



Australian Government

Department of Defence

FACILITIES TO SUPPORT NAVAL OPERATIONS IN THE NORTH

Darwin, Northern Territory

STATEMENT OF EVIDENCE TO THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

Canberra, Australian Capital Territory

March 2018

[This page intentionally blank]

Contents

Identification of the Need	5
Background	6
Importance of Larrakeyah Defence Precinct and <i>Coonawarra</i>	6
Existing Civilian Assets	7
Description of Proposal	9
Options Considered to Fulfil the Identified Need	10
Environment and Heritage Assessment	11
Overview	11
Heritage	12
Flora and Fauna	13
Asbestos and Other Hazardous Materials	13
Soil Contamination	14
Per and Poly-Fluoroalkyl Substance	16
Hydrocarbon Pollution	16
Sediment and Water Quality	16
Unexploded Ordnance	17
Key Legislation	18
Applicable Codes and Standards	18
Consultation with Key Stakeholders	19
Purpose of the Works	20
Project Objective	20
Detailed Description of the Proposal	20
Project Element 2 – Construct a New Ready Use Fuel Facility	23
Details and Reasons for Siting Selection	25
Zoning and Approvals	26
Planning and Design Concepts	26
Mechanical Services	27
Hydraulic Services	27
Electrical Services	27
Fire Protection	28
Security	29
ICT Services	29
Environmental Sustainability of the Project	29
Energy Targets	30
Compliance with Local, State/Territory and Commonwealth Water and Energy Policies	30
Workplace Health and Safety Measures	31
Provisions for People with Disabilities	31
Childcare Provisions	32
Public Transport, Local Road and Traffic Concerns	32
Impact on Local Community	32
Construction Environmental Management Plan	33
Related Projects	34

Cost Effectiveness and Public Value	35
Outline of Project Costs	35
Details of the Project Delivery System	35
Construction Schedule	35
Public Value	36
Revenue	36

Attachments

1. Locality Plan
2. Larrakeyah Defence Precinct Site Plan
3. Project Element 1 – Construct New Wharf Facilities
4. Project Element 2 – Construct a New Ready Use Fuel Facility
5. Larrakeyah Defence Precinct Combined Projects Site Plan

FACILITIES TO SUPPORT NAVAL OPERATIONS IN THE NORTH PROJECT

Identification of the Need

1. Darwin is strategically vital for supporting Australian Defence Force (ADF) operations across Australia's northern approaches, as a location from which to mount, deploy and sustain military operations and will continue to be for the long term. The Larrakeyah Defence Precinct comprises of Larrakeyah Barracks and HMAS *Coonawarra*. It is located on the coast, approximately two kilometres west of the Darwin Central Business District (CBD) and was established in 1932¹. A locality and site location plan for the Larrakeyah Defence Precinct is provided at Attachments 1 and 2.
2. The 2015 White Paper on Developing Northern Australia outlined the Government's commitment to a strengthened Defence presence in northern Australia. The subsequent 2016 Defence White Paper confirmed the importance of key enabling capabilities such as Defence bases and foreshadowed upgrading of Larrakeyah Barracks and Coonawarra to support the introduction of more capable offshore patrol vessels (OPV) and to enhance support to Australian Defence Force (ADF) operations.
3. Sustained by multiple transport systems providing access to various forms of logistic supply and support, Darwin is effectively the only port capable of providing the facilities necessary for forward support to a range of maritime operations and exercises, particularly when mounting maritime operations into the region. To meet these requirements Darwin must have facilities capable of providing timely logistic support to Royal Australian Navy (RAN) and foreign warships and to other operational elements of the ADF when required.
4. As the only Naval Base in the Darwin region, *Coonawarra* fulfils the requirement to sustain visiting RAN and foreign warships by providing forward operating support functions.

¹ The Defence Estate Strategy 2016-36 identifies Larrakeyah Barracks as a Joint Facility referred to as the Larrakeyah Defence Precinct.

5. As Navy's force-in-being expands, there will be a growing emphasis on ensuring the necessary logistics support capacity is maintained. There is currently insufficient wharf space in Darwin to readily support major ADF operations or major multi-ship maritime exercises. The Facilities to Support Naval Operations in the North (FSNON) Project will provide Navy with the capability to mount and hold ready, major fleet units for major exercises or operations from Darwin over the next 100 years.

Background

6. Larrakeyah Barracks (now referred to as the Larrakeyah Defence Precinct) was established in 1932². ADF units and organisations currently located at the Larrakeyah Defence Precinct include Headquarters Northern Command (HQ NORCOM), with the Deputy Commander NORCOM being the Senior ADF Officer, and Headquarters North West Mobile Force (NORFORCE). *Coonawarra* is a lodger unit on Larrakeyah Defence Precinct. In 1982, Darwin Naval Base (now named *Coonawarra*) was constructed at Larrakeyah Cove to protect vessels and equipment from adverse weather and includes two breakwaters which form an enclosed harbour, a fuel storage and distribution system, a shiplift facility, a harbourmaster and crew support building, a patrol boat maintenance shed and a workshop and stores complex.

Importance of Larrakeyah Defence Precinct and *Coonawarra*

7. *Coonawarra* is a key maritime support base (being the homeport for 12 Armidale Class Patrol Boats (ACPB) and other support vessels) providing administrative, training, logistics and maintenance support for the homeported fleet units and support to visiting ships. Australian Border Protection Customs Service patrol boats also regularly utilise *Coonawarra* wharf facilities when available. The Navy's Patrol Boat Group is also located at Larrakeyah Defence Precinct, while the Patrol Boat Systems Program Office which provides through life support for the ACPB is located in leased premises in the Darwin Central Business District.
8. In 2002 the Government approved the acquisition of the ACPB to replace the Fremantle Class Patrol Boats. A facilities project at *Coonawarra* was approved and constructed in 2006 for the

² The Defence Estate Strategy 2016-36 identifies Larrakeyah Barracks as a Joint Facility now referred to as the Larrakeyah Defence Precinct.

delivery of a Port Services Organisation and Standby crew facility as well as an additional 250kL fuel tank necessary to support patrol boat operations.

9. In the past, visiting RAN and foreign warships relied heavily on the Darwin City wharves (Stokes Hill Wharf, Fort Hill Wharf and the Iron Ore Wharf) to provide necessary berthing facilities, logistics support, and replenishment of supplies and delivery of fuel to ships berthed alongside. The Stokes Hill Naval Fuel Installation (now decommissioned) was located adjacent to the Darwin City Waterfront precinct and Stokes Hill Wharf. The facility provided fuel to Navy vessels berthed alongside the Fort Hill Wharf by pipeline to the wharves and by road tanker (to ready use storage tanks at *Coonawarra* and to Navy vessels alongside at other locations), or by filling the Self-Propelled Water/Fuel Lighter (SPWFL), which could then bunker vessels at anchor or berthed alongside. The Stokes Hill Naval Fuel Installation closed in December 2014.

