

Historic and Cultural Heritage Values

A study of the historic and cultural heritage of East Arm and the Darwin Harbour region has been undertaken for the EAW expansion project. The scope of the study included a:

- desktop study describing the legislation, physical and environmental setting, history of Darwin and environment, World War II (WWII) East Arm heritage, maritime cultural heritage, Indigenous heritage, and
- field survey (undertaken by cultural heritage specialists accompanied by a Larrakia representative).

The objectives of the study were to:

- Locate and record prescribed archaeological objects or places as defined under the NT *Heritage Conservation Act 1991* (HCA).
- Assess the nature and distribution of any archaeological materials located.
- Assess the significance of any archaeological places or materials according to the heritage significance criteria established under the HCA.
- Advise DLP regarding mitigation of impacts on any archaeological places or objects.
- Advise DLP on the future management of any located places or objects.

This chapter presents a summary of the historic and cultural heritage study (refer **Appendix C**). Commitments relating to heritage, based on the findings and recommendations of this study, are also included.

18.1 Legislative and Social Basis for Cultural Heritage Protection

Cultural heritage conservation legislation is complicated in Australian jurisdictions. This is the result of the evolution of the Australian constitutional framework, particularly the inclusion of new themes, such as Aboriginality, heritage and the environment into an existing regulatory framework. The result of this evolutionary change is that the Commonwealth retained responsibility for Indigenous issues, including some cultural heritage issues, while the States and Territories retained control of land use and development control.

Cultural heritage in the NT is protected via several different legislative mechanisms. Protected cultural heritage places can be divided into three main themes, Indigenous sacred sites, Indigenous archaeological places and objects, and general heritage places. Cultural heritage conservation in the NT is regulated at the Territory and Commonwealth levels. Local government has limited powers regarding the protection of cultural heritage places.

18.1.1 Commonwealth Acts

Native Title Act 1993

Aboriginal cultural heritage moved to the Commonwealth's jurisdiction following the Constitutional referendum of 1967. The result of this referendum amended Section 51 and gave the Commonwealth powers to legislate on Aboriginal issues. The *Native Title Act* gives some Aboriginal people the ability to access and use traditional lands for some purposes. Agreements, known as Indigenous Land Use Agreements, may be entered into by Native Title claimants and other interested parties on the nature of land use and access to land, including the protection of cultural heritage resources.

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Aboriginal and Torres Strait Islander Heritage Protection Act 1984

This Act is a site protection Act of 'last resort', meaning that the Act is meant to provide emergency protection for Aboriginal and Torres Strait Islander heritage sites when all other avenues have been exhausted. Generally an Indigenous group must apply to the Minister to have protective covenants placed over an area or site. The power to provide such protection resides in Section 51 of the Constitution giving the Commonwealth powers on Aboriginal issues. Therefore this Act may override all State and Territory cultural heritage acts.

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act commenced 16 July 2000. On 1 January 2004, a new Commonwealth heritage regime came into effect following amendments to the EPBC Act. The legislation proscribes the criteria for listing National Heritage places and Commonwealth heritage places and management principles for National Heritage and Commonwealth Heritage places. The Heritage Division of Department of Environment and Heritage is the Commonwealth agency responsible for the administration of the EPBC Act and providing support to the Australian Heritage Council. The Australian Heritage Council is to be supported by an Indigenous Heritage Committee to advise the Council on sites of Aboriginal significance. The new Commonwealth heritage regime has created two new heritage registers, and is retaining the Register of the National Estate as a database.

The Historic Shipwrecks Act 1976 (Historic Shipwrecks Act)

The *Historic Shipwrecks Act* protects historic wrecks and associated relics that are more than 75 years old and in Commonwealth waters extending from below the low water mark to the edge of the continental shelf. Each of the States and the NT has complementary legislation, which protects historic shipwrecks in State waters, such as bays, harbours and rivers. The Minister for the Environment, Heritage and the Arts can also make a declaration to protect any historically significant wrecks or articles and relics which are less than 75 years old.

As the Commonwealth has no powers in regards to land use, the power emanating from the Act resides in the Commonwealth's powers to negotiate funding and other arrangements in relation to conservation of heritage places.

18.1.2 Northern Territory Acts

The Heritage Conservation Act 1991 (Heritage Conservation Act)

This Act provides a mechanism to conserve heritage in the NT and the agency responsible for the administration of this Act is Heritage Conservation Services, NRETAS. The Act provides for the creation of a Heritage Advisory Council (HAC). The HAC assesses and recommends places to the Minister for the Environment for inclusion on the NT Heritage Register.

NRETAS plays a major role in promoting heritage conservation in the NT and maintains the NT Heritage Register. The *Heritage Conservation Act* provides legislative protection for declared heritage places in the NT. The *Heritage Conservation Act* also provides for the nomination and declaration of places and objects as 'Heritage Places' if they are significant to the NT. There are criteria that are to be applied to such places to assess whether they meet a sufficient level of heritage significance.

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The Northern Territory Aboriginal Sacred Sites Act 1989 (Sacred Sites Act)

The AAPA administers the *Sacred Sites Act*, the aim of which is the protection and prevention of the desecration of sacred sites in the NT. A sacred site is defined as a site that is sacred to Aboriginals or otherwise of significance according to Aboriginal tradition, following the ALRA. Tradition is narrowly defined to spiritual beliefs and customs of Aboriginal people and generally does not include practices arising from traditional camping and living places, historic places, Indigenous archaeological sites, or hunting and gathering activities.

Included in the Act is the provision of a clearance mechanism for Government, industry and the public to seek advice regarding the presence of sacred sites. The AAPA does this through a Site Registration and Authority Certificate process and maintains a register of sacred sites. The AAPA consists of a Board made up of members from the Indigenous community which decides whether sacred sites meet a registration test.

The functions of the Act are undertaken by Authority staff, such as preparation of site registration reports and Authority Certificate assessments. Assessment for an Authority Certificate is undertaken by anthropological staff members of the Authority in consultation with Aboriginal Custodians. The Authority Certificate should not be viewed as a *de facto* social impact statement from Traditional Owners (TOs). The Authority consults with Aboriginal Custodians only in relation to sacred sites as defined by the Act and is not concerned with other social impacts on Indigenous communities.

Sacred sites are afforded a blanket form of protection under the Sacred Sites Act whether they are registered or not. However a sacred site that has the status of an AAPA 'recorded site', or is recorded in the course of a development assessment must meet the formal registration standards applied by the AAPA Board.

The Aboriginal Land Rights (NT) Act 1976

The ALRA establishes the role of Aboriginal Land Councils in the NT. The ALRA also places protective measures on sacred sites within Aboriginal Land Trusts, but cannot protect sites outside of Aboriginal Land Trusts. The Land Councils are required to maintain a Land Information Register (LIR), which usually includes details of Traditional Aboriginal Owners and cultural site information. This register is not available for public searches.

The definition of Aboriginal tradition for the purposes of ALRA is not as narrowly prescribed as that enforced by the AAPA to just spiritual beliefs and customs of Aboriginal people. ALRA allows for a much broader inclusion of culturally significant sites that are associated with practices arising from traditional camping and living places, historic places, Indigenous archaeological sites, or hunting and gathering activities.

18.2 Register Searches

18.2.1 Northern Territory Heritage Register

A search of the NT Heritage Register indicated that no nominated or declared heritage places are located within the immediate EAW expansion area. It was noted that the following declared heritage places are located within 5 km of the proposed development zones:

- East Arm Quarantine Anti-Aircraft (AA) battery;

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- The *Kelat* shipwreck; and
- WWII East Arm Quarantine AA site.

Other notable historic places include the WWII Catalina Wreck Site #6 (refer Section 18.6), which is subject to Interim Conservation Orders under the NT *Heritage Conservation Act*. Additionally, the following WWII Catalina flying boat wreck sites, located between 1.5 km and 5 km from the proposed development area have been nominated to the NT Heritage Register (refer also Section 18.6). Catalina 6 (US Navy Patrol Wing 10) is not shown in maps owing to sensitivity regarding its location and possible looting. In this study, Catalina wrecks 1, 2, and 6 are of the main concern regarding the proposed East Arm development works.

- WWII Catalina aircraft wreck sites: Catalina wreck sites 1 to 6
 - Catalina 1: RAAF A24-1
 - Catalina 2: RAAF A24-69
 - Catalina 3: RAAF A24-206
 - Catalina 4: US Navy Patrol Wing 10 28-5MNE
 - Catalina 5: US Navy Patrol Wing 10 PBY-4
 - Catalina 6: US Navy Patrol Wing 10 PBY-4.

18.2.2 Northern Territory Archaeological Site Database

As presented in Table 18-1 and Figure 18-2, a search of the NRETAS Site Database indicated that there were a number of previously recorded archaeological sites located within the EAW area. These sites include Aboriginal shell middens, historic sites and WWII infrastructure features. At the time of surveying, the Heritage consultant was unable to relocate East Arm 1 and concluded that this site was destroyed in the course of the EAW development. (It is confirmed that during the development of Stage 1, sites unable to be avoided were identified, catalogued, photographed and destroyed).

Table 18-1 NRETAS Database Archaeological Sites within East Arm Project Area

Site Name	Museum No.	Easting	Northing	Zone	Map sheet	Map Sheet	Site Type
East Arm 1	50730020	706500	8618600	52	5073	Darwin	Shell midden
East Arm Scatter 1	-	707738	8619267	52	5073	Darwin	Historic site / object
East Arm Scatter 2	-	707850	8619500	52	5073	Darwin	Historic site / object
East Arm Quarantine Station	50730021	706600	8619000	52	5073	Darwin	Historic object/place
East Arm 2	50730065	707100	8618500	52	5073	Darwin	Shell midden, isolated stone artifact
East Arm 3	50730066	705800	8619300	52	5073	Darwin	Shell midden

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18.2.3 Sacred Sites Register Inspection

The Proponent has had the previous AAPA certificate verified, and has submitted a new application for areas outside the coverage of the original certificate (**Appendix R**). AAPA has not yet provided a response to the application to date.

18.2.4 Australian Heritage Database

There are no places listed on the Australia Heritage Database within the proposed study area.

18.2.5 Australian National Shipwreck Database

As presented in Table 18-2 and Figure 18-1, there are three shipwrecks within 1–1.25 km of the proposed development, and three further wrecks located between 1.25 km and 3 km to the southeast (including the Kelat shipwreck, refer Section 18.2.1). All six wrecks are registered on the Australian National Shipwreck Database. In addition, an unidentified shipwreck is located to the south-west of the proposed railway loop; this is discussed further in Section 18.10.1. All wrecks are outside Project development areas.

