not anticipated by ANI at SCY.* o Future requirements established by the new Australian Naval Nuclear Power Safety Regulator (ANNSPR), which may substitute for above ARPANSA codes of practice.	End-of-life (EOL) radiation gauges, detector check sources, contaminated clothing &/or PPE		●

3.2.2 Waste hierarchy

In addition, waste streams were categorised by their expected disposal fate per the Waste Hierarchy – see illustration in Figure 3-2 below. This Waste Hierarchy principle is the:

- Objective for sustainable waste management in South Australia per the State's *Environment Protection (Waste to Resources) Policy (W2REPP) 2010* (South Australian Government, 2021), and
- Guiding principle for waste management in South Australia per the State's 2020-2025 Waste Strategy (Green Industries SA, 2020).

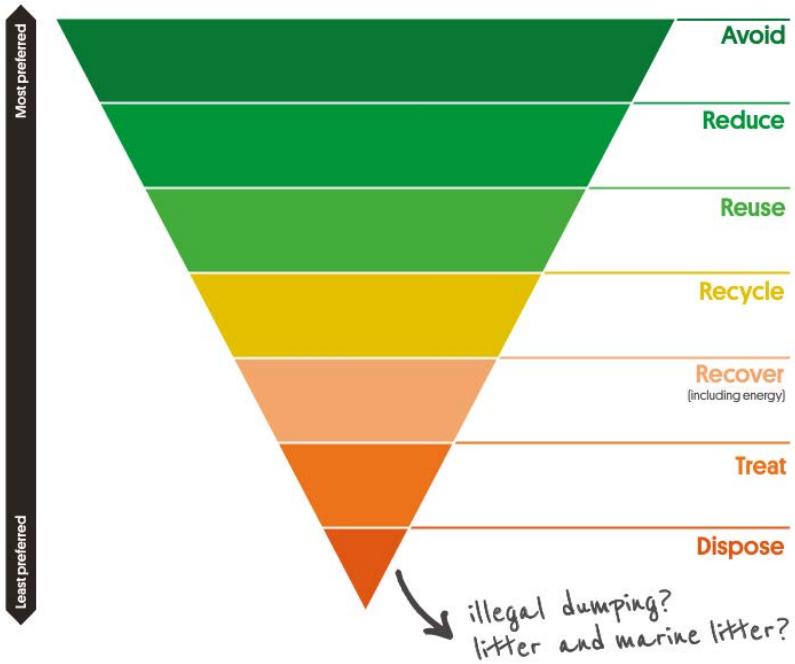

Figure 3-2 – The Waste (management) Hierarchy. *Image source: South Australia's 2020-2025 Waste Strategy (Green Industries SA, 2020)*

3.3 Construction phase assessment

Table 3-2 overleaf gives a preliminary indicative assessment of the potential waste streams from the construction phase (which includes demolition activities), including type of waste material, possible volume generation and disposal fate (by waste classification in line with Waste Hierarchy).

- In short, this assessment suggests that:
  - An early high-level estimate (prepared by Colby Phillips Advisory – see notes on next page) suggests over a 100,000 tonnes of waste material could potentially be generated by the construction phase of this project over 10 years.
  - > 90% of this material should be diverted away from landfill disposal through:
    - Reuse on-site of demolished masonry, concrete, and waste soils,
    - Recycling, mainly by construction and demolition (C&D) industry re-processors, and/or
    - Recovery of dry and non-hazardous waste material as a refuse derived fuel (RDF) (to provide an energy source)

{Cont. overleaf}

Table 3-2 – Preliminary indicative assessment of waste streams for construction phase (which includes demolition activity) including high-level indicative volume estimates. *Volumes to be confirmed from future site and soil contamination surveys and project design details.*

Category	Waste material	Indicative volume* (tonnes)	Potential disposal fate (primary)				
			Reuse	*Recycle*	*Recover*	*Treat*	*Landfill*
1. Standard waste & recycling	*Masonry*	79,000					
	Metals	5,000					
	Organics	3,400					
	Cardboard & Paper	700					
	Plastics	1,300					
	Glass	340					
	Other Material	110					
	Sub-total	***89,850***	***50,560***	***30,910***	***4,140***		***4,240***
2. Hazardous waste including soils	*Soil / Masonry (demolition)*	800				800	
	Other (construction activity)	430				430	
	Sub-total	***1,230***				***1,230***	
3. Contaminated waste	*Low-level contaminated*	1,680					1,680
	Intermediate-level contaminated	1,120					1,120
	Sub-total	**2,800**					**2,800**
4. Waste soils	*Waste derived fill (clean)*	71,200	71,200				
	Intermediate waste soil (some contamination)	3,700			3,700		
	Sub-total	***74,900***	***71,200***		***3,700***		
TOTALS	***By volume***	**168,780**	**121,760**	**30,910**	**7,840**	**1,230**	**7,040**
	By %	**100%**	**72%**	**18%**	**5%**	**1%**	**4%**

** Should only be considered ±50%, to be confirmed once more project information becomes available. Developed based on other assessments by Colby Phillips Advisory on project material inventories for greenhouse gas emission assessment (Colby Phillips Advisory, 2024a) and dangerous goods (Colby Phillips Advisory, 2024b) to support EIS of the SCY project.*

Some notes about how this assessment was developed follow below.

- For 1. Standard waste & recycling category, wastes were sub-categorised by construction material per Green Building Council Australia (GCBA) material categories used for assessing embodied carbon in building materials (*viz.* the CCRE2 assessment prepared for project Greenhouse Gas (GHG) Emissions (Colby Phillips Advisory, 2024a)).
- For 2. Hazardous waste, these would be sub-categorised (even though not done here):
    - Per the South Australia *Environment Protection (Waste to Resources) Policy (W2REPP) 2010* (South Australian Government, 2021), and
    - Using the UN Code in the *National Environment Protection (Movement of controlled waste between States and Territories) Measure 2012* (Australian Government, 2012).

- Potential waste volumes were estimated from expected SCY project construction expenditure and volume waste generation per dollar invested for construction in South Australia using recent economic and waste industry data from:
    - Australian Bureau of Statistics integrated Environmental-Economic Accounts[4], and
    - Green Industries SA reported waste generation for the construction and demolition sector in South Australia Circular Economy reporting[5] .
- The potential disposal fate for these waste streams is based on recycle rate data in South Australia Circular Economy reporting (Green Industries SA, 2020) and from industry experience.

Some additional commentary by waste sub-category follows below.

- ***1. Standard waste & recycling –***
    - Volume generation during demolition would be dominated by masonry materials (i.e., bricks, concrete) with significant contributions by metals (i.e., steel frames), timber and organic material (from clearing site vegetation).
        - Most of these materials could be reused on site or sent to local recyclers (C&D re-processors, composters, metal recyclers).
        - There could be some hazardous waste in these materials, depending on past land use(s) of the SCY site (e.g., asbestos, CCA-treated timber, PCBs, E-waste) and this would need to be separated on-site and/or checked for acceptability (i.e., against SA EPA waste classification criteria) before landfill disposal, or otherwise sent to a licensed hazardous waste disposal facility (see 2 below).
    - During building activities, most waste would be off-cuts, unused materials and/or associated packaging.
        - There would be a range of source separated single materials (e.g., metal, cardboard, timber, etc.) or mixed waste streams (i.e., small off-cuts, mixed material or laminated items, packaging materials, etc.).
        - Source separated materials would be sent directly for recycling, but mixed materials would likely be sent to a facility (in Adelaide) to produce a refuse derived fuel (RDF) for waste to energy (which is common practice in the industry already).
        - Some materials would end up in the waste bin for disposal to landfill.
- ***2. Hazardous waste (inc. soils) –***
    - Any waste or soil if identified as hazardous would need to be sent to a licensed hazardous waste disposal facility for recovery and/or treatment (as landfill disposal of hazardous waste in South Australia is banned).
    - The volume if these hazardous wastes is not expected to be substantial but would be confirmed once site surveys of soil and materials in existing structures take place (before demolition) and during construction planning.
- ***3. Contaminated waste –***
    - Some waste (or even soil) with contamination can be disposed of to landfill if it meets the SA EPA waste classification criteria (SA EPA, 2010).
    - Again, the volume if this waste is not expected to be substantial but it would need to be confirmed later by site surveys and during construction planning.