Existing Civilian Assets

10. **Fort Hill Wharf.** The Fort Hill Wharf is the only remaining operational berth in the Darwin City Waterfront Precinct and is also the site of the Darwin cruise ship terminal. This wharf is operated by the Darwin Port Corporation as the port's cruise ship berth, but is used periodically to berth visiting RAN and foreign major fleet units. It is approximately 300 metres in length and has a purpose-built passenger terminal. The continued growth of cruise shipping visiting or operating from Fort Hill Wharf, with 46 visits in 2016, has added to an increasing demand for berth space at this wharf.
11. **East Arm Wharf.** The East Arm Wharf is located in east Darwin Harbour, approximately 22 kilometres by road from *Coonawarra*, as shown in Attachment 2, and is positioned at the end of the Adelaide to Darwin trans-continental railway and the northern end of the Stuart Highway. The wharf was commissioned in 2000 and provides 754 metres of quay line across four berths. The wharf was not constructed for Defence vessels and in some cases should these vessels need to berth at East Arm, Navy will be required to supply additional waterline fendering to enable such berthing. The adjacent Marine Supply Base facility is privately owned and operated and supports the operation of offshore oil and gas support vessels of up to 90 metres in length.
12. **Wharf Access - Deed of Licence.** In 2015, a new Deed of Licence was established between Defence and the Darwin Port Corporation to guarantee access of 170 days per annum to

berths at Fort Hill Wharf and occasional access to East Arm Wharf for at least 15 years, with potential for further extensions totalling a maximum of 10 years. Berthing Rights under this Deed allow Defence to moor or anchor vessels within the Port and to berth vessels at a wharf. This includes all rights to load and unload cargo (including military supplies, personnel and equipment) and to fuel and de-fuel vessels. The Berthing Rights also include the right to raft a vessel alongside another vessel that is berthed at a wharf.

13. **Fuelling Arrangements.** Defence has recently transitioned to an arrangement whereby all bulk fuel for Navy is now provided directly from commercial ADF10 diesel stocks out of the Darwin Industry Fuel Terminal at East Arm, rather than Defence-owned bulk fuel facilities. As a consequence, visiting major ships are generally refuelled by a SPWFL, either when berthed at Fort Hill Wharf or at anchor. The SPWFL is refuelled from a number of points on the East Arm Wharf. In some cases, ships may embark fuel by road tanker when alongside Fort Hill Wharf. Where larger quantities of fuel need to be embarked expeditiously, visiting RAN and foreign warships can berth at East Arm Wharf to embark fuel by pipeline, before moving to an alongside berth at Fort Hill Wharf or to anchor. Armidale and Cape Class patrol boats berthed at *Coonawarra* are generally supplied with fuel by pipeline from the existing *Coonawarra* ready use tanks, which are currently filled by road tanker.
14. **Darwin Bulk Liquids Terminal.** This facility is also referred to as the Vopak Terminal and is located a few kilometres outside East Arm Wharf, as shown at [Attachment 1](#). The terminal currently holds a range of commercial petroleum and diesel products contained within the Darwin Bulk Liquids Terminal, aviation fuel tanks, hazardous liquid storage tanks, and a disused bio-diesel production and storage facility, referred to as the Darwin Bio-diesel Terminal. Bunker lines from the terminal run to the East Arm Wharf and the Marine Supply Base facilities. Road tanker offload / on-load gantries and working accommodation and laboratories occupy the road frontage of the terminal. There is vacant land adjacent the Darwin Bulk Liquids Terminal that on behest of the Northern Territory (NT) Government may be used by other fuel storage operators to increase resilience and competition to the fuel market in the NT.
15. **Multi User Barge Ramp Facility.** The Multi User Barge Ramp facility was constructed at East Arm by the NT Government in 2016 to support Defence and commercial activities. Defence provided a contribution of \$16.1 million towards the construction of the facility and has guaranteed access under a Deed of Licence for 60 days per annum for initially 20 years with options to extend for a further 10 years (up to 30 years). The facility is operated and

maintained by the NT Government's Land Development Corporation. This facility enables landing craft from the Navy's Landing Helicopter Dock vessels to load and unload equipment and stores.

16. **Nett Reduction in Naval Berthing and Fuelling Capacity.** Since 2008, the availability of the Darwin City Wharf facilities for berthing Naval vessels has reduced by 60 percent. The Stokes Hill Wharf is no longer used to berth and refuel visiting warships as it is unsuitable for larger vessels and is no longer part of the secure port area. The Iron Ore Wharf has been demolished and the Fort Hill Wharf has a reduced berthing availability. Furthermore, vessels are no longer able to refuel by pipeline at the Fort Hill Wharf since the closure of the Stokes Hill Naval Fuel Installation.

Description of Proposal

17. This proposal will address the significant shortcomings in existing operational support facilities at the commercial Darwin Port. It will provide a new wharf for berthing of RAN ships and a new ready use fuel storage facility which will support fuelling vessels alongside, independent of commercial port activities. Vessel types to be berthed and refuelled include amphibious ships, afloat support vessels, surface combatants and specialist naval vessels, such as submarines, mine hunter coastal vessels and hydrographic ships.
18. The proposed new outer wharf is to be located immediately to the west of the existing enclosed harbour. A large hardstand will be constructed on the adjacent shoreline to provide a marshalling and storage area for vehicles and equipment. A range of shore services will be provided to "cope" points on the wharf. Support buildings will provide covered storage space for equipment and will accommodate the engineering services infrastructure required to service the wharf with power, fuel and other services, plus ablution facilities. A new access road will link the higher areas of Larrakeyah Defence Precinct to the proposed hardstand and wharf.
19. The proposed Defence Fuel Installation – Maritime (DFI-M) ready use fuel facility will store 3.5 megalitres of diesel fuel in two tanks to facilitate fuel quality management and to provide a level of redundancy. The tanks will be linked by pipeline to all *Coonawarra* berths, including the proposed new outer wharf, to ensure that ships can refuel expeditiously when berthed at *Coonawarra*. A plan showing the proposed building and infrastructure works is provided at [Attachment 2](#).