Table 18-2 Registered Historic Shipwrecks, East Arm

ID	Vessel Name	Vessel Type	Year Built	Year Wrecked	Type of Wreck	Construction Material
3408	Con Dao 3	Unrecorded	Unknown	1978	Unknown	Wood
3427	East Arm Barge 2	Barge	Unknown	1945	Unknown	Not Recorded
3428	East Arm Two Part Barge	Barge	Unknown	1945	Unknown	Not Recorded
3429	Vietnamese Refugee Boat 1	Unrecorded	Unknown	1976	Stranded	Not Recorded
3430	Vietnamese Refugee Boat 2	Unrecorded	Unknown	1976	Stranded	Not Recorded
3477	Kelat	Sailing	1881	1942	Japanese air raid	Steel

18.3 History of Darwin and its Environment

Darwin represents one of the most intensively occupied areas in the NT for the past 150 years. The history of the Darwin region has been well documented in Powell (1988) and Carment (1996) and a summary of the history of Darwin City are compiled from these references. European presence in the NT was beginning to have a significant increase. Darwin, known as Palmerston until 1911, was established in 1869.

The city and port facility were to be located on a peninsula in Darwin Harbour and become an economic and administrative centre for the NT. In 1872 the Overland Telegraph line was established, cementing the small town's existence. Following this event, a port facility was constructed and a gold rush period began in the 1870's. A railway was built to Pine Creek in 1889 and further development of the town continued. Many of the historic structures in Darwin date from this period.



Source: EarthSea, 2011

Figure 18-1 Registered/Recorded Shipwrecks and sites from the NRETAS Archaeological Site Database, East Arm

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The development of the mining and pearling industries and the domestic economy attracted Chinese, Japanese, Phillipinos and Malay workers and families to settle in Darwin. Middle class Europeans in Darwin managed to establish a social hierarchy, which in turn segregated the locations that people settled in the township. This led to the demarcation of areas as being the white administration and residential zones the establishment of a “Chinatown” and shanty area where the dispossessed Larrakia people lived.

In 1911 administration of the NT was transferred from SA to the Commonwealth Government. A build-up of defence personnel in the 1930s saw the population of Darwin increase from a few thousand to approximately 15,000 by the outbreak of hostilities in 1941. WWII developments had a significant impact on the development of Darwin. During WWII many developments occurred in and around Darwin. The major developments were the construction of the Stuart Highway in 1941, air force airstrips, the stationing of large numbers of military personnel and use of the Harbour for naval purposes.

Destruction has also been as significant in the history of Darwin as development. Cyclones in 1897 and 1937 caused much damage and rebuilding. WWII also was a period of destruction by bombing, and rebuilding. Much debris was left over from WWII and was not dealt with until 1951. The post-war period saw Darwin rebuilt; the existence of a Chinatown ended, however. Then in 1974, Cyclone Tracey had a large impact on the appearance and development of Darwin in the following decade.

As a result of the general historical events and growth of the township of Darwin, it is possible to predict the types of archaeological materials associated with each period. Table 18-3 attempts to list the types of materials that may be encountered in the East Arm area.

Table 18-3 History and likely Relics Encountered At Darwin Archaeological Sites.

Period	History	Archaeological Relics
1869- 1911	Includes occupation of Darwin, specifically the 1880's period during the gold rush era, first major buildings.	Chinese pottery and ceramics, hand-made bottles and fragments, match tins, tobacco tins, gin bottles, Chinese artefacts, European ceramics
1911-1939	Commonwealth administration, Vestey's era, build up of Military, depression	Machine made modern bottles and glassware,
1939-1945	WWII construction, damage and reconstruction	spent ammunition casings, WWII beer bottles, other bottles & glassware, plain ceramics, metal fragments (e.g. star pickets, wire), building fragments (e.g. bricks, glass, corrugated iron, tiles, pipes, unexploded ordnance [UXO])
1946-1960	Post War Reconstruction	building materials and discard ie bricks, glass, corrugated iron, tiles, pipes, food & beverage refuse
1961-1974	Growth of Darwin as a regional capital	Typically identifiable as modern manufactured items
1974-1980	Cyclone Tracy and modern development of Darwin	Building material discard, window glass, asbestos fibrous cement sheeting, corrugated iron, drink bottles, food and beverage refuse. This material was disposed of at several dump sites around Darwin.

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18.4 WWII Archaeological at East Arm

There are three previously recorded WWII sites located in the East Arm area (refer Figure 18-2). WWII activities in the general area involved RAAF flying boat activities, covert operations training area and headquarters, and Army static air defence positions.

WWII sites on Middle Arm are relevant to East Arm as these locales were often supplied and linked to the bases on East Arm, especially the Z Force operations and anti-aircraft search light (AASL) positions.

Static air defence including heavy anti aircraft (HAA) positions consisting of four 3.7 inch guns were established at Quarantine (East Arm) and on Middle Point. In support of these HAA positions were a series of search light batteries and positions located from Middle Point and along Middle Arm (refer Table 18-4).

Table 18-4 Previously Recorded WWII Sites in The East Arm Area

Name	Theme	Description
East Arm Flying Boat Base	Air operations: Offence	Established in 1942 the base was used by the US Navy and later RAAF Catalina squadrons. Ramp, hangar foundation slabs and some artefact material remain under threat by the East Arm Port development
Lugger Maintenance Section	Land operations: covert	Former 'Z' Special Unit base for covert operations against the Japanese from 1942, utilising the 'Snake' boats and RAAF and USAAF aircraft. Lugger ramp and work area, main camp and associated infrastructure and some artefact material remain. Under threat by East Arm Port development - access unknown
'Quarantine' HAA	Defence: air static	Declared Heritage Place. Constructed by the 14th HAA Bty and a Pioneer Company, the site featured four 3.7-inch A-A guns and command infrastructure. Extant gun sites, command post, camp area, extensive artefact material and fortified entry point remain. Evidence of searchlight battery occupation of high ground to the south exists in artefact material.
Middle Point AASL	Defence: air static	Searchlight battery positions Darwin Harbour - Sites feature foundation slabs, reinforced positions, pathways, artefact material including refuse pits and dumps. Access to the sites is limited due to their remote nature.
Middle Point AASL	Defence: air static	Searchlight battery positions Darwin Harbour - Sites feature foundation slabs, reinforced positions, pathways, artefact material including refuse pits and dumps. Access to the sites is limited due to their remote nature
Peak Hill Z-Force Training Camp	Land operations: covert	Z-Force established a training area on Wickham Point. Site consists of series of concrete slabs, concrete tiled hut bases, slip-way, well, and refuse areas and pits.

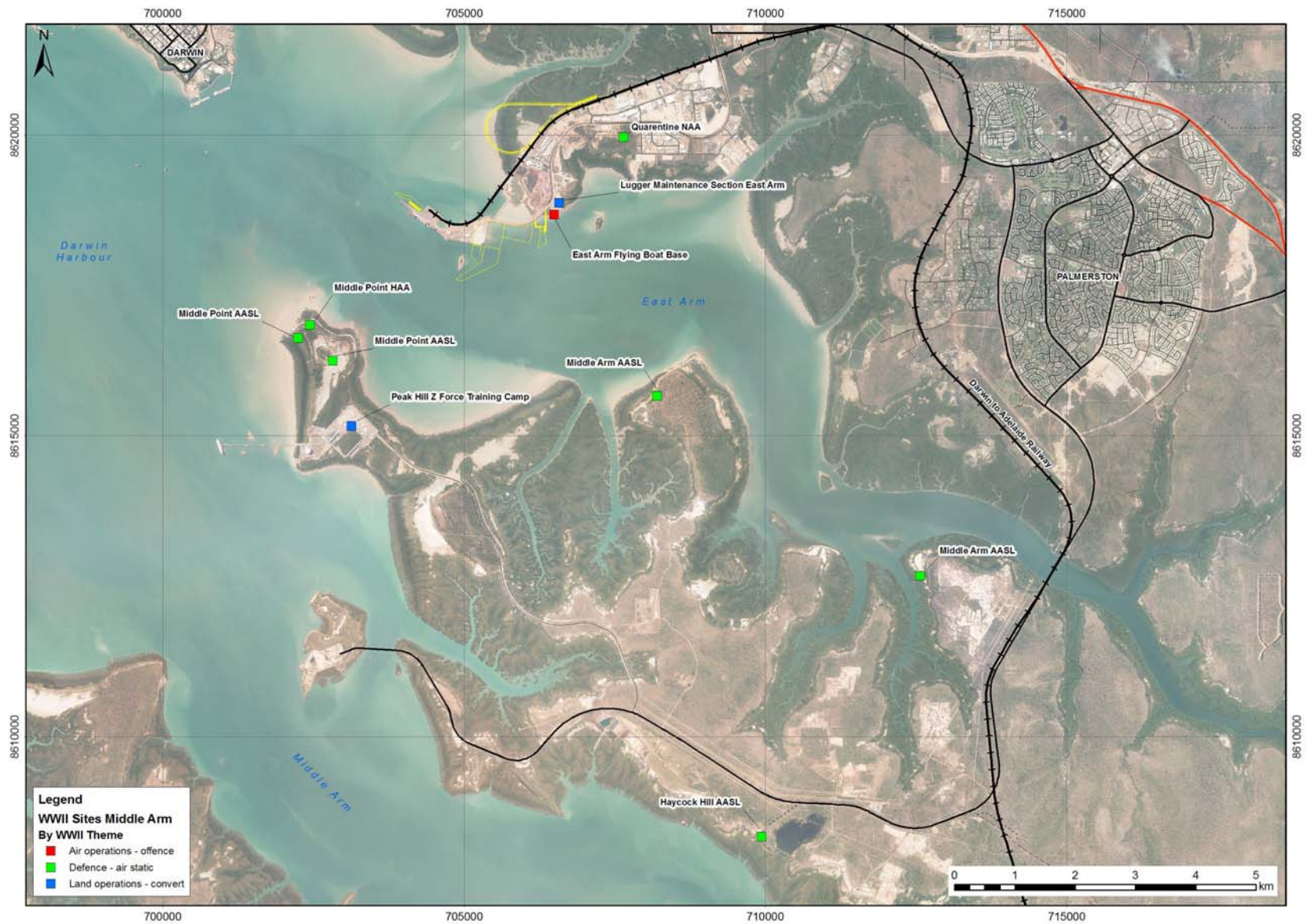


Figure 18-2 Previously recorded WWII Sites in the Middle Arm and East Arm Areas

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18.4.1 RAAF Catalina Squadrons and Flying Boat Base at East Arm

The Royal Australian Air Force (RAAF) Flying Boat Base occupied the northern and southern portions of Quarantine Island. The accommodation area was sited on the north end of the island and the operations area and workshops to the south. The following is an extract from the Conservation Commission of the NT publication on the East Arm Flying Boat Base:

“During 1942-43, Darwin’s East Arm was developed by No61 Works Wing to facilitate the long range mining and bombing operations carried out by the Catalina Flying Boats throughout the South West Pacific Area. Prior to this The American Navy had made use of the site to load Catalina’s with magnetic mines.”