[4] See: Environmental-economic accounts | Australian Bureau of Statistics (abs.gov.au)

[5] See: Circular Economy Resource Recovery Report (CERRR) 2020–21 (greenindustries.sa.gov.au)

- ***4. Waste soils –***
    - Most waste soil the site should be suitable for on-site reuse or being sent to a C&D re-processor for recycling where it meets the SA EPA's Waste derived fill (WDF) or intermediate waste soil criteria (SA EPA, 2013).
    - However, the volume of this material will depend on final site design and site surveys to test and classify soils to be excavated and identify any contamination present.

3.4 Operational phase assessment

Table 3-3 overleaf gives a preliminary assessment for potential waste streams from the operational phase, including type of waste material, possible volume generation and disposal fate.

- In short, this assessment suggests that:
    - Potentially up to 2,000 tonnes of waste material per year (on average) could be generated by the operational phase of this project.
    - Potentially > 70% of this material should be diverted away from landfill disposal, mainly by source separating these materials and sending them to local recyclers.
    - Radioactive waste is expected to be generated at the site.
        - But it challenging to predict exactly how much at until more project information becomes available on volumes and types that may be produced.
        - Some or even much of this radioactive waste (including very short-lived waste after holding) may be suitable for landfill disposal if it meets the Exempt classification per ARPANSA Codes of practice for radioactive waste management (2020),
        - Other low-level waste radioactive would need to be stored on site until a future planned National Radioactive Waste Disposal Facility is built[6],
        - *Note: No intermediate or high-level radioactive waste from the SCY site is anticipated by ANI.*

Once more, some brief notes about how this assessment was developed follow below.

- For the 1. Standard waste & recycling category, wastes were sub-categorised by expected material sub-categories for:
    - Standard office / industrial / site activities – which would include relatively standard waste streams (e.g., carboard, paper, mixed recyclables with metals, plastics, garden waste, food waste) that might be elsewhere at similar sites, e.g., offices, large multi-building sites, basic industrial and/or business warehousing activities, etc., and

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[6] The Australian Government is planning a National Radioactive Waste Management Facility (NRWMF) for disposal of Low Level Waste (LLW) and Intermediate Level Waste (ILW), see: Radioactive waste disposal and storage | ARPANSA.

Table 3-3 – Preliminary assessment of potential waste streams for operational phase including high-level indicative volume estimates. Volumes to be confirmed from project design details.*

Category		Indicative annual volume (tpa)	Potential disposal fate (primary)					Radioactive Waste fate (primary)		
			Reuse	*Recycle*	*Recover*	*Treat*	*Landfill*	Store	*National Radioactive Waste Disposal Facility*	*Temporary storage & repatriation*
1. Standard waste & recycling	***Standard office / industrial /site activities***									
	– *Paper & Cardboard*	670								
	– *Garden Waste (inc. some soil / mulch)*	380								
	– *Food Waste*	210								
	– *Glass*	30								
	– *Plastic*	80								
	– *Other wastes (e.g., hard waste, e-waste, etc.)*	110								
	Submarine manufacturing activity materials									
	– *Steel / ferrous*	300								
	– *Copper*	10								
	– *Brass*	3								
	– *Aluminium*	20								
	– *Glass*	7								
	– *Plastic*	10								
	– *Other materials (non-ferrous metals, ceramics, e-waste, etc.)*	30								
	Sub-total	***1,860***	***40***	***1,280***	***110***	***20***	***410***			
2. Hazardous waste		***80***				***80***				
3. Contaminated waste	– *Low-level contaminated*	35					35			
	– *Intermediate-level contaminated*	15					15			
	Sub-total	***50***					***50***			
5. Radioactive waste^	– *Exempt*	TBA	*To be advised (TBA) – Quantities of radioactive waste are not known by ANI at this time, as the detail design of the submarines is still in progress.*							*N/A*
	– *Very short-lived waste*									
	– *Very low-level waste*									
	– *Low-level waste*									
	– *Intermediate level waste*	NIL	*No radioactive waste of this type is expected by ANI at the SCY.*							
	– *High level waste*	NIL								
	Sub-total	***TBA***						***TBA***		*See comment above*
TOTAL	**By volume**	**1,990**	**40**	**1,280**	**110**	**100**	**460**	**TBA**		
	By %	**100%**	**2%**	**65%**	**5%**	**5%**	**23%**			

*^ Classifications per ARPANSA Guide for Classification of Radioactive Waste (2020). TBA = To be advised – Quantities of radioactive waste are not known by ANI at this time, as the detail design of the submarines is still in progress. * Should only be considered ±50%, to be confirmed once more project information becomes available.*

- Submarine manufacturing activity materials – additional waste streams arising from submarine manufacturing materials, which would include (but not be limited to):
  - Ferrous and non-ferrous metal waste,
  - Plastic wastes of differing polymer types,
  - Glass waste, and
  - Other submarine manufacturing material wastes (e.g., minerals, coated materials, multilaminate materials, ceramics, e-waste, etc.)
- For 2. Hazardous waste, as mentioned for the construction phase assessment these would be sub-classified (even though not done here):
  - Per the South Australia *Environment Protection (Waste to Resources) Policy (W2REPP) 2010* (South Australian Government, 2021), and
  - Using the UN Code in the *National Environment Protection (Movement of controlled waste between States and Territories) Measure 2012* (Australian Government, 2012).

– For the 4. Radioactive category, sub-categorisation was per the ARPANSA Guide for Classification of Radioactive Waste (2020), which are illustrated in Figure 3-3 overleaf and summarised below.
  - ***Exempt wastes (EW)–*** which (if approved) may be disposed of direct to landfill (or sewer if liquid waste or atmosphere if gaseous).
  - ***Very short-lived (VSLW) and very low-level waste (VLLW***) – which would require (on-site or off-site) storage and/or treatment before (an approved) disposal.
  - ***Low level (LLW) wastes*** – which would be stored until the future planned National Australian[7] or other appropriate radioactive waste disposal facility becomes available.
– Indicative waste volumes (for non-radioactive waste) in Table 3-3 were estimated from expected SCY operational phase activities based on:
  - Typical waste resource generation metrics for office buildings and other activities, e.g., as published in the South Australian Better Practice Guide – Waste Management in Residential or Mixed-Use Developments (Zero Waste SA, 2014).
  - Analysis of submarine construction requirements by Colby Phillips Advisory for CCRE2 assessment prepared for project Greenhouse Gas (GHG) Emissions (Colby Phillips Advisory, 2024a)).
  - Analysis by Colby Phillips Advisory on dangerous goods that could be used in the project for HR4: Dangerous Substances (2024b).
  - Other indicative estimates of potential other waste material volumes based on industry experience.
– These waste volume estimates can be confirmed once more project information about the operational phase becomes available.
– *Note: ANI has advised that there will be no high-level or intermediate level radioactive waste produced at the SCY during the project life.*

[7] The Australian Government is planning a National Radioactive Waste Management Facility (NRWMF) for disposal of Low Level Waste (LLW) and Intermediate Level Waste (ILW), see: Radioactive waste disposal and storage | ARPANSA.