Options Considered to Fulfil the Identified Need

20. To determine the most appropriate infrastructure solutions, Defence undertook master planning and design activities that included extensive user consultation meetings and investigations to establish the functional requirements for each element of the proposed naval facilities project. A 'Do Nothing' option was rejected because the significantly reduced availability of commercial port berths for Navy warships in Darwin impacts on the ADF's ability to meet Government directed readiness and support levels.
21. A range of possible alternative technical solutions for the wharf, the associated infrastructure and the ready use fuel facility were subsequently developed during the key Schematic Design Review milestone. This milestone determined the most cost-effective design solutions for each element of the project.
22. **Wharf Design Options.** The following design options were considered for the wharf:
 - a. **Option 1 - Offshore Wharf:** a piled open wharf structure located approximately 55 metres from the shoreline, in sufficient water depth to achieve a natural berth pocket to avoid the need for dredging.
 - b. **Option 2 - Marginal Wharf:** a piled open marginal wharf structure which backs onto the existing shoreline providing vehicular access along the wharf length, with a dredged berth pocket.
 - c. **Option 3 - Pontoon Wharf:** a floating pontoon wharf, constructed from steel or concrete and located approximately 80 metres from the shoreline, in sufficient water depth to achieve a natural berth pocket to avoid the need for dredging and to obtain a suitable access ramp gradient at low tide.
23. The Schematic Design Review concluded that Option 1 - Offshore Wharf met the Navy's operational requirements, minimised design, construction and environmental risks (by avoiding the need to dredge) and provided flexibility to meet future capability requirements.
24. A more detailed examination of the user requirements for the wharf was then completed to identify the capability / cost trade-offs against various wharf configurations. Lengths of up to 330 metres and widths up to 33 metres were evaluated. A proposed length of 250 metres and a width of 25 metres, with one mooring dolphin at each end of the wharf was assessed to be the most cost-effective wharf configuration, as it provided sufficient area for resupply

operations to be effectively and safely carried out. Various technical solutions for the required wharf services, the hardstand and the access road were also examined.

25. **Ready Use Fuel Storage Facility Design Options.** For the ready use fuel facility, alternative designs for the tanks and associated fuel distribution network were evaluated. Tank heights between six and 12 metres high were considered, with 10 metre high tanks being assessed as the most effective design solution from operational, cost and visual impact perspectives. Three fuel distribution network designs were also examined for the proposed associated fuel distribution network, with a single pipe system agreed as the most cost-effective and safe design. This eliminated the need to retain a separate fuel distribution network for the Attack and Fremantle Wharves.

Environment and Heritage Assessment

Overview

26. An Environment Report (ER) has been completed for the project to consider the proposed activities against the obligations of the Commonwealth's *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (*EPBC Act*). The ER identifies and assesses the environmental and heritage factors of the project and recommendations for pragmatic risk mitigation measures. The ER has been prepared following *Guidance on the Preparation of an Environmental Report* (Department of Defence, version No. 1.4, July 2014).
27. The assessment concluded that with the application of the recommended mitigation measures, the action of the project will not have a significant impact under the *EPBC Act*, therefore a referral under the *Act* would not be required.
28. The ER identified that the environmental and heritage risks, including indigenous and non-indigenous heritage considerations are generally low, and are manageable through the development of a site-specific Construction Environmental Management Plan (CEMP).
29. Detailed environmental and heritage site investigations and reporting requirements have been undertaken to facilitate the likely required government and/or stakeholder approvals (i.e. Commonwealth and/or Territory) and this information has been consolidated in a comprehensive ER which addresses the Facilities to Support Naval Operations in the North project.

Heritage

30. A baseline review of heritage values and potential impacts has been undertaken for the preparation of the ER. The FSNON project falls within the *Coonawarra* precinct, which is identified in the Heritage Management Plan as having low heritage, value (Godden Mackay Logan 2010:123). However, areas of high heritage sensitivity are located nearby, including the Larrakeyah Precinct Headquarters Building (Commonwealth Heritage List#105192) and the surrounding NORFORCE HQ heritage precinct.
31. The Northern Territory's *Aboriginal Sacred Sites Act* protects both known and currently unrecorded sacred sites. The proposed FSNON works are located some 700 m south of a recorded Sacred Site Precinct, but no direct impacts on the place are anticipated. Consultation with the Larrakia people determined there are no issues for this project.
32. As part of the separate Larrakeyah Defence Precinct Redevelopment project, AAPA approval has been provided to undertake temporary construction works in the southern portion of the Sacred Site Precinct. There will be some overlap of the management controls specified in the AAPA certificate that the FSNON project will also need to implement, including provision of cultural heritage training to ensure workers are aware of the restriction with the Sacred Site and ongoing consultation with the traditional Custodians.
33. There are no registered marine heritage sites in the project area, however, there are remnants of the World War II degaussing range located approximately 0.5 km to the south of the *Coonawarra* Basin in Darwin Harbour. This site was declared a heritage place on the NT Heritage Register in May 2013. The Darwin-Java underwater telegraph cable is also understood to be located in the vicinity of the project to the east of the project site. The proposed project will not disturb either site.
34. A review of side scan sonar and magnetometer survey data identified a number of anomalies on the sea bed that may be indicative of possible wrecks, military or communications infrastructure, or other submerged heritage. During any underwater Unexploded Ordinance clearances, an unexpected finds procedure will be implemented for heritage items. Where heritage items are suspected, they will be assessed by a maritime heritage specialist.

Flora and Fauna

35. Larrakeyah Defence Precinct is a highly modified environment, however some remnant vegetation remains. The monsoon vine thicket area along the coastal escarpment is locally significant because of its aesthetic value and its utilisation as a wildlife corridor by local fruit-eating fauna. Previous studies of adjacent connected vegetation areas indicate the vine thicket area supports a high diversity of birdlife. Due to its aesthetic value and utilisation by local fruit-eating mammals (bats), birds and reptiles as a wildlife corridor, this area is considered locally significant and worthy of preservation and protection. The biological values of the native habitat areas are also threatened by weed infestation, physical disturbance by human activities and the dumping of waste.
36. A terrestrial fauna and migratory shorebird survey was carried out during the planning phase, along with an EPBC Act Significant Impact Assessment (SIA). The SIA for listed threatened species indicated that the project is unlikely to result in a significant impact to species listed as threatened under the EPBC Act, which have a moderate or greater likelihood of occurring within the project area.
37. It is unlikely that activities associated with the FSNON works would impact on the vine thicket community, with only a small section of cliff vegetation to be removed which is already highly disturbed, to be removed.
38. Safeguards will be implemented during construction to minimise the spread of introduced terrestrial flora and fauna species proximate to the project area, including vehicle cleaning, targeted weed control and other preventative measures.

Asbestos and Other Hazardous Materials

39. The project requires the demolition and removal of existing infrastructure, and may encounter unexpected finds, such as asbestos and other hazardous materials during trenching and other excavation activities for the project.
40. An intrusive hazardous material assessment will be required prior to demolition and refurbishment activities to manage the risk of encountering hazardous materials.
41. The removal of asbestos and other hazardous materials from buildings earmarked for refurbishment or disposal, or asbestos cement pipes disturbed during construction, will be undertaken in accordance with the applicable Territory legislation and be addressed in the

project Construction Environment Management Plan (CEMP). The CEMP will require the site/region asbestos containing material management plan to be updated to manage asbestos containing material risks associated with subsurface services infrastructure left in-situ or within refurbished buildings as part of the project.

