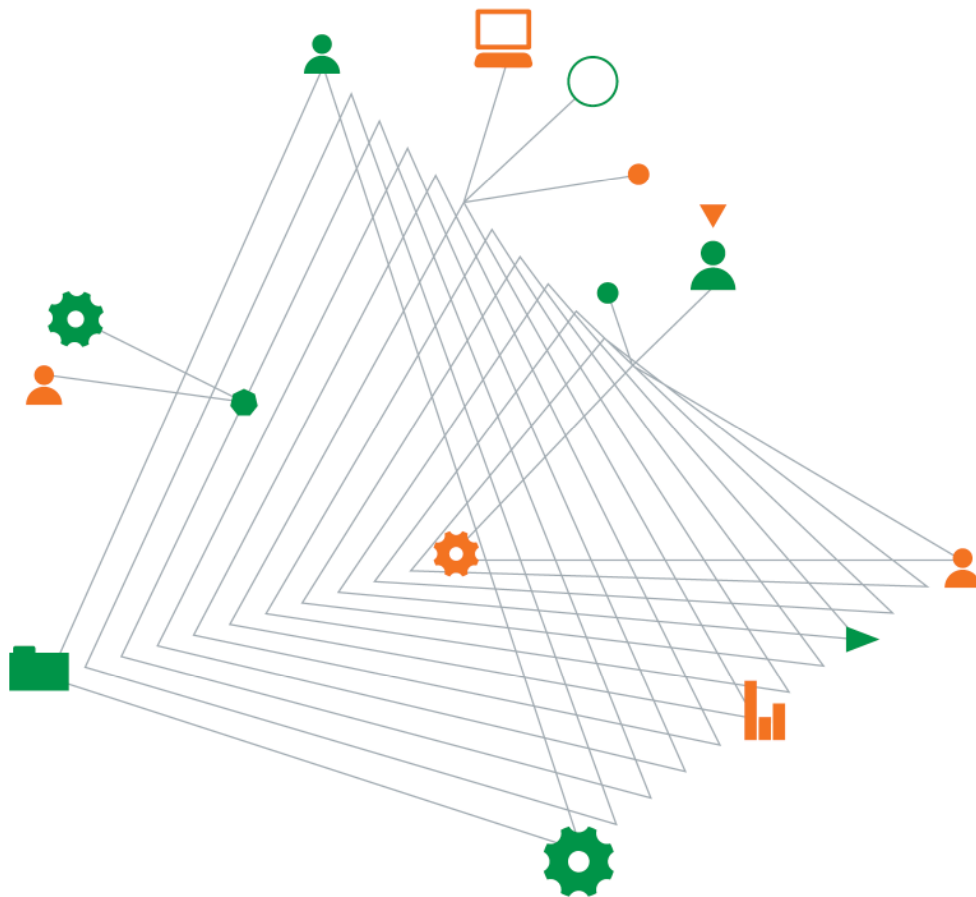
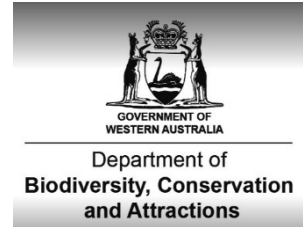


Department of Biodiversity, Conservation and Attractions - Parks and Wildlife Service

Voluntary Auditor's Report

Wedge and Grey Reserves

30 October 2017



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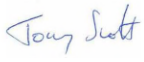
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Voluntary Auditor's Report

Prepared for
Department of Biodiversity, Conservation and Attractions - Parks and Wildlife Service

Prepared by Coffey Environments Australia Pty Ltd

Level 19, Tower B, Citadel Tower 799 Pacific Highway
Chatswood NSW 2067 Australia
t: +61 2 9406 1119 f: +61 2 9911 1003

Contaminated Sites Auditor	Tony Scott WA DWER Accredited Contaminated Sites Auditor - Senior Principal 
Project Manager	Richelle Bunbury Senior Environmental Scientist

30 October 2017

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Figure 2. Work Area Boundary – Wedge

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Figure 4. Wedge ACM Assessment Overview

Figures 4.1 – 4.18: Wedge ACM Assessment and Identification Records

Figure 5. Grey ACM Assessment Overview

Figures 5.1 – 5.5: Grey ACM Assessment and Identification Records

¹ The figures used in this VAR are a reproduction of those prepared by Senversa and included in their RDSI report.

Appendices

Appendix A - Certificates of Title

Appendix B – Form I Auditors Declaration

Appendix C – Form H Commissioners Declaration

Appendix D – Auditor Correspondence

1. Introduction

1.1. Audit Details

In the capacity as a Western Australian Contaminated Sites Auditor (the 'Auditor') Tony Scott of Coffey Environments Australia Pty Ltd (Coffey) was engaged by Department of Biodiversity, Conservation and Attractions (DBCA) – Parks and Wildlife Service (formerly Department of Parks and Wildlife, referred to as 'Parks and Wildlife' herein) on 11 April 2016 to provide voluntary auditing services in relation to the Wedge Reserve and Grey Reserve located on Part Reserve 43283 and Part Reserve 43284, Shire of Dandaragan respectively presented on Figure 1.

This interim Voluntary Auditor's Report (VAR) includes a review of reports pertaining to contaminated sites investigations and remediation activities undertaken at the sites (Wedge and Grey Reserves). The reports the subject of this VAR are described as forming an intermediate and discrete stage of the overall progress to satisfactory remediation and management of asbestos issues at the Wedge and Grey Settlements.

Therefore, the VAR includes the Auditors opinion on the risk to human health, environment and environmental value and makes recommendations for additional works to allow development of a future VAR including a recommendation for a contaminated site (CS) re-classification consistent with the *Contaminated Sites Act 2003* (CS Act).

1.2. Defined Audit Boundary

The legal definition of the Audit boundary for both Wedge and Grey Reserves is defined in accordance with the cadastral boundary as presented on the Certificate of Title (Appendix A). Wedge Reserve covers 213 ha and is comprised of with 219 shack sites, one operational waste transfer station and another waste transfer station no longer in use (in a different location). Grey Reserve covers 193 ha and is comprised of 119 shack sites and one operational waste transfer station which is located where the original waste transfer station was located.

Upon commencement of the Audit, Parks and Wildlife advised the investigation areas for the Wedge and Grey Reserves would comprise of defined work area boundaries focussed particularly on the Wedge Settlement and Grey Settlement) (as defined in Figure 2 and Figure 3):

- Wedge (Management Zones A, B, C, D2, E and F) and Grey (Management Zones V, W, X and Y).
- Wedge (Management Zone H) and Grey (Management Zone Z): Investigation and remediation in these areas is proposed to be limited to track areas only.
- Aboriginal Cultural Heritage Zone D1 and tip sites (T1 and T2) were excluded from this project (and this Audit).

Noting within these defined management zones the investigation boundary has been further refined to include cleared shack areas, tracks and other frequently accessed areas (generally represented on figures as shaded light orange areas). In this regard the area that has been audited is limited to these locations. Further, the investigations and remediation focused on surface soils to about 10cm depth. Hence the VAR is limited vertically to surface soils within these areas.

The legal definition of the Wedge and Grey Reserves are described in Section 2.1 below.

1.3. Audit Information

Parks and Wildlife engaged Mr Tony Scott, of Coffey, to provide contaminated sites auditor services and prepare a VAR. This VAR has been produced in general accordance with the CS Act (including associated amendments/regulations) and relevant Department of Water and Environmental Regulation (DWER) guidance (and its predecessor Department of Environmental Regulation - DER). The following table presents relevant audit information.

Table A – Audit Details

AUDIT DETAILS	
Name of the WA DWER Contaminated Sites Auditor	Tony Scott (Appendix B – DWER Form I, Auditor's Statement)
Contaminated Sites Auditor Contact Details	Coffey Services Australia Pty Ltd ² Level 19, Tower B, 799 Pacific Highway Chatswood, NSW 2067, Australia Phone: (02) 9406 1000
Date Contaminated Sites Auditor was accredited under the CS Act (2003)	14 December 2006
Name and Contact Details of person who engaged the Auditor	Mr Colin Ingram (Appendix C – DWER Form H, Commissioners Statement).
Relationship to the site	Oversees management of Wedge and Grey Reserves for Parks and Wildlife
Site Owner	Unvested reserves placed under the management of Parks and Wildlife by order of the Governor with the approval of the Minister for Lands and the Minister for Environment.
Reason for Audit and relevant section of CS Act or EP Act	<i>Voluntary Audit but site has been classified as Possibly Contaminated – investigation required (PC-IR) (13 January 2010)</i>
Date Audit Commenced	11/04/2016
Date Audit Completed	30 October 2017
Type of Audit	<input type="checkbox"/> Mandatory Audit <input checked="" type="checkbox"/> Voluntary Audit
Stage in Contaminated Site Assessment Relevant to the Audit	Completion of Remedial Detailed Site Investigation by Senversa (the Assessor).

² Coffey Environments Australia Pty Ltd changed name to Coffey Services Australia on 1 October 2016. Coffey Environments Australia Pty Ltd and Coffey Services Australia Pty Ltd are sister companies both owned by the same entity. The Auditor was engaged and has completed the Audit under Coffey Environments Australia Pty Ltd although is currently an employee of Coffey Services Australia Pty Ltd. Coffey Environments is still a legal entity.

1.4. Terminology

The terminology used in this VAR relation to the asbestos is as defined in the WA DoH (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites as follows:

1. Asbestos Containing Materials (ACM): Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Taken to be sound material, even as fragments, and not fitting through a 7 mm x 7 mm sieve.
2. Asbestos Fines (AF): Includes asbestos free fibres, small fibre bundles and also ACM fragments that can pass through a 7mm x 7mm sieve.
3. Fibrous Asbestos (FA): Friable asbestos materials, such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products. Asbestos material in a condition such that it can be broken or crumbled by hand pressure.

1.5. Audit Context

Wedge and Grey Reserves have been subject to construction of recreational shacks in an uncontrolled and unregulated manner from the 1950s to 1990s. The shacks were constructed from various building materials, predominantly those that were cheap and easily transportable, including ACM.

The areas where shacks were established are commonly termed the Wedge Settlement and Grey Settlement, respectively. For the purposes of this report the terms Wedge Settlement and Grey Settlement (collectively Wedge and Grey Settlements) are used in this report to refer to the area occupied by shacks, tracks and frequented common areas while the term Wedge Reserve and Grey Reserve refers to the whole of the reserves for each site, respectively.

Wedge and Grey Reserves were classified by the DWER as *Possibly Contaminated – Investigation Required (PCIR)* based on information referring to the presence of asbestos contamination in soils within the vicinity of shacks.

In early 2012, following the outcome of a 2010 Parliamentary Inquiry into shacks sites in WA, Parks and Wildlife commenced an assessment and planning exercise to determine an appropriate level of shack retention and the location and form of possible public recreation and tourism infrastructure at the Wedge and Grey Settlements. The proposal to develop possible public recreation and tourism infrastructure at the Wedge and Grey Settlements and shack retention assessment is a contentious issue with shack owners from both the Wedge and Grey Settlements represented through the Wedge Island Protection Association (WIPA) and the Grey Community and Conservation Association (GCCA). In addition, the Wedge and Grey Settlements are under assessment for listing on the State Register of Heritage Places under the Heritage of WA Act 1990.

During the planning exercise it was identified that significant volumes of ACM were present across Wedge and Grey Settlements, both within buildings and as fragments present in shallow surface soils, which may pose a risk to human health. As managers of Wedge and Grey, Parks and Wildlife needed to ensure the provision of these facilities in the future do not pose a risk to site visitors with a short to medium term goal to characterise and manage risks to human health and the longer term goal to have much of the Wedge and Grey Settlements to be decontaminated and free of asbestos.

1.6. Documents reviewed

The Auditor's review has extended to the following reports prepared by Senversa. Copies of these reports are presented in Appendix D.

- Senversa (2016) Sampling, Analysis and Quality Plan Wedge and Grey Settlements. Prepared for Department of Parks and Wildlife, 15 July 2016.
- Senversa (2017) Remedial Detailed Site Investigation, Wedge and Grey Settlements. Prepared for Department of Parks and Wildlife, 18 May 2017.

Senversa engaged McElhinny Consultancy Pty Ltd (McElhinny) to undertake ACM identification and removal works³.

In addition to review of the above reports Parks and Wildlife also provided the following background document to contextualise the project.

- Aurora Environmental (2016a) Additional Soil Sampling and Wedge and Grey Reserves. 31 March 2016.
- Aurora Environmental (2015) Asbestos Assessment and Preliminary Management Plan – Wedge and Grey Settlements, Shire of Dandaragan. Report Number: AP2015/155, Version: V1. Prepared Department of Parks and Wildlife, 10 November 2015.

The Auditor has read each of these reports for background knowledge when undertaking the review of the work completed by Senversa that formed the primary focus of this VAR. In addition the Aurora (2015) report included a detailed summary of the following report which the Auditor has not viewed or reviewed:

- GHD (2014) Contamination Investigations at the Wedge and Grey Squatter Shack Communities. Preliminary Site Investigation. January 2014.

The following report is publically available on the Parks and Wildlife website however was not reviewed as part of the audit:

- Aurora Environmental (2016b) Asbestos Management Plan – Wedge and Grey Reserves. Report Number: AP2016-031, Version: V1. Prepared Department of Parks and Wildlife, 4 November 2016.

1.7. Background relevant to the VAR

In 2012, the Department of Environment and Conservation (DEC now DWER) Moora District Office and DBCA were successful in obtaining funding from the Contaminated Sites Management Account (CSMA) with the funds to initially be used to undertake a preliminary site investigation (PSI) of suspected contaminated sites at the Wedge and Grey Settlements. Funding was primarily to be applied to undertaking initial groundwater investigations on the down gradient impact of areas used for waste disposal and landfill purposes. The PSI, completed by GHD in 2014, reported concentrations of heavy metals slightly exceeding relevant groundwater investigations levels.

The PSI recommended a second phase of groundwater investigations be undertaken, including installation of bores within the areas occupied by shacks. However, on the basis of PSI results and

³ The works comprised a systematic walkover of the Site by four field personnel under the supervision of a Field Supervisor. Accessible areas in an approximate 10 m radius around the shacks (where practical), vehicle tracks and common areas between the tracks were assessed, recorded electronically and remediated where appropriate.

following advice from the DWER it was considered that the residual funds were inadequate to conduct the recommended investigations and that no further groundwater investigation be undertaken as it was not a priority.

The PSI identified the presence of several sources of ACM contamination, although the risks to receptors were generally considered to be very low for the current site circumstances. GHD recommended further actions to manage the risks associated with the identified ACM, including formal management of existing buildings, infrastructure and waste disposal activities.

In 2015, Parks and Wildlife commissioned Aurora Environmental (Aurora) to prepare an Asbestos Assessment and Preliminary Management Plan (Aurora 2015). This study was a first step to understand the nature and extent of ACM risks in and around buildings at Wedge and Grey Settlements and the requirements for the safe management or removal of ACM.

The Aurora (2015) assessment found that there were multiple locations of soils impacted by ACM fragments around shacks and frequently accessed areas (e.g. common areas and tracks) and within the dedicated waste disposal areas. Aurora inspected 490 sites (including former and current shack sites – 6 sites were inaccessible) and an internal inspection of 17 shacks. ACM was identified (or suspected) at 259 of the sites, with 859 possible ACM products identified. An estimated volume of ACM was approximately 7000m². A range of ACM was identified including friable materials.