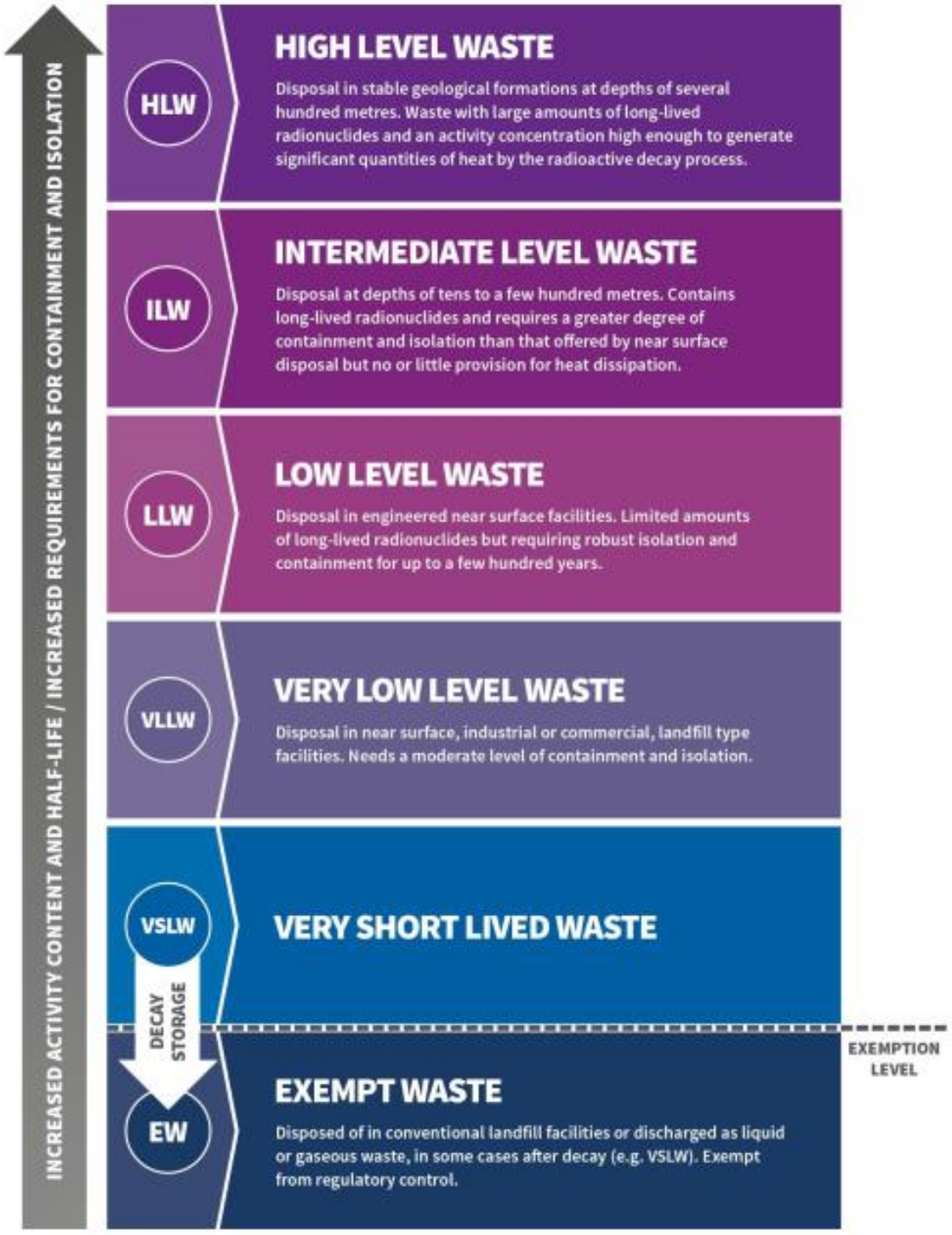

Figure 3-3 – The six classes of radioactive waste. *Image Source: ARPANSA Guide for Classification of Radioactive Waste (2020). The figure illustrates in a generalised manner the relationship between classification, activity content, half-life, and disposal options. Refer to ARPANSA guide. Note: Intermediate Level and High-level radioactive waste are not anticipated by ANI at SCY.*

4 Waste management advice & disposal fate

4.1 Overview

As noted in the previous section, the future SCY site during both construction and operational phases could be a complex site with multiple and diverse waste streams, on-site management, and disposal requirements.

- Table 3-1 (on page 15) previously introduced the (five) main categories of these waste streams and identified which may be present during different project phases.
- Table 3-2 (page 17) and Table 3-3 (page 20) made estimates of expected volumes during the construction and operational phases, respectively, which are further described with examples
- Figure 4-1 overleaf maps out at high level how these different waste streams should be handled by the SCY project based on South Australian legislation and regulation of these waste materials, including:
    - Licensing and approvals,
    - Typical or regulatory classification of these waste streams,
    - Waste transport provider licensing and/or approval classifications, and
    - Disposal fate by facility or type (and in line with the Waste Hierarchy).

The following sections provide preliminary advice on how these waste streams would be managed. It can be used to guide further planning and design development waste management for the SCY project and site.

4.2 Licensing &/or approvals

4.2.1 Non-radioactive waste streams

For non-radioactive waste stream Categories 1 to 4, the SCY project would require approvals and/or licensing by the SA EPA under the *SA EPA Act 1993* (South Australian Government, 2024):

- Construction phase – including (but not limited to):
    - To commence construction activities for the SCY site (as it will require a future license to operate),
    - Undertaking of Maritime Construction Works,
    - Waste re-processing if > 100 tonnes over 12 months, and
    - Activities involving handling and disposal of listed wastes which may include asbestos and any hazardous wastes on-site.
- Operational phase – including (but not limited to):
    - Undertaking Manufacturing activities, and
    - Activities involving listed wastes.

These SA EPA approvals and/or licenses would set out (for each phase of the project):

- Set conditions for management of these waste streams,
- Require that this waste management is in line with relevant Regulations and Environment Protection Policies, Codes of Practice and/or Guidelines,
- Which would include requirements for:
    - Transport of waste – by SA EPA licensed waste transporters (Category A or B),
    - Disposal of waste – at SA EPA licensed facilities, and

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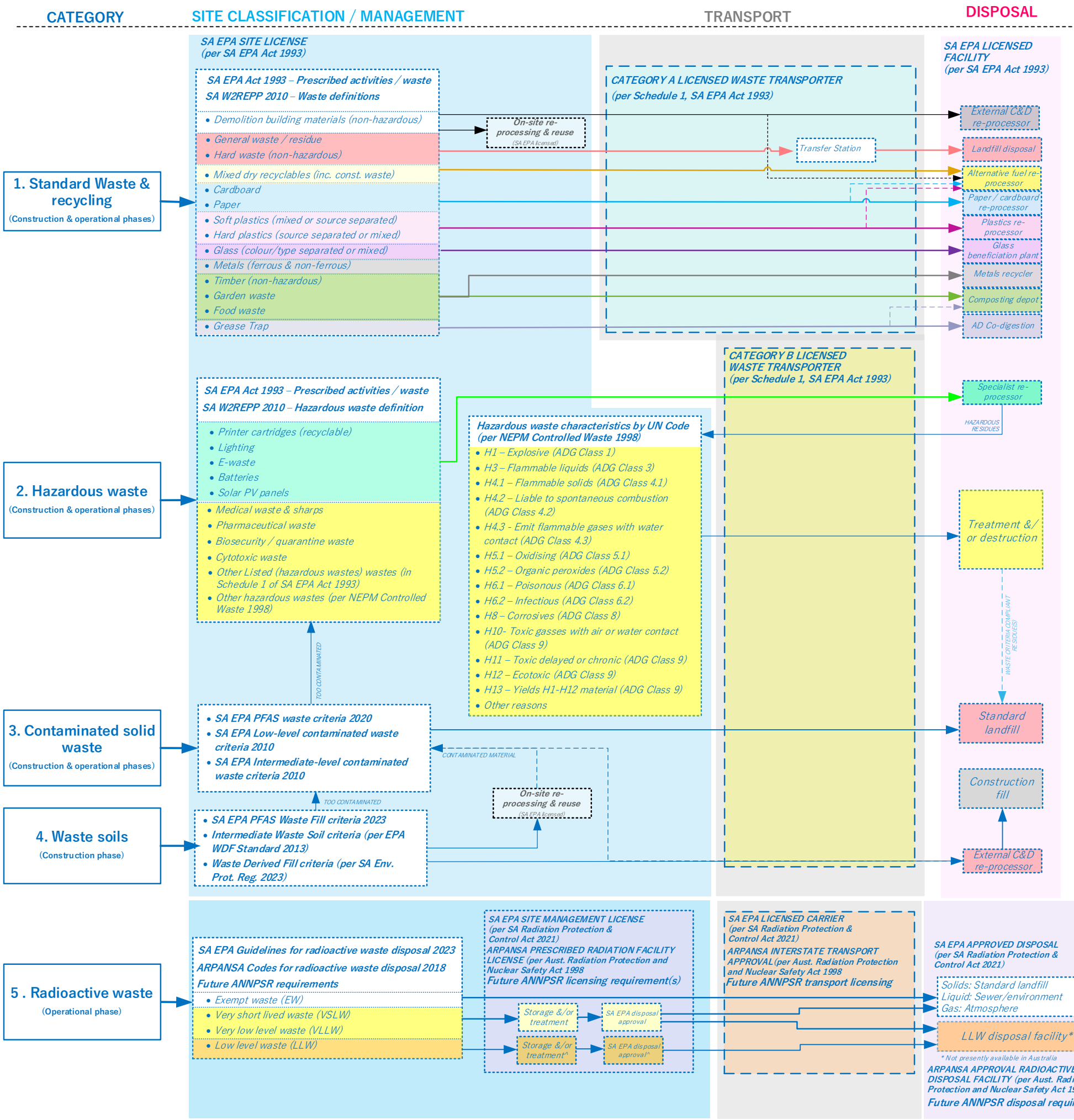