Soil Contamination

42. The Contaminated Sites Register (CSR) for *Coonawarra* identifies seven sites that are located within, or adjacent to, the footprint of Project Elements 1 and 2.
43. The sites registered on the CSR that have the potential to be impacted or disturbed as part of the project are described as follows:
 - a. Project Element 1 – New Wharf Facility (including Stormwater works);
 - i. Southern Reclaimed Area / Hazardous Materials Storage comprise much of the footprint of Project Element 1. The area comprises a large area previously reclaimed using imported fill material. The CSR allocates a Medium risk rating to the area; and
 - ii. North Maritime Services Building - Septic Tank is located in the eastern end of Project Element 1. The area is used for sewage storage or disposal. The CSR allocates a Medium risk rating to the area.
 - b. Project Element 2 – DFI-M Ready Use Fuel Facility (including Fuel Pipeline)
 - i. *Coonawarra* Bulk Storage is located outside of the footprint of Project Element 2 however the alignment of the fuel pipeline traverses one registered CSR site. This site was used for waste storage, treatment or disposal and reportedly incorporates above-ground and underground storage tanks used for the storage of bulk oil, bilge water and dirty/waste oils. The CSR allocates a Low risk rating to the area;
 - ii. North Eastern Ship Transfer Yard is located within the footprint of Project Element 2. The site is reportedly used for the storage of bulk fuels and the storage, treatment or disposal of wastes. The site also includes above ground storage tanks supplying diesel used in refuelling vessels. The CSR allocates a Low risk rating to the area; and

- iii. Corrosion Control Workshop is located within the footprint of Project Element 2. The site is used for the manufacture / formulation and application of paints. The CSR allocates a Medium risk rating to the area.
 - c. In addition to the above, two further sites included on the CSR are traversed by the proposed alignment of the fuel pipeline associated with Project Element 2. These areas are:
 - i. Ship Transfer Yard (Abrasive blasting – High risk rating); and
 - ii. *Coonawarra* Boat Basin Marine Sediments (Potential impact from sediment run-off including tri-butyl tin - High risk rating).
44. An intrusive soil contamination investigation was completed in the footprint for the project areas. The laboratory analysis collected from boreholes and test-pits indicated that the concentrations of contaminants of concern were below the adopted investigation levels. Although concentrations of contaminants were below the adopted investigation levels, Defence will ensure:
- a. If significant excavation of soils is planned within the footprint of the Project Elements, a more detailed assessment will be completed in the immediate vicinity of the excavations to inform the development of soil management actions.
 - b. For all areas in which fuel storage or waste storage tanks are to be removed or decommissioned, appropriate soil characterisation and soil remediation and / or management will be completed including associated validation of residual soils.
 - c. For areas formerly used for storage, actions for the management of contaminated soils will be included in the CEMP (or equivalent) to allow for the appropriate management of any contamination identified.
45. The likelihood of Acid Sulphate Soil/Potential Acid Sulphate Soil (ASS/PASS) in the footprints of Project Element 1 and 2 was assessed as low considering the areas comprise reclaimed fill material, and the presence of tidal marine waters.
46. A Soil Management Plan/Remediation Action Plan will be prepared to provide instruction on how to handle, store and dispose of excess spoil generated by the project. Contaminated soil will be managed in accordance with Defence Contamination Guidelines (i.e. onsite

bioremediation or disposed by licensed waste contractor) and where required, further investigation will be undertaken to characterise materials for off-site disposal. Provisions for the management and or removal of contaminated soils and materials have been included in the construction program and cost estimates for the Project.

Per and Poly-Fluoroalkyl Substance

47. No evidence of Per and Poly-Fluoroalkyl Substances (PFAS) has been found during the site investigation works. However, the most recent groundwater sampling event identified low concentrations of Perfluorooctane Sulfonic Acid (PFOS). The concentrations are below the trigger values for the site and are not considered a result of a new or direct source of impact within the last twelve months (GHD 2016).
48. Provisions for the management and or removal of any material identified to contain of Perfluorooctane Sulfonic Acid (PFOS) and of Perfluorooctane Acid (PFOA) will be managed in accordance with the Commonwealth Environmental Management Guidance on PFOS and PFOA (DRAFT), Department of Environment and Energy, October 2016.

Hydrocarbon Pollution

49. Operating the existing and proposed fuel facilities gives rise to the potential for hydrocarbon pollution from refuelling operations affecting marine habitats and species, and the recreational use of Darwin Harbour. An assessment of potential impacts from hydrocarbon spills will be carried out as part of the oceanic processes modelling, and will include preparing an oil spill model and wastewater/ stormwater discharge model. An oil spill boom and spill kits will be provided for use as part of fuelling operations.

Sediment and Water Quality

50. The proposed construction activities have a potential to impact on water quality and marine habitats. Marine investigations have measured sediment and turbidity to assist in assessing sediment transport and water quality issues. There is no plan to conduct dredging as part of this project.
51. The mitigation measures proposed in the ER will treat stormwater runoff from areas under construction to reduce the amount of sediment entering the stormwater system.

Unexploded Ordnance

52. The FSNON project area falls within a region that was a known conflict site during World War II. The extent of ordnance used in these areas is relatively unknown; however, it was identified that there was a potential risk that unexploded ordnance (UXO) and historic wrecks may be encountered within the project site.
53. A previous desktop assessment of UXO risk for the project identified that landside Project Elements associated with FSNON were considered to be negligible and 'As Low As Reasonably Practicable' (ALARP). However, it was also noted that due to the potential for individual items of either Japanese or Allied UXO to be present, controls would need to be implemented. These controls would include UXO Finds Protocol and UXO awareness training to be undertaken for the Managing Contractor's personnel and subcontractors to understand the risk and process should UXO be identified on site.
54. UXO in the marine environment has also been considered for FSNON works, and surveys were commissioned to obtain clearances prior to commencing marine piling or any other intrusive seabed works.
55. A marine geophysical field investigation using side scan sonar and a magnetic gradiometer and a pedestrian magnetic survey were completed during the Schematic Design Review within the FSNON wharf and hardstand area. The survey area described as 180 m from the existing revetment wall (0.11km²) to further assess the UXO risk associated with the marine side of the project. The aim of the surveys was to identify ferrous targets with magnetic properties similar to known UXO.
56. During the marine UXO survey a total of 201 targets were detected and interpreted/subdivided. In addition, the pedestrian UXO survey of the revetment wall identified an additional 11 buried targets. It should be noted that these targets are described as unidentified ferrous objects and not necessarily UXO. As a result of the UXO survey, diving is proposed to further investigate and eliminate targets which are not UXO and to allow clearance of any actual UXO, prior to commencement of any marine piling or any other intrusive seabed works for the project.
57. The number of anomalies identified on the sea bed during the marine survey is of interest for the project marine heritage aspect as they may be indicative of possible wrecks, military or communications infrastructure, or other submerged heritage. As such, it is recommended that

during underwater UXO clearances, an unexpected finds procedure be implemented for heritage items. Where heritage items are suspected, they would be assessed by a maritime heritage specialist.

58. UXO awareness training will be undertaken to ensure the risk of UXO is understood. The management of any UXO found during construction will be included in the CEMP.