Numbers 20 and 42 Squadrons operated as part of No 76 Wing with Catalinas mining harbours, performing air sea rescue duties, and generally harassing the enemy, which by then was retreating to the home islands. Despite No 42 Squadron moving east to Melville Bay near Gove in July 1944, the unit maintained a detachment at East Arm and, with the cessation of hostilities, Catalinas were involved in the planned evacuation of prisoners of war from Singapore and other areas.”

The Flying Boat Base was constructed in late 1942 and was ready for occupation on 23 September 1943 (Dermoudy, 1993). No. 2 Flying Boat Maintenance Unit was stationed at the Quarantine Island Flying Boat Base. In 1943 Catalina Squadrons were moved to Darwin to facilitate the long range mining and bombing operations in the ‘North West Area’. On the 1 June 1944 No. 42 Squadron joined 43 Squadron at Darwin moving to the East Arm flying boat Base (Alford, 1991).

According to Dermoudy (1993) the Catalina aircraft were also used for air-sea rescue and covert insertion operations. Catalinas provided support for the Operations of 200 Flight, a unit formed for use by the Allied Intelligence Bureau and its ‘Z’ Special Unit operatives (Alford, 1991). Alford (1991) provides a description of the RAAF Catalina operations:

“...the Catalina flying boats came and went for anything up to 24 hours at a time. Their missions, be they rescue, bombing or mine laying, were hazardous in the extreme; the ‘Cats’ were slow, vulnerable and lacking proper defences, however they managed to sink shipping and bottle up the Japanese with precision mine laying as far north as the Philippines, Hong Kong and Taiwan.”

The last mine-laying operation was conducted on 30 July 1945 (Alford, 1991). The last weeks of the War were spent harassing the enemy wherever possible. At the end of hostilities of WWII, Australian Prisoners of War held in Singapore were repatriated to Australia via the flying boats from Darwin. According to the Australian Prisoner of War Reception Group, approximately 13,428 Allied personnel were repatriated from Singapore, the majority by hospital ships.

Catalinas and other aircraft evacuated only 1,244 personnel, as only the fittest ex-prisoners of war were able to cope with this method of transport. RAAF flying boat operations ceased on Quarantine Island on 1947 when No. 112 Air-Sea-Rescue Flight disbanded in October. This marked the end of Catalina operations from Quarantine Island.

18.4.2 Archaeology of the RAAF Flying Boat Base

There are few remaining terrestrial structures from the RAAF Flying Boat Base. These consist of the crash boat slipway, remnants of a jetty, a tarmac and parking apron, and ramp. The former crash boat slipway is a substantial structure consisting of a concrete structure and steel rail for the slipway trolley.

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This slip resembles in construction a lifeboat slipway common in Britain during the late 19th and 20th centuries. It is likely that the crash boat resided on the slip until launch, and then was retrieved via a winch and trolley. There are no visible remains of the trolley or the winch / cable. There are a number of extra rails lying parallel to the slip, possibly from the upper slip way where the rails are absent, or from the bituminised Catalina apron to the west. The concrete ramp used to bring Catalina Flying Boats out of the water is located to the south and below the tarmac and apron.

Located higher and to the north of the Crash Boat Slipway and the Catalina Ramp is a large level area with what appears to be old bitumen seal. Part of the apron has been cross sectioned by sea erosion showing the compressed gravel surface preparation. There is only one layer evident in this erosion section, indicating that the current surface is most likely to be the original 1943 sealed surface for the Catalina tarmac and apron.

The remains of the Flying Boat Base jetty are located to the north of the Crash Boat Slipway and approximately 30 m south of the location of the Lugger Maintenance Section (LMS) Jetty. According to the 1946 map the Flying Boat Base Jetty was a much larger structure than the jetty used by the LMS.

It is difficult to determine from the remains of the structure at low water springs the actual length of the original structure. There are two large mooring blocks located near the Crash Boat slip and the remains for the Flying Boat Base Jetty. It is possible that one or both these features relate to the WWII period of use. Both are constructed in multiple concrete pours, usually an indicator of age.

18.4.3 Anti Aircraft Operations at East Arm

When enemy air action against mainland Australia was anticipated, the Australian military command allotted nine AA Composite Regiments for mobile AA defence of Darwin. In early August 1941 reconnaissance parties investigated Darwin Harbour to seek out suitable search light battery locations.

Places surveyed included Talc Head, Picnic Cove and Swires Bluff on the eastern side of the Cox Peninsula. Other areas including an unnamed island on the West Arm of the Harbour, Flagstaff Hill, Channel Island, Middle Point and East Arm Island were also selected as AASL locations.

18.4.4 Z Special Unit at East Arm

A section of the Z Special Unit or Services Reconnaissance Department (SRD) operated from Darwin during WWII, with the area of operations mainly in East Timor and Borneo. Although SRD had a limited role in the South West Pacific sphere, it attracts greater public interest (being a Special Forces type operation) compared to the involvement of other divisions of the armed services.

The LMS site at Quarantine Island, East Arm was allocated to SRD in April 1943. SRD was satisfied with the choice of location, as secrecy was a priority. LMS was the site of all SRD operations and administration for the Darwin area. Attempts to establish a satellite camp for training purposes began in July 1943 after SRD took over the LMS facility at Quarantine Island. By July 1943 Peak Hill (on the end of Wickham Point) was selected as the satellite training camp and LMS applied to Darwin Fortress Command for Peak Hill to be allocated for SRD use.

Timorese civilians and Portuguese nationals began arriving in Darwin after the Japanese invasion of Timor in February 1942. The last major evacuation of Timorese occurred in December 1942 when the

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Australian forces finally withdrew from Timor. SRD specifically organised the evacuation of Timorese civilians they considered as candidates for inclusion in future operations in Timor.

Timorese civilians formed a work group at the LMS base at East Arm. Very little is known of the Timorese involvement in Darwin during WWII. However it is known that many of the Timorese evacuees were organised into labour groups by Netherlands Forces Intelligence Section to conduct works in the Darwin Fortress area. It is assumed that they provided labour for capital works and general camp duties and possibly assisted Dutch / Australian Squadrons operating in the NT.

18.4.5 Archaeological Features of the Lugger Maintenance Section

A considerable number of features still remain from the LMS at East Arm (refer Figure 18-3). Amongst the features exist the slipway feature, concrete structures for workshops, engine rooms, battery charging rooms, mess complex, latrines, washhouse, stores, and various building foundations. The site is in a ruinous state.

Amongst the ruins are scattered piles of refuse comprising broken glass, bricks and other masonry, broken fibrous cement, and rusted tin. Around the slipway pieces of tin, aluminium and other metal off cuts from the workshops can be found.

18.5 Maritime Cultural Heritage – Darwin Harbour

Little is known of previous non-Indigenous use of the Darwin Harbour prior to the settlement of Darwin in 1869. The harbour was noted and briefly visited by colonial explorations during the 19th Century. Following Goyder's landing in 1869 in Darwin at the base of Fort Hill, the southern tip of the Darwin peninsula has been a major hub of shipping activity through to the present for northern Australia. Figure 18-4 shows Fort Hill Wharf circa 1869.

During the 1870s and 1880s the Fort Hill area was used as the landing for ships' passengers and cargo accessed by a derelict timber and stone jetty and later the wreck of the vessel *Gulnare*. The bay formed by Stokes Hill and Fort Hill peninsulas remained essentially as a walkway along the foreshore and a jetty along with railway head were established at Stokes Hill.

By the late 1930s the threat posed by the Japanese throughout the Pacific was being taken seriously by the Australian Government. A rapid build up of defences commenced as early as 1932 with developing the naval oil tanks at Stokes Hill, thus strengthening the area as a major hub for naval shipping. WWII saw a major build up naval and shipping activity from 1939 to 1945. The Stokes Hill Wharf area continued to be in commercial and naval service through to today.

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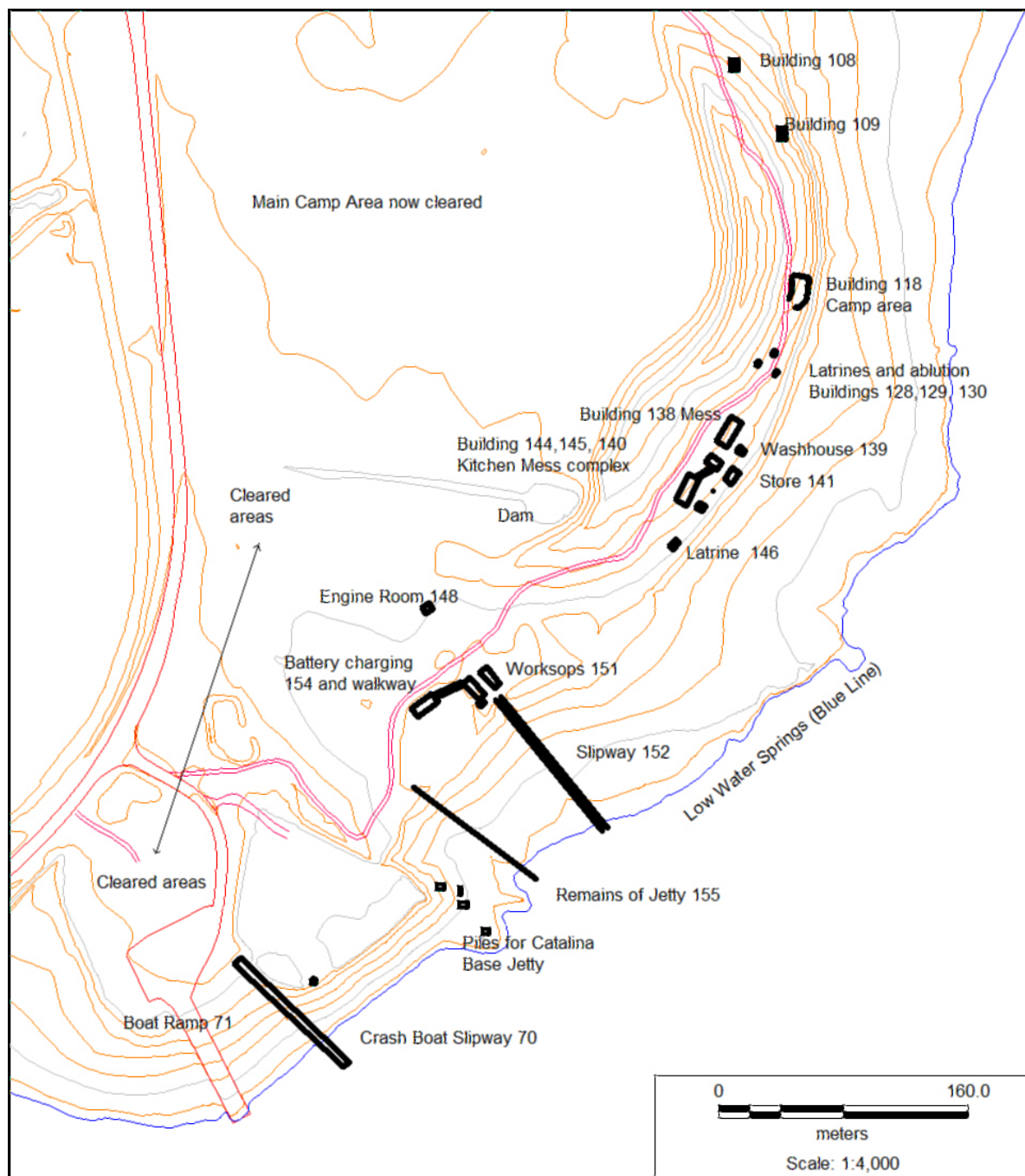