Figure 4-1 –Diagram illustrating potential or expected site management licensing and approvals, expected disposal fate, and transport requirements by waste category. *Note: This overview in some places necessarily simplifies the categorisation and classification of these wastes to aid concise presentation. It is a complex subject, and there may be or is more detail that needs to be considered in waste management planning as the project proceeds. Citations for relevant documents referenced in this figure as follows. SA EPA Act 1993 (South Australian Government, 2024). NEPM Controlled Waste 1998 (Australian Government, 2012). SA EPA Low-level contaminated waste criteria 2010 (SA EPA, 2010). W2REPP 2010 (South Australian Government, 2021) SA EPA Intermediate-level contaminated waste criteria (SA EPA, 2010). EPA WDF Standard 2013 (SA EPA, 2013). SA Env. Prot. Reg. 2023 (South Australian Government, 2024). ARPANSA C-2 Code for safe transport of radioactive material 2019 (ARPANSA, 2019). SA EPA COC-2 Facility design & shielding 2022 (SA EPA, 2023). SA EPA Guidelines for radioactive waste disposal 2023 (SA EPA, 2024). ARPANSA C-3 Code for (Disposal facilities for solid) radioactive waste disposal 2018 (ARPANSA, 2018a). ARPANSA C-6 Code radioactive waste disposal (by the user) 2018 (ARPANSA, 2018b). SA EPA PFAS waste criteria 2020 (SA EPA, 2020). South Australia Radiation Protection & Control Act 2021 (South Australian Government, 2021). For radioactive waste, future compliance requirements will include any under the recently enacted Australian Naval Nuclear Power Safety Act 2023 and Australian Naval Nuclear Power Safety Regulator (ANNSPR) established under this Act. Note: Intermediate Level and High-level radioactive waste are not anticipated by ANI at SCY.*

- SA EPA approvals may apply other special conditions for waste management relevant to the site and/or activities.

The above requirements would include an expectation per the South Australia *Environment Protection (Waste to Resources) Policy 2010* that source separation for resource recovery is reasonably practiced before waste material is sent for landfill disposal (i.e., *viz.* Clause 11 of this Policy)

To consider and/or provide any future approvals and/or license the SA EPA would require the proponent to provide with any application a waste management plan (WMP) (for each project phase) – outlining the:

- Legislative requirements
- Waste streams at site during that project phase,
- Their type or classification,
- Expected volumes,
- On-site handling and storage, and
- Transport and disposal arrangements.

Section 0 of this report gives more details on the required content for these waste management plans.

4.2.2 Other requirements for hazardous &/or contaminated wastes

In addition to SA EPA requirements, management of hazardous &/or contaminated wastes during the SCY project would or may fall under the following legislation.

- ***Work health and safety***
  - South Australia *Work Health and Safety Act 2012* (South Australian Government, 2024)
  - South Australia *Work Health and Safety Regulations 2012* (South Australia Government, 2024)
  - South Australia Approved Codes of Practice in South Australia (see: Codes of Practice | SafeWork SA)
- ***Dangerous goods***
  - South Australia *Dangerous Substances Act 1979* (South Australian Government, 2021)
  - South Australia *Dangerous Substances (General) Regulations 2017* (South Australian Government, 2017)
  - South Australia *Dangerous Substances (Dangerous Goods Transport) Regulations 2023* (South Australian Government, 2023)
- ***Explosive materials (if applicable, see Note below)***
  - South Australia *Explosives Act 1936* (South Australian Government, 2020)
  - South Australia *Explosives (Security Sensitive Substances) Regulations 2021* (South Australian Government, 2021)
  - South Australia *Explosives Regulations 2011* (South Australian Govenment, 2020)
  - *Note: Storage or use of explosives is not expected by ANI at SCY during the project, but some dangerous goods may contain explosive materials and fall under the above legislation.*

Note: If the SCY project and site fall under Commonwealth area, then relevant Australian Government legislation may apply too. [For further discussion / explanation of this, refer to other report by Colby Phillips Advisory for HR4: Dangerous Substances (2024b)*.]*

These requirements for on-site storage and handling, transport and disposal would need to be considered during project design development and may require additional licensing and/or approvals from relevant South Australian (and/or Australian) Government agencies, e.g., SA EPA, SafeWork SA.

4.2.3 Radioactive waste

Category 5 Radioactive waste during the project operational phase would require separate approval and/or licensing by the:

- SA EPA under the SA *Radiation Protection and Control Act 2021* (South Australian Government, 2021), and
- ARPANSA under the Australian *Radiation Protection and Nuclear Safety Act 1998* (Australian Government, 2024).
- ANNPSR which has recently been established under the *Australian Naval Nuclear Power Safety Act 2024*, which was enacted on the 24 October 2024.

For SA EPA approval:

- The proponent would need to prepare a radiation waste management plan (RMP) that complies with the SA EPA's Code of Compliance for radiation management plans 2022 (2023), which would provide required details for dealing with the radioactive waste including (but not limited to):
    - Types and classification per ARPANSA Codes of practice for transport and disposal of radioactive waste (see: Codes and standards | ARPANSA)
    - Expected volumes and radioactive emission types and levels,
    - Potential exposure doses and risks.
    - On-site handling and storage,
    - Transport,
    - Disposal,
    - Competencies and training of personnel handling the waste,
    - Monitoring, protection, and safety management for the waste including storage, transport, and/or disposal, and
- Transport of this waste would only be able be undertaken by a carrier licensed by the SA EPA (under this Act).
- Likewise, disposal of the waste could only be at an SA EPA approved facility.

ARPANSA approvals under the Australian *Radiation Protection and Nuclear Safety Act 1998* (Australian Government, 2024) may require:

- A license for the site (or relevant parts of it) to operate as prescribed radiation facility where low-level waste storage and management may happen.
- For any interstate movement or export of this waste, approval(s) for transport and/or disposal would be additionally required.
- For other facilities where radioactive waste from the SCY may be subsequently disposed of.

In addition, future requirements and/or approvals from the newly established ANNPSR may supersede and/or substitute for (all or aspects of) the above ARPANSA approvals.

4.3 Management, transport & disposal

4.3.1 Standard waste & recycling

As illustrated in Figure 4-1, it is expected that source separation of waste for resource recovery would occur during both project phases.

- This would require multiple types of recycling bins to be provided to the site for both construction and operational phases.
    - These could vary in type or size (e.g., large skip bins, front-lift bins, rear-lift bins, mobile garbage bins, other receptable types) depending on waste volume being generated (in a particular site location) and requirements for transfer to secure collection points elsewhere on the site.
    - For large volume waste materials during demolition phase, like masonry and concrete, these could be stored in dedicated areas and/or bunkers on-site until re-processed and reused (for construction) or sent to an external construction and demolition (C&D) re-processor.
- The location, design, and use of the waste storage areas for these bins or areas (in each phase) would reflect best practices, including signage, colour signals, safety and security, and induction and training of site personnel to use them.
    - Further design development would identify:
        - The optimal locations and configuration of these waste storage areas across the site, and
        - Ensure that user disposal and cleaner facilities and systems support best practice source separation practices to maximize landfill diversion.
- For transport and disposal, South Australia already has a well-developed waste and resource recovery industry to cater for these waste streams.
    - There are multiple licensed Category A transport providers that can cater for all the waste streams identified in Figure 4-1.
    - Similarly, there are licensed disposal facilities that can receive and process these waste streams to maximize resource recovery and landfill diversion.
    - Table 4-1 overleaf gives examples for these Category A transport providers and licensed disposal facilities in or near Adelaide for each of the Standard waste & recycling streams identified in in Figure 4-1 (which could be used by the SCY project).
- During construction phase, demolition and construction waste materials would be managed according to a construction waste management plan (cWMP) included as part of the Construction environmental management plan (CEMP) developed and approved by the SA EPA in line with its guideline for CEMPs (SA EPA, 2024) – see Section 5.2 later.
- For the operational phase, standard waste & recycling management would be performed in accordance with an operational waste management plan (oWMP) developed in line with the South Australian Better Practice Guide – Waste Management in Residential or Mixed-Use Developments (Zero Waste SA, 2014) and other relevant codes of practice or guidance agreed with the SA EPA – see Section 5.3 later.