Key Legislation

59. The following key legislation is relevant to this project:
- a. *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*;
 - b. *Building and Construction Industry (Improving Productivity) Act 2016 (Cth)*;
 - c. *Work Health and Safety Act (WH&S) 2011 (Cth)*;
 - d. *Work Health and Safety (National Uniform Legislation) Act (NT)*
 - e. *Work Health and Safety (National Uniform Legislation) Regulations (NT)*; and
 - f. *Disability Discrimination Act 1992 (Cth)*.

Applicable Codes and Standards

60. The design of the proposed works will comply with all relevant and current Defence standards, Australian standards, codes and guidelines including, but not limited to:
- a. National Construction Code – 2016 (NCC 2016);
 - b. Defence Manual of Infrastructure Engineering – Electrical (MIEE);
 - c. Defence Manual of Fire Protection Engineering (MFPE);
 - d. Defence Manual of Infrastructure Engineering – Bulk Fuel Installation - Design;
 - e. Defence Estate Quality Management System; and
 - f. Defence Security Manual.
61. An accredited building certifier has been engaged to certify the compliance of the design and will be engaged to certify compliance of the completed works.

Consultation with Key Stakeholders

62. To develop the requirements and proposed solutions for this proposed redevelopment, extensive consultation has been undertaken with the relevant Defence users and technical authorities.
63. Defence has developed a comprehensive consultation and communication strategy that recognises the importance of providing local residents, statutory authorities and other interested stakeholders, including special interest groups, an opportunity to provide input into, or raise concerns relating to the proposed works.
64. As part of this strategy, the following communication methods have been or will be adopted:
 - a. letterbox drops to neighbouring residential areas confirmed as affected by the construction works;
 - b. community information sessions; and
 - c. local newspaper advertisements.
65. In implementing this strategy, consultation has occurred or will occur, with the following key external stakeholders:
 - a. Federal Member for Solomon, Mr Luke Gosling OAM, MP;
 - b. Northern Territory Senator, the Hon Nigel Scullion;
 - c. Northern Territory Senator, Malarndirri McCarthy;
 - d. Territory Member for Port Darwin, Mr Paul Kirby MLA;
 - e. Northern Territory Chief Ministers Department;
 - f. Northern Territory Department of Transport;
 - g. Northern Territory Department of Trade, Business and Innovation;
 - h. Darwin Harbourmaster;
 - i. Darwin Ports Corporation;

- j. City of Darwin;
 - k. Aboriginal Areas Protection Authority;
 - l. Local Indigenous Group (Larrakia people);
 - m. Power and Water Corporation (P&WC);
 - n. NT Chamber of Commerce; and
 - o. Master Builders Association
66. Defence plans to conduct two community information sessions prior to the PWC hearing.

Purpose of the Works

Project Objective

67. The objective of this proposal is to deliver new berthing capabilities at *Coonawarra* to accommodate varying combinations of major surface combatants, Offshore Patrol Vessels and submarines, with the largest warship being the Landing Helicopter Dock (LHD); and to provide fuel storage and refuelling capabilities to meet the current and projected demand.

Detailed Description of the Proposal

Project Element 1 – Construct a New Wharf

68. The proposed new outer wharf will comprise six project sub-elements. These sub-elements are addressed in the following paragraphs.

Project Element 1.1 – Construct the New Wharf Structure

69. The proposed wharf will be located immediately to the west of the current enclosed harbour encompassing Larrakeyah cove, placing the wharf in front of the existing Port Services Office and the reclaimed area, which is the site of the proposed hardstand.

70. The proposed wharf will comprise a 250 metre long by 25 metre wide wharf deck, with one mooring dolphin at each end of the wharf fitted with navigational aids to alert general maritime traffic to the presence of the wharf. The proposed wharf will be a piled structure with a quay line nominally 55 metres from the shoreline with 32 metres and 42 metres long approach bridges spanning between the wharf and the proposed hardstand. The wharf will be able to be extended in the future to the northwest, with minimal interruptions to existing operations.
71. Access from the hardstand to the wharf will be via two access bridges. The bridges are designated as one way traffic to de-conflict hazardous traffic movements. However, ramps can be used as two way traffic for emergency vehicles. Ramps are flared to facilitate truck turning onto the wharf. Personnel walkways are provided on each ramp to allow pedestrian access from the shore. Personnel shelters are provided on each access ramp with drinking fountains located within the shelters.
72. The width of the proposed access bridges will be 8.5 metres to allow for a clear width roadway of four metres, a 1.5 metre pedestrian access path, a two metre services corridor, kerb and bridge barrier.
73. A plan and elevation for the proposed wharf and access bridges are provided at Attachment 3.

Project Element 1.2 – Install Wharf Services

74. A range of services are proposed to be provided to the wharf. All wharf services shall be underslung and six cope points provided at regular intervals along the quay line. A catwalk will be provided under the deck for maintenance activities. The proposed services will include potable water, fresh water fire-fighting, general power and lighting, refuelling, sullage, information and communications technology (ICT) and security services.

Project Element 1.3 – Provide the Wharf Accessories

75. Proposed wharf accessories include fendering, cathodic protection, loose equipment such as refuelling pipework a portable air compressor, and mobile gangways. Interchangeable pneumatic fenders, chains and floating fender frames catering for the various hull pressures and hull profiles will be supplied and installed. These accessories will be stored in an equipment storage facility to be located on the adjacent hardstand.

76. A field applied pile protection system will be installed to the piles, in conjunction with a cathodic protection system, to minimise maintenance.

Project Element 1.4 – Construct the New Hardstand and Associated Buildings

77. The proposed hardstand has been planned to provide the greatest flexibility for laydown and support operations. The hardstand will provide all weather access for laying down stores, provisions and equipment including containerised loads, palletised items, fenders, portable equipment for fuelling, and gangways. The hardstand may also be used for the occasional parking of heavy vehicles and equipment such as mobile cranes. The hardstand will also be provided with lighting to permit night operations and tie down points for portable equipment for use in cyclonic conditions.
78. The proposed hardstand of up to approximately 3000 square metres in area will be constructed at a level that complements the wharf and wharf access bridge levels. The hardstand will be constructed with interlocking concrete block pavers on a flexible pavement to provide heavy duty pavement to all areas.
79. New buildings and structures will be located on the periphery of the hardstand area. The Wharf Support Warehouse will be a large portal framed metal clad building, enclosed on three sides, with extensive roller shutter access to the wharf hardstand to enable vehicles to manoeuvre trailers into the building and to facilitate fork lift access for handling of pallets. The proposed building height will allow pallets to be stacked up to three high on modern efficient racking systems. The building will also accommodate the mobile gangways and will accommodate a temporary woodworking facility to replace the existing facility being demolished to make way for the new fuel storage facility. This temporary woodworking shop will continue to manufacture custom timber blocks to fit between the cradles and the vessels being lifted out of the water on the shiplift. This operation will remain until the shiplift is demolished under the separate Offshore Patrol Vessel (OPV) Facilities project. At this point the woodworking shop will be discontinued.
80. Other proposed support buildings include a shore services building to accommodate electrical, ICT, fire-fighting pumps, fuel pumps and ablutions facilities. A dangerous goods store is being provided at the hardstand to replace the existing aged storage facilities that are being demolished to make way for the new fuel storage facility.