Figure 18-3 Map showing the Location of WWII Archaeological Features at the LMS Base

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Source: EarthSea, 2011

Figure 18-4 Fort Hill Wharf Area Circa 1879

18.5.1 Shipwrecks in Darwin Harbour

Types of ship that are known to have wrecked in Darwin Harbour include schooners, pearling luggers, a number of larger steel ships such as those sunk in WWII, several early types of steel steamship, small fishing vessels, a tank barge, trawlers, yachts, and miscellaneous small vessels.

Wrecking events for ships and aircraft can happen at any time, largely owing to accidents or poor maintenance and lack of seaworthiness. Gales and severe storms were known to have wrecked various water craft from time to time on the harbour. However, in the case of Darwin Harbour, there have been a number of significant wrecking events that have taken place which have contributed to the maritime archaeological record.

These events are:

- 1897 Cyclone – approximately 6 vessels lost.
- WWII – approximately 10 vessels lost and a number of aircraft.
- 1974 Cyclone Tracy – approximately 20 vessels lost.

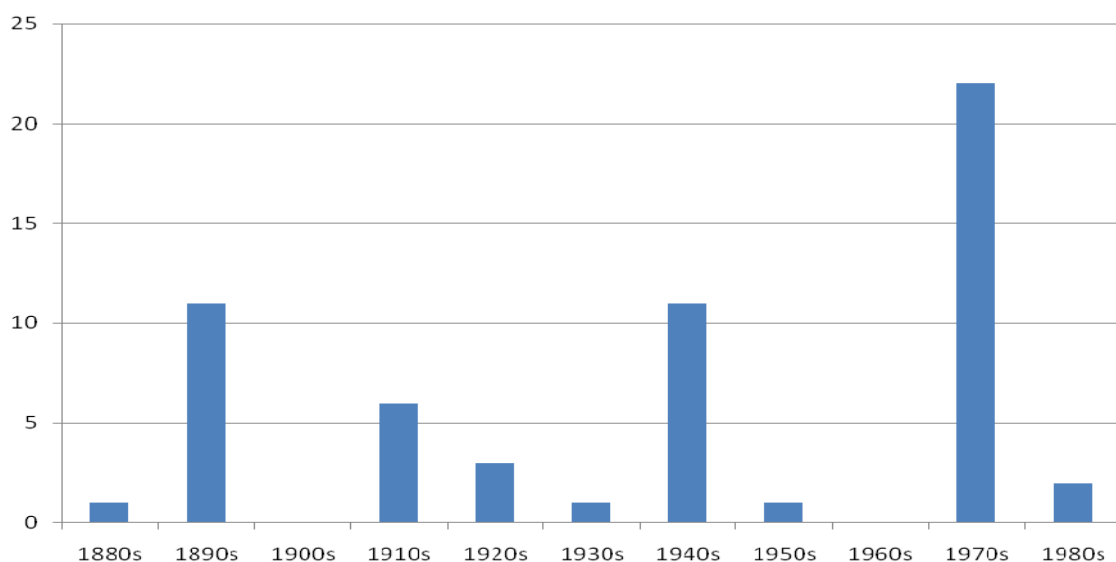
Figure 18-5 shows the distribution of reported shipwrecks by decade in Darwin Harbour. Noticeable increases are seen in the decades of the major wrecking events. For example, on 7 January 1897 a cyclone killed approximately eighteen people on land and another ten at sea, and destroyed nineteen of the twenty-nine pearling luggers at anchor.

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The most famous of the wrecks in Darwin Harbour date to WWII. Australia experienced the first attack on its mainland territory on 19 February 1942 with the Darwin bombing. 188 Japanese planes attacked both land and offshore targets. This first attack lasted forty minutes and was followed by a second only an hour after the first ended. It is estimated that 243 Australians and allies were killed that day. Six Allied ships sunk in Darwin harbour as a result of that first air raid on Darwin in 1942.

Cyclone Tracy accounts for the majority of shipping lost in Darwin Harbour, and like the 19 February 1942 bombing raids, resulted in a major loss of life. These vessels were generally smaller than the capital ships sunk in WWII. The large proportion of ships that were wrecked included fishing trawlers, ferry boats, yachts, and two Royal Australian Navy (RAN) naval patrol boats.

Since Cyclone Tracy, the main contributor to shipwrecks in Darwin Harbour can be attributed to government policy rather than a particular wrecking event. At the end of the Vietnam War, dozens of Vietnamese refugee boats began to arrive at Darwin Harbour. Generally the ships and boats were in very poor condition and were scuttled, burnt, or left to rot in the mangroves of Darwin Harbour. Later border protection policy and apprehension of illegal Indonesian fishing vessels has resulted in similar vessel destruction.



Source: EarthSea, 2011

Figure 18-5 Chart Showing Reported Wrecks per Decade

Further wrecks continue to be identified in Darwin Harbour with the recent discovery of the Huddersfield (yet to be confirmed), a 174 t schooner was lost in Frances Bay in December 1928.

18.6 Flying Boat Wreck Sites in the East Arm Area

There are six PBY Catalina flying boat wrecks in the general East Arm area (refer Table 18-5 and Figure 18-6). These Catalina flying boats sank during WWII. Of the 6 wrecks, 3 belong to the United States Navy Air Force and 3 to the RAAF. Most notably the 3 US Navy Catalina flying boats were sunk on the 19 February 1942 during the first major Japanese air raid on Darwin.

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Table 18-5 List of PBY Catalina Flying Boat Wrecks in the East Arm Area

Name	Also known as	Location	Owner	Comments
Catalina 1	RAAF Catalina A24-1	Exposed at low tide in East Arm, Darwin Harbour	Commonwealth	Crashed in 1945 on mission to Singapore to retrieve POW's
Catalina 2	PBY-5A model A24-69 BAN 34056	Submerged in East Arm, Darwin Harbour	Commonwealth	Caught fire by accident on 14 December 1945
Catalina 3	PB2B-1 model A24-206 BAN 44217 ex RAF JX611	Submerged in East Arm, Darwin Harbour	Commonwealth	Sank from accidental depth charge explosion 20 th June 1945
Catalina 4	28-5MNE #41 Ex Y41 Netherlands	Submerged in East Arm, Darwin Harbour	US Navy	Sunk in first air raid 19 Feb 1942 Only 1 of this type in harbour
Catalina 5	PBY-4 Model Unknown PBY 4	Submerged in East Arm, Darwin Harbour	US Navy	Sunk in first air raid 19 Feb 1942 (1 of 2 in harbour)
Catalina 6	PBY-4 Model Unknown PBY 4	Submerged in East Arm, Darwin Harbour	US Navy	Sunk in first air raid 19 Feb 1942 (1 of 2 in harbour)

18.6.1 19th February 1942 and the US Navy Catalina Aircraft

The United States Navy had Catalina aircraft stationed in Darwin with Patrol Wings 10 and 22. According to Alford (1991) the first aircraft destroyed by the Japanese force that bombed Darwin on the 19 February 1942 was a Catalina of the US Navy Patrol Wing 10. The Catalina was shot down off the northern tip of Bathurst Island.

During the first air raid by the Japanese on Darwin a total of 23 ships were sunk or badly damaged. It was reported that some Japanese aircraft had also crashed into the sea (Alford, 1991). The Japanese air raid on 19th February accounted for the loss of three US Navy Catalina aircraft in East Arm.