4.3.2 Hazardous waste

Transport and disposal arrangements required for hazardous waste produced by the SCY project would be readily available in Metropolitan Adelaide too, which has existing industrial activities producing similar wastes that already require the same services.

- Volumes of these hazardous waste would (usually) be much lesser than standard waste & recycling waste streams.
- Types of bins and storage for hazardous wastes (e.g., containers, bottles, drums, tanks, etc.) would be different (in size and type) to standard waste & recycling and reflect their requirements for safe containment during storage and transport due to the dangerous goods nature or hazardous attributes of their origin material(s) (e.g., acid, alkali, oxidising agent, toxic substance, etc.) – *see other report by Colby Phillips Advisory for HR4: Dangerous Substances* (2024b)*, for more information on potential types of these hazardous substances that may be used during (both phases of) the SCY project.*
- Likewise, the location, design, and use of the waste storage areas would follow relevant codes and standards and best practices for handling these hazardous wastes, including storage design for containment and safety (e.g., segregation, setbacks, restricted access, materials selection, bunding, safety showers, ventilation, specialized training, etc.), (dangerous goods) signage, colour signals, safety and security, and induction and training of site personnel to use them.
- These facilities would be designed, managed, and used in line with relevant requirements (and standards) for the dangerous good(s) or hazardous substance(s) present in the waste in:
    - Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code) (National Transport Commission, 2024), and
    - SafeWork SA's Code of Practice for managing risks of hazardous chemicals in the workplace (2024).
- South Australia already has existing waste industry capability to cater for transport and disposal of these hazardous waste streams.
    - There are multiple licensed Category B transport providers that can transport the hazardous waste streams identified in Figure 4-1.
    - Similarly, there are SA EPA licensed hazardous disposal facilities that can receive and process different hazardous waste streams to safely treat and/or dispose of them.
    - Table 4-1 overleaf gives examples for these Category B transport providers and licensed disposal facilities in or near Adelaide for hazardous streams identified in Figure 4-1 (for the SCY project).
    - *Note: Most hazardous waste is banned from landfill disposal per the South Australia Environment Protection (Waste to Resources) Policy 2010 (South Australian Government, 2021).*

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Table 4-1 – Examples of waste transporters or carriers and disposal facilities and/or re-processors for different waste streams that would be generated by the SCY project

Waste category	Waste type	Disposal facility(ies) / Re-processor(s) examples	Transport provider(s) examples
1. Standard Waste & recycling	• Demolition building materials (non-hazardous)	• Resource Co, Adelaide Resource Recovery	• Category A Licensed waste transporters: • May vary depending on waste &/or recycling items • Local examples include (but are not limited to): o *Veolia (all waste types)* o *Cleanaway (all waste types)* o *Redmondis (all waste types)* o *Jeffries (organics & food waste)* o *Allied waste services (construction only)* o *Royal Park Salvage (construction)* o *Nitschke Liquid Waste (grease trap)*
	• General waste / residue	• Integrated Waste Services Transfer Station, Wingfield Resource Recovery Centre / Transfer Station), Integrated Waste Services Dublin Landfill, Cleanaway Inkerman Landfill	
	• Hard waste (non-hazardous)		
	• Mixed dry recyclables (inc. const. waste)	• Adelaide Veolia - ResourceCo Recovery / Alternative Fuel Facility	
	• Cardboard	• Multiple transfer stations accept (in Adelaide), Visy Paper (Re-processor)	
	• Paper		
	• Soft plastics (mixed or source separated)	• Recycling Plastics Australia (all types), YCA Recycling (all types), IPLEX Pipelines (PVC), Vinidex (PVC & PE), Foamex (PS)	
	• Hard plastics (source separated or mixed)		
	• Glass (colour/type separated or mixed)	• Visy Glass, Orora Beverage	
	• Metals (ferrous & non-ferrous)	• Adelaide Metal Recycling, Denron metals, Sims Metals Australia	
	• Timber (non-hazardous)	• Jeffries, Peats Soils & Garden Supplies, Integrated Waste Services	
	• Garden waste		
	• Food waste		
	• Grease Trap	• Above organics recycling business, SA Water Wastewater Treatment Plants	
2. Hazardous wastes (including contaminated soils)		• Cleanaway Wingfield Treatment Plant (Oils, acids, alkalis, inorganic chemicals, organic solvents including liquids and some solid forms • Veolia South Australia Thermal Treatment facility (Medical, quarantine, confidential and pharmaceutical waste, inks, paints, dyes, some organic solvents) • Southern Waste ResourceCo (Residues from industrial waste treatment, contaminated soils) • Adelaide Resource Recovery (Asbestos, contaminated soils) • Resource Co (Contaminated soils) • Electronic Recycling Australia (E-waste)	• Category B Licensed waste transporters • May vary depending on hazardous waste item • Local examples include: o *Veolia* o *Cleanaway* o *Redmondis*
3. Contaminated wastes		• Where meeting the SA EPA criteria for landfill disposal: See above disposal facilities for General waste / residue	• Where meeting the SA EPA criteria for disposal: See above for Category A licensed waste transporters
		• Where exceeding the SA EPA criteria for landfill disposal: See above disposal facilities for Hazardous wastes	• Where exceeding the SA EPA criteria for landfill disposal: See above for Category B licensed waste transporters
4. Contaminated soils		• Where meeting the SA EPA criteria for waste soils: Suitable construction sites	• Category A Licensed waste transporters
		• Where not meeting SA EPA criteria for waste soils: refer to 3. Contaminated wastes above	• Where not meeting SA EPA criteria for waste soils: refer to 3. Contaminated wastes above

Waste category	Waste type	Disposal facility(ies) / Re-processor(s) examples	Transport provider(s) examples
5. Radioactive waste	***Type / classification:***	***Per SA EPA approved radioactive waste management plan under Radiation Protection & Control Act 2021 and ARPANSA approval for interstate movement or export of waste material***	
	• Exempt (EW)	• See above disposal facilities for General waste / residue	• See above for Category A licensed waste transporters
	• Very sort-lived waste (VSLW)	• Store on site until meets Exempt levels	• See above for Category A licensed waste transporters
	• Very low-level waste (VLLW)	• Store on site until meets Exempt levels or National Disposal Facility* is available	• If Exempt, see above. • If not Exempt, SA EPA licensed carrier (see examples below) &/or ARPANSA transport approval. o Remote Transport Australia o Energy Logistix
	• Low-level waste (LLW)	• Store on site until National Disposal Facility* is available	• SA EPA licensed carrier (see examples above) &/or ARPANSA transport approval (interstate / export)
	• *Intermediate level waste (ILW) &/or High-level waste (HLW)*	*Not applicable: ANI have advised no intermediate or high-level radioactive waste will be generated at the Osborne SCY site.*	

** The Australian Government is planning a National Radioactive Waste Management Facility (NRWMF) for disposal of Low Level Waste (LLW) and Intermediate Level Waste (ILW), see: Radioactive waste disposal and storage \| ARPANSA.*

For hazardous wastes that may contain explosive materials, separate additional requirements for transport and disposal would or may apply. *Note: ANI has advised that explosives won't be used or present at the SCY during the project. Some dangerous goods may have explosive properties and are the explosive materials referred to here.*

- The management of these explosive materials would or may additionally fall under the:
  - South Australia *Explosives Act 1936* (South Australian Government, 2020) and *Regulations 2011* (South Australian Govenment, 2020) (which reference the ADG Code too),
  - *NEPM (Movement of Controlled Waste between States and Territories) Measure 1998* (National Transport Commission, 2024), and
  - *Commonwealth Explosives Act 1961* and *Transport Regulations 2002* (for any planned interstate movement and/or disposal).
- Both transport and disposal of waste containing explosive materials in South Australia or travelling interstate may need to be separately licensed by:
  - SafeWork SA and/or other State-based agency(ies) (in relevant jurisdiction),
  - Safe Work Australia (at National Level), and / or
  - Australian Department of Defence.
- The above parties would need to be engaged to identify suitable transporters and/or disposal arrangements for these wastes, as it will be specific to that waste material (which can be confirmed once more details about hazardous wastes in the project become available)
- For transport, licensees would need to comply (among other special licensing conditions that may apply) with the Australian Code for the transport of explosives by road and rail (Workplace Relations Ministers' Council, 2009).