Project Element 1.5 – Construct the New Access Road to the Wharf and Hardstand

81. A new, second all weather access road is proposed from Allen Avenue to the new hardstand to accommodate the increased traffic associated with the proposed wharf and hardstand. The proposed road will be suitable for cars, trucks up to B-double size, forklifts and mobile cranes. The proposed construction will comprise a flexible bituminous concrete wearing course on crushed rock base. The road will be one lane in each direction with a total width of 7m with clear zones on each side of the road. The maximum grade has been limited to 8% in accordance with Austroads guidelines.

Project Element 1.6 – Shore Power

82. The Offshore Patrol Vessel (OPV) facilities project may require shore power to support its berthing on the new wharf. Should the OPV project be approved to proceed, the works may be undertaken by the FSNON project under a funding transfer arrangement. This would maximise efficiencies and provide value for money to the Commonwealth by delivering these works whilst the wharf is being constructed.

Project Element 2 – Construct a New Ready Use Fuel Facility

83. The proposed DFI-M Ready Use Fuel Facility has been master planned to allow for 3.5 million litres of new capacity plus a future 2.5 million litres usable storage, bringing the potential future storage capacity to six mega litres of ADF 10 if required. The proposed design avoids the need to decommission any of the existing tanks during construction, however there will be down time of patrol boat bunkering during crossover to the new fuel facilities while the new pipework connections are made. Existing infrastructure will be retained, including the wharf bunker points and lines from near the base of the Attack Wharf; the waste oil facilities; the quarantine system and the road tanker offloading facilities. Some existing facilities will be demolished, including the bulk fuel tanks, the existing tank farm compounds and pipework; and the 150 mm nominal bore fuel pipeline from the existing tank farm through the shiplift area.
84. The proposed new ready use fuel facility comprises two project sub-elements. These sub-elements are addressed in the following paragraphs. A plan, elevation and selected detailed drawings of the proposed fuel facility are at Attachment 4.

Project Element 2.1 – Construct the Tank Farm and Associated Engineering Infrastructure

85. **Storage Tanks.** Two vertical storage tanks are proposed to provide redundancy and to allow the facility to operate when one tank is out of service for inspections or maintenance. The tanks will each provide 1.75 million litre usable volumes and be approximately 10 metres high and 17 meters in diameter. The tanks will be fabricated from uncoated grade 316 stainless steel.
86. **Fuel Distribution Network.** The key parts of the proposed fuel distribution system are described as follows:
- a. **Importing Fuel.** A new 250 mm nominal bore (250NB) delivery point will be provided at the proposed new wharf for the delivery of fuel by ship. The proposed design also allows delivery to be made by road tanker and includes a new road tanker import pump.
 - b. **Exporting Fuel.** The proposed design includes a single outgoing bunkering system serving the proposed new wharf and existing wharf bunker system. The system includes its own set of new pumps, filters, meters and pipework, with built in redundancy and will allow gravity bunkering if required.
87. **New Wharf Bunkering.** Bunker points are provided for all vessels berthed at the new wharf. The system will allow for the large difference in flow rates and pressures required by different vessels at the new wharf. Backloading to tanker ship will also be possible. The proposed design also provides a new connection from the proposed tanks to the existing Attack and Fremantle wharves. The new pipework will be connected to the existing Attack Wharf bunker lines via new pumps, filters and a meter at the new DFI-M Ready Use Fuel Facility.
88. **Cathodic Protection.** Underground pipelines shall have cathodic protection to the relevant Australian Standards and the American Petroleum Institute's Recommended Practice 651.
89. **Civil and Stormwater.** Bulk civil works will be required to provide a relatively flat area for the new fuel facility. The tank foundations will be mounded and have a concrete lined skirt. The compound floor will be concrete lined with a geosynthetic clay liner underneath. Bund walls will be concrete. The area will be graded to drain the tank compound away from the tanks to a sump. A valve in the compound would normally be kept closed to contain any spills or leaks. Rainwater will pool in the compound and will subsequently be drained to

stormwater via an interceptor. Stormwater drainage will also be required for the fuel farm road, yard area and the fuel farm buildings.

Project Element 2.2 – Construct the Fuel Quality Control Centre

90. The proposed Fuel Quality Control Centre (FQCC) will be a multi-purpose building providing:
 - a. a control room with two control stations and three additional desks;
 - b. a Fuel Quality Control (FQC) Laboratory;
 - c. a workshop/store;
 - d. a meeting/lunch room;
 - e. ablutions/change area, including space for a washing machine and drier;
 - f. a garage for the bunker truck; and
 - g. a disabled carpark space.
91. The proposed FQC Laboratory is for ADF10 testing and therefore will comply with the relevant requirements for diesel testing. The laboratory will include a fume cupboard, stainless steel benches, a safety shower and eyewash and a twin bowl sink and drying area. The floor and walls will be impervious and resistant to any petroleum products and chemicals used in the laboratory and will be graded to provide containment. A samples cabinet will be provided outside, near to the laboratory door.

Details and Reasons for Siting Selection

92. For each of the proposed new buildings site selection boards (SSB) have been completed in accordance with the approved Zone Plan and Defence estate development guidelines. The SSB typically consider the suitability of the site for the proposed function, the locations of related functions, access to services and infrastructure, movement by vehicles and pedestrians to and from the site, and heritage and environmental management factors.
93. The proposed new wharf will be located immediately to the west of the current enclosed harbour and provides:

- a. access to and from the hardstand for vehicles and services;
 - b. visibility from Port Services Office;
 - c. can be extended in the future; and
 - d. does not interfere with existing vessel movements at *Coonawarra*.
94. The preferred location for the new tank farm is in the vicinity of the current fuel storage area located adjacent the Senior Sailors' Car Park.

Zoning and Approvals

95. All elements of the proposal are located within the boundaries of Commonwealth-owned and Defence-controlled land. Accordingly, no civilian authority or design approvals are required, although the works will comply with the relevant standards and regulations (where applicable).
96. The proposed development complies with the Defence approved Larrakeyah Barracks Zone Plan dated 24 June 2009.

Planning and Design Concepts

97. The general design philosophy for the proposed facilities incorporates the following considerations:
- a. provision of cost effective and functional facilities of energy efficient design suitable for the climate of the site;
 - b. adoption, where possible, of conventional construction techniques and materials, in particular those commonly used by the construction industry and consistent with those already utilised on the base;
 - c. maximum use of existing infrastructure and facilities to minimise capital costs;
 - d. use of readily available and durable materials that combine long life while minimising maintenance;
 - e. infrastructure services planning and structure design taking into account future flexibility, projected demand and Defence policies for reliability and redundancy;

- f. recognition of site constraints, security requirements, the established Zone Plan, and functional relationships to existing facilities; and
- g. planning services and structural design to accommodate flexibility.