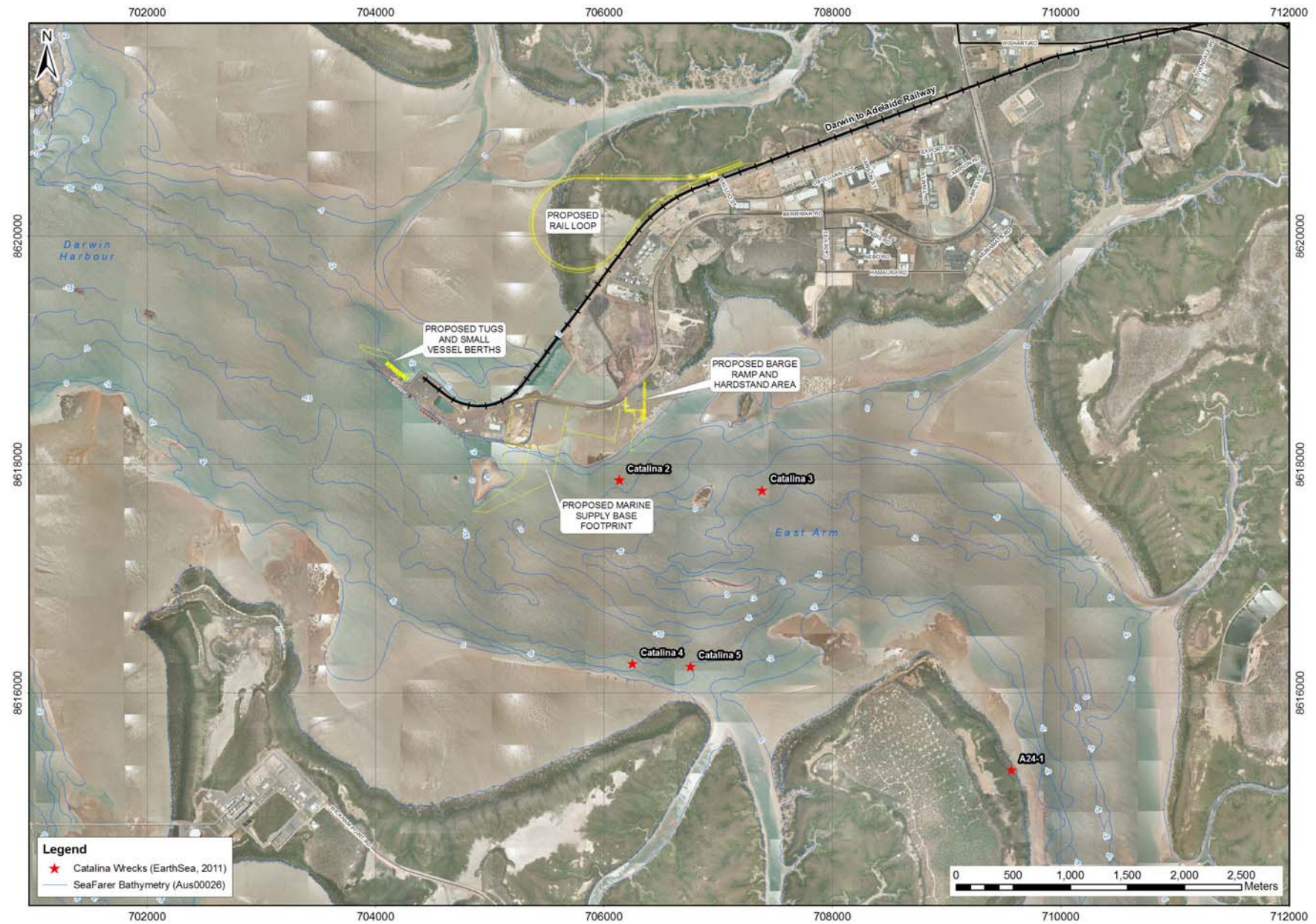


Figure 18-6 Location of Wrecked Catalina Flying Boats – Catalina 6 not shown owing to request from NTG

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18.6.2 RAAF Catalina Aircraft Wrecks

The wreck site known as 'Catalina 2' is a PBY-5A (M) Catalina flying boat. It has been identified as RAAF aircraft A24-69 (Bureau of Aeronautics Number: 34056). This aircraft caught fire by accident on 14 December 1945.

The wreck site known as 'Catalina 3' is a PB2B-1 Catalina flying boat and has been identified as RAAF aircraft A24-206 (Bureau of Aeronautics Number: 44217; Ex-Royal Air Force JX611). This aircraft sank as a result of an accidental depth charge explosion on 20 June 1945. Site inspections revealed the explosion occurred on the starboard wing. The starboard wing was blown off and lies some sixty metres away from the main wreck site.

On the 30 August 1945, aircraft A24-1 was wrecked as a result of a take-off accident (refer Figure 18-7). This aircraft was the first Catalina to see service in the RAAF. On the 6 January 1943 this aircraft sunk the Japanese troopship 'Nichiryu Maru'.



Source: EarthSea, 2011

Figure 18-7 Catalina 5 A24-1 Wreck Site

18.7 Background Ethnography

According to ethno-historical sources, East Arm Peninsula falls within the traditional country of the Larrakia (Foelsche, 1882; Tindale, 1974). Parkhouse (1895), the paymaster of South Australian railways at Port Darwin for some years, wrote "The territory of the Larrakia, in which Port Darwin is situated, embraces the seaboard from Shoal Bay to Southport, and extends inland to the forty-sixth

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mile on the railway line". He noted that the Larrakia were closely allied and intermarried with the Wulna people occupying the territory to the east and west of Adelaide River.

In the early days of European settlement ethno-historical documents describe the Larrakia as heavily dependent on fish, crabs, and shellfish. Fish and crabs were procured from reef pools or from constructed fish stone or wood traps using the tides, or from rivers, creeks and waterholes by spearing, netting or using certain poisonous barks or leaves to stupefy the fish (Basedow, 1907; Basedow, 1925; Foelsche, 1882).

Dugout canoes were used for fishing and hunting of dugong and turtles (Basedow, 1907; Basedow, 1925), and bark and dugout canoes used to transport items such as turtles and shellfish (King, 1969). Ethnographic and historical accounts reveal a rich material culture and ceremonial life practiced by the Larrakia and neighbouring groups (Basedow, 1907; Basedow, 1925; Foelsche, 1882; Parkhouse, 1895).

Material culture obtained from Aboriginal locals at Port Darwin in the early years of the European settlement demonstrates extensive use of natural resources. Much of the material culture consisted of perishable items, such as body ornaments made of reed beads, feathers, bark or fur, bamboo and reed spears, nets and bags and wood implements (Basedow, 1907; Foelsche, 1882; Kerr, 1971).

The most visible remains of subsistence and settlement activities in the region likely to be preserved in the archaeological record are shell mounds. Preserved within these deposits are likely to be skeletal remains of other animals that were exploited such as fish, crab, kangaroo, wallaby, snake and bird.

Other items of material culture likely to be preserved in the archaeological record include stone spear heads, stone axes, stone pestles (pounding stones) and grinding stones (mortars), hearths made from stone or lumps of termite nests, and stone or shell tools used for cutting or scraping.

Reports describe Aboriginal people along the NT coast, including Larrakia, using heated stones and termite nest material in ovens in the ground to cook kangaroo and some plant foods such as yams, cycad palm nuts, wild rice and water lilies (Basedow, 1907; Foelsche, 1882).

Also likely to survive are pieces of ochre, used to decorate implements, weapons or message sticks (Basedow, 1907), or mixed with emu fat to paint youths for initiation ceremonies, warriors preparing for ceremonial battles, and also the bodies of the dead (Basedow, 1925; Foelsche, 1882). Human skeletal remains may also be found in sandy beach ridges or near shell mounds. Foelsche (1882) recorded that the Larrakia buried their dead in shallow graves.

18.8 Indigenous Archaeology of Darwin Harbour

Historic Indigenous cultural heritage places of cross-cultural engagement are generally referred to by archaeologists as contact period sites. Very few of these types of sites have been documented for the Darwin region. Most sites on the NRETAS archaeological site database are "pre-contact" Indigenous Cultural Heritage Places such as Aboriginal shell middens, stone artefact scatters and quarries.

Most of the previously recorded pre-contact sites are clustered on Wickham Point and around Haycock Reach on the southern coastline of Middle Arm peninsula (refer Figure 18-8). All middens in this region dated thus far belong to the pre-European period.



Figure 18-8 Distribution of Previously Recorded Sites from the NRETAS Archaeological Site Database

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18.9 Results of Heritage Study

18.9.1 Terrestrial Archaeology

An archaeological survey of the study area was carried out in December 2010. The survey aimed to identify Indigenous and historic archaeological features within the subject area. Owing to early onset of the wet season, ground surface visibility through the survey region was generally poor as extensive grasses and vegetation covered most of the survey area.

It was noted that large areas of the proposed EAW expansion had been subjected to significant ground disturbance. The most intact areas were that of the mangrove mud flats and black soil areas. The majority of the high ground area had been significantly impacted from former ground disturbance.

18.9.2 Indigenous Cultural Heritage

The survey located two Indigenous cultural heritage places. These consisted of a shell midden and one stone artefact scatter. The shell midden is located on the mangrove mudflats adjacent to the existing railway and within the proposed rail loop area. The stone artefact scatter is located on the southern side of the East Arm towards the mouth of Hudson Creek, approximately 4 km from the project area.

The former East Arm 3 Indigenous site recorded on the NT Archaeological Site Database has been destroyed by the current development of the EAW, and no longer exists as an archaeological site. Refer to **Appendix C** for full site descriptions and Figure 18-8 for site locations.

The shell midden consists of a discrete mound primarily of *Anadara granosa* (granular mud ark), coupled with a relatively high density of quartz flakes. A diversity of other shell species was also noted. Based on the underlying geomorphology it is likely that the mound continues sub-surface below the mangrove mudflat. A low density background scatter of quartz stone artefacts surrounded the shell midden.

The artefact scatter located at the mouth of Hudson Creek consists of a low density scatter of quartz flakes, retouched flakes and cores. The quartz artefacts are located on a stony laterite bench surface, which is unlikely to present any depth of deposit.

18.9.3 Historic Cultural Heritage

As presented in Tables 18-6 and 18-7, the historic cultural heritage places and features located within the subject area relate to the WWII use of East Arm. A series of dump features were found along the margin of the mangroves north of the current railway line.

Three refuse dump features were identified and a site complex of 44 gallon drums. The dumps were mostly typical collections of WWII refuse consisting of bottles, rusted tin fragments, drums and corrugated iron sheeting. Of particular note was the WWII Dump Feature 3 which consisted of what could be interpreted as barracks or workshop refuse. This feature had cotton reels, an 'Australia' badge, pieces of tin, and what appeared to be a piece of aircraft frame.

WWII Site 1 consists of five features where 44 gallon drums have been buried in the ground and filled with gravel. These features were typically circular in shape or formed a cross pattern. The features were interspersed with bottle refuse and rusted tin fragments. The site is difficult to interpret.

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Table 18-6 Indigenous Archaeological Site Descriptions from the East Arm Study Area

Sites	Site Features	Location	L x W (m)	Description
Indigenous Site 1	Midden, Stone Artefacts	On the mud flats adjacent to the current railway line. The site is in relatively good condition given its close proximity to the railway. Site centroid -706101E 8619839N	4m x 3.7m	A small <i>Anadara granosa</i> midden. <i>Anadara</i> consists of the majority of shell. Other species includes <i>Telescopium</i> , <i>Nerita</i> sp, <i>Terrebrallia</i> , <i>Volema</i> , and <i>Chicoreus</i> . Stone artefacts consist of quartz cores and flakes with a maximum artefact density of 10/m ² . Very highly likely to consist of subsurface midden deposit. Some shell is dispersed up to 50 metres surrounding the midden. The midden is approximately 30-40cm high above the mud flat. A scatter of quartz artefacts is also found surrounding the midden up to 50 metres radius.
Indigenous Site 2	Stone Artefacts	Located in the southern area of the proposed subject area on the fringe of the mangroves and laterite high ground. The area consists of a laterite outcrop on the edge of a black soil area with sparse woodland fringe, some paperbark trees and <i>Livistonia</i> sp. Site centroid -709143E 8619556N	30m x 15m	An artefact scatter of quartz stone artefacts consisting of flakes, cores, retouched flakes, and flake pieces, Artefact densities averaged 5/m ² with a maximum density of 15/m ² .