Hazardous waste management for construction and operational phases would be documented in the project cEMP and oWMP (as noted in Section 4.3.1 for Standard waste & recycling waste)

4.3.3 Contaminated solid waste

Actual or suspected contaminated solid waste would be handled and stored in the same way as outlined in Section 4.3.2 for hazardous waste until its level of contamination (can be tested) and classification (to decide its acceptable disposal fate) was confirmed.

- If meeting the SA EPA current criterial (SA EPA, 2010) that permits landfill disposal, it could then be handled, transported and disposed of in the same way as general waste / residue (as outlined Figure 4-1 and Table 4-1), but with extra precautions taken that is reflective of the contamination present in it.
- If exceeding these SA EPA criteria, it would be managed and dispose of as a hazardous waste.

Again, management of these materials would be outlined (for each project phase) in the project cEMP and oWMP for each phase.

4.3.4 Waste soils

Waste soil for the SCY project during its construction phase would be managed as follows.

- Any reuse and/or disposal of this material would happen in line with:
  - The SA EPA Standard for the production and use of Waste Derived Fill (SA EPA, 2013), which uses quality criteria to classify soils into three types (based on their contamination levels):
    - ***Waste derived (or clean) fill (WDF) –*** of low or negligible contamination and can be safely used without restriction as a construction fill,

        - ***Intermediate waste soil (IWS)*** – which contains higher levels of contamination but can still be used as construction fill where a site-specific risk-based assessment determines the material will not cause future environmental or health hazards, or
        - ***Contaminated waste soil*** (CWS) – that exceeds the IWS criteria and is not suitable for construction fill unless treated / remediated to meet WDF &/or IWS criteria above.
    - The *National Environment Protection (Assessment of Site Contamination) Measure 1999* (National Environment Protection Council, 2013) – for testing and assessment of waste soils to determine its classification.
- Waste soils that meet the WDF and /or IWS would be (where feasible) reused as construction fill at the site.
    - CWS can also be used at the site for construction fill but would require treatment to meet the WDF and/or IWS criteria.
- Waste soils, including CWS, where surplus to on-site site reuse requirements, could be sent an external licensed C&D re-processor.
    - This C&D re-processor may remediate CWS so it can be reused.
- For CWS that will not be remediated for reuse as construction fill, its disposal fate would be assessed based on whether it was classified as a:
    - Contaminated solid waste (per Section 4.3.3), or
    - Hazardous waste (per Section 0)
- Waste soil re-processing and reuse is a well-developed activity in South Australia and there are multiple businesses licensed in Adelaide to provide transport and/or disposal of this material.

The management of waste soils would be included in the project cEMP

4.3.5 Radioactive waste

It is expected that:

- Most radioactive waste produced during the SCY project would be classified as exempt (EW) to very low-level waste (VLLW),
- With some low-level waste (LLW), and
- *Per advice from ANI, there would be no intermediate level waste (ILW) or high-level radioactive waste (HLW).*

Storage, transport, and disposal arrangements for radioactive waste produced by the AUKUS SCY project in Metropolitan Adelaide would be limited and more challenging to manage as explained below.

There would be several levels of licensing and approvals needed:

1. SA EPA under the SA *Radiation Protection and Control Act 2021* (South Australian Government, 2021), and
2. ARPANSA under the Australian *Radiation Protection and Nuclear Safety Act 1998* (Australian Government, 2024).
3. ANNPSR which will be established under the recently enacted *Australian Radiation Protection and Nuclear Safety Act 1998,* which may substitute for (some or all) ARPANSA licensing and /or approval requirements for nuclear safety of activities relating specifically to AUKUS submarines.

For the SA EPA licensing and approval:

- The SCY would need to develop a radiation management plan (RMP), for approval and licensing by the SA EPA per its guideline (SA EPA, 2024) for these RMPs.

  - It would necessarily need to address the requirements for radioactive waste management at the site.
  - This approval and RMP provisions for radioactive waste at the site would need comply with all requirements handling, storage, transport, and disposal of radioactive material per the:
    - South Australia *Radioactive Protection & Control Act 2021* (South Australian Government, 2021),
    - South Australia *Radioactive Protection & Control Regulations 2022* (South Australian Government, 2022),
    - SA EPA Codes od Compliance issued under the above legislation (see: Codes of Compliance | EPA), and
    - Referenced ARPANSA Codes and standards (see: Codes and standards | ARPANSA).

- Handling and storage of radioactive waste at the SCY site would require specialised and secure storages, which would need to be classified and comply with:
  - SA EPA Code of Compliance for facility design and shielding 2022 (SA EPA, 2023), and
  - Referenced ARPANSA Codes and standards (see: Codes and standards | ARPANSA).

– Disposal of radioactive waste would depend on its classification per the ARPANSA Code for Disposal of Radioactive Waste (2018b) as follows. *Note: ANI has advised that no intermediate level waste (ILW) or high-level radioactive waste (HLW) expected at the SCY.*
  - ***Exempt waste*** –
    - Could be disposed of to landfill where meeting the generic criteria for exemption (and clearance) are available in Schedule I of the General Safety Requirements No. GSR Part 3 Radiation Protection (IAEA, 2014), and
    - Subject to confirmation and approval by the SA EPA under the South Australia *Radiation Protection and Control Regulations 2022* (South Australian Government, 2022), following SA EPA Guidelines for waste management application/ plan to dispose of unsealed radioactive material (SA EPA, 2024).
  - ***Very short-lived and very low-level waste –***
    - Might be disposed of to landfill once able to be stored and/or treated to meet Exempt waste criteria above and same SA EPA approvals, or
    - Alternatively, would be held and stored like low-level waste below for later disposal to a suitable radioactive disposal facility.
  - ***Low-level waste –***
    - Would need to be held and stored in a suitable and secure facility (at the SCY site or elsewhere) until suitable disposal facility becomes available in Australia (as is presently being planned[8]).

- Transport of radioactive waste required separate licensing under the South Australia *Radioactive Protection & Control Act 2021* (South Australian Government, 2021) and comply with the ARPANSA Code for the Safe Transport of Radioactive Material (2019).

[8] The Australian Government is planning a National Radioactive Waste Management Facility (NRWMF) for disposal of Low Level Waste (LLW) and Intermediate Level Waste (ILW), see: Radioactive waste disposal and storage | ARPANSA.

- Carriers licensed by the SA EPA for transport of radioactive materials are available in Metropolitan Adelaide but there are fewer (licensed) service providers (e.g., Energy Logistix (Aust.), Remote Transport Australia).
- For any transport interstate or export overseas, suitable licensed transport carriers would need to be identified.
    - For interstate jurisdictions, each other State &/or Territory has similar regulatory arrangements to South Australia, and it is expected they will, too, have licensed or approved waste transport providers, which may include some already approved or licensed in South Australia by the SA EPA.
    - For export overseas, it will depend on the destination country and the carrier will need to be approved by ARPANSA.

For ARPANSA licensing and approval:

- Licencing or approvals would be needed for:
    - The site (or relevant parts of it) to operate as prescribed radiation facility where low-level waste storage and management is happening.
        - This licensing may be integrated into the wider ARPANSA license for the site to handle nuclear or radioactive materials.
        - Similar information and plans would need to be developed as for the SA EPA radiation management plan, but it will need to be tailored and/or expanded to ensure it aligns with relevant ARPANSA Guidelines and license application criteria and/or requirements under the Australian *Radiation Protection and Nuclear Safety Act 1998*.
    - For any interstate movement or export of this waste, approval(s) for transport and/or disposal that was required.
        - Which would only apply where low-level waste was being transported interstate for disposal or storage.
        - If such were to happen, it would be signalled, and approval sought as part of the above prescribed radiation facility application to ARPANSA.
    - Future disposal facilities for low-level waste.
        - Such facilities do not yet exist in Australia, but as already mentioned one is being planned by the Australian Government.
        - These future disposal facilities would need to be separately licensed as well by ARPANSA for that purpose.