Mechanical Services

- 98. The mechanical services for the proposed new buildings have been designed according to the function and needs of each building. The proposed mechanical services will meet specific user needs, relevant ventilation, thermal comfort and air quality requirements, and the mandatory requirements of the NCC 2016. All proposed mechanical plant will interface with the site Building Management System.
- 99. In the FQCC building, the laboratory will have a positive pressure heating, ventilation and air conditioning system utilising direct expansion air handling units. Fume cupboards will be provided in the FQC laboratory. Compressed air will be provided in the FQC laboratory and in the fuel facility for the activation of the pneumatically actuated valves and minor pumps.

Hydraulic Services

- 100. Where new stormwater systems are required to ensure flood protection for new buildings and roads and car parks, those services will be connected to the new trunk services being provided as part of the proposed separate Larrakeyah Barracks Redevelopment project.
- 101. All new stormwater pits and modifications to existing pits will be constructed to comply with the relevant standards to meet a 100-year design life. New stormwater quality treatment devices, required to prevent pollution of local marine environments, will be designed or selected from standard units, to manage potential pollutants.

Electrical Services

- 102. All electrical services required for proposed new wharf and fuel facility will be connected to the trunk services being delivered as part of the separate Larrakeyah Barracks Redevelopment project. These new services will comply with the requirements of the Manual of Infrastructure Engineering – Electrical (MIEE) and the relevant Australian Standards addressing general electrical installations and electrical installations in hazardous areas.
- 103. Specific considerations for the fuel facility's electrical services include:

- a. earthing and bonding – in general all large metallic structures including tanks, pipe-work, electrical panels, junction boxes and cable trays will be bonded to the main earthing system;
 - b. lightning protection will be provided in accordance with the relevant standards;
 - c. all electrical equipment will be selected to comply with the hazardous area classification;
 - d. security lighting will be pole mounted floodlight type and controlled via a daylight sensor supplemented with on/off/auto control switches; and
 - e. task lighting will be provided, including at the pump raft and pipe manifolds, controlled via local on/off switches or daylight sensors.
104. All new electrical infrastructure and switchboards will have spare capacity to allow for future growth. Sub-metering will be included in new buildings and where deemed appropriate in refurbished buildings. The meters will be monitored through the site's Building Management System, which will support an active energy management program on site.

Fire Protection

105. All construction and fire protection requirements will, as a minimum, be in accordance with the provisions of the NCC 2016, Defence MFPE, and all other applicable codes and Australian Standards.
106. **Fuel Facility.** As the fuel facility will be storing combustible product, fire protection will be provided by hydrants set at a minimum of every 60 metres. Additional fire protection would include fire extinguishers and a fire alarm system within the FQCC building in accordance with the requirements of the MFPE. While no fire detection is proposed in the tank farm, a new analogue addressable detection and alarm system, including point detection and alarm devices, a Fire Indicator Panel and occupant warning devices will be provided in the new FQCC building.
107. All new Fire Indicator Panels will be connected to the Main Fire Indicator Panel in the Barracks Pass Office.

Security

108. Advice from Defence's security authorities has been incorporated in the designs for the proposed facilities and the proposed security features will comply with the Defence Security Manual.
109. For the fuel facility, these will include:
- a. CCTV coverage of the fuel farm and tank wagon loading gantry;
 - b. a Class 2 perimeter fence to restrict unauthorised access;
 - c. a Zone 2 physical security construction and treatment for the FQCC building perimeter; and
 - d. security lighting.

ICT Services

110. ICT services will be provided to the new facilities. At the fuel facility, a communications room will be provided in the proposed FQCC building. ICT services to be provided include Defence Voice Network and Defence Restricted Network (DRN) points at each workstation, Defence Engineering Services Network points at plant locations and cabling for a fixed UHF/VHF fixed radio transmitter/receiver at the office for communicating with commercial tank ships.
111. For the wharf, these services will include:
- a. DRN; and
 - b. Navy's shore based ICT system (NINSHORE).

Environmental Sustainability of the Project

112. The Commonwealth is committed to Ecologically Sustainable Development (ESD) and the reduction in greenhouse gas emissions. Defence reports annually to Parliament on the energy efficiency targets, established by government, as part of its commitment to improve ESD. Defence also implements policies and strategies in energy, water and waste to improve natural resource efficiency and to support its commitment to the reduction of energy consumption, potable water consumption and waste diversion to landfill.

113. Where opportunities exist, the project has adopted cost effective ESD measures as a key objective in the design and development of project elements. These measures have been incorporated into the design of most aspects of the proposed works and include:
- a. **Minimising Energy and Greenhouse Gas Emissions.** Strategies to minimise energy and greenhouse gases include adopting passive building design principles for new facilities, using energy efficient heating, ventilation, and air conditioning systems, lighting and control systems, maximising natural ventilation, and installing energy management systems.
 - b. **Reducing Water Use.** Specifying water efficient fixtures and fittings will reduce potable water use.
 - c. **Improving Indoor Environment to Maximise Occupant Comfort.** Improving daylight in occupied spaces, providing shading for privacy and glare control, optimising building orientation, and using low volatile organic compounds (VOC) paints, carpets and adhesives, as well as low emission wood products will improve air quality and occupant comfort levels.
 - d. **Smart Metering.** Smart meters will be installed in accordance with the requirements of the Defence National Sub-meter Program and will be suitable for connection to Defence National Resource Data Management System.

Energy Targets

114. The requirements of Defence's SMART Infrastructure Manual and Building Energy Performance Manual have been adopted for the proposed new buildings.
115. Sub-metering will be installed to buildings and infrastructure in accordance with the requirements of the NCC 2016 Sect J, Defence's SMART Infrastructure Manual and Building Energy Performance Manual.

Compliance with Local, State/Territory and Commonwealth Water and Energy Policies

116. All buildings will be designed, constructed, operated and maintained in order to use energy and water as efficiently as possible and to comply with the following statutory and Defence requirements:
- a. Section J of the NCC 2016;

- b. Commonwealth Energy Efficiency in Government Operations Policy 2007;
- c. Department of Defence Building Energy and Performance Manual, Version 4 – December 2012;
- d. Department of Defence SMART Infrastructure Manual, Version 1 – May 2015;
- e. Department of Defence Water Management Strategy 2006-2009; and
- f. Department of Defence Waste Minimisation Policy 2007.

Workplace Health and Safety Measures

117. The Australian Government is committed to improving work health and safety outcomes in the building and construction industry. This proposed redevelopment will comply with the requirements of the *Work Health and Safety Act 2011(Cth)*, Work Health and Safety (Commonwealth Employment – National Standards) Regulations and relevant Defence policies.
118. In accordance with the *Building and Construction Industry (Improving Productivity) Act 2016*, project contractors will also be required to hold accreditation from the Office of the Federal Safety Commissioner under the Work Health and Safety Accreditation Scheme.
119. Safety aspects of the proposed redevelopment have been addressed during the design development process and have been documented in a Safety in Design Report. A Work Health Safety Plan will be required to be developed for the construction phase prior to the commencement of any construction activities. All construction sites will be secured appropriately to prevent public access, or access by unapproved Defence personnel, during the construction period. No special or unusual public safety risks have been identified.