Specifically, Aurora identified 206 shacks located on the Wedge and Grey Settlements with ACM within the building structure or ACM impacted soils in their immediate vicinity. Aurora concluded that the issue of asbestos in soils was widespread and the estimated ACM concentration in soil at numerous locations exceeded the DoH criterion for the protection of human health and consequently warranted some form of management or remediation. In regards to ACM the Asbestos Assessment and Preliminary Management Plan made the following recommendations:

- All known or potential friable ACM should be removed, by an asbestos removalist holding a current unrestricted asbestos removal licence, with a priority allocated to those materials with the highest fibre release potential and in most regularly accessible locations;
- Asbestos cement debris should be targeted for removal with the asbestos register used to assist in prioritisation on the basis of accessibility of ACM and its condition;
- Removing ACM in 1 and 2 above removes all materials in the category of 'high fibre release potential' within the register (apart from gutter and tank deposits and asbestos fines in soil). Materials in the 'moderate fibre release potential' category should then be considered for removal in priority of accessibility and then condition. This process should be repeated until the next review of the register and then reassessed in order to determine whether further actions are required;
- Guidance material should be provided to shack owners in relation to the risks associated with ACM along with its assessment, safe treatment, removal and disposal. Some good guidance documents and fact sheets available from the Department of Health are recommended in addition to the preparation of new guidance developed specifically to address the ACM and its inherent risk at Wedge and Grey Settlements;
- All stored or disused asbestos products should be removed from in and around shacks, such as stored asbestos cement panels, old electrical mounting boards, soak wells etc.;
- Unsealed asbestos cement materials internal to shacks should be considered for sealing or painting, particularly if not in good condition or have exposed broken edges;
- Asbestos roofs should be removed if in poor condition and if not in poor condition either be removed or have gutters installed to deliver water to tanks or soak wells and not cause a drip line with the potential for asbestos fibres to impact adjacent soils;

- Shacks in the possession of Parks and Wildlife and confirmed as containing ACM should be considered for removal to reduce the likelihood of ACM becoming a health risk as a result of further degradation or vandalism;
- Where dismantling or removal of shacks is to be carried out, either all fibre cement materials should be suspected as containing asbestos or individually sampled and analysed for confirmation (due to the limitations of their survey methodology described in Section 4.1 of their report). Also once shacks have been removed, the soils in the vicinity of the shack should be validated (by a competent and experienced person) as being free of visible asbestos impacts;
- In accordance with the Health (Asbestos) Regulations, 1992 reasonable precautions must be taken to prevent asbestos fibres entering the atmosphere whilst handling asbestos-containing material. Also asbestos removal from workplaces must be conducted in accordance with the Code of Practice for the Safe Removal of Asbestos, 2nd Edition [NOHSC:2002(2005)] and by the following licensed removalists;
 - I. An *Unrestricted* or *Restricted* removal license - where more than 10m² of non-friable asbestos is to be removed;
 - II. An *Unrestricted* removal license - where friable ACM is to be removed;
- All removed ACM must be wrapped and disposed of in accordance with legislative requirements and at a facility which is licensed to accept asbestos waste;
- Positional occupational airborne fibre monitoring in selected shacks should be considered to assist in the assessment of risk during their occupancy;
- Additional personal airborne fibre monitoring should be conducted in dry conditions on personnel working in close proximity to shacks or other areas where ACM may be prevalent;
- Signage should be positioned to warn occupants and visitors to the reserves of the potential to come into contact with ACM and advise not to disturb it;
- Shack owners should be advised to independently have an internal inspection, by a competent asbestos surveyor, of their individual buildings as it is expected that many more ACM will be identified, some of which will potentially be friable.

Based on the findings of the preliminary asbestos in soils assessment the Asbestos Assessment and Preliminary Management Plan (Aurora 2015) the following recommendations were made for consideration:

- Conduct regular Emu picking (including raking) programmes to reduce the overall amount of ACM on surface soils, prioritising high access/trafficked areas;
- Conduct a detailed assessment of asbestos impacts in soils to improve confidence for determining final remedial measures.

Aurora were subsequently commissioned in 2016 to undertake soil sampling within the designated waste disposal areas at Wedge and Grey Settlements. The objective was to assess the presence of asbestos in soils at the locations of ACM waste disposal. The results of the limited soil sampling identified the presence of asbestos fines (AF) or Fibrous Asbestos (FA) at all locations within the Grey waste disposal area and ACM and AF at two locations within the Grey waste disposal area. The concentrations of AF/FA exceeded the adopted WA DoH guideline (0.001%). The tips sites were not included as part of the scope of the audit.

Parks and Wildlife subsequently commissioned Senversa Pty Ltd (Senversa) to undertake the next phase of works to assess and manage ACM at Wedge and Grey, comprising works described as a Remedial Detailed Site Investigation (RDSI) as recommended by Aurora. Senversa proposed to build on works previously conducted on the site to provide further confidence in the characterisation of impacts to inform future remediation works. Although Senversa noted that a staged approach was

being undertaken for the assessment and management of asbestos issues at the site and noted it was not the intent of this stage of works to conclusively reduce the risk in a quantifiable manner or below a specified (or acceptable) threshold.

The Auditor was appointed by Parks and Wildlife prior to them seeking tenders for the RDSI works awarded to Senversa. The Auditor was not involved in assessment of tenders or aware of the work scope proposed by Senversa which formed the basis of the commercial and contractual arrangement between Parks and Wildlife and Senversa. However, the Auditor notes that Parks and Wildlife have been consulting with WA DoH on the ongoing assessment and management of asbestos at the Wedge and Grey Settlements (and WA DoH have been involved in also reviewing the work undertaken by Senversa and earlier work by Aurora). The SAQP set out the works to be undertaken in the RDSI.

As the initial part of their works Senversa prepared a Sampling and Analysis Quality Plan Wedge and Grey Shack Settlements dated 20 June 2016 (the SAQP). The SAQP was reviewed and endorsed by the Auditor on 5th July 2016 noting previous studies have identified the potential presence of other contaminants within the Wedge and Grey sites but that the focus of the proposed studies was purely on asbestos only.

The Senversa SAQP and RDSI focussed on two distinct aspects of at the site being:

- Identification of ACM in soil and reduction of visible ACM impacts to the extent practicable such that risk represented is reduced; and
- Characterisation of Asbestos Fines (AF) in soil that may have resulted from degradation of ACM within built structures (e.g. run-off from asbestos rooves), with the main objectives of the RDSI including obtaining additional information on contamination status of soils by AF in the vicinity of shacks

Senversa noted in their SAQP that the outcomes of this stage of works must not be construed to include:

- 1) Identification of all ACM present in soil at the Site;
- 2) Removal of all ACM present at the Site or identified through this assessment; or
- 3) Reduction of risk related to asbestos to recognised acceptable levels.

Further, Senversa highlighted that the SAQP and the RDSI placed an emphasis on frequented accessible areas in the immediate vicinity of shacks and former shacks), common areas (cleared areas that are likely frequented but removed from the immediate vicinity of shack such as areas between shacks) and access tracks. They also noted that whilst regard would be had for vegetated areas (unlikely to be regularly frequented) to the extent practical and warranted based on judgement in the field, these areas will be defined and will not be subject to the same level of assessment as the designated assessment areas (i.e. may not be accessed at all or may be subject to cursory inspection).

The implementation of the SAQP commenced with a preliminary site walkover and scope / methodology pilot trial which was undertaken by Senversa on the 18th and 19th July 2016. The purpose of the pilot trial was to ground truth the proposed methodology presented in the SAQP and assist in identification of any additional issues that may need addressing. Upon completion of the pilot trial Senversa determined the ACM removal and sampling methodology as outlined in the SAQP was appropriate for implementation across both the Wedge and Grey Settlements. This was subsequently communicated to Parks and Wildlife and the Auditor and Senversa continued the undertaking of the RDSI works as described in the SAQP.

1.8. Scope of VAR

Senversa describe the objective of their study was to:

- Build on the works already completed by Aurora and others to improve confidence in the characterisation of asbestos impacts to inform future remedial planning including obtaining additional information on contamination status of soils by AF in the vicinity of shacks; and
- Reduce the amount of identifiable ACM (to the extent practical), particularly within the most accessed areas, such that the risk represented is reduced.

Thus, Senversa, with agreement of Parks and Wildlife, did not propose or address any other potential contaminants or contamination issues, other than asbestos in the surface soils (to 10cm) in those particular defined areas, at the Wedge and Grey Settlements.

Therefore, the scope of this VAR presents the findings of the Wedge and Grey Settlements contaminated site audit comprising of the development of a SAQP, the implementation of the RDSI program and associated reporting.

1.9. Objectives of the VAR

The *Contaminated Sites Regulations 2006* (the Regulations), provide the following definition of “audit”, in relation to a site, as meaning to carry out a review of the investigation, or remediation of a site to determine one or more of the following:

- a) the nature and extent of any contamination of the site;
- b) the nature and extent of the investigation or remediation of the site;
- c) whether any restrictions on the use of the site are required;
- d) the suitability of the land for a specific use, or a specific range of uses;
- e) whether any further investigation of the site is required, recommended or necessary;
- f) whether any further remediation of the site is required, recommended or necessary so that the site is suitable for all uses, or for a specific use, or a specific range of uses;
- g) the suitability or appropriateness of a management plan.

As noted above the Senversa objective of the RDSI was to build upon the existing characterisation of ACM impacts and undertake opportunistic removal of ACM in the top 10cm of the soil profile and to undertake preliminary assessment of AF in surface soils at a limited number (12) of representative shacks⁴ to test their hypothesis (discussed later). Hence the RDSI was not focused on full remediation of ACM including any at depth (greater than 10cm) or full characterisation of AF at the Wedge and Grey Settlements.

As a result of the purpose and objectives of the RDSI in relation to ACM and AF, and acknowledging that this study was one step in the overall staged approach to assessment and management of

⁴ Of different construction and conditions assessed to fall into one of the following hypothesised categories: High Potential; Medium Potential; or Low Potential. The Medium Potential sites were subdivided into 2 categories: i) shacks with low damaged/deteriorated ACM roof; and ii) shacks with ACM in structures but without ACM roof.

asbestos issues at the Wedge and Grey Settlements, the objectives of this VAR is to address the following:

- the nature and extent of the investigation or remediation of the site;
- whether any further investigation of the site is required, recommended or necessary;
- whether any further remediation of the site is required, recommended or necessary so that the site is suitable for all uses, or for a specific use, or a specific range of uses.

1.10. Auditor support team

The Auditor did not require to seek support from members of his expert support team for this project. However, he did draw on the support of internal Coffey resources Richelle Bunbury and Dave Hellens as Audit Assistants on this project.

DoH expert representatives (initially John Howell and subsequently Perinia Otness), were providing advice to Parks and Wildlife during the project and were involved in also providing comments on the RDSI for Senversa response and attended meetings which the Auditor and Senversa attended.

2. Site details

2.1. Site identification

Table B provides a summary of key information identifying the area covered by this VAR.

Table B – Site Identification

Site Identifier	Wedge Reserve	Grey Reserve
Legal Description	Part Reserve 43283	Part Reserve 43284
Certificate of title (COT) for the Site	3064 / 200 COT documentation is provided in Appendix A.	3153 / 729 COT documentation is provided in Appendix A.
COT for off-site properties impacted by soil and/or groundwater contamination	None	None
Current site plan	Refer to Figure 2 Audit Site Definition.	Refer to Figure 3 Audit Site Definition.
Municipality	Shire of Dandaragan	
Site Area	213 ha	193 ha
Location	150km north of Perth	170km north of Perth
Number of structures	~ 360 (~290 being shacks)	~ 135 (~119 being shacks)
Area subject to VAR	Shaded area around shacks and along access tracks as shown in Figures 4.1 to 4.18 ⁵ Areas outside this area was not subject to any works during the RDSI and investigations were confined to asbestos in surface soils. Other contaminants, and asbestos contamination beyond these areas are not addressed in this VAR.	Shaded area around shacks and along access tracks as shown in Figures 5.1 to 5.5 ² Areas outside this area was not subject to any works during the RDSI and investigations were confined to asbestos in surface soils. Other contaminants, and asbestos contamination beyond these areas are not addressed in this VAR.
Current and proposed zoning	Under the Shire of Dandaragan Local Planning Scheme 7 both Wedge and Grey Settlements are zoned for parks and recreation.	
Current classification under the CS Act, and date of classification.	<i>Possibly Contaminated Investigation Required (PC-IR) (13 January 2010)</i>	

⁵ Figures have been reproduced from Senversa (2017) Remedial Detailed Site Investigation report.

2.2. Current and Proposed Land Use

Wedge and Grey Settlements comprise recreational shacks located in an uncontrolled / unregulated manner and numerous unsealed access tracks that historically provided access to Wedge and Grey. There is little formality to the settlements in their arrangement layout and alignment of tracks. The area surrounding the shacks and tracks comprises remnant native coastal vegetation. Wedge is the larger of the two settlements.

The original architectural character of the shacks has a strong emphasis on materials that were easily transportable on the rough four wheel drive tracks. Recycled building materials and basic building techniques were employed in the construction of the original shacks.

Apart from the shacks, the settlements include refuse sites that are located away from the main settlements. Wedge also has a former clay pigeon shooting range present in the eastern portion of the settlement, which is now used for sporting and social events.

The Auditor notes that potential contamination issues associated with current and historic refuse areas, the clay pigeon shooting range and other site uses, apart from those related to asbestos, were outside the scope of this VAR.

2.3. Current and Proposed Surrounding Land Uses

An overview of current and proposed surrounding landuses are presented within Table C below based on information presented within Senversa (2017) RDSI.

Table C – Surrounding Land Use Current and Proposed

Direction	Surrounding Land Use - Wedge	Surrounding Land Use - Grey
North	Current – Bushland, sand dunes and tracks.	Current – Bushland and tracks.
	Proposed – No change currently proposed ⁶ .	Proposed – No change currently proposed.
East	Current – Bushland and isolated tracks.	Current – Bushland and tracks. Indian Ocean Drive ~ 500 m east.
	Proposed – No change currently proposed.	Proposed – No change currently proposed.
South	Current – Sand dunes and Indian Ocean.	Current – Bushland and isolated tracks.
	Proposed – No change currently proposed.	Proposed – No change currently proposed.
West	Current – Sand dunes and Indian Ocean.	Current – Sand dunes and Indian Ocean.
	Proposed – No change currently proposed.	Proposed – No change currently proposed.

⁶ The proposed landuse will need to be reassessed once Parks and Wildlife complete the planning exercise and determine the location and form of public recreation and tourism infrastructure proposed for Wedge and Grey Settlements.

2.4. Site history summary

Senversa presented a site history summary within the RDSI (Senversa 2017) which was based on a review of the GHD (2014) Preliminary Site Investigation (PSI) report as follows. The Auditor has not reviewed the GHD (2014) PSI as part of this VAR.

- Certificates of Title indicate that the Wedge and Grey Settlements are located on Crown Land, with Parks and Wildlife (formerly Department of Environment and Conservation, DEC) listed as the primary interest holder.
- Historic aerial photographs indicate that Wedge and Grey Settlements were predominantly covered by natural, native bushland, sand tracks and sparse shacks until the 1980's when significant development of the shacks occurred. The settlements have remained relatively unchanged since the 1990's.
- Wedge and Grey Settlements were classified by DWER as "*Possibly contaminated – investigation required*" on 13 January 2010 based on information referring to the presence of asbestos contamination in soils within the vicinity of shacks.
- A review of the classification was undertaken by DWER in 2016, however the classification was unchanged. Based on available information a Basic Summary of Records (BSR) search was not undertaken as part of the scope of the investigations conducted on-site to date, as such justification on classification is based on reviewed reports.
- A search of the Department of Mines and Petroleum (DMP) database identified that there was no licenced storage of dangerous goods.
- A review of council records identified that no formal complaints have been lodged, however a number of requests have been lodged with regards to access roads, rubbish collection and lease renewal agreements.
- Detailed site inspections and interviews with settlement representatives from Wedge and Grey Settlements were undertaken on 20 August 2013.