As mentioned earlier, the ARPANSA licensing and/or approvals may be superseded or substituted with separate or additional requirements by the newly established ANNPSR.

5 Waste management plans

5.1 Overview

The following types of waste management plans are recommended or required for the SCY project.

- ***Construction phase – construction waste management plans (cWMP)*** as part of the construction environmental management plan (CEMP) for SA EPA approval.
- ***Operational phase –***
    - ***Operational waste management plan (oWMP)*** – which will cover the waste management of all wastes at the site during the project's operational phase and integrate and reference the following plan for radioactive waste management.
    - ***Radiation management plan (RMP)*** – which would be required for approval by the SA EPA for management of radioactive materials used or produced during the SCY project.
    - ***Prescribed radiation facility plan (PRFP) –*** to support the waste management aspects of the ARPANSA licensing of the site as a prescribed radiation facility.

The following sections recommend the required content of these plans for waste management, which can be used to prepare these documents once relevant project information becomes available.

5.2 Construction waste management plan (cWMP)

As previously noted in Section 4.3.1, during the construction phase a construction environmental management plan (CEMP) for the SCY project would need to be developed and approved by the SA EPA.

- The content of this CEMP would follow the SA EPA guideline for this document (SA EPA, 2024).
- Under this guideline, a CEMP requires waste management planning for:
    - Site contamination –assessment and management of waste soils, and
    - Waste – including general waste, hazardous waste, and usage of waste fill.
- This would normally be demonstrated by including with the CEMP a cWMP as a separate document (appended or attached).
- This cWMP would need to demonstrate alignment with SA EPA objectives for waste management, including (but not limited to):
    - Promote the principles of ecologically sustainable development,
    - Apply the waste management hierarchy (including minimising waste),
    - Promote the circulation of materials or circular economy, and
    - Protect, restore, and enhance the quality of the environment.

Table 5-1 overleaf outlines the recommended cWMP framework and content.

- This cWMP framework and content is relatively standard for supporting "best" industry practice.
- As can be observed it requires considerable information on the project not available at current time and can be populated once this becomes available.
- Due to the scale and complexity of this project, this cWMP could be take time to develop fully.
- It may also need to flexible enough to evolve over the 10-year construction time frame for the project, and so should be subject to annual reviews to ensure it is still relevant throughout this period.

{Cont. three pages over}

Table 5-1 – Recommended framework and content of cWMP &/or oWMP for SCY project

Section	Recommended content
1. Introduction / context	Outline the context and purpose of the cWMP
2. Project description	Provide description of project relevant to waste management planning, including (but not limited to): – Location – Proposed site development plan – Activities that would happen during the project – Types of waste that would be produced from these activities – Relevant development metrics for assessing the volumes of these wastes – Neighbouring public activities or sensitive land uses and/or environmental issues requiring consideration in waste management planning
3. Relevant planning & design requirements	Itemise and overview relevant planning & design requirements for management of construction phase wastes generated by the project, including (but not limited to): – Legislation (i.e., Acts, Regulations, protection policies etc.), – Associated codes and / or guidelines, – Other expected planning or design principles (e.g., jurisdictional Waste Strategy, feedback / engagement with stakeholders, site restrictions / preferences, etc.)
4. Waste management plan objectives	Outline the objectives for construction or operational phase waste management, e.g., – Sustainability rating (e.g., Green Star credit, NABERS rating), – Landfill diversion outcome, Waste Hierarchy &/or Circular economy practices, – Minimise noise, nuisances & other environmental impacts (e.g., minimise contamination in stormwater run-off into nearby river), etc.
5. Waste classification & inventory	– List and classify construction or operational phase waste & recyclables that would be source separated – Estimate volumes of these wastes & recyclables – Identify when and where these wastes &/or recyclables would be generated (if large site with multiple activities that may occur over a multi-year time)
6. Waste soils management (construction phase only)	Separate section for waste soil management during construction phase including: – If site contamination is present, – Whether there will be any contaminated soils requiring remediation and/or intermediate waste soil requiring site specific assessments or management. – How these will be managed, reused and/or disposed of.
7. Waste collection services & bin requirements	– Identify collection access points to the site and where bins would be presented for collection – List of collection services including type of truck, collection frequency and type and bins – Service schedule outlining the number of bins collected and thus the on-site storage requirement by waste storage at the site
8. Waste system design & operation	– Description of waste system design and operation (including for hazardous wastes and waste soils): o Waste storages – ▪ Location, size, bins / receptacles on concept plan ▪ Key design features required (e.g., containment, bunding, bin wash, ventilation, access to and from, signage, etc.) ▪ Operation of the waste storage

Section	Recommended content
	o Transfer paths – to and from these waste storages for: ▪ User disposal (by staff, cleaners, other parties) ▪ Collection (direct or presentation elsewhere) o User disposal systems – ▪ Separate bins / receptables / trolleys required for users to source separate their waste and recycling and transfer it to waste storages for disposal o Collection – ▪ Design of the collection access points including interfaces with the public domain and any swept path modelling needed to demonstrate access can be achieved safely using proposed collection trucks ▪ Scheduling and operation of collections to support site waste management o Transport & disposal – ▪ Requirements for transport and disposal of waste & recyclable materials, which may include licensing / approves for transport providers and disposal facilities, emergency, and security arrangements
9. Public & environmental (risk) assessment & management	– As required, how the waste system has been designed and would operate to minimise public and environmental impacts (i.e., noise, odour, hazards) – which can include risk assessment to demonstrate how these were identified and mitigated to acceptable level
10. Emergency & fire risk management	– Details on the emergency and fire responses related to waste management at the site, including systems and infrastructure available, required notifications and contacts.
11. Reporting & compliance	– Compliance register – List of reporting / compliance that must be undertaken – Describe how will these be managed and met
12. Monitoring & review	– Monitoring of waste management performance including review frequency and how changes would be made if needed to rectify poor performance
13. Implementation	– Roles and responsibilities of relevant parties in implementing the cWMP – Education and training of site users that is needed to support successful implementation of the cWMP – WMP review frequency to determine if it needs refinement

5.3 Operational waste management plan (oWMP)

For consideration of site licensing under the *EPA Act 1993*, the SA EPA will expect that operational phase waste management is properly undertaken, again in line with its objectives for waste management in South Australia (as outlined in Section 5.2).

- This would be demonstrated by developing an oWMP.
- This oWMP is normally developed in two stages:
    - ***Planning approval version*** – which is higher level and focused on demonstrating that waste management can be adequately provided for in the future design of the development and will satisfy SA EPA and State planning requirements:
        - Waste generation volumes are known,
        - Source separation and recycling can be provided for (in line with the Waste Hierarchy),
        - There is adequate waste & recyclables storage space provision at site (and this is shown and documented at concept level on the plans),
        - Collection trucks needed can access the site and this is shown and documented at concept level on the plans),
        - Waste & recyclables would be collected and disposed of by licensed transporters to licensed disposal facilities, and
        - Consideration has and/or will be given in the final design to managing any public, environmental and fire risks.
    - ***Operational version*** – which is more detailed and reflects the final proposed design and operation once the project is built and becomes operational.
        - It is developed during the construction phase before the site becomes operational in conjunction with applying for the site license from the SA EPA.
        - It includes all the final design and operational details and procedures for the waste systems, which will be implemented by site users to effectively manage waste and recycling at the site.
        - This operational version then becomes a living document that is regularly reviewed and updated over the life of the project to reflect changes in site activities and waste collection and disposal practices that can happen.
        - For the SCY project, this oWMP would need to evolve as different parts of the project across the site across the 10-year construction time frame are completed and become live.
- The content of the oWMP is like that recommended for the cWMP in Table 5-1 (with adaptions to suit the operational phase of the project).
- For radioactive waste management, the oWMP would align with (or refer to) the site's SA EPA approved RMP (see next section).

5.4 Radiation management plan (RMP)

Radioactive waste management would need to be separately approved by the SA EPA as part of the site's radiation management plan (RMP) that must be developed under the South Australia *Radiation Protection and Control Act 2021* (South Australian Government, 2021).

- The purpose of a RMP is to provide:
  - Description of site and activities,
  - The nature of radiation sources and risks (from these activities),
  - The controls established to manage those risks,
  - The procedures established for proper use and handling of radioactive materials and radiation sources,
  - The storage and/or disposal of the radioactive materials, and
  - Confirm that these measures in place achieve compliance with regulatory requirements and relevant codes or standards for the safe handling and use of radiation sources.
- The RMP necessarily address the management of radioactive waste at the site and would be the source of information for managing this waste stream included in the oWMP.
- It would provide details on how all classes of radioactive waste produced during the operational phase of the SCY project would be stored and/or disposed of.
  - As noted already, further details of these radioactive wastes to be included in this RMP are expected to become available during further design development of the project.
  - Nearly of this waste would be exempt to low-level radioactive waste.
    - The Exempt waste (EW) and very short-lived waste (VSLW) (after holding) – should be able to be disposed of to landfill (with SA EPA approval).
    - Very low-level waste (VLLW) to low level waste (LLW) – would need to be stored (on-site or elsewhere) until Australia builds its planned National Radioactive Waste Disposal Facility[9] (which may be in South Australia or interstate).
  - *Note: No intermediate or high-level radioactive waste from the SCY site will be generated per advice from ANI.*

[9] The Australian Government is planning a National Radioactive Waste Management Facility (NRWMF) for disposal of Low Level Waste (LLW) and Intermediate Level Waste (ILW), see: Radioactive waste disposal and storage | ARPANSA.

5.5 Prescribed radiation facility plan (PRFP): Radioactive waste management

The content of this plan would mirror that of the relevant content in the SA EPA RMP above but would additionally address other matters specific to the ARPANSA licensing process for a prescribed radiation facility. Currently, ARPANSA provides the following specific guidance regarding radioactive waste that must be provided by a license applicant (ARPANSA, 2023).

- *Plans and arrangements should demonstrate:*
  - *(1) A description of the arrangements for the safe handling, treatment, transport, storage and ultimate transfer or disposal of any waste arising from all past, current, and proposed conducts and dealings.*
  - *(2) A full description of the physical, chemical, and radiological properties of the waste (including gaseous and liquid discharges) arising from all past, current, and proposed conducts and dealings.*
  - *(3) Arrangements for the minimisation of radioactive waste generation.*
    Processes for the collection, segregation, characterisation, classification, treatment, conditioning, storage, and disposal of radioactive waste.
  - *(4) Provision for the safe handling of waste by having appropriate handling equipment and selecting short and uncomplicated routes.*
  - *(5) An assessment is performed of the integrity of waste control measures to ensure that they are fault tolerant.*
  - *(6) If fissile material is present, documentation (including calculations) to assess whether criticality is possible. If criticality is possible, documentation detailing the provisions for ensuring that criticality cannot occur.*
  - *(7) Compliance with the requirements of appropriate statutory authorities and any local regulations (e.g., Trade Waste Agreements).*

Note: This ARPANSA requirement may be replaced or supplemented by future new requirements established by the ANNPSR for nuclear activities at the SCY.

5.6 Additional Note: Planning for rehabilitation and decommissioning phases

It is unknown when the SCY project will end.

- Current plans suggest the final (fifth) SSN-AUKUS submarine would be completed by mid-2050.
- However, additional AUKUS submarines may be commissioned, extending the development's life for many years after.
- Moreover, the site and its infrastructure may:
    - Become part of the on-going submarine sustainment and maintenance program, and/or
    - Be converted and integrated into other Defence shipbuilding projects.
- At the end of its life, any surplus parts of the site would probably be decommissioned and rehabilitated as needed for redeployment for other development uses.
    - Plans for this decommissioning and rehabilitation would reasonably be developed at that time as it is not known in advance:
        - What parts of the site would be affected,
        - If they would require any special rehabilitation (they may require none), and
        - What the future land use might be.
    - These plans would likely become part of any planning application for a future development, which would develop its own waste management plans like the AUKUS SCY project is doing here for the current site development.
    - There is merit in ensuring that current development of the site maximises the opportunity for future reuse and /or recycling of materials in this future event.
    - It is recommended that this is included as a part of the design planning for the construction phases of the project.

6 Key references

ARPANSA. (2018a). *Code for Disposal Facilities for Solid Radioactive Waste*.

ARPANSA. (2018b). *Code for the Disposal of Radioactive Waste by the User*.

ARPANSA. (2019). *Code for the Safe Transport of Radioactive Material*.

ARPANSA. (2020). *Guide for Classification of Radioactive Waste*. RPS G-4.

Australian Government. (2012). *National Environment Protection (Movement of Controlled Waste between States and Territories) Measure Minor Variation 2012 (No. 1)*. 21 November 2012.

Australian Government. (2024). *Australian Radiation Protection and Nuclear Safety Act 1998*. Ver.: C2024C00083 (C14).

Colby Phillips Advisory. (2024a). *Osborne SCY EIS: CCRE2: Greenhouse Gas Emissions*.

Colby Phillips Advisory. (2024b). *Osborne SCY EIS: HR4: Dangerous Substances*.

Green Industries SA. (2020). *Supporting the Circular Economy: South Australia's Waste Strategy 2020-2025*.

IAEA. (2014). *IAEA Safety Standards: General Safety Requirements Part 3, No. GSR Part 3*. INTERNATIONAL ATOMIC ENERGY AGENCY.

National Environment Protection Council. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999*. F2013C00288.

National Transport Commission. (2024). *Australian Code for the Transport of Dangerous Goods by Road & Rail, Edition 7.9*. Retrieved from https://www.ntc.gov.au/sites/default/files/assets/files/Australian%20Code%20for%20the%20Transport%20of%20Dangerous%20Goods%20by%20Road%20%26%20Rail%20-%20Edition%207.9%20%28Volume%20I%20%26%20II%29.pdf

SA EPA. (2010). *Current criteria for the classification of waste—including Industrial and Commercial Waste (Listed) and Waste Soil*. EPA 889/10.

SA EPA. (2013). *Standard for the production and use of Waste Derived Fill* . ISBN 978-1-921495-07-6 .

SA EPA. (2020). *Landfill disposal criteria for PFAS-contaminated waste* . EPA 1125/20.

SA EPA. (2023). *Code of Compliance for radiation management plans 2022*. COC-1: 15 February 2023.

SA EPA. (2023). *Code of Compliance, COC-2, for facility design and shielding 2022*.

SA EPA. (2024). *Construction environmental management plan*. EPA 1095/24.

SA EPA. (2024). *Guidelines for waste management application/ plan to dispose of unsealed radioactive material*. Contained within: Annual waste management plan/application for approval to dispose of unsealed radioactive material.

SafeWork SA. (2024). *Code of Practice - Managing risks of hazardous chemicals in the workplace* .

South Australia Government. (2024). *Work Health and Safety Regulations 2012*. Version: 1.7.2024 .

South Australian Govenment. (2020). *Explosives Regulations 2011* . Version: 1.7.2020 .

South Australian Government. (2017). *Dangerous Substances (General) Regulations 2017, Version: 1.9.2017*.

South Australian Government. (2020). *Explosives Act 1936*. Version: 1.7.2020.

South Australian Government. (2021). *Dangerous Substances Act 1979, Version: 17.9.2021* .

South Australian Government. (2021). *Environment Protection (Waste to Resources) Policy 2010*. Version: 1.12.2021 .

South Australian Government. (2021). *Explosives (Security Sensitive Substances) Regulations 2021* . Version: 1.9.2021 .

South Australian Government. (2021). *Radiation Protection and Control Act 2021*.

South Australian Government. (2022). *Radiation Protection and Control Regulations 2022*. No 92 of 2022 published in Gazette 27.10.2022 p 6377.

South Australian Government. (2023). *Dangerous Substances (Dangerous Goods Transport) Regulations 2023,Version: 3.8.2023*.

South Australian Government. (2024). *Environment Protection Act 1993*. Version: 1.3.2024.

South Australian Government. (2024). *Environment Protection Act 1993*. Version: 1.3.2024.

South Australian Government. (2024). *Environment Protection Regulations 2023*. Version: 1.7.2024.

South Australian Government. (2024). *Work Health and Safety Act 2012* . Version: 1.7.2024.

Workplace Relations Ministers' Council. (2009). *Australian Code for the transport of explosives by road and rail*. 3rd Edition.

Zero Waste SA. (2014). South Australian Better Practice Guide – Waste Management in Residential or Mixed Use Developments.