Provisions for People with Disabilities

120. Access for people with disabilities will be provided in accordance with the NCC 2016, Australian Standard AS1428³, the DDA Act and the Defence Policy ‘Disabled Access and other Facilities for Disabled Persons’. Where the requirements of the NCC have not been met,

³ AS 1428 – 2010: Design for access and mobility

an alternative design or management strategy has been proposed and documented in an Alternative Solution Report which has been developed in consultation with Defence.

121. Access for people with disabilities is not required to some areas in the proposed new facilities, which are exempt under section D3.4 of the NCC 2016, as access for people with disabilities would be inappropriate, because of the particular purpose of the area.

Childcare Provisions

122. No additional childcare facilities are being provided under this project.

Public Transport, Local Road and Traffic Concerns

123. There is no increase to the establishment's population arising from this project.
124. During the construction phase, there will be an increase to the number of large vehicles on Larrakeyah Defence Precinct delivering materials to site and undertaking construction activities. The effects of this increase on the internal and external road networks will be mitigated through the development of a Traffic Management Plan, ongoing and regular coordination of all construction activities with local Defence authorities, and de-confliction with peak traffic times such as Defence work starting time, school drop off and pick up times. This plan will be incorporated in the proposed Construction Environment Management Plan.
125. The construction of a new front entrance under the proposed Larrakeyah Barracks Redevelopment project will significantly improve traffic congestion in Packard Street and Larrakeyah Terrace.

Impact on Local Community

126. While the proposed construction sites are within the establishment's boundaries and construction activities are not expected to cause noticeable disruption to businesses and residences located near Larrakeyah Defence Precinct, some aspects of the construction and operation of proposed wharf and fuel installation works may be of concern to the community. These aspects include:
- a. air emissions from construction and operational activities;
 - b. increased traffic on local (residential) road network during construction and operation;
 - c. increased marine traffic during construction and operation;

- d. safety issues associated with increased traffic and changes to harbour conditions;
- e. visual impact of new wharf and other development along the shoreline;
- f. visual impact of the new fuel tanks;
- g. potential for impacts on tourism and recreational activities; and
- h. noise and vibration impacts from construction and operation of the new wharf and fuel facilities.

127. A number of specialist investigations have been completed during the planning phase to assess the potential impact of the project and to ensure appropriate mitigation measures are implemented. Investigations undertaken included:

- a. An assessment of terrestrial noise to help manage community concerns and social impacts. The assessment included baseline noise monitoring at representative receptors to assess existing noise levels and develop criteria to use for the construction and operation and present mitigation options.
- b. An air quality impact assessment was completed and involved a review of the baseline climate and background air quality, an atmospheric dispersion modelling study to assess the potential air quality impacts associated with the proposed project at identified sensitive receptors, and review of mitigation options;
- c. A visual impact assessment to help manage community concerns or in response to stakeholder requirements, including an assessment of the existing visual character of the proposed wharf development and surrounding areas; assessment of impact and identification of measures to mitigate potential visual impacts.

Construction Environmental Management Plan

128. The Managing Contractor will be required to manage all construction activities, in accordance with the CEMP, to minimise any disruption to the local community. This plan will include control measures designed to mitigate potential impacts on Defence and local communities such as increased on-base and local traffic movements; noise, dust and vibration generated during construction activities; and erosion and sediment control required during the construction phase to protect the environment.

Related Projects

129. The following projects that will deliver facilities or infrastructure at Larrakeyah Barracks during this project's proposed delivery period are shown on Attachment 5. Each of the following projects have been taken into consideration when developing this proposal:

- a) The Larrakeyah Barracks Redevelopment project proposes upgrading facilities and engineering services to comply with current standards and to provide spare capacity for future developments at Larrakeyah Barracks. The redevelopment includes upgrading of critical engineering trunk services required for the proposed wharf and fuel facility.
- b) The Offshore Patrol Vessel (OPV) Facilities Project proposes to extend the Attack Wharf and strengthen and upgrade the Attack and Fremantle Wharves to support the larger OPV. It also proposes to provide new working accommodation, maintenance and support facilities. The OPV Facilities project will require shore power to the new outer wharf and quarantine fuel facilities located in the new Fuel facility compound.
- c) The Joint Health Command Garrison Health Facilities Upgrade project will deliver a permanent health facility at Larrakeyah Defence Precinct to replace the existing interim facility. The PWC Hearing for this project occurred in January 2018 and subject to approval, construction is currently planned for the period July 2018 to June 2019.
- d) A component of the Defence Terrestrial Communications Network Facilities Project will occur at Larrakeyah Defence Precinct.

Cost Effectiveness and Public Value

Outline of Project Costs

130. The estimated out-turned cost of this project is \$272.561 million, excluding Goods and Service Tax. The cost estimate includes the construction costs, management and design fees, furniture, information communications technology, fittings and equipment, contingencies, and escalation allowance.
131. An increase in the net personnel operating costs of \$4.1 million per annum is anticipated due to the addition of new facilities and infrastructure which will require additional maintenance, cleaning and utilities expenses.

Details of the Project Delivery System

132. A Project Manager / Contract Administrator (PM/CA) has been appointed by the Commonwealth to manage the projects works and associated administration of the contracts during the Planning Phase. Subject to Parliamentary approval, value for money assessments and satisfactory performance of the PM/CA, the Commonwealth may extend the PM/CA Contract into the delivery phase of the proposed works.
133. A Managing Contractor has been engaged to undertake the design of the facilities, which have been completed to 50% Schematic Design stage. Subject to Parliamentary approval of the project, value for money assessments and satisfactory performance, the Commonwealth may extend the Managing Contractor's contract into the delivery phase of the project. The Managing Contractor form of delivery provides the Commonwealth with buildability input into the design while promoting opportunities for small to medium enterprises by sub-contracting design and construction trade packages.

Construction Schedule

134. Subject to Parliamentary approval of the project, construction is expected to commence in October 2019 and be completed in June 2023.

Public Value

135. The proposed facilities project will contribute significantly to the Navy's ability to provide timely logistic support to RAN and foreign warships and to other operational elements of the ADF when required.
136. Existing infrastructure will be re-used where it has been possible to meet the users' requirements and to minimise capital costs.
137. The project will employ a diverse range of skilled consultants, contractors and construction workers and may provide opportunities for up-skilling and job training to improve individual skills and employability on future projects. The project will employ a maximum workforce of approximately 240 personnel and an average construction workforce of approximately 130 personnel.

Revenue

138. No revenue is expected to be derived from this project.