Source EarthSea, 2011

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Table 18-7 Historic Archaeological Sites and Features from the East Arm Study Area

Sites	Easting	Northing	Site Features	Location	L x W (m)	Description
WWII Dump Feature 1	707594	8620902	44gallon drum dump	On edge of mangroves and ridge, northern side of railway	10m x 10m	A collection of WWII 44 gallon drums, some pieces of broken concrete. Likely to have been bulldozed to this location during construction of railway.
WWII Dump Feature 2	707857	8620899	Artefact scatter	On edge of mangroves and ridge, northern side of railway	5m x 5m	An area of refuse dumped at the mangrove margin consisting of a partial water tank, metal boxes, high density of fragments of tin, and bottle fragments, Some pieces of sewer and water pipes, masonry fragments, some ceramics. All pieces typical of WWII infrastructure.
WWII Site 1	707912	8620876	Drum emplacement feature; artefacts	Located on mangrove fringe to the north side of the railway line	150m x 20m	Approximately five features where drums have been buried and filled with Anadara shells and gravel in circular patterns and are spaced approximately 20 m apart along the mangrove fringe. The drums buried in the ground on their side and standing. A further four mounded built features with drums and gravel was found skirting the mangrove fringe. The drums are highly corroded. Interspersed are several dumps of WWII era beer bottles, rusted tin. Molten pieces of aircraft type aluminium were noted in the assemblage.
WWII Dump Feature 3	708072	8620961	Scatter of artefacts	Located on mangrove fringe to the north side of the railway line	3m x 3m	A small assemblage of personal scrap and barracks rubbish consisting of cotton reels, wire, tin, an 'Australia' shoulder badge and some possible pieces of aluminium from an aircraft.

Source EarthSea, 2011

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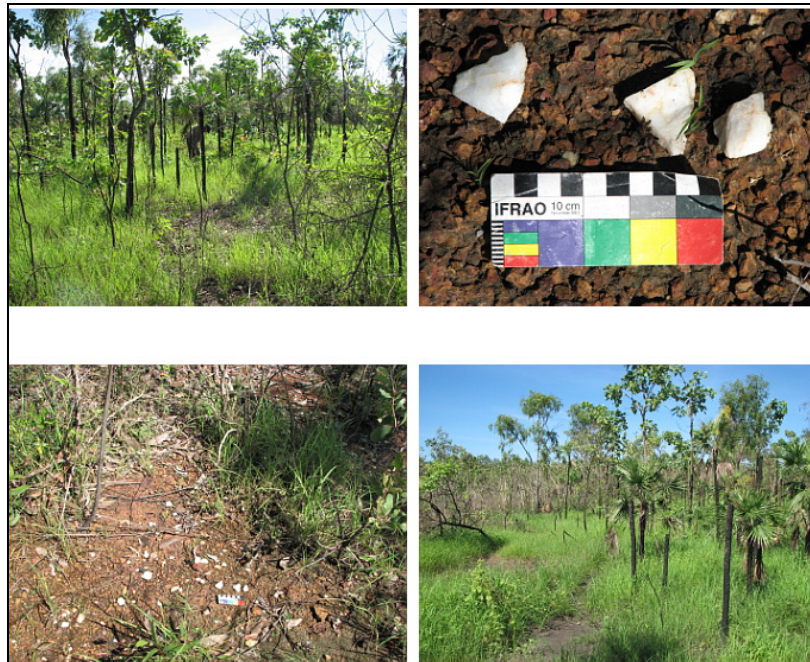


Figure 18-9 Location of Sites Recorded During Survey

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18.9.4 Heritage Site Images

Figures 18-10 to 18-14 present a selection of images of the sites recorded during the current survey.



Source: EarthSea, 2011

Figure 18-10 Indigenous Site 1: Shell Midden.



Source: EarthSea, 2011

Figure 18-11 Indigenous Site 2: Artefact Scatter

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Source: EarthSea, 2011

Figure 18-12 WW2 Site 1 Drum Features



Source: EarthSea, 2011

Figure 18-13 WW2 Drum dump

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Source: EarthSea, 2011

Figure 18-14 WW2 Dump Feature 2

18.10 Maritime Archaeology within the Vicinity of Development Areas

The current EAW is relatively close to the main area of traditional shipping operations of the Darwin Stokes Hill Wharf precinct. Seven shipwrecks and six Catalina Flying Boat wrecks have been identified in the East Arm area that could potentially be impacted by the proposed expansion and associated operations; none of these sites are located within the proposed EAW project area. (refer Figure 18-15).

As presented in Section 18.2.5, six nearby shipwreck sites are recorded on the Australian National Shipwreck Database. Of these, only the Kelat shipwreck has been placed on the NT Heritage Register. The Kelat is located approximately 3 km south of the project area. In addition, an unrecorded wreck (*Unidentified Shipwreck 1*) lies approximately 200 m south-west of the rail loop footprint, as presented in Figure 18-16. This is discussed further below.

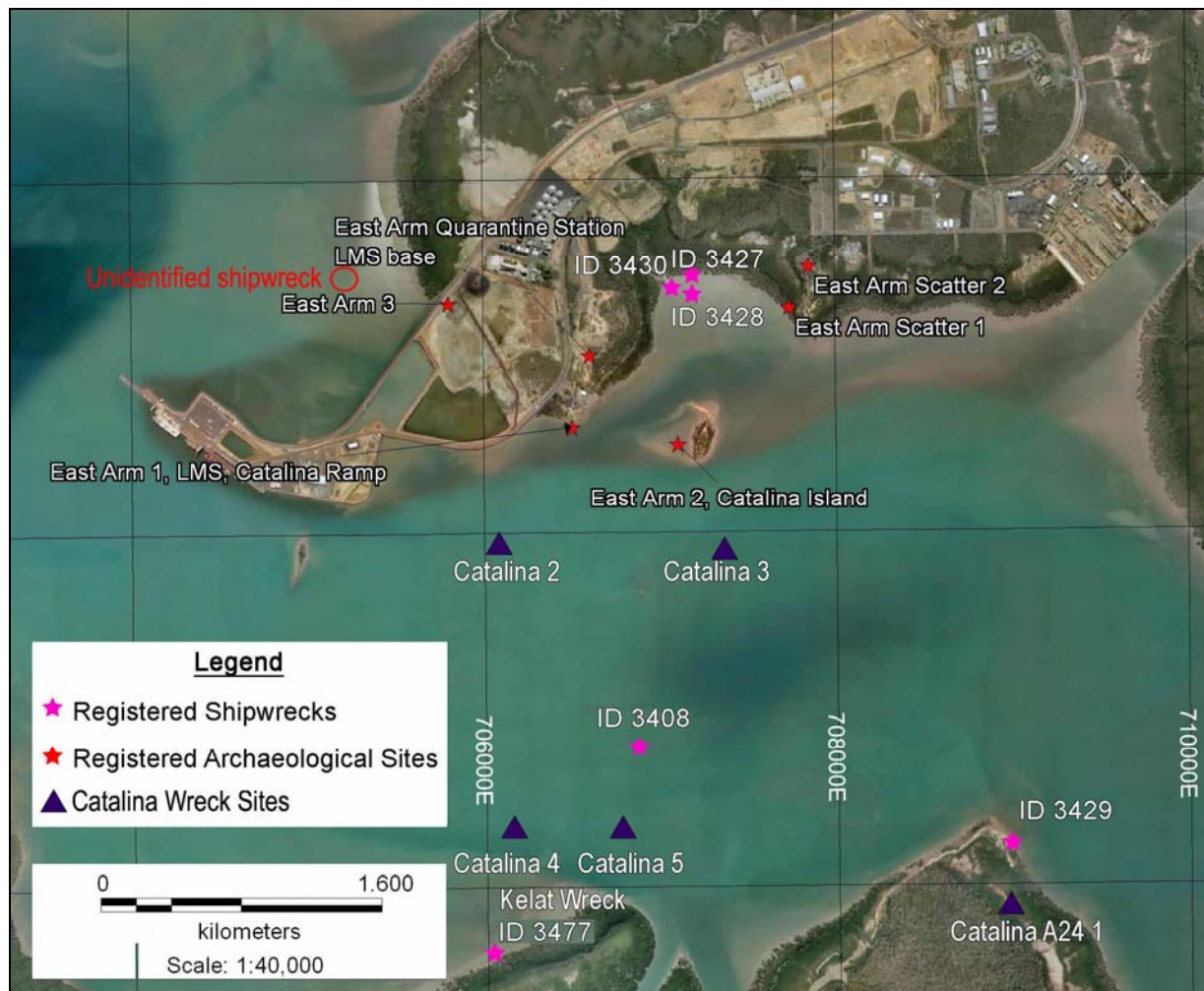
Shipwrecks close to the East Arm development are:

- ID3427: East Arm Barge 2
- ID3428: East Arm Two Part Barge
- ID3430: East Arm Vietnamese Refugee Boat 2
- Unidentified Shipwreck 1.

The following shipwrecks are found over 2 km from the proposed East Arm development:

- ID3408: Con Dao 3 (refer Figure 18-1)
- ID3429: East Arm Vietnamese Refugee Boat 1 (refer Figure 18-1)
- ID3477: Kelat, sunk Japanese air raid 1942.

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Source: EarthSea, 2011

Figure 18-15 Archaeological Sites Proximal to East Arm

18.10.1 Unidentified Shipwreck 1

Unidentified Shipwreck 1 is located near the proposed railway loop of the EAW expansion area and was reported to the NTG in 2002 (refer Figure 18-15, Figure 18-16, and Figure 18-17). It is likely that this shipwreck is one of the Vietnamese refugee boats, or an Indonesian fishing vessel, that had been scuttled at East Arm. The shipwreck appears to be of some age, probably from the 1970s.

In recent examinations of the same area at low tide, however, there is little evidence of this shipwreck. It is likely that this shipwreck has been covered by marine sediments or has deteriorated significantly since the photograph had been taken and is now no longer visible. Some subsurface remnants of this shipwreck may be found in the marine sediments.

18.10.2 Kelat Shipwreck

The only Heritage Registered shipwreck in the general East Arm vicinity is that of the Kelat (refer Figure 18-15 and Figure 18-18). The Kelat was a coal barge built in 1881 and saw service in WWII. It

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was damaged in the Japanese air raid on the 19 February 1942 and sank at its current location several days later. The Kelat lies approximately 3 km south of the proposed development.



Source: EarthSea, 2011

Figure 18-16 Location of Shipwrecks Close to the Project Area



Source: EarthSea, 2011

Figure 18-17 Unidentified Shipwreck at the East Arm Port Area

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Source: EarthSea, 2011

Figure 18-18 Kelat shipwreck 1942 (Figure courtesy Ron Urquart Collection, Northern Territory Library, PH0311/0023).