3. Environmental setting

The following information has been sourced from reports reviewed as part of this Audit.

3.1. Topography

Topography in the area ranges between approximately 1 metre Australian Height Datum (mAHD) to 7 mAHD with the Wedge and Grey Settlements situated on the swan coastal plain.

3.2. Regional Geology

The generalised surface geology at Wedge and Grey is Safety Bay Sand forming mobile dunes underlain by limestone at depth. During the site inspection by the Auditor he noted the widespread occurrence of rock either as outcrop and subcrop (typically along the coastal edge) amongst dune sands.

3.3. Hydrogeology

Sediments of the superficial formation form an unconfined aquifer with groundwater flowing in a westerly direction towards the Indian Ocean. Groundwater elevation ranges between 0.34 mAHD to 0.66 mAHD at Wedge and 0.33 mAHD to 0.40 mAHD at Grey.

The Auditor notes that locally the ground elevations for both sites can vary (up to 3-4m+) variations over small distances which means the depth to groundwater table from the existing surface could vary depending on the elevation of the land locally.

3.4. Hydrology

There are no permanent surface water features on the Wedge and Grey sites. The nearest surface water body is the Indian Ocean located immediately west of both the sites. During the site inspection by the Auditor following heavy rainfall some areas of ponded surface water were noted at Wedge Settlement.

3.5. Beneficial uses of groundwater and sensitive receptors

It is understood part of the PSI scope included a limited groundwater investigation however the Auditor has not reviewed the GHD (2014) PSI as part of this VAR. There is no further information available in the reports reviewed as part of this VAR regarding groundwater beneficial use and sensitive receptors (this is not considered significant giving consideration to the scope of the audit being limited to asbestos in soils which have a low potential to adversely impact groundwater).

3.6. Acid Sulphate Soil

Reports reviewed as part of this VAR have not included any information regarding the presence or absence of acid sulfate soils on the site.

3.7. Aboriginal Heritage

Parks and Wildlife have indicated that there are no recorded Aboriginal cultural heritage sites within the Audit Site. They have also advised that the Aboriginal cultural heritage site D₁ (refer to Figures 2 and 3) was excluded from the RDSI project.

4. Contaminants of potential concern

Both Wedge and Grey reserves have been classified under the Contaminated Sites Act 2003 by the DWER as “*Possibly Contaminated – Investigation Required*”. As a BSR search has not been conducted details on the classification have not been provided to the Auditor.

It is acknowledged that the scope of this VAR was limited by Parks and Wildlife to asbestos, mostly in the form of ACM and some preliminary investigations of AF. The Auditor understands that DoH were involved in the development of the scope of the Audit and also the RDSI.

Thus, in this regard other contaminants associated with past and present activities on-site and nearby off-site could apply in consideration to Attachment B of DER (2014) *Assessment and management of contaminated sites*.

Based on information presented within the Senversa (2017) report, it is understood the limited groundwater investigation conducted by GHD identified the presence of heavy metals (aluminium, copper, lead, nickel, selenium and zinc) in groundwater at concentrations exceeding the adopted guidelines with electrical conductivity (EC) and ammonia was also recorded at elevated levels at both Wedge and Grey. However, there were no investigations by Senversa in relation to other non-asbestos contaminants.

5. Assessment criteria

5.1. Senversa approach

Senversa noted in their SAQP and in the RDSI that the DoH (2009) Guidelines For The Assessment, Remediation And Management Of Asbestos-Contaminated Soils in Western Australia from the basis of guidance in relation to asbestos and also noted that with respect to contamination criteria:

“The DoH takes a risk-based and, where necessary, conservative approach to the uncertainties associated with protecting the public from asbestos-contaminated sites.”

Senversa proposed the following assessment criteria (DoH 2009), for the assessment of asbestos investigation and remediation outcomes, based on the identified land use being recreational and shack community:

- 0.001% w/w for AF/FA.
- 0.02% w/w for ACM.
- No visible asbestos in the surface 10 cm.

Consistent with DoH (2009) guidance Senversa referred to the following equation in order to calculate the concentration of ACM:

$$\% \text{ Soil Asbestos} = \frac{\% \text{ Asbestos Content} \times \text{ACM (kg)}}{\text{Soil Volume (L)} \times \text{Soil Density (kg/L)}}$$

where it is assumed that: % Asbestos Content (within asbestos cement material) = 15% and soil density = 1.65 kg/L

Senversa noted in relation to the application of the DoH (2009) criteria for the RDSI that the project represented an intermediate stage of assessment and remediation (with limited scope and objectives) and as such DoH assessment criteria was utilised as tools to guide work and aid assessment and remediation only.

Senversa also noted the following:

- With respect to ACM in soils identification and remediation, a broad approach has been adopted that sought to identify all ACM in surficial soils (nominally top 10 cm) within accessible areas and to remove this material where practical. With reference to the calculation presented above given the specific objectives and limitations of the project and that all identified ACM was removed to the extent practical, risk assessment applying the equation was not utilised. However, the following decisions rules were applied for the ACM identification and removal program:
 - ACM has not been identified, no further actions with respect to ACM will be required;
 - ACM has been identified and has been characterised and removed to the extent practical, no further actions with respect to ACM will be required; and
 - ACM has been identified and has not been removed, due to justified constraints, further action in the form of remediation or management will be required.
- With respect to the assessment of AF, Senversa has similarly utilised the DoH criteria of 0.001% w/w to assist with reporting clarity and understanding risk at a screening level whilst

recognising the limited nature of assessment has lent itself to discussion in terms of the presence / absence of AF (particularly between shack types) and related risk implications rather than a detailed risk assessment applying a quantitative threshold criterion. Further, Senversa indicated for this assessment, where asbestos has been detected initially by the laboratory, it has been assumed to exceed the DoH assessment criteria of 0.001%w/w (as identified in the DQOs) regardless of additional (non-NATA method) calculations made by the laboratory. However, the following decision rules were adopted:

- if AF was identified it will be considered to represent a potential risk to human health unless further, more detailed assessment concludes otherwise;
- the absence of AF at locations where it is expected (as per the hypothesis – discussed later) will result in further consideration (and possibly assessment) being required;
- a holistic (whole of data set) consideration will be used to assess whether:
 - AF has been meaningfully delineated;
 - high potential sites are distinctive from other sites; and
 - useful inferences can be made from the investigated shacks to the balance of shack and shack types at Wedge and Grey.

5.2. Auditor approach

The Auditor notes that the RDSI project represented an intermediate stage of assessment and remediation of asbestos issues at Wedge and Grey and that this was agreed between Parks and Wildlife and Senversa. The Auditor opinion on the assessment criteria provided below is based on this understanding.

The Auditor considers the use of the guidelines presented in the WA DoH (2009) guidance is appropriate.

In relation to ACM the Auditor considers the application in the manner described by Senversa is considered to be generally appropriate given the context that the RDSI was an intermediate stage in overall resolution of asbestos issues at Wedge and Grey Settlements that placed an emphasis on the frequented areas of the settlements i.e. the accessible areas in the immediate vicinity of shacks and former shacks), common areas (cleared areas that are likely frequented but removed from the immediate vicinity of shack such as areas between shacks) and access tracks.

However, the Auditor notes that Senversa indicated that whilst regard was had for vegetated areas (unlikely to be regularly frequented) to the extent practical and warranted based on judgement in the field, these areas are defined and have not been subject to the same level of assessment as the designated assessment areas (i.e. were either not accessed at all or were subject to cursory inspection only).

In relation to AF the Auditor notes although the DoH (2009) assessment criteria was referred to the laboratory results were not discussed within the report in context of concentrations above guidelines nor calculations performed. As discussed later in this VAR, the Auditor considers further assessment of risks related to the reported laboratory results could have been completed and would have been beneficial.

6. Evaluation of compliance, assessment, remediation and validation

The assessment and management of contaminated sites within Western Australia are intended to be undertaken in a staged manner. All stages of site assessment generally include the relevant stage of risk assessment, which also includes an appraisal of the source, pathway and receptor linkages. When assessing potentially contaminated sites the Source-Pathway-Receptor (SPR) approach is used to develop a conceptual site model (CSM). If one or more of the source, pathway or receptor linkages are absent, no overall linkage exists and thus there is no likelihood of risk. Therefore, investigations focus on determining if a source is present and establishing the nature and extent of the contamination, and thus determining if a potential pathway exists to identify receptors.

This VAR relies upon site assessment works conducted by Senversa (refer to Section 1.6 for a list of documentation presented to the Auditor for review). The Auditor has based the technical review on professional experience and relevant published guidelines that include but are not limited to the WA Contaminated Sites Guidelines developed by DWER and in particular WA DoH guidelines for asbestos-contaminated soils which provide guidance on the assessment and management of asbestos contaminated sites in WA, as required for the purposes of section 97(1) of the CS Act. As part of the audit, the work completed by Senversa has been reviewed by the Auditor in the context of its accuracy, completeness and general compliance to relevant legislation, regulations and guidelines.

This section of the VAR provides the Auditor's evaluation of the quality, accuracy and completeness of the soil investigations and the on-site remediation works conducted to date.

The detailed Auditor reviews and associated correspondence is presented as Appendix D. Copies of the reviewed reports are provided to accompany this VAR.

6.1. Compliance Summary

6.1.1. Senversa (2016) Sample and Analysis Quality Plan (SAQP) Wedge and Grey Settlements

The Auditor was provided with a Senversa report entitled Sampling and Analysis Quality Plan Wedge and Grey Settlements, dated 20th June 2016 (the SAQP), for independent Contaminated Sites Auditor review. The SAQP outlined the proposed strategy for additional asbestos investigation works to be conducted at both Wedge and Grey.

As stated previously the objectives of the investigation, as stated by Senversa, were to:

1. Build on the works already completed by Aurora and others to improve confidence in the characterisation of asbestos impacts to inform future remedial planning; and
2. Reduce the amount of identifiable ACM (to the extent practical), particularly within the most accessed areas, such that risk represented is reduced.

Senversa indicated in the SAQP that they had undertaken a review of the previous investigations (GHD 2014, Aurora 2015 and 2016a) and considered the data presented was suitably reliable for use in the assessment of asbestos associated with the shack communities. As stated in Section 1.6 the Auditor has not formally reviewed the Aurora documents and has not been provided the GHD (2014) report. However based on the informal review of the Aurora documents undertaken for background knowledge when undertaking the review of work completed by Senversa, the Auditor agrees with Senversa that the information within these reports can be reliably used to inform additional works focused solely on asbestos in surface soils, particularly ACM, at the Wedge and Grey Settlements.

The SAQP included a Conceptual Site Model and Data Quality Objectives (7 step) for both the ACM and AF/FA investigations. The SAQP also included sampling and analysis procedures to be undertaken in the RDSI works, experience and qualifications of the personnel nominated for the field program along with Quality Assurance /Quality Control (QA/QC) program and details of community consultation and stakeholder engagement. There was one SAQP which addressed both the Wedge and Grey settlements.

The Auditor provided comments on the SAQP (presented in Appendix D) which were subsequently addressed by Senversa who presented the Auditor with a revised SAQP. Overall the Auditor was satisfied the comments on the initial version of the SAQP were adequately addressed and the methodology to undertake the works had been successfully implemented during the pilot trial. The Auditor therefore considered that the SAQP in its revised form was appropriate for implementation.

Overall the Auditor considers the various elements included in the final SAQP generally addressed DWER and DoH requirements for a SAQP and was considered adequate.

6.1.2. Senversa (2017) Remedial Detailed Site Investigation, Wedge and Grey Settlements

The Auditor was provided with a Senversa report entitled Remedial Detailed Site Investigation Wedge and Grey Settlements, dated 13 October 2016 (the RDSI), for independent Contaminated Sites Auditor review.

The RDSI report presents results from the implementation of the SAQP at the Wedge and Grey Settlements. Noting the investigation itself was considered an intermediate phase of works and was not to be interpreted in terms of site reclassification at this stage.

The Auditor, along with DoH expert representative, Perinia Otness, provided comments on the RDSI for Senversa response however not all comments were addressed by Senversa. Based on the initial review of the RDSI the Auditor was of the opinion that although a substantial amount of data was collected during the RDSI works, the analysis of the information (and in particular the AF laboratory data) did not take advantage of the available data. In particular, it was considered the analysis currently presented in the critical sections of the RDSI including risk assessment, conceptual site model, conclusions and recommendations fell short of that normally expected in a DSI report.

The Auditor considered that through further interpretation of available data, the CSM and a more detailed assessment of risks it may have been possible to reach more substantial conclusions and recommendations for future actions and/or management / remediation requirements. Including consideration of any immediate short term remediation / management requirements that may need to be implemented at both Wedge and Grey sites.

Senversa responded to the Auditor and DoH comments to the extent possible based on project limitations presented within the RDSI (Senversa 2017) and Auditor response register. In particular, Senversa were of the view that doing further interpretation was beyond the scope of their commission and beyond the DQOs.

The Auditor agreed that although the finalised RDSI report had not addressed all comments, that report finalisation would support the progression of the project and development of a VAR which would provide the DWER with a site update, including residual issues, and make recommendations for further works.

The Auditor reviewed the final RDSI for compliance against the DWER and DoH guidelines including i.e. site identification, site history, a summary of previous investigations, DQOs, relevant investigation criteria, field methodology developed and implemented according with DoH (2009) guidance. In this regard while Senversa did not address all Auditor and DoH comments the Auditor considered the

RDSI generally covered the topics required in regulator checklists for reports of this kind and provided acceptable documentation of the works undertaken and a basis for building future works upon.

6.2. Evaluation of assessment, remediation and validation

This section of the VAR presents the Auditors evaluations of the assessment, remediation and validation works as described in the Senversa (2017) Remedial Detailed Site Investigation, Wedge and Grey Settlements.

6.2.1. Summary description of RDSI works

The methodology for the ACM investigation as presented within the RDSI (Senversa 2017) is summarised as follows:

1. Initially dividing the Wedge and Grey Settlements into a set of distinct areas defined as:
 - Shacks – areas defined as accessible areas surrounding a shack or the footprint of a former shack to approximately 10 m radius from the structure.
 - Access tracks – areas defined as cleared vehicular access tracks.
 - Common areas – accessible and frequented cleared areas.
 - Vegetated areas – areas within the management zones as described within Section 1.2.
2. Undertaking a systematic walkover of the accessible areas (in grid based fashion where possible with transects spaced no more than 3m apart);
3. Identification and recording the presence of suspected ACM.
4. Collection of surficial ACM and raking (using a rake with teeth < 7mm spacing and > 10cm long) of the area where ACM is identified with at least two passes of raking with a 90° directional change to expose ACM within the approximately top 10 cm of the soil profile. Raking was to continue until no visible ACM was identified in a pass; and
5. Visual validation that identified ACM has been removed where practical and appropriate.

The areas covered by the Senversa investigation and remedial works for Wedge Reserve are shown in Figures 4.1 to 4.18 and for Grey Reserve are shown in Figures 5.1 to 5.5. The Auditor notes that these works did not cover all of the respective Reserves.

To guide asbestos removal works Senversa developed a ranking and classification system which comprised of the following steps:

1. Assessment of ACM condition as either good, fair or poor.
2. Undertake a preliminary ranking assessment which determined if material would be removed, delayed or assessed for removal. A series of decision rules supported how the ACM occurrence would be ranked.
3. Classify ACM occurrence as either 'resolved' or 'outstanding'.

Senversa developed a data management and naming nomenclature to ensure field data was recorded consistently and accurately. This included:

- Investigated areas and what was found and removed to be documented on field sheet
- Field sheets to be submitted from the field to Senversa data management staff on a daily basis who review the field sheets on a daily basis to assess any discrepancies. Where

discrepancies identified these were communicated to field supervisor who would assess reasons for discrepancy.

Data was entered in the field on tablets onto pre-loaded electronic field sheet with satellite aerial maps of the settlements with a layer showing each shack (and their assigned numbers) also preloaded on the tablet. A GPS (with reported accuracy of 1m) was connected to the tablet via bluetooth to allow accurate location in the field. Where ACM observed a field form was completed including a detailed description of the observation and action undertaken. A field form was completed for each shack assessed. The information from the field forms was used to update the existing Asbestos Register.

The methodology for the AF/FA investigation presented within the RDSI (Senversa 2017) was developed building on previous investigation works by Aurora⁷. Based on the results from Aurora an investigation of the potential distribution of AF/FA in the vicinity of shacks, particularly with runoff from shacks with asbestos rooves and/or gutters, and also more general potential around shacks as result of general wear and tear. The SAQP presented a hypothesis to further investigate the distribution of AF/FA in relation to asbestos roof / gutter condition by selecting a number of shacks with different construction and conditions as follows:

1. Hypothesised High Potential - Moderately damaged / deteriorated ACM roof with four locations selected for investigation including G028, G092, W013 and W099.
2. Hypothesised Medium Potential
 - a) Low damaged / deteriorated ACM roof with three locations selected for investigation including G103, W055 and W162.
 - b) Shacks with ACM within the structure (i.e. walls, fence, etc.) but without an ACM roof with three locations selected for investigation including G009, W149 and W245.
3. Hypothesised Low Potential - Shacks without the presence of ACM within the structure, control samples collected from two locations; G67 and W170.

The AF/FA assessment procedure is summarised as follows:

- Sample locations were selected on a case by case basis, targeting areas those areas considered most likely to be impacted (i.e., roof run-off or drip zones).
- Sample location were stepped out from the identified area of runoff and GPS co-ordinates recorded.
- A 500 mL wetted sample was collected (with an allowance of up the 15 samples per structure) with the presence, size and condition of any ACM recorded.

ACM collected during the investigation was placed in large black plastic bags and transferred to a lockable skip bin at the end of each day. At the end of the project the skip bin was disposed to the Northam Landfill (licensed to accept asbestos waste).

The field program was supervised by: Sarah Horgan (Senversa Lead Scientist) with over 10 years contaminated land experience who had completed and supervised numerous asbestos assessments and remediation; and Phil McElhinney (McElhinney Consulting Field Supervisor) who has over 35

⁷ Asbestos Register identified 52 structures where asbestos rooves and/or gutters are present within structures. Aurora sampled 5 of these locations and detected AF within all sampled location (G028, G073, G107, W073 and W099). The concentrations of AF detected were not reported by Aurora who assumed that a detection indicated an exceedance of the adopted guideline of 0.001%.

years' experience in construction, civil, demolition and mining industries and is a licensed (restricted) asbestos removalist.

Senversa documented in the RDSI variations from the SAQP.

Due to the large scale of the project, prior to implementation of the SAQP at the Wedge and Grey Settlements, Senversa undertook a pilot trial in order to assess if the proposed approach was adequate. An update was provided to the Auditor presenting the outcomes of the pilot trial with no changes made to the investigation approach or the SAQP.

6.2.2. Summary of RDSI results

A brief summary of the RDSI results are presented below.

ACM identification and removal undertaken at Wedge Settlement can be summarised as:

- 370 structures were assessed at Wedge with a total of 285 recorded as having no ACM identified within an approximate 10 m radius of the shack structure.
- A total of 85 shacks recorded ACM at one or more locations within an approximate 10 m radius of the shack structure (total of 154 individual records).
- ACM was identified at 31 track locations and nine common areas within Wedge.
- Identified ACM comprised scattered fragments ranging between 1 cm to 30 cm in size or larger sized quantities of fibre cement sheeting panels.
- The fibre cement sheeting panels generally included corrugated fence panels, flat or square corrugated wall panels and corner capping panels.
- Friable ACM was recorded at one location, buried in a dune to the north of W012 (extent of impact not confirmed), noting that this area has been identified as “outstanding” and thus requiring future management.
- ACM was identified and recorded at 194 locations throughout Wedge. Of the 194 locations, 157 of the records where ACM was identified, fell into the criteria for remediation during the Remedial DSI and were resolved.
- Thirty-seven (37) records of identified ACM were classified as being “outstanding” as follows:
 - Mounds – Eight occurrences of mounds of material with ACM fragments observed buried throughout the mound. Mounds were generally no more than 1.5 m in height but varied between 1 m to 5 m in length and 1 m to 2 m in width.
 - Buried ACM sheeting or smaller suspect ACM fragments at depths greater than 10 cm – Four occurrences.
 - ACM sheeting larger than 1 m² in area – 13 occurrences
 - ACM fragments scattered over an area larger than approximately 10 m² – 12 occurrences.

Noting the additional works subsequently undertaken by Parks and Wildlife are considered to have resolved some of these outstanding occurrences of ACM at Wedge Settlement.

ACM identification and removal undertaken at Grey Settlement can be summarised as:

- 142 structures were assessed at Grey with a total of 85 recorded as having no ACM identified within an approximate 10 m radius of the shack structure.
- A total of 57 shacks recorded ACM at one or more locations within an approximate 10 m radius of the shack structure (total of 108 individual records).
- ACM was identified at 16 track locations and three common areas within Grey and comprised of scattered fragments ranging between 1 cm to 30 cm in size or larger sized quantities of discarded fibre cement sheeting.
- The fibre cement sheeting panels generally included corrugated fence panels, flat or square corrugated wall panels and corner capping panels.
- No friable asbestos was recorded at Grey. One occurrence of vinyl tiling was observed across a driveway at Grey and was sampled for asbestos confirmation.
- ACM was identified and recorded at 127 locations throughout Grey. Of the 127 locations, 111 of the records where ACM was identified, fell into the criteria for remediation as part of the Remedial DSI and were resolved.
- Sixteen (16) records of identified ACM were classified as being “outstanding” as follows:
 - Mounds – Three occurrences of mounds of material with ACM fragments observed buried throughout the mound. Mounds were generally sand dunes at Grey, with two of the shacks constructed on the mounds.
 - Buried ACM sheeting or smaller ACM fragments at depths greater than 10 cm – Four occurrences.
 - ACM sheeting larger than 1 m² in area – Eight occurrences.
 - ACM fragments scattered over an area larger than approximately 10 m² – One occurrence.
- Noting the additional works subsequently undertaken by Parks and Wildlife will have resolved some of these outstanding occurrences of ACM.

A total of 360kg of ACM was disposed, comprising 59kg removed from Wedge and 94kg from Grey Settlements, respectively (although there were some large sheets included in the final disposed weight which could not be electronically weighed and some disposal of ACM from shack owners also was included in the total weight disposed).

Senversa submitted 53 ACM samples for laboratory analysis with a summary as follows:

- Wedge Settlement – 26 samples submitted, 10 confirmed not to contain asbestos
- Grey Settlement – 27 samples submitted, 9 confirmed not to contain asbestos

A summary of the AF/FA sampling, giving consideration to hypothesis scenario is as follows:

Table D Number of Samples containing AF/FA

Scenario	No. of samples that contained AF/FA (Shack ID)				Total
High	6 (W099)	4 (W013)	1 (G092)	1 (G028)	12
Medium (roof)	1 (W162)	0 (W55)	0 (G103)		1
Medium (structure)	1 (W245)	2 (W149)	9 (G009)		12
Low	0 (W170)	0 (G67)			0

Senversa noted the number of samples containing asbestos at G009 may be associated with an issue unrelated to shack construction (i.e. broken ACM from another source) which is possibly supported by the nature of asbestos detected by the laboratory.

Senversa also noted the AF varied in nature (assumed to be related to different building material types and nature of degradation) and also noted no free fibres were detected in any samples.

The Senversa RDSI included a CSM and limited risk assessment based on the results reported in the document.

6.2.3. Auditor evaluation of assessment, remediation and validation

The Auditor evaluation of the key aspects of the assessment, remediation and validation are discussed within Table E below.

Table E Auditor Evaluation of assessment, remediation and validation reported within the RDSI

Aspect	Auditor evaluation
Auditor inspection	<ul style="list-style-type: none"> The Auditor and Audit Assistant undertook a site inspection while Senversa were undertaking the RDSI works on 3rd August 2016. The site inspection included both Wedge and Grey Settlements. The Auditor was able to observe areas where the ACM inspection and removal had been undertaken, observe the procedures for inspection and raking around a shack, observe the field recording of data and general conditions and environment of each site. The Auditor was satisfied with the works observed during the site inspection.
DSI Sampling and Analysis Program	<ul style="list-style-type: none"> The Auditor was generally satisfied with the sampling and analysis program undertaken by Senversa given the objectives and the fact that this works was an intermediate step in achieving the longer term remediation and management of asbestos issues at the Wedge and Grey Settlements, noting that a significant number of structures built of and/or containing asbestos remain in the settlements. The Auditor notes that visual identification of ACM was used as the primary measure of asbestos for the remedial works, while laboratory analysis was used as a supporting tool to confirm presence of asbestos in representative samples of suspected ACM fragments. Laboratory analysis was used testing the AF/FA distribution around a small selection of structures to test a hypothesis developed by Senversa which was considered appropriate. Due to the nature of the investigations there was limited judgemental sampling based on observations and as the works focused on removal of visible asbestos in the top 10cm sampling densities as set out in DoH (2009) were not used which was considered appropriate given the objectives.

<p>Sampling, Monitoring and Analytical Method</p>	<ul style="list-style-type: none"> • Hand picking (emu-bob) and raking (where undertaken) was considered generally consistent with the methodologies outlined in the WA DoH (2009). • The laboratory analytical procedures appeared to generally comply with WA DoH Recommended Procedures for Laboratory Analysis in Soil (June 2011) requirements and appropriate analytical and reporting procedures were used. Exceptions noted was that typically a smaller soil sample size was analysed for AF/FA than recommended and the laboratory did not include a statement confirming consistency with these WA DoH guidelines. However, given the small amount of sampling and the recommendation for further investigation on this aspect this is not considered to be a significant issue which materially impacts the outcome of the audit. • Field supervisors and managers generally met the experience requirements as set out in the WA DoH (2009) guidelines. • Overall the Auditor was satisfied with the sampling, monitoring and analytical methods used given the project objectives.
<p>Quality and completeness of work</p>	<ul style="list-style-type: none"> • The Auditor considers that quality and completeness of Assessor work is generally compliant with DWER and DoH guidance. However it is considered by the Auditor given the significant amount of data collected the level of interpretation is somewhat limited, particularly in relation to AF/FA and risks. • The report provides evidence that the soil asbestos investigation, remediation and validation have generally been performed by competent persons, with evidence including curriculum vitae and licences in the case of asbestos removal.
<p>Conceptual site model</p>	<ul style="list-style-type: none"> • The Auditor notes the preliminary CSM presented within the Senversa RDSI was limited to asbestos only which is considered acceptable within the context of this project. The Auditor does note there are other potential sources of contamination which require consideration in the future. • The Auditor agrees with the source-pathway-receptor linkages presented within the Senversa CSM and also agrees with the Senversa assessment that potential linkages exist and Senversa's assessment presented under the heading Remedial DSI Refinement. • The Auditor was of the opinion if further interpretation of data had been undertaken it may have been possible to develop a more detailed CSM. This is discussed in the following section of the VAR.
<p>Risk Assessment</p>	<ul style="list-style-type: none"> • In relation to ACM the Auditor agrees with Senversa conclusion that the RDSI has inherently reduced the risk from ACM across the site. The majority of ACM removed were occurrences of small fragments of ACM from around shacks. • The Auditor considered the risk assessment presented within the RDSI was limited and could have been enhanced with further contextualisation, particularly with regard to risks associated AF/FA identified in the vicinity of existing ACM structures. This is discussed further below. • In this regard the Auditor notes that the descriptions of samples with reported results exceeding 0.001% of AF/FA recorded a variety of forms of asbestos including bonded asbestos cement sheeting, fibro fragments, asbestos containing fibre bundles, asbestos containing fibrous material and friable asbestos cement sheeting. As noted by Senversa no free fibres of asbestos were reported in any samples (at the LOR of 5 fibres). As noted Senversa have not explored or considered the risks that may be posed by these different forms of asbestos.
<p>Validation of asbestos removal works</p>	<ul style="list-style-type: none"> • No formal validation sampling as traditionally applied in contaminated sites context was undertaken. However, the Auditor notes there was a form of validation undertaken by the Senversa field manager / lead scientist checking a portion of the areas of ACM identification and removal.

	<ul style="list-style-type: none"> • As presented on Figures 4.1 to 4.18 and Figures 5.1 and 5.5 for Wedge and Grey Reserves, respectively, locations termed as 'areas assessed' have been regarded as remediated (to the extent practicable) via inspection and collection and where required under the Senversa field procedures, raked. Thus, visual validation of asbestos removal works on tracks, common areas and adjacent to shacks occurred and recorded on field sheets. • In addition the classification system employed by Senversa identified areas where ACM was identified and classified as resolved or ACM identified and classified as outstanding and remain on site (although it is understood that some of these may be have been addressed in the subsequent works commissioned by Parks and Wildlife discussed in the next section of this VAR).
<p>Conclusions and recommendations</p>	<ul style="list-style-type: none"> • The Auditor considers that quality and completeness of Assessor work is generally compliant with DWER and DoH guidance. The Auditor considers the works have built upon the work undertaken by Aurora and has enhanced the knowledge of the asbestos issues at the Wedge and Grey Settlements. • The Auditor agrees in general with the conclusions and recommendations presented in the Senversa report subject to the comments in the following points and subsequent sections of the report. • It is considered by the Auditor given the significant amount of data collected the level of interpretation is somewhat limited. • Previously in response to the Auditor comment Senversa concluded the removal of 360 kg of ACM from the most frequented areas of the settlements has greatly reduced the risk of exposure to asbestos for relevant receptors (current shack residents, recreational visitors and Parks and Wildlife workers and contractors)." The Auditor agrees with this conclusion however the Auditor was of the opinion that the report did not take full advantage of the available data, particularly in relation to assessment of risks related to the AF/FA identified during the program. • The Auditors considers more substantial conclusions and recommendations for future actions, priorities and/or management / remediation requirements may have been achieved if further data assessment had been undertaken.
<p>Community consultation</p>	<ul style="list-style-type: none"> • Parks and Wildlife has engaged with all relevant stakeholders. Parks and Wildlife distributed a leaflet to shack owners prior to being undertaken. Leaflets were also provided to field scientists to distribute to shack owners if approached. • The Auditor did not review the community consultation information developed by Parks and Wildlife however the summary presented within the Senversa (2017) report the level of engagement with stakeholders (primarily undertaken by Parks and Wildlife) is considered to have been appropriate.

6.3. Remediation Works Conducted Post RDSI

Parks and Wildlife recently advised the Auditor in March 2017 a contractor was subsequently commissioned to remove ACM which was reported within the RDSI as 'outstanding' and remained on-site.

Approximately 1,900 kg of asbestos sheets was disposed of during this event with either lying loose or stock piled near to shacks at Wedge and Grey Settlements. During these site remediation works asbestos sheets which had been dumped on the Aboriginal Heritage site at Wedge were also removed, the weight of which is included in the 1,900 kg.

The sheets were removed from the following sites as detailed in the Senversa report “Appendix H: Summary of Outstanding Records”:

Table F Post RDSI Remediation Works Summary

Shack ID	Map No (Senversa 2017 Figures 4 - 5)	Easting	Northing
56	2	321260.1426	6606198.8535
85	2	321388.2764	6606196.8906
50	2	321372.3451	6606125.1063
100	3	321250.1883	6606441.5004
106	3	321229.7338	6606393.4936
116	4	321181.0976	6606617.414
116	4	321189.5502	6606610.972
12	6	327733.5931	6588966.4942
19	6	327650.0084	6588966.0849
78	4	327230.1819	6588994.4005
99	4	327065.0945	6589143.3855
110	9	326963.4166	6589163.7644
92	2	327169.4152	6588983.6934
161	16	326978.6489	6589871.6622
288	8	327396.337	6589345.9509
355	5	327534.6105	6589090.1151
355	5	327335.9806	6589144.6854

In addition to the sites identified above asbestos sheets were removed from the following sites:

1. Shack ID Wedge 110: Approximately 10 sheets
2. Aboriginal Heritage Site: 42 full asbestos sheets.

The Auditor was not involved in this work nor has been provided with a report detailing the methodology and outcomes. Therefore, the Auditor cannot independently review this work and consequently has provided no comment on this work within this VAR.

7. Auditor assessment

This section summarises the Auditor’s assessment of the quality, accuracy and completeness of the Senversa RDSI works as required by the DER (2016) Requirements for Mandatory Auditor Reports Contaminated Sites Guidelines. For each of the VAR requirements generally an overall evaluation or comment is presented followed by comments specifically relating to either ACM or FA/AF.

Table G Auditor Assessment of Wedge and Grey Remedial Detailed Site Investigations

VAR Requirements	Auditor assessment
<p>Auditor evaluation of the contamination status of each land parcel comprising the site (including all affected land parcels)</p>	<p>As previously mentioned in Section 1.2 and elsewhere in this VAR the investigation boundary does not reconcile with the cadastral boundary of the Reserves on which the Wedge and Grey Settlements are located. The asbestos investigation boundaries were limited to defined Management Zones developed by Parks and Wildlife and excluded Aboriginal Cultural Heritage Zone (Wedge only) and the tip sites present at both Wedge and Grey (refer to Figures 2 and 3). This was further refined to frequented accessible areas within these zones (excluding vegetated areas) and the surface soils within these areas. As such the Auditor review has been limited to the investigation boundary as determined by Parks and Wildlife and Senversa and does not include all of each land parcel.</p> <p>In relation to the ACM works the aim was to reduce the amount of ACM on the site (with a focus on areas frequented the most) while also defining the areas of impact – hence the Remedial DSI.</p> <p>In relation to the additional investigation works for AF/FA, the Auditor notes the purpose was not to investigate all potential areas of the site or all shacks with degraded ACM for AF but rather Senversa had developed a hypothesis as whether AF in soils could be associated with the presence of degraded ACM used to build shacks (rooves or gutters). The limited investigations were focused on assessing this hypothesis through a limited investigation sampling program of at total of 12 representative sites within the 3 hypothesised categories of: High Potential (4 locations); Medium Potential⁸ (6 locations); and Low Potential (2 locations).</p> <p>The focus of Senversa’s studies and hence the Auditor evaluation of the contaminated status of Wedge and Grey was focussed on the identified contaminants of concern, ACM and fibrous asbestos (AF/FA). The Auditor’s evaluation of these are discussed separately due to these having a different context of potential risk to receptors.</p> <p>Note the Auditor considers that whilst the original trigger for investigation was the identification of ACM in soil, other chemicals of potential concern (COPCs) have not been considered as part of Senversa’s study (although some limited consideration of other contaminants has been considered in previous studies) and as such could be relevant future considerations based on findings of the GHD PSI and the Aurora studies along with site history.</p> <p>ACM</p> <p>Senversa engaged licensed asbestos removalist McElhinney Consulting Pty Ltd (License Number WARA 1512), to remove ACM for asbestos removal works on both Wedge and Grey Settlements. Asbestos removal was subsequently validated through visual inspection by Senversa (and sampling where ACM was encountered).</p>

⁸ Subdivided into 2 categories: shacks with low damaged/deteriorated ACM roof; and shacks with ACM in structures but without ACM roof.

ACM investigation works involved an extensive grid based site walkover targeting a 10 m radius around shacks, tracks to shacks, tracks to the beach and common areas. A total of 360 kg of ACM was removed from both Wedge and Grey Settlements during the RDSI, with the majority of occurrences reported as scattered small fragments surrounding the shacks. At Wedge, out of 197 reported ACM occurrences 157 were classified as resolved and at Grey out of 127 reported occurrences 111 were classified as resolved. The occurrence of ACM not classified as resolved was reported as outstanding and remains on site. Some of these have been subsequently addressed in a separate exercise commissioned by Parks and Wildlife, which has not been independently reviewed by the Auditor.

The final site condition presented within the CSM of the RDSI (Senversa 2017) reported the presence of surficial ACM fragment within shack communities with potential for degradation and release of asbestos fibres into the atmosphere posing a potential inhalation risk as potentially complete. In this regard the Auditor considers the risk assessment presented within the RDSI was limited and based on the significant amount of data collected, could have been expanded upon to assess potential risk further along with prioritising future actions. In relation to this the Auditor recognises that bonded ACM in good condition generally poses a low risk (but where scattered on the ground there is potential for breaking up and release of fibres), although degraded ACM poses a greater risk of release of asbestos fibres.

Additionally, it is the Auditors experience that often following a thorough emu-pick that areas cleared of visible ACM at the surface may be subject to re-emergence of ACM, particularly after rainfall and in sandy soil environments similar to Wedge and Grey Settlements where surface soils are granular and subject to ongoing movement.

Overall the Auditor is of the opinion the ACM contamination status of Wedge and Grey Settlements has improved significantly following the completion of the works documented in the RDSI (and presumably also as a result of the post RDSI remediation works commissioned separately by Parks and Wildlife).

The Auditors previous experience is that it is common following an emu picking event for residual ACM (within the surface 10cm or perhaps deeper) that was not observed during the event may emerge following the event due to movement of soils, rain and other events. This should be reassessed some period after the completion of the RDSI works.

AF/FA

A limited targeted AF/FA assessment was conducted on-site to build on initial investigation works undertaken by Aurora and to test the Senversa hypothesis as to whether AF/FA in soils could be associated with the presence of degraded ACM used to build shacks (rooves or gutters).

The investigations revealed the presence of AF in soils above DoH 0.001% guidelines which were considered more likely to be associated with ACM rooves and / or gutters in deteriorated conditions. As such based on the results of limited investigations the available data tends to support Senversa's hypothesis, with the exception of findings at one location (G009). However, the Auditor is of the opinion that while the Senversa work represented an additional knowledge and data based further investigations is required to examine this hypothesis further and to assess the potential for human health risks from AF/FA, including closer evaluation of the Senversa data and collection of additional data. Review of any available air monitoring results may also assist in better assessing the risks.

The Auditor considers an important aspect of further assessment of the Senversa data and additional investigations would be the form of AF/FA. The Auditors review of the laboratory data included in the RDSI report indicates that in many samples where AF/FA was reported to exceed the DoH (2009) criteria (0.001%) the sample description noted variety of forms of asbestos including bonded asbestos cement sheeting, fibro fragments, asbestos containing fibre bundles, asbestos containing fibrous material and friable asbestos cement sheeting. As noted above the form of asbestos present (free fibres, fibre bundles, friable

	<p>asbestos containing sheeting, asbestos containing sheeting etc) will be critical to understanding the risks posed by the AF/FA. Senversa did not discuss or consider this aspect in their assessment which the Auditor considers is important in understanding the risk profile and remediation / management requirements. Future works should consider this aspect closely.</p> <p>Overall, the Auditor is of the opinion the data presented within the RDSI has provided a preliminary indication of AF/FA contamination status of the site. However due to the limited nature of the investigations and interpretation of data the nature and extent of contamination and potential risk to receptors is not fully understood and as such further investigations and more rigorous interpretation of the data is warranted with a particular focus on better understanding the relationship between the condition of ACM in structures and the potential for AF/FA in adjacent soils and the potential associated health risks in order for the contamination status of the Wedge and Grey Settlements to be further evaluated.</p>
<p>Auditor assessment of whether the contamination poses or potentially poses a risk of harm to public health, the environment or any environmental value</p>	<p>The refined CSM presented within the Senversa (2017) RDSI presents the following SPR linkages as potentially complete:</p> <ol style="list-style-type: none"> 1. SPR1: the presence of surficial ACM fragment within shack communities (including surrounding shacks, common areas and on tracks) with potential for degradation and release of asbestos fibres into the atmosphere posing a potential inhalation risk to shack residents, recreational visitors, Parks and Wildlife workers and contractors. 2. SPR2: asbestos fibres released from degraded asbestos structures and associated with drip lines and gutter runoff released into the atmosphere posing a potential inhalation risk to shack residents, recreational visitors, Parks and Wildlife workers and contractors. <p>The Auditor assessment of potential risk, based on available information, is presented below.</p> <p>ACM</p> <p>The ACM investigation works focussed on shack locations, tracks and common areas and were conducted in general accordance with the DoH (2009) methodology presented in Table 2 Summary of Hand-picking method. Taking into consideration the comprehensive process applied during the ACM investigation works and the amount of ACM removed from surface soils (to 10cm) both Wedge and Grey Settlements, the Auditor considers the potential risk of impact to human health and environmental value [i.e. beneficial use conducive to public benefit, public amenity, public safety, public health or aesthetic enjoyment (DWER 2014)] from ACT at surface is considered to be significantly reduced from that which existed prior to the works, and is likely to be low.</p> <p>As noted previously, it is the Auditors experience that often following a thorough emu-pick that areas cleared of visible ACM at the surface may be subject to re-emergence of ACM, Further, evaluation of the areas remediated for presence of re-emerged ACM would provide additional data to better assess the level of residual risk following the ACM remedial works completed by Senversa.</p> <p>As such the Auditor concludes further works are required in order to provide a better understanding of the potential risk to human health and / or the environment associated with ACM in surface soils at Wedge following the RDSI, including assessment or emergence of residual ACM post remedial works. Further works would also be required in areas outside those addressed in the RDSI and also assessment of potential for ACM at depths beyond 10cm.</p>

AF/FA

Building on works conducted by Aurora (2015) Senversa identified the key problem to be addressed for the AF/FA assessment was to characterise the contamination status of soils by AF/FA in the vicinity of shacks and test the hypothesis to whether AF/FA in soils could be associated with the presence of degraded ACM in the constructed shacks (rooves or gutters). The AF /FA assessment was conducted at 12 shacks to assess the following scenarios:

- Scenario 1: High potential (ACM moderately damaged or deteriorated rooves).
- Scenario 2: Medium potential (ACM rooves in reasonable condition or those that had ACM within the structure).
- Scenario 3: Low potential (No ACM in structure - background / control).

Based on the laboratory results and noting the limited nature of the investigation it was determined (as a preliminary indication) reasonable that those shacks with ACM rooves and / or gutters in deteriorated condition are more likely to be associated with AF/FA in soils in their vicinity. There was one main anomaly to the hypothesis where G009 assessed as having a medium risk (structure) recorded 9 identifications of asbestos AF/FA.

However, in context of potential risk to receptor, there was limited interpretation of findings with a tier 1 screening using available assessment criteria not conducted, nor consideration of the form of AF/FA observed in samples in the laboratory. It is considered the RDSI report presented a preliminary assessment of contamination status of the site with a limited assessment of potential risk, and in particular potential for asbestos in soils to become airborne and pose a health risk to site users and visitors. As such the Auditor concludes further works are required to collect additional data in order to further assess the hypothesis and provide a knowledgeable assessment of the potential risk to human health and / or the environment associated with AF/FA at Wedge and Grey Settlements.

In relation to this aspect the Auditor also notes that the recording of building conditions was at a level which did not enable easy correlation or analysis of the results against the condition of ACM in the adjacent building.

The Auditor notes the greatest risk is inhalation of free asbestos fibres. In this regard when assessing risk related to AF/FA it is important to give consideration to the sample description and form of asbestos as reported by the analytical laboratory. The Auditor notes that in a number of samples that recorded a FA / AF concentration >0.001% the sample descriptions indicates a variety of forms of asbestos was observed including: bonded asbestos cement sheeting; fibro fragments; asbestos containing fibre bundles; asbestos containing fibrous material and friable asbestos cement sheeting. The Auditor notes there were no free fibres reported (at the laboratory limit of reporting of 5 fibres). The risk profile of asbestos bound into fibro fragments (particularly those in good condition) would be expected to be lower than friable sheeting asbestos cement sheeting or asbestos containing fibre bundles, while free fibres would pose the greatest risk. Asbestos fibre bundles or fibrous material were only noted in samples from high risk sites (W013 and W099). Thus, understanding the form of asbestos will be important in identifying the risk profile.

Nevertheless, further investigations would be required to enable a better understanding and assessment of risks related to AF/FA, which should include a more comprehensive investigation program to further test the hypothesis which includes careful documentation of the condition of the building(s) adjacent to the sampling locations and where analysis of the data gives consideration to the form of the AF/FA identified in samples.

Auditor assessment of whether the contamination status of the site has, or potentially has, a detrimental effect on the use of the site/environmental values including surface and groundwater resources.

ACM

A combined total of 360 kg of ACM was removed from Wedge and Grey during the asbestos investigation (and an additional significant quantity of 1,900 kg of ACM was subsequently removed under a separate commission by Parks and Wildlife). In the context of the current site use, primarily being visitors staying in shacks, and the environmental values of the site the Auditor considers the ACM removal works have significantly improved the asbestos in soils contamination status of the site.

However, past experience would suggest that complete removal of all ACM fragments on the ground in the areas subject to remediation is unlikely, and re-emergence of residual ACM is likely. The potential for detrimental effect will be related to the amount of residual ACM present and its potential to breakdown and release asbestos fibres.

Bonded ACM in good condition will minimise the risk of release of asbestos fibres which could pose a detrimental effect on the use of the site. Appropriate management (which may include additional collection) of residual ACM would be expected to minimise the potential for detrimental effects on the use of the site.

Residual ACM is not expected to have a detrimental effect on surface and groundwater resources at the site.

AF/FA

Based on the Auditors review of the RDSI and CSM it is the Auditors opinion there is currently insufficient assessment regarding the presence of AF/ FA in soils to determine if there is a detrimental effect on site uses and environmental values.

However, should there be widespread AF/FA at the site, this could pose a detrimental effect on the site uses.

The presence of AF/FA are not likely to significantly impact surface water or groundwater resources at the site.

Assessment as to whether the condition of the site is impacting surrounding land and/or landuses

The asbestos investigation boundaries of Wedge and Grey Settlements were limited to accessible or frequented areas within defined Management Zones developed by Parks and Wildlife and excluded Aboriginal Cultural Heritage Zone (Wedge only) and the tip sites present at both Wedge and Grey (refer to Figures 2 and 3). An assessment to whether the current site condition of both Wedge and Grey Settlements have potentially impacted on the surrounds has not been discussed within the RDSI.

However in relation to on-site sources posing risks to the surrounding land and or landuses, the Auditor considers that based on the results of on-site monitoring undertaken during the remediation works, the risk from on-site sources of ACM to off-site receptors is low based on the following rationale:

- The Auditor notes that the original and primary activity resulting in ACM in site soils, being historical building of the shacks which are either still present on-site or have been demolished. These have been built within a defined portion of the site and based on site history and the results of the works it appears impacts are more likely to be present within the area of investigation (although some significant quantities have also been subsequently removed in some areas outside the investigation area under a separate commission by parks and Wildlife). Further, ACM fragments are not expected to have much opportunity for movement or migration from the site. Offsite migration would need to be by either wind or water which is considered unlikely.
- The areas surrounding both the Wedge and Grey Settlements include beach, sand dunes, bushland and isolated tracks. The largely undeveloped nature of

An assessment as to whether any further investigation is required, recommended or necessary.

these adjoining areas means there is limited use (mostly to short term visitors or residents⁹ of the settlements) so the potential for impact is low.

- However the Auditor acknowledges asbestos investigations did not extend beyond a defined investigation boundary so there is potential for ACM fragments to be present off-site, particularly if historical dumping of construction waste has occurred outside the investigation area.

As stated there is insufficient information at this time to assess impacts from AF/FA however, for similar reasons outlined above the potential for impact on surrounding land is likely to be low.

Overall the Auditor considers that a substantial amount of data was collected during the RDSI works but considers that the analysis does not take full advantage of the available data. In particular, it is considered the analysis currently presented in the critical sections of the RDSI including risk assessment, conclusions and recommendations fall short of what could have been expected. However, in relation to AF/FA it is noted that limited data is available.

By giving further consideration to the available data, the CSM (post the RDSI) and conducting a more detailed assessment of risks, particularly related to AF/FA it may have been possible to reach more substantial conclusions and recommendations for future actions and/or management / remediation requirements. This should have include consideration of any immediate short term remediation / management requirements for both Wedge and Grey Settlements.

For example it may have been possible to divide the site into zones based on the various forms of asbestos present such as risk of ACM (high, medium, or low risk), outstanding areas of ACM (high, medium or low risk) areas not investigated for ACM, and risks for AF/FA (high, medium, or low risk) etc giving consideration of the issues discussed in the DoH (2011) Guidance Note on Identification, Assessment and Management of Asbestos Contamination in Regional Public Areas or some other similar risk based approach / outcome and draw conclusion and prioritise recommended actions and timeframes for implementation by Parks and Wildlife.

Further assessment is required in those areas outside the RDSI investigations areas and potential for soils at depth to be impacted by ACM. Further assessment should also be undertaken for other potential contaminants. Further Assessment should give consideration to outcomes of the planning exercise on proposed land uses.

The Auditor opinion in relation to the further assessment based on results of the RDSI works are as follows:

ACM

- Based on asbestos removal works conducted by Senversa the Auditor considers there are large expanses on the Wedge and Grey Settlements where asbestos was not observed and / or was removed as part of the RDSI works. However, as noted above previous experience would suggest there is potential for re-emergence of residual ACM due to the dynamic environmental properties of both the Wedge and Grey Settlements (mobile sand dune systems) and the historical nature of site activities. The extent of such re-emergence is likely to be dependent upon the amount of ACM originally

⁹ Mostly expected to be temporary and non-permanent residents including ones who come and go fairly regularly but do not live in the settlements on a permanent basis.

present and the success of the implementation of the works. The Auditor considers that this could be assessed through further assessment / investigation work to confirm the status of ACM contamination in areas classified as resolved by Senversa. The Auditor considers to confirm the current contamination status of Wedge and Grey, completion of a site walkover survey (or emu-bob) in several representative areas will provide an indication of the re-emergence of residual ACM. The need for a more widespread site-walk-over (or emu bob) or additional remedial / management works can be assessed based on the outcome of an initial walk-over survey.

- At the time of completion of the RDSI there were 37 and 16 locations of ACM which have been recorded as outstanding on Wedge and Grey Settlements respectively. Subsequent works (under a separate Parks and Wildlife commission) has resulted in 19 of these being remediated (although these works have not been reviewed as part of this audit). Further consideration should be given to remediation / management of the remaining known areas of concern giving particular attention (or priority) to outstanding areas located in more accessible locations (i.e. tracks or common areas) and / or poor condition which may represent a higher risk.
- Details of known locations of residual ACM impacts, condition, fibre potential release risk, disturbance potential and recommended actions are presented within Senversa (2017) Appendix D Asbestos Register – Table 1. This should be reviewed in light of the additional post RDSI works to develop a management strategy to address the known residual areas of ACM impacts on Wedge and Grey Settlements.
- Future investigation works should include application of Tier 1 assessment criteria, where appropriate, including w/w% to allow a better understanding of overall impact on-site and assist in further understanding of potential risk to receptor and updated the CSM.

AF/FA

As mentioned previously the AF/FA investigation was conducted at 12 shacks to assess the following scenarios:

1. Scenario 1: High potential (ACM moderately damaged or deteriorated rooves).
2. Scenario 2: Medium potential (ACM rooves in reasonable condition or those that had ACM within the structure).
3. Scenario 3: Low potential (No ACM in structure - background / control).

Based on the laboratory results it was established, as a preliminary indication, reasonable that those shacks with ACM rooves and / or gutters in deteriorated condition were more likely to be associated with AF/FA in soils in their vicinity. In regards to these findings the Auditor has undertaken an assessment in relation to the need for any further investigations remediation or management and has made the following conclusions:

- The Auditor is of the opinion that the risk profile associated with AF/FA in soil at Wedge and Grey Settlements should be further assessed using information presented in Table 2 Wedge Settlement Asbestos Fibre Sampling Results and Table 3 Grey Settlement Asbestos Fibre Sampling Results presented in Appendix J of Senversa (2017) RDSI and collection of additional data to enhance the data set.
- If possible further interpretation and discussion regarding the quantity and extent of AF/FA found should be undertaken taking into consideration relevant contextual information about the adjoining shacks including:

	<ul style="list-style-type: none"> ○ Site/shack, roof conditions. ○ Location of downpipes, gutters and conditions. ○ Ground surface type, outflow places and contours. ○ Weather side / non weather side. ○ Age, history. ○ Photos and location plans. ● It would also be beneficial to complete a review of any personal or static air sampling data undertaken during the asbestos investigation (including those by Aurora and any others available) could also add additional knowledge to the results of the above tasks. ● Further investigations are considered necessary to build on the knowledge obtained by the above tasks to enable the conduct of further assessment of potential risk using a weight of evidence approach in accordance with the DoH guidelines. ● The CSM presented within the RDSI should be updated using available information and a more complete CSM should be developed along with more detailed assessment of risks. ● In relation to further assessment of risk there should be a strong focus on the risks posed by AF/FA associated with deteriorated structures across the site and determining any interim management / remediation measures are required.
<p>An assessment as to whether any remediation or risk mitigation/management measures are required at the site and recommendations relating to remediation or risk mitigation management measures</p>	<p>ACM</p> <p>Based on Auditor experience and giving consideration to the amount of asbestos removed from Wedge and Grey Settlements during the RDSI works, the Auditor considers that the potential re-emergence of residual ACM fragments cannot be eliminated and as such may require future remediation/management.</p> <p>The need for future remediation/management should be based on the results of the additional site walk-over surveys or additional remedial / management works. The need for future remediation/management should also give consideration to the longer term land use plans for the Reserves.</p> <p>If future management (and/or remediation) is required, this should be achieved through an Asbestos Management Plan (AMP). In addition Wedge and Grey Settlements are publically accessible areas which the AMP will need to acknowledge and develop appropriate risk mitigation management measures.</p> <p>Furthermore as discussed previously area of known “outstanding” residual ACM require further assessment to determine appropriate remediation / implementation of management measures to mitigate potential risk to receptors.</p> <p>AF/FA</p> <p>As previously discussed based on the information reviewed by the Auditor there is uncertainty relating to the nature and extent of AF/FA present at the site and the associated risk, as such it is considered by the Auditor that prior to the development of any remediation strategies or risk mitigation / management measures further assessment of risk should be conducted. These should give consideration to the points outlined above and managed in accordance with the AMP.</p>
<p>Assessment of completeness and effectiveness of remediation or risk mitigation/management measures completed at the site.</p>	<p>It is the Auditors opinion that a significant amount of asbestos removal works has been conducted on the Wedge and Grey Settlements as part of the RDSI.</p> <p>In this regard it is considered the RDSI asbestos removal works (and the subsequent additional post RDSI works separately commissioned by Parks and Wildlife) have improved the contamination status of Wedge and Grey however further assessment, as outlined above, is recommended to confirm the</p>

	<p>completeness and effectiveness of works (and re-emergence of residual ACM) already conducted at the Wedge and Grey Settlements and to assess the risks of residual ACM and hence the need for additional remediation / management works.</p> <p>At the completion of the RDSI works 53 locations (37 at Wedge and 16 at Grey) where ACM was identified remained “outstanding” (i.e. remediation was not undertaken). Although it is understood subsequent work commissioned by Parks and Wildlife has addressed some, but not all of these “outstanding” occurrences of known ACM remain.</p> <p>As noted previously the Senversa RDSI was confined to ACM and did not address ACM in soils outside of the frequented and accessible areas or in soils greater than 10cm depth, nor for other potential contaminants. The Senversa assessment of AF/FA was a limited qualitative investigation of a small sample of representative shacks only (to test their hypothesis).</p>
<p>The suitability or appropriateness of a management plan</p>	<p>Senversa undertook investigation works on the Wedge and Grey Settlements between the 4 and 19th of August 2016. Following these works Aurora was commissioned by Parks and Wildlife to develop an AMP for the Wedge and Grey Reserves, dated 4th November 2016. The AMP has not been provided for Auditor review as part of this VAR however based on brief informal review it is understood the objective of the AMP is to present the necessary controls to ensure ACM present within the Wedge and Grey Reserves do not present a health risk to Parks and Wildlife employees, contractors and others such as emergency service personnel, lessees of shacks, their guests and the public. It is understood the AMP also includes protocols for the identification, evaluation, management and where necessary removal of asbestos containing materials in the workplace (Aurora 2016).</p>
<p>Evaluation of suitability of the site (parcel specific where relevant) for the current or proposed land uses.</p>	<p>In providing the Auditors evaluation of suitability of the Wedge and Grey Reserves parcels the Auditor notes:</p> <ol style="list-style-type: none"> 1. As discussed previously, Senversa indicated that a staged approach is being taken to assessment and management of asbestos issues and as such the RDSI works forms an intermediate and discrete stage in the overall progress toward satisfactory remediation and management of asbestos issues at Wedge and Grey Settlements. So the intention of the works were not focused on achieving full closure of the asbestos issues at the Wedge and Grey Reserves. 2. Additionally, the works were confined to surface soils in specific areas within the Grey and Wedge Reserves as described in Section 1.2, and not the whole of the Reserves or at depth nor for other potential contaminants. The areas where RDSI works were further refined within these as follows: <ol style="list-style-type: none"> a) The ACM works were focused on reduction of ACM in soils in the most frequented areas of the site i.e. the accessible areas in the immediate vicinity of the shacks and former shack, common areas (cleared areas that are likely frequented but removed from the immediate vicinity of shack such as areas between shacks) and access tracks. Whilst regard was given to vegetated areas (unlikely to be regularly frequented) to the extent practical and warranted based on field judgement, these areas have not been subject to the same level of assessment as frequented areas. b) The AF/FA works were focused on soils at a limited number of locations within the frequented areas. <p>The areas subject to the RDSI works are shown on Figures 4.1 to 4.18 and Figures 5.1 and 5.5.for Wedge and Grey Reserves, respectively.</p> <p>Therefore due to the fact that the RDSI works were only an intermediate and discrete stage in achieving satisfactory remediation and management of asbestos</p>

issues at the reserves (or parcels) and giving consideration to comments above, the Auditor considers it is premature to evaluate the suitability of the parcels for the current or proposed uses at this stage. Additionally, due to the limitations on the areas of the Wedge and Grey Reserves that were subject to the RDSI works it is not possible for the Auditor to provide an opinion on the evaluation of the whole of these parcels.

However, in relation to ACM the Auditor agrees with Senversa that the RDSI works has inherently reduced the risk from ACM across the areas assessed and remediated. The subsequent removal of additional ACM some of which was identified by Senversa and recorded as “outstanding” and others in areas outside those subjected to the RDSI (under a separate commission by Parks and Wildlife) are expected to have also reduced the risk in these areas. Nevertheless, as noted above previous experience of the Auditor is that following remediation it is not uncommon for fugitive ACM to be observed and the suitability of the site for the current and future use will be dependent upon the degree to which fugitive ACM returns within the areas addressed by the RDSI. The suitability for current and future uses will also be influenced by the ongoing management of the ACM within the existing buildings and distribution of ACM in areas not addressed by the RDSI (and the additional works commissioned by Parks and Wildlife); as well as the range of proposed future uses and any future remediation and management (including management of removal of shacks containing ACM). Lastly, the Auditor notes that the risks of asbestos bonded in ACM is generally low, but the risk (and hence suitability of Reserves) can be more elevated in degraded or weathered ACM.

In relation to AF/FA as noted above the Auditor considers further works are required to be undertaken to better understand the nature and distribution of the AF/FA, including the contextual information about shacks and condition of ACM building materials before it is possible to provide comment on the suitability of the site of the current and proposed uses. The risks of AF/FA and the potential impact on site suitability are expected to be greatest in areas in close proximity where degraded ACM is present in shacks (particularly rooves and gutters) and where degraded ACM may have been dumped.

Thus, overall, the Auditor is of the opinion that until additional information has been obtained on the outstanding issues discussed above, it is not possible for the Auditor to provide a more definitive comment on the suitability of the Wedge and Grey Reserves for the current and proposed uses.

Finally the Auditor notes that the focus of the RDSI works and this VAR has been on asbestos in near surface soils in specific areas and there has been no consideration of asbestos in other locations or other potential contaminants and as such it is not possible to provide any comment in relation to site suitability for other potential contaminants at the Wedge and Grey Reserves.

8. Conclusions and recommendations

8.1. Conclusions

The Auditor is required to assess all relevant information¹⁰ and exercise professional judgement in forming an opinion as to whether the site has been investigated appropriately and meets, or has been remediated to, a defined standard and is suitable for a particular landuse.

The Auditor has conducted the review of the Wedge and Grey Settlements SAQP and RDSI prepared by Senversa in context of the overarching investigation objectives being “to build on the works already completed by Aurora, and others, to improve confidence in the characterisation of asbestos impacts to inform future remedial planning including obtaining additional information on contamination status of soils by AF/FA in the vicinity of shacks; and to reduce the amount of identifiable ACM (to the extent practical), particularly within the most accessed areas, such that the risk represented is reduced (Senversa 2017)”.

Taking into consideration these objectives, the Auditor considers the investigation works provide detailed data to allow further characterisation of the nature and extent of ACM present on both the Wedge and Grey Settlements and build on the works initially conducted by Aurora. Additionally the Auditor considers that the removal of 360 kg of ACM in the RDSI (combined with the subsequent removal of a further 1,900 kg under separate Parks and Wildlife commission¹¹) has improved the condition of both the Wedge and Grey Settlements, and is expected to reduce the overall exposure scenario and therefore potential risk to receptors. The ACM investigations presented in the RDSI were restricted to specific frequented and accessible areas (shacks, tracks and common areas) and to surface soils (to 10cm depth) meaning that other portions (beyond and below) have not been assessed.

The AF/FA asbestos in soil investigation have also built on the work by Aurora however limitations in terms of the assessment of risk have reduced the value of the study. Nevertheless, the hypothesis tested to assess whether those shacks with ACM rooves and / or gutters in deteriorated condition were more likely to be associated with AF/FA in soils generally showed a promising correlation that warrants further exploration and investigation and more detailed assessment of risks. The Auditor notes that while asbestos was present in a variety of forms (which may have different risk profiles), no free fibres (at the laboratory limit of reporting – 5 fibres) were reportedly detected in any of the samples. Free asbestos fibres and fibre bundles which could breakdown to release asbestos fibres pose the greatest risk to receptors.

With respect to the site’s land use suitability, the Auditor is required to consider all available information and data, the extent of “remediation”¹² of the site and the level of risk to human health, ecology and environmental value. In this regard, overall the Auditor considers a significant amount of data was collected during the RDSI which built upon the Aurora investigation works, however interpretation of the data was limited in nature and in the absence of a risk assessment the Auditor is

¹⁰ Contamination investigation, remediation and validation works undertaken are complete, accurate, defensible and in accordance with WA legislation, relevant guidelines and policies.

¹¹ Not subject to independent reviewed by the Auditor or part of this VAR.

¹² CS Act s4 “... remediation in respect of a site that is contaminated includes —

- (a) the attempted restoration of the site to the state it was in before the contamination occurred;
- (b) the restriction, or prohibition, of access to, or use of, the site;
- (c) the removal, destruction, reduction, containment or dispersal of the substance causing the contamination, or the reduction or mitigation of the effect of the substance;
- (d) the protection of human health, the environment or any environmental value from the contamination;”

unable to provide a more definitive comment the suitability of the Wedge and Grey Reserves for the current and proposed uses.

Further to the above the reports the subject of this VAR are described as forming an intermediate and discrete stage in the overall progress to satisfactory remediation and management of asbestos issues at the Wedge and Grey Settlements. Therefore, as the RDSI was confined laterally and vertically within the sites, there has been no validation of the remedial works, the nature, distribution and risks of AF/FA remain unresolved and there are potentially other contamination issues which have not been investigated the Auditor considers the Contaminated Site (CS) classification should remain unchanged i.e. Potentially Contaminated – Investigation Required, at this stage.

Finally the Auditor notes that the focus of the RDSI works and this VAR has been on asbestos and there has been no consideration of other potential contaminants and as such it is not possible to provide any conclusions in relation to site suitability for other potential contaminants at the Wedge and Grey Reserves.

8.2. Recommendations

Based on the information provided in the reviewed reports and the Auditor's professional opinion, the following recommendations are endorsed by the Auditor.

- As the work the subject of this VAR represents an intermediate and discreet stage in the overall progress toward satisfactory remediation and management of asbestos issues at the Wedge and Grey Reserves it is recommended that a 'road map' documenting the steps and stages in achieving the resolution of all issues is developed, if one hasn't already been developed. The recommendations below should feed into the roadmap.
- The remaining "outstanding" occurrences of ACM should be prioritised for appropriate remediation/management and remediation/management works undertaken on the basis of this prioritisation. Prioritisation should be based on the risk profile. The Asbestos Register should be updated to reflect such works.
- Based on the AF/FA asbestos in soil data, which generally established, a promising relationship for the hypothesis that degraded ACM in shack rooves and gutters have the highest potential for the presence of AF/FA in soils, the Auditor recommends further exploration and investigation of the hypothesis is required. This should have a focus on contextualising the findings (e.g. description of material and potential source) to inform the potential risk profile. Review of any available asbestos air monitoring data should be considered when assessing these AF/FA risks.
- The results of these additional AF/FA investigations should be use to assess the remediation/management requirements and where required, an appropriate remediation/management strategy should be developed based on the risks.
- Prior to completion of these recommended AF/FA studies, shacks with degraded ACM rooves and/or gutters should be managed in accordance with the Aurora (2016) AMP. If the AMP does not provide details of appropriate management requirements the AMP should be updated to address this issue.
- Giving consideration to the amount of asbestos identified at the Wedge and Grey Settlements during the RDSI, the Auditor considers that there is a strong potential that re-emergence of

residual ACM fragments will occur¹³. It is recommended completion of a site walkover survey (or emu-bob) is undertaken in several representative areas subject to investigation and remediation under the RDSI are assessed for each settlement. This will provide an indication of the re-emergence of residual ACM and the significance of any re-emergence issues. The need for a more widespread and/or regular site walkover (or emu bob) or additional remedial / management works can be assessed based on the outcome of an initial walk-over survey.

- Further to the previous point as it is difficult to completely eliminate ACM in surface soils (particularly given the site conditions) the Auditor recommends the implementation of an AMP to ensure that there are appropriate processes and procedures in place to manage the re-emergence and/or the chance for finds of ACM prior to full resolution of contamination issues at the site. The Auditor is of the understanding that the Aurora (2016) AMP has been developed for implementation at the Wedge and Grey Settlements (however this document has not been provided for Auditor review). It is recommended that the AMP includes such management procedures (developed in accordance with relevant DoH and DWER and relevant WHS guidelines) and if it does not it should be updated to include these.
- In order to support the reclassification of the Wedge and Grey Settlements the Auditor recommends a full contamination assessment, should be undertaken, including a basic summary of records, building on all the previous investigation findings. This includes areas outside of the shacks, tracks and common areas assessed for asbestos contamination, including a focus on areas cleared or open in the past which may have been conducive to historical dumping. This should also include investigation of deeper soils (greater than 10cm) for asbestos and consideration of other potential contaminants (i.e. not just asbestos) across the settlements. These studies should also give consideration to proposed land use areas across the Reserves resulting from the planning exercise.

¹³ Especially since 50+% of shacks contain ACM (inside or part of fabric).

9. Limitations

9.1. Limitations of the Audit

This Audit Report expresses the opinion of the Auditor regarding the studies reviewed during this audit, and where commented on the condition of the site from a contamination perspective at the time of the completion of the audit.

This Audit Report represents a review of data and information (together, “information”) relating to the subject of this report. The information was not obtained by the Auditor or Coffey Environments Pty Ltd, but from other sources and contacts, some of whom may be noted in the report. The Auditor has conducted reasonable checks as to the adequacy of the information provided, and is satisfied that it is suitable for the purpose of auditing. However, the Auditor notes that inherent in any assessment approach (and audits that rely on such assessments) is the fact that the information is based upon a number of “spot” tests and that conditions may vary between locations.

It should be recognised that investigations / studies, including those substantially following guidelines made or approved by the WA DWER, are normally statistically based, and there is always some uncertainty in such studies. Thus, whilst the audit has been prepared in accordance with the professional standards expected of an Auditor, as with any assessment based on discrete sampling, it is possible that unexpected conditions or unidentified contamination exists between sampling locations.

The analyses, evaluations, opinions and conclusions presented in this report are based on the information provided, and they could change if the information is found to be unrepresentative of conditions between sampling and analysis locations.

The Auditor and Coffey Environments Pty Ltd will not update the report and has not taken into account events occurring after the time its review was conducted. If the condition of the Audit Area is subsequently altered, the Auditor’s opinion may change.

Should conditions be encountered within the Audit Area which are not consistent with this Audit Report, the occurrence should be reported to the Auditor for further consideration and action as appropriate.

The audit is confined to an assessment of the contamination studies reviewed during the audit.

The audit DOES NOT include:

- An as assessment of the suitability of the land within the Audit Area for the proposed use(s).
- An assessment of the suitability of any buildings on the site for proposed use(s).
- An assessment of the suitability of soil, fill, groundwater or other media for offsite disposal or for any other purpose other than the use with the Rous Head Reclamation Area.
- An assessment of the suitability of soils or other media for agricultural purposes.
- An assessment of the geotechnical suitability of the land for proposed use(s).
- An assessment for any other purposes except contamination.

The Audit Report has been prepared in general accordance with the WA DEC (2006) Contaminated Sites Auditors: Guidelines for Accreditation, Conduct and Reporting, and other advice given to auditors by the WA DEC from time to time.

10. References

Aurora Environmental (2015) Asbestos Assessment and Preliminary Management Plan – Wedge and Grey Settlements, Shire of Dandaragan. Report Number: AP2015/155, Version: V1. Prepared Department of Parks and Wildlife, 10 November 2015.

Aurora Environmental (2016a) Additional Soil Sampling and Wedge and Grey Reserves. 31 March 2016.

Aurora Environmental (2016b) Asbestos Management Plan – Wedge and Grey Reserves. Report Number: AP2016-031, Version: V1. Prepared Department of Parks and Wildlife, 4 November 2016.

Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.

Department of Water and Environmental Regulation (2014) *Assessment and management of contaminated sites*.

Department of Water and Environmental Regulation (2016) Requirements for Mandatory Auditor Reports Contaminated Sites Guidelines.

GHD (2014) Contamination Investigations at the Wedge and Grey Squatter Shack Communities. Preliminary Site Investigation. January 2014.

National Occupational Safety and Health Commission [NOHSC: 2002(2005)] Code of Practice for the Safe Removal of Asbestos, 2nd Edition.

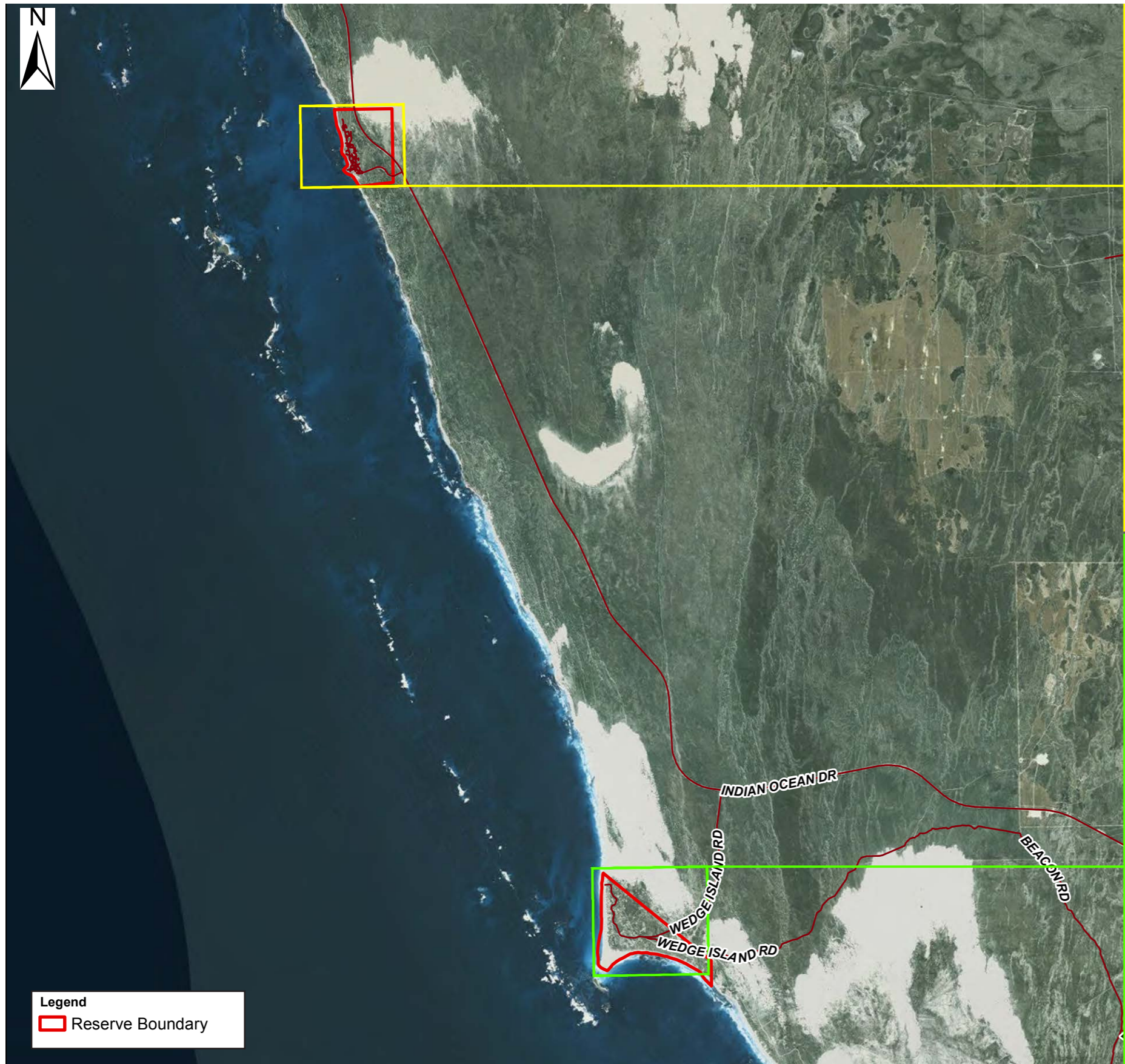
Senversa (2016) Sampling, Analysis and Quality Plan Wedge and Grey Settlements. Prepared for Department of Parks and Wildlife, 15 July 2016.

Senversa (2017) Remedial Detailed Site Investigation, Wedge and Grey Settlements. Prepared for Department of Parks and Wildlife, 18 May 2017.

Figures

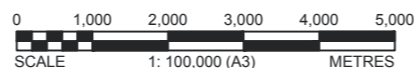
(The figures used in this VAR are a reproduction of those prepared by Senversa and included in their RDSI report)

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 Reserve Boundary

NOTE: Figure from Senversa, Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements, P11935_02_F001_site location, 13/09/2016



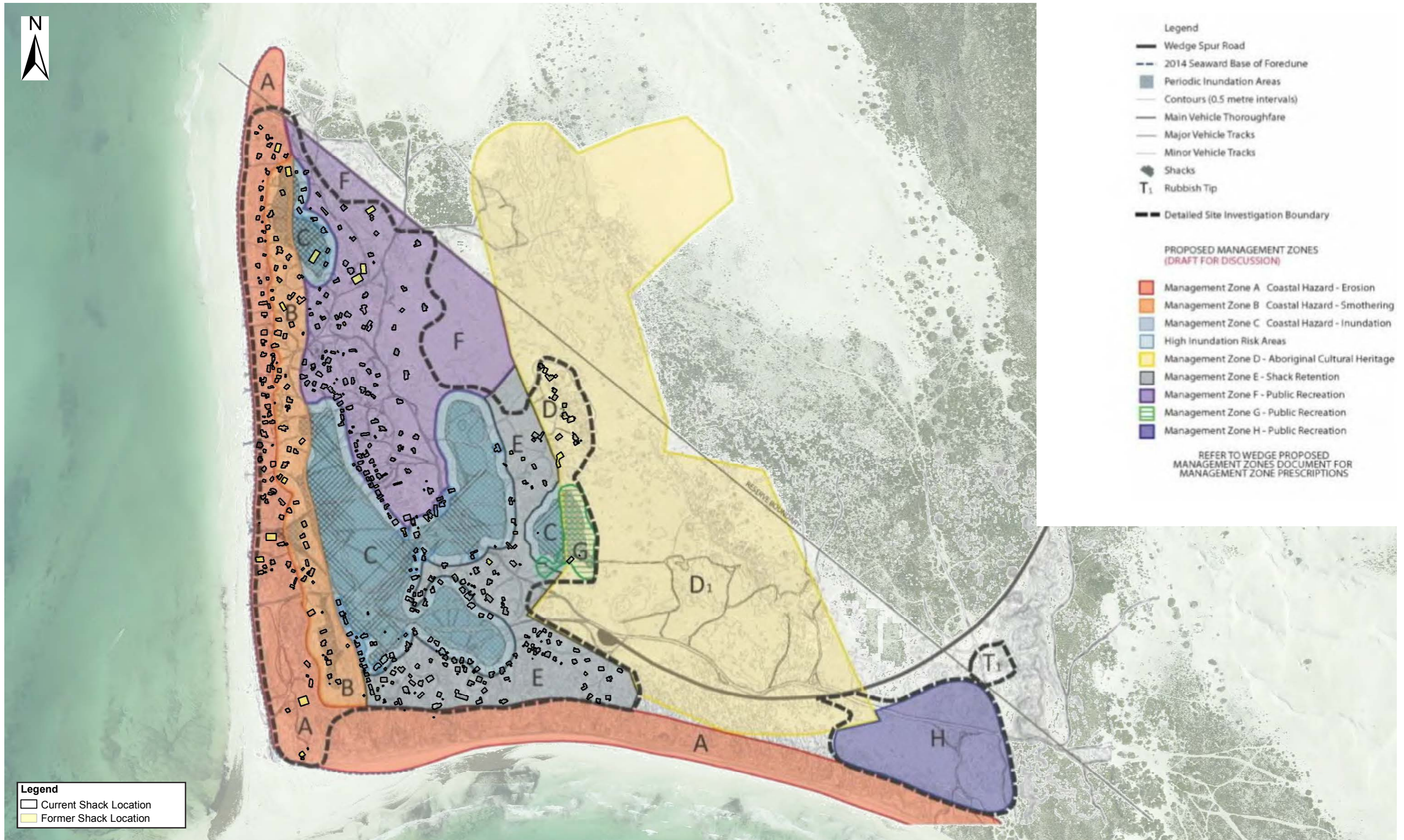
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	A	ORIGINAL ISSUE	JO	RB	21/09/17

drawn	JO
approved	RB
date	21/09/2017
scale	AS SHOWN
original size	A3



client:	PARKS AND WILDLIFE		
project:	WEDGE AND GREY SETTLEMENTS VOLUNTARY AUDITOR REPORT WESTERN AUSTRALIA		
title:	SITE LOCATION PLAN		
project no:	ENAUPERT05451AA-R01	figure no:	FIGURE 1
		rev:	A

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no.	description	drawn	approved	date
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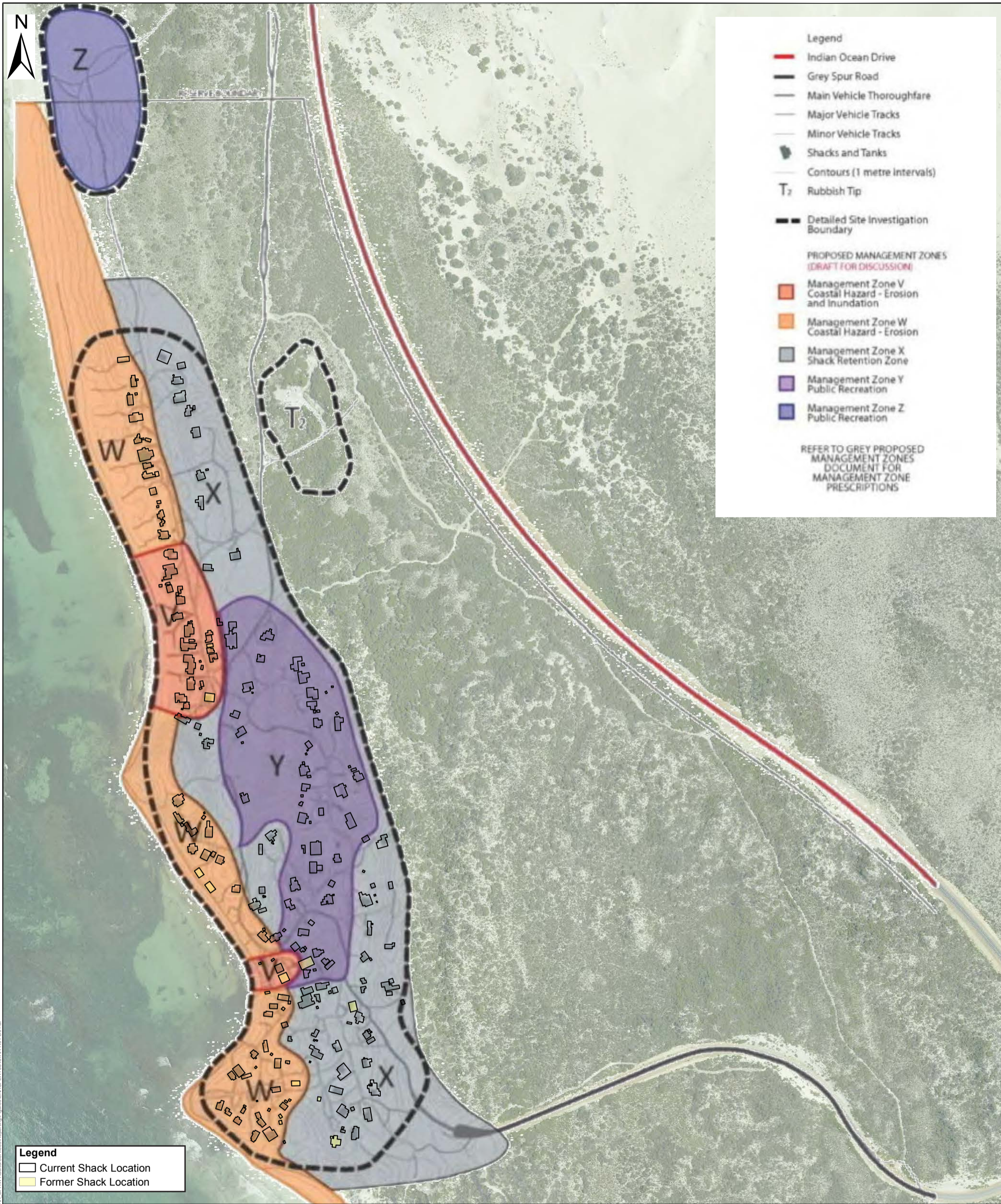
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drawn	JO
approved	RB
date	21/09/2017
scale	AS SHOWN
original size	A3



client:	PARKS AND WILDLIFE		
project:	WEDGE AND GREY SETTLEMENTS VOLUNTARY AUDITOR REPORT WESTERN AUSTRALIA		
title:	WORK AREA BOUNDARY - WEDGE		
project no:	ENAUPERT05451AA-R01	figure no:	FIGURE 2
rev:	A		



Legend
 □ Current Shack Location
 □ Former Shack Location

Legend

- Indian Ocean Drive
- Grey Spur Road
- Main Vehicle Thoroughfare
- Major Vehicle Tracks
- Minor Vehicle Tracks
- Shacks and Tanks
- Contours (1 metre intervals)
- T₂ Rubbish Tip
- Detailed Site Investigation Boundary

PROPOSED MANAGEMENT ZONES (DRAFT FOR DISCUSSION)

- Management Zone V Coastal Hazard - Erosion and Inundation
- Management Zone W Coastal Hazard - Erosion
- Management Zone X Shack Retention Zone
- Management Zone Y Public Recreation
- Management Zone Z Public Recreation

REFER TO GREY PROPOSED MANAGEMENT ZONES DOCUMENT FOR MANAGEMENT ZONE PRESCRIPTIONS

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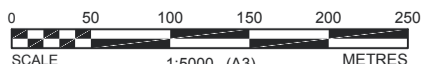
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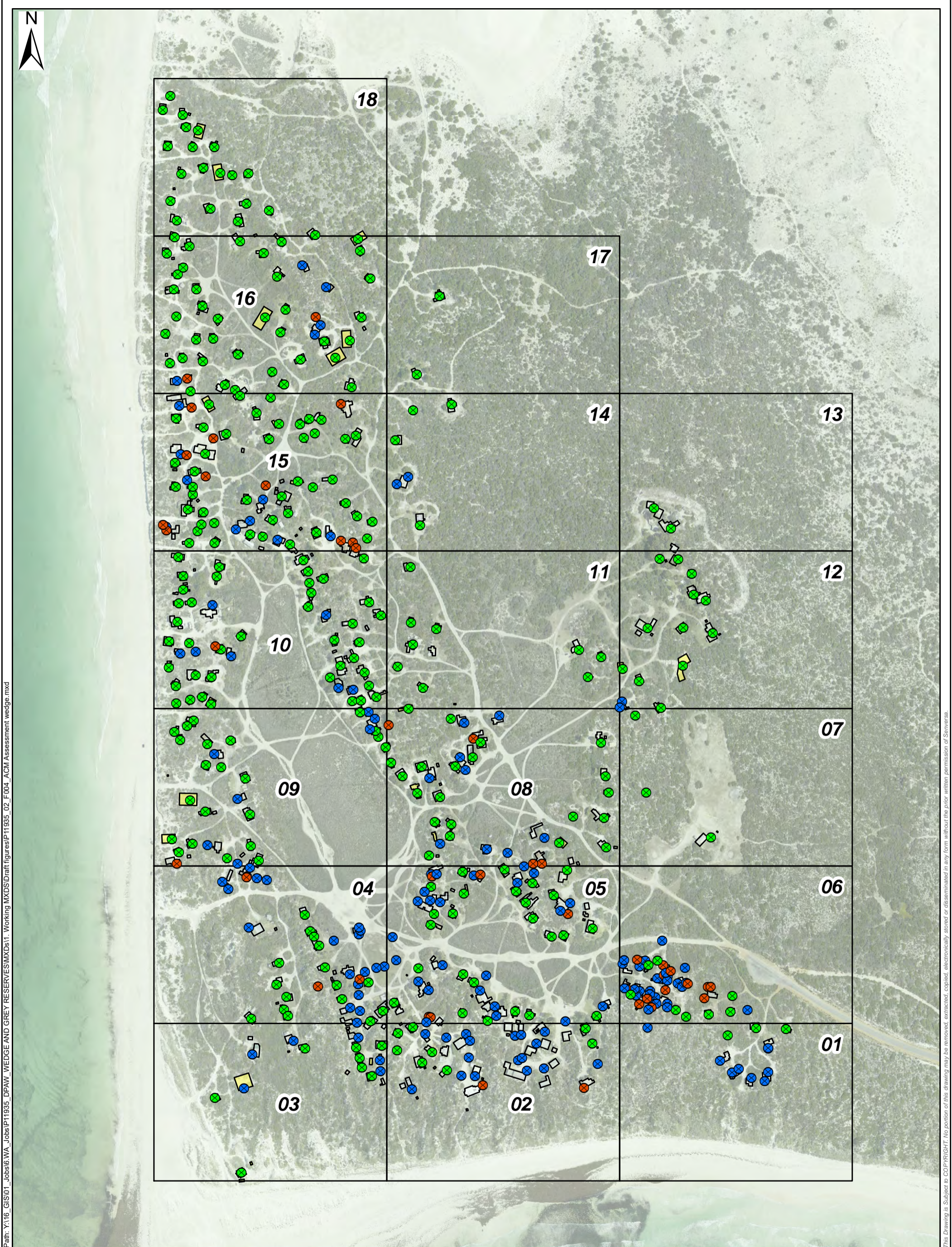
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	A	ORIGINAL ISSUE	JO	RB	21/09/17

	drawn	JO
	approved	RB
	date	21/09/2017
	scale	AS SHOWN
	original size	A3



client:	PARKS AND WILDLIFE		
project:	WEDGE AND GREY SETTLEMENTS VOLUNTARY AUDITOR REPORT WESTERN AUSTRALIA		
title:	WORK AREA BOUNDARY - GREY		
project no:	ENAUPERT05451AA -R01	figure no:	FIGURE 3
		rev:	A





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Website: www.senversa.com.au

- Legend**
- No ACM identified
 - ACM identified but classified as resolved
 - ACM identified but classified as outstanding
 - Maps 4.1-4.18 Extent
 - Current Shack Location
 - Former Shack Location

Aerial imagery sourced from DPaW

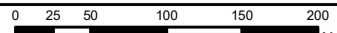
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Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ⊗ ACM identified but classified as resolved
- ⊗ ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaW

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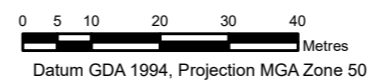


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Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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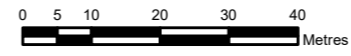
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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaw

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Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife

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Legend

- No ACM identified
- ⊗ ACM identified but classified as resolved
- ⊗ ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaw

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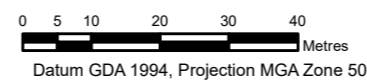


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Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaw

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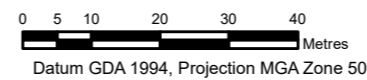


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Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaW

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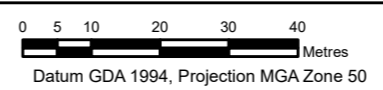


Figure No:	4.05
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



Path: Y:\16_GIS\Jobs\P11935_DP\AW_WEDGE AND GREY RESERVES\MXD\1. Working\XDS\Draft\figures\P11935_02_F004-18_ACM Assess and IR maps -wedge.mxd

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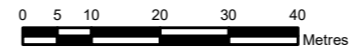
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Phone: (08) 6557 8881
Fax: (03) 9606 0074
Website: www.senversa.com.au

Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaw

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		



Datum GDA 1994, Projection MGA Zone 50

Figure No:	4.06
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaw

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		

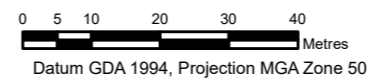


Figure No:	4.07
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ⊗ ACM identified but classified as resolved
- ⊗ ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaW

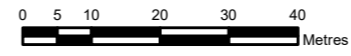
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File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		
 <p>Datum GDA 1994, Projection MGA Zone 50</p>			

Figure No:	4.08
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaW

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		

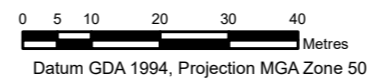


Figure No:	4.09
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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


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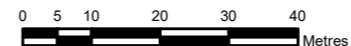
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Website: www.senversa.com.au

Legend

-  No ACM identified
-  ACM identified but classified as resolved
-  ACM identified but classified as outstanding
-  Current Shack
-  Assessed Area Wedge
-  Former Shack

Notes:
Aerial imagery sourced from DPaw

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		



 0 5 10 20 30 40 Metres
 Datum GDA 1994, Projection MGA Zone 50

Figure No:	4.10
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaW

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		

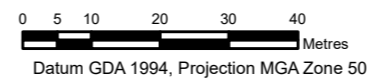


Figure No:	4.11
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaW

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		

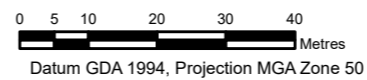








Figure No:	4.12
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife

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Legend

-  No ACM identified
-  ACM identified but classified as resolved
-  ACM identified but classified as outstanding
-  Current Shack
-  Assessed Area Wedge
-  Former Shack

Notes:
Aerial imagery sourced from DPaW

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		

0 5 10 20 30 40
Metres
Datum GDA 1994, Projection MGA Zone 50

Figure No: 4.13

Title: Wedge ACM Assessment & Identification Records Maps

Project: Remedial Detailed Site Investigation

Location: Wedge and Grey Shack Settlements

Client: Department of Parks and Wildlife

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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaw

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
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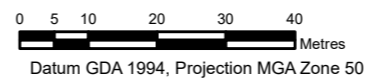


Figure No:	4.14
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaw

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
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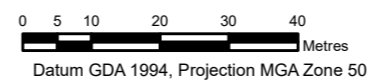


Figure No:	4.15
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaw

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		

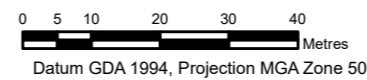


Figure No:	4.16
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack
- Assessed Area Wedge
- Former Shack

Notes:
Aerial imagery sourced from DPaW

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F004-18_ACM Assess and IR maps -wedge		

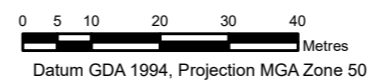


Figure No:	4.17
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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- Legend**
- No ACM identified
 - ACM identified but classified as resolved
 - ACM identified but classified as outstanding
 - Current Shack
 - Assessed Area Wedge
 - Former Shack

Notes:
Aerial imagery sourced from DPaw

Designed:	S. Horgan	Date:	15/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
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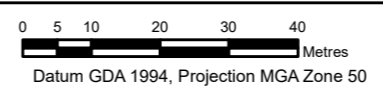