18.10.3 Catalina Aircraft Wrecks

There are two WWII Catalina aircraft wreck sites located approximately 1-2 km east of the proposed development (refer Figure 18-15). A third Catalina wreck (Catalina 6) is located over 1 km to the south; Catalina 6 is not shown on maps owing to sensitivity regarding its location and possible looting. Table 18-8 lists wrecks within 2 km of the proposed development; it is noted that all are outside the Project area.

Table 18-8 WWII Catalina Wrecks within 2 km of Proposed Development.

Name	Also known as	Relationship to Development
Catalina 2	PBY-5A model; A24-69; BAN 34056	Outside of development zone: minor risk from related maritime activities
Catalina 3	PB2B-1 model; A24-206; BAN 44217 ex RAF JX611	Outside of development zone: minor risk from related maritime activities
Catalina 6	US Navy Patrol Wing 10 aircraft	Outside of development zone: minor risk from related maritime activities

Source: EarthSea, 2011

18.11 Heritage Significance Assessment

The heritage values for the cultural heritage places documented in this study are discussed in this section. Tables 18-9 and 18-10 summarise the results of the heritage assessment.

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Table 18-9 Cultural Heritage Assessment of Sites Likely to be Affected by EAW Development

Site Name – ID	Type	Discussion	Heritage Assessment Value
Indigenous Site 1	Midden; Stone Artefacts	Well preserved site Poorly documented in Darwin region High potential for archaeological information Valued by Larrakia	Very High cultural and archaeological significance
Unidentified Shipwreck 1	Wrecked boat – possibly Vietnamese refugee boat	Poorly preserved Unknown regarding ship/type/history Possibly S.E. Asian vessel. Social history and association with Vietnamese refugee history high	Limited archaeological significance Moderate social and cultural significance

Source: EarthSea, 2011

Table 18-10 Cultural Heritage Assessment of Sites Located Nearby the Proposed EAW Development

Site Name – ID	Type	Discussion	Heritage Assessment Value
Indigenous Site 2	Stone Artefacts	Well preserved site Poorly documented in Darwin region High potential for archaeological information Valued by Larrakia	High cultural and archaeological significance
WWII Dump F1	44 gal drum dump	Highly disturbed Site type widely represented Low scientific value	Low cultural and archaeological significance
WWII Dump F2	General refuse	Site disturbed Widely represented Limited diversity of material in site	Low cultural and archaeological significance
WWII Dump 3	Scatter of personal refuse	Relatively intact Poorly represented in region	Moderate cultural and archaeological significance

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Site Name – ID	Type	Discussion	Heritage Assessment Value
		Some diversity of material	
ID3408 Con Dao 3 ID3430 Vietnamese Refugee Boat 2 ID3429 Vietnamese Refugee Boat 1	Vietnamese refugee shipwrecks 1976-78	Poorly preserved Relatively little information available about ships/type/history Social history and association with Vietnamese refugee history high	Limited archaeological significance Moderate social and cultural significance
ID3427 East Arm Barge 2 ID3428 East Arm Two Part Barge	WWII small water craft shipwreck sites	Generic WWII small craft Very poorly preserved with few visible remains Not suitable for recreational dive sites	Limited archaeological significance Limited social significance Moderate historical significance
WWII Catalina 2 and 3	RAAF Catalina wreck sites	Well preserved wreck sites Very well documented history Very well documented wreck sites Recreational dive sites Valued by WWII community (i.e. aircraft enthusiasts)	Very high archaeological, historical, and social significance
WWII Catalina 6	US Navy PatWing 10	Well preserved wreck sites Very well documented history Only recently discovered Valued by WWII community (i.e. aircraft enthusiasts)	Very high archaeological, historical, and social significance
Kelat	WWII shipwreck site	Declared Heritage Place NT Heritage Conservation Act	Very high archaeological and cultural significance
WWII Site 1	Drum features	Very poorly preserved but foundations intact Incinerator sites poorly represented in Darwin Limited diversity of refuse types	Moderate cultural and archaeological significance

Source: EarthSea, 2011

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18.11.1 Indigenous Cultural Heritage

The following section assesses the significance of the archaeological site within the proposed development area, and other archaeological sites within 5 km of the proposed development. It is noted that archaeological sites outside the proposed development area have little bearing on the Project, but may have relevance to the larger scheme of the Indigenous occupation of the Darwin region. Sites that may hold significance according to Aboriginal tradition as provided for under the Sacred Sites Act are dealt with under a separate process through the AAPA.

Protection is afforded to all Indigenous archaeological places that correspond to the criteria set out in the Heritage Conservation Act. Development proponents may apply to destroy or disturb a registered site. The Department assesses applications and provides advice to the Minister who may then grant or decline consent.

This regulatory framework is a specific sites-based approach. Sites have therefore been ranked according to a set of archaeological assessment criteria to deal with the regulatory regime. This has been undertaken in order to achieve a better understanding of the spatial distribution of archaeologically significant features in the area that are able to assist in further archaeological investigations of major research questions.

Nonetheless, it is still important to view the survey results as part of an Indigenous cultural landscape. The archaeological record of the Darwin Harbour overwhelmingly demonstrates the importance of the region to Aboriginal groups in the past. Therefore the archaeological record of East Arm area has to be considered within the larger scheme of the Indigenous occupation of the Darwin region.

18.11.2 Cultural Significance

Cultural significance of sites is determined by members of the Larrakia community according to their cultural world view. Indigenous people place a high cultural value on their archaeological sites and cultural heritage.

While archaeological assessment commonly focuses on material cultural remains of the archaeological record that have survived through time, from the Indigenous viewpoint, the archaeological record is part of a landscape that is a living existence, with a spiritual presence. Thus, people living within this landscape relate to the whole - all of the landscape - not particular parts.

Within this whole, parts may have provided preferred living places, parts may have had more defined spiritual significance, and parts may have provided specific resources. Thus cultural heritage significance relates to people's perspectives of place and sense of value, within the context of history, environment, aesthetics and social organisation.

18.11.3 Indigenous Archaeology Assessment

The archaeology of Darwin Harbour provides evidence of complex adaptations by Aboriginal people to a distinctive and unique coastal environment on the margins of the present tropical savannah zone over the last 3,000 years. Some sites demonstrate occupation through to the European Contact period. The Darwin Harbour area appears to have operated as an aggregation locale for groups particularly throughout the Holocene.

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Shell middens and scatter have the potential to yield scientific information, not only about thousands of years of Aboriginal cultural lives and practices, but also about environmental change that has occurred over this period. Radiocarbon dates previously obtained on shell middens show that the main period of mound building is between 1500 and 500 years BP (before present) (Bourke, 2000).

Excavations of shell middens undertaken at Middle Arm peninsula (Crassweller, 2006; Bourke, 2000), and Hope Inlet and Shoal Bay (Bourke, 2000) have revealed that although middens are composed of mainly large *Anadara granosa* cockle shells from the mudflats, there is variation in content (including bone and stone artefacts) and internal structure of middens that may be related to cultural practices, changes in foraging strategies and environmental change (Bourke, 2005). This research highlights the importance of undertaking more detailed investigations on sites that may look similar on surface inspection.

The archaeology of the survey area when considered as a cultural landscape can assist with investigations on residential mobility, economy, and social organisation through investigation of the shell and stone artefact assemblages and evidence of grinding technologies, including understanding of:

- settlement and mobility of Indigenous people through time and space
- the regional nature and distribution of archaeological sites
- technological change and variability in artefact assemblage
- adaptation to changing environments through time, and
- social complexity and intensification issues in coastal arid zones of north Australia.

Bird and Hallam (2006) state that the “significance of individual archaeological features and localities is greatly enhanced by the way they mirror the web of associations linking people and landscape through time”. For example, investigation of technological activities, and which faunal communities were hunted and consumed aids in reconstructing settlement mobility and land use strategies.

In the survey area, shell midden accumulations can be dated, shells provide direct evidence of species consumed, stone artefacts can be analysed to investigate technological change and adaptation to environments, and overall these elements can contribute significantly to investigations of social changes in the late Holocene.

18.11.4 WWII Terrestrial Site Assessment

Previous heritage assessments of WWII static air defence infrastructure in the Darwin region have found that several sites have significant cultural heritage values. Two HAA battery sites (Fannie Bay and Quarantine Island) have been declared to the NT Heritage Register. Recognition has also been made of defence infrastructure used in headquarter roles or pivotal parts of the defence coordination system (i.e. Darwin RAAF Base and Berrimah RAAF Fighter HQ).

The Quarantine AA Battery is significant as the only complete gun-site of its type within the Darwin area. According to the NT Heritage Register (NRETAS, 2011) it is highly significant as it is of a design which was discontinued by the Defence Force in the mid 1940s and one this is unique to the NT.

According to the NT statement of heritage value, the HAA battery is valued for their social associations with the events of WWII in Northern Australia (NRETAS, 2011). The East Arm HAA is part of the larger site complex which has a variety of remains demonstrating the complexity of a WWII defence installation.

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The historic refuse remains that have been located in the current survey are likely to reflect the range of activities that were occurring on the East Arm Peninsula, from the Z-Force, the artillery positions, and the air force base. The only distinguishing factor found in the refuse areas was the debris of personal effects that indicated Australian Army units rather than Air Force.

The refuse sites have been disturbed through the clearing activities for the current EAW. The WWII drum features are however of some interest as they reflect perhaps the refuse disposal process of the units based in the area. However the current condition of these features is very poor and provides limited archaeological value. The personal effects from the small scatter provide some social heritage value. Overall, the heritage value of these sites is ranked low.

18.11.5 Heritage Significance of the WWII Aircraft Wreck Sites

Although all the Catalina aircraft were destroyed in WWII, there are two major differences in heritage significance between the RAAF and US Navy wrecks. The RAAF Catalina wrecks are historically significant for their association with the operations from the Flying Boat Base during WWII. The US Navy Catalina wrecks are historically significant for their association with the Allied withdrawal from the Dutch East Indies, the early Darwin defence preparations, and the first Japanese bombing raid on Darwin in 1942.

The heritage value of Quarantine Island (which no longer exists in its previous form) lay in its pre and post war use as a quarantine station, holding Vietnamese 'Boat' people, a clandestine commando / intelligence base, and a RAAF flying boat base. As discussed previously, the RAAF flying boats from East Arm conducted specific tasks in WWII that could not be achieved by other standard RAAF units. The Catalina aircraft had an operational range twice that of other aircraft and provided a unique form of logistical support. Given the extensive coastline of Australia and the many islands in the Indonesian archipelago, the RAAF Catalina aircraft were able to provide support to any coastal region.

Heritage significance of the Catalina wrecks believed to be US Navy aircraft is largely vested in their association with the initial bombing of Darwin by the Japanese on 19th February 1942. Shipwrecks in Darwin Harbour have been declared as heritage places owing to their association with the first bombing raid on Darwin on 19th February 1942. It is reasonable to say that the US Navy Catalina aircraft sunk on this day are significant for similar reasons. The wrecks represent the only extant remains of the many aircraft destroyed on that day in February.

Research thus far indicates that there would be a minimum 16-18 Catalina wrecks in Australian waters, and of the original 3272 aircraft manufactured, less than 3% still currently exist. These aircraft exist in varying state of integrity; operational, static display, and as wrecks. However, only a small number have been identified as RAAF aircraft used in WWII. Even fewer aircraft are likely to remain which were in service with the US Navy from the early years of the Asia-Pacific theatre of WWII.

18.11.6 Heritage Value of Maritime Shipwrecks

It has been established that the Kelat shipwreck has a high level of cultural heritage significance as it is a declared heritage place on the NT Heritage Register.

The other maritime shipwrecks that are noted within the survey area consist of the former WWII barge wrecks and the Vietnamese refuge boat shipwrecks. The shipwrecks are all located in the intertidal zone. In this zone the wrecks are subjected to major tidal influences and corrosion from constant exposure, and siltation of mangrove mud. Constant exposure to air will enhance corrosion combined

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with salt attack and tropical marine fauna that will destroy timbers. Therefore these wrecks are considered to be in very poor condition with little of the vessels remaining intact that can be seen from onshore or aerial observation. The location of the wrecks makes these sites relatively inaccessible owing to their position on the mud banks, therefore rendering site inspections and / or diving very difficult.

The WWII barges were used to facilitate movement of supplies and personnel to the various remote HAA and AASL stations around Darwin Harbour, as well as the Special Z Force training facility at Wickham Point. They played an important role in the strategic defence of Darwin. The barges were generally of generic types and historically poorly documented in records. Their wreck sites may be able to provide some limited information about vessel types. The social value of these vessels is probably low considering that they were a general work vessel.

The Vietnamese refugee boats on the other hand were probably reasonably well documented in records by Customs and Immigration. The manufacture and working life history of these vessels is probably relatively unknown to Australian records, however, and given the length of time since the wrecking events, and the disruption of the Vietnamese War to Vietnamese governance, there is probably limited documentation about these vessels from their country of origin.

These shipwreck sites will provide limited archaeological information about the ships, but they have social and historic association with the Vietnamese refugee arrivals in the 1970s. This was a significant period of Australian immigration history, and Darwin was in the forefront of this migration event.

These shipwreck sites present limited interpretative opportunity and have very limited scope for recreational diving.

18.12 Cultural Heritage Management

18.12.1 Sites of Interest

As a result of field surveys and desktop research conducted for this study the following Indigenous, historic and maritime archaeological places have been identified:

- Indigenous shell midden
- Indigenous stone artefact scatter
- Three WWII historic features relating to refuse dumps
- One WWII historic refuse incinerator complex
- Maritime wreck sites consisting of RAAF Catalina A24-69 (Catalina 2) and A24-206 (Catalina 3)
- Maritime wreck sites

It is noted that only two of these sites, Indigenous Site 1 (Figure 18-9) and an unidentified shipwreck (Figure 18-16), are located within the proposed development area (both near the rail loop), however the sites will not be impaired by the construction of the rail loop.

18.12.2 Cultural Heritage Management Summary

A summary of the management measures arising from this cultural heritage assessment addressing concerns regarding cultural heritage values in the area is provided in Table 18-11.

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Table 18-11 Summary of Management of Cultural Heritage Places Located in The Vicinity of the EAW Expansion

Site Name – ID	Heritage Assessment Value	Current Legislative Protective Mechanism	Management Summary
Indigenous Site 1	Very High cultural and archaeological significance	Interim conservation orders <i>Heritage Conservation Act 1991</i>	The site (Figure 18-9) is not proposed to be impaired by the EAW Expansion Project. CEMP and EMP will refer to the site, and manage any potential impacts. However, if the site cannot be avoided, seek permit for salvage from NT Minister for Heritage, involve Larrakia community participation, and undertake further archaeological research.
Indigenous Site 2	High cultural and archaeological significance	Interim conservation orders <i>Heritage Conservation Act 1991</i>	The site (Figure 18-9) is well away from Project development areas. CEMP and EMP will refer to the site, and manage any potential impacts
WWII Dump F1	Low cultural and archaeological significance	None	CEMP and EMP (for rail loop) will refer to these sites, and manage any potential impacts
WWII Dump F2	Low cultural and archaeological significance	None	CEMP and EMP (for rail loop) will refer to these sites, and manage any potential impacts
WWII Dump 3	Moderate cultural and archaeological significance	None	CEMP and EMP (for rail loop) will refer to these sites, and manage any potential impacts
WWII Site 1	Moderate cultural and archaeological significance	None	CEMP and EMP (for rail loop) will refer to these sites, and manage any potential impacts
Unidentified Shipwreck	Limited archaeological significance Moderate social and cultural significance	None	CEMP and EMP will refer to the site (Figure 18-15), and manage any potential impacts. However, if the site cannot be avoided, locate, identify, and record remnants, undertake documentation by maritime archaeologists, and consult and document social history with Vietnamese community.

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Site Name – ID	Heritage Assessment Value	Current Legislative Protective Mechanism	Management Summary
ID3408 (Con Dao 3) ID3430 (Vietnamese Refugee Boat 2) ID3429 (Vietnamese Refugee Boat 1)	Limited archaeological significance Moderate social and cultural significance	None Currently on Australian National Shipwrecks Database	CEMP and EMP will refer to these sites, and manage any potential impacts
ID3427 (East Arm Barge 2) ID3428 (East Arm Two Part Barge)	Limited archaeological significance Limited social significance Moderate historical significance	None Currently on Australian National Shipwrecks Database	CEMP and EMP will refer to these sites, and manage any potential impacts
WWII Catalina 2 WWII Catalina 3 WWII Catalina 6	Very high archaeological, historical, and social significance	Nominated to the NT Heritage Register <i>Heritage Conservation Act 1991</i>	CEMP and EMP will refer to these sites, and manage any potential impacts Establish mooring and no-go zones for maritime craft operating in the area during construction and operation
Kelat	Very high archaeological and cultural significance	Declared Heritage Place <i>Heritage Conservation Act 1991</i>	CEMP and EMP will refer to these sites, manage any potential impacts Establish mooring and no-go zones for maritime craft operating in the area during construction and operation

Source: EarthSea, 2011

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18.12.3 Construction Cultural Heritage Management Plan

The CEMP would incorporate a Cultural Heritage Management Plan. The Plan would contain the recommendations, details, and the conservation steps to be taken in regards of the Indigenous, historic, and maritime cultural heritage places and features as identified in this DEIS.

The Plan would also identify the means of communication and consultation with the general public, with special attention to the Indigenous community.

18.12.4 Indigenous Cultural Heritage Sites

The Indigenous archaeological sites located in this survey are afforded interim protection under the Heritage Conservation Act until the Minister for Heritage determines otherwise. These archaeological sites contain a representative sample of the significant archaeological features of the general Darwin Harbour area. Nonetheless, it is also noted that features located within these site boundaries may, or may not be related to each other in a behavioural and temporal sense.

As discussed above only one site (Indigenous Site 1) is in the Project development area, and this site is not proposed to be impaired by the EAW Expansion Project. However, should the proposed EAW Expansion impact the site, the following archaeological mitigation works would be implemented with the general disturbance approval:

- Consultation with the Indigenous community.
- Excavation and recording of shell deposits and scatters by a qualified archaeologist.
- Collection and submission of samples for radiocarbon determinations to assess timings of marine exploitation, occupation of the area, and residential mobility patterns.
- Collection and metrical analysis of a reasonable sample of the stone artefact assemblages to investigate stone artefact technology issues and residential mobility patterns.
- Establish a protective buffer zone around the site until Ministerial approval has been sought for the disturbance of these sites and mitigation works have been conducted.

18.12.5 Historic WWII Archaeological Sites

The review has identified four historic WWII archaeological features located in the vicinity of EAW. It is unlikely that there will be any impact on these four WWII historic sites.

If disturbance is required, however, these sites would only be disturbed or destroyed after further mapping and documentation of the artefact assemblages and features is undertaken.

It is noted that there is generally a high level of interest from sections of the community in the conservation and management of WWII sites. Developments from WWII infrastructure had a large impact on the Darwin Harbour region, especially East Arm. DLP would notify the public prior to any potential impacts to WWII sites.

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18.12.6 Maritime Wreck sites outside the proposed development area

There are four significant maritime wreck sites within 2 km of the proposed EAW expansion area. These wreck sites are located to the south and east of East Arm and consist of the following sites:

- Catalina 2 (RAAF Catalina A24-69)
- Catalina 3 (RAAF Catalina A24-206)
- Kelat
- Catalina 6.

These wreck sites are not protected under the Shipwrecks Act. These aircraft wreck sites have been nominated to the NT Heritage Register. Ownership of the RAAF Catalina aircraft is still believed to be by the Commonwealth. These WWII aircraft have been assessed by the NT Heritage Branch as having a high level of cultural heritage significance; however a final assessment has not been made by the Minister for Heritage. It is noted that none of the sites are war graves.

As noted above, the wreck sites are outside of the proposed development area, and modelling results show that dredging activities associated with the Project will have little impact on current flows and sedimentation (Chapter 8).

18.12.7 Maritime Wrecks Site within the proposed development zone

There is one maritime wreck site identified near the proposed railway loop. This site is the unidentified maritime wreck site that may be a Vietnamese refugee boat wreck. The wreck site appears to be in poor physical condition and preservation. If the site is a Vietnamese shipwreck, it is likely to have some social and historical value.

This site is not proposed to be impaired by the EAW Expansion Project. However, should the proposed EAW Expansion impact on the site, a program would be undertaken by a maritime archaeologist to positively identify, document and map the wreck.

18.13 Commitments

- *Indigenous Site 1 (shell midden and artefact scatter) adjacent to the rail loop would be avoided as much as is practicable. If disturbance cannot be avoided, the site will be studied, documented and recorded prior to disturbance.*
- *The unknown shipwreck site to the south-west of the rail loop would be avoided as much as is practicable. If disturbance cannot be avoided, the site will be studied, documented and recorded prior to disturbance.*
- *The CEMP and EMP for the proposed development will refer to the heritage sites identified by the historic and cultural heritage sites.*

18 Historic and Cultural Heritage Values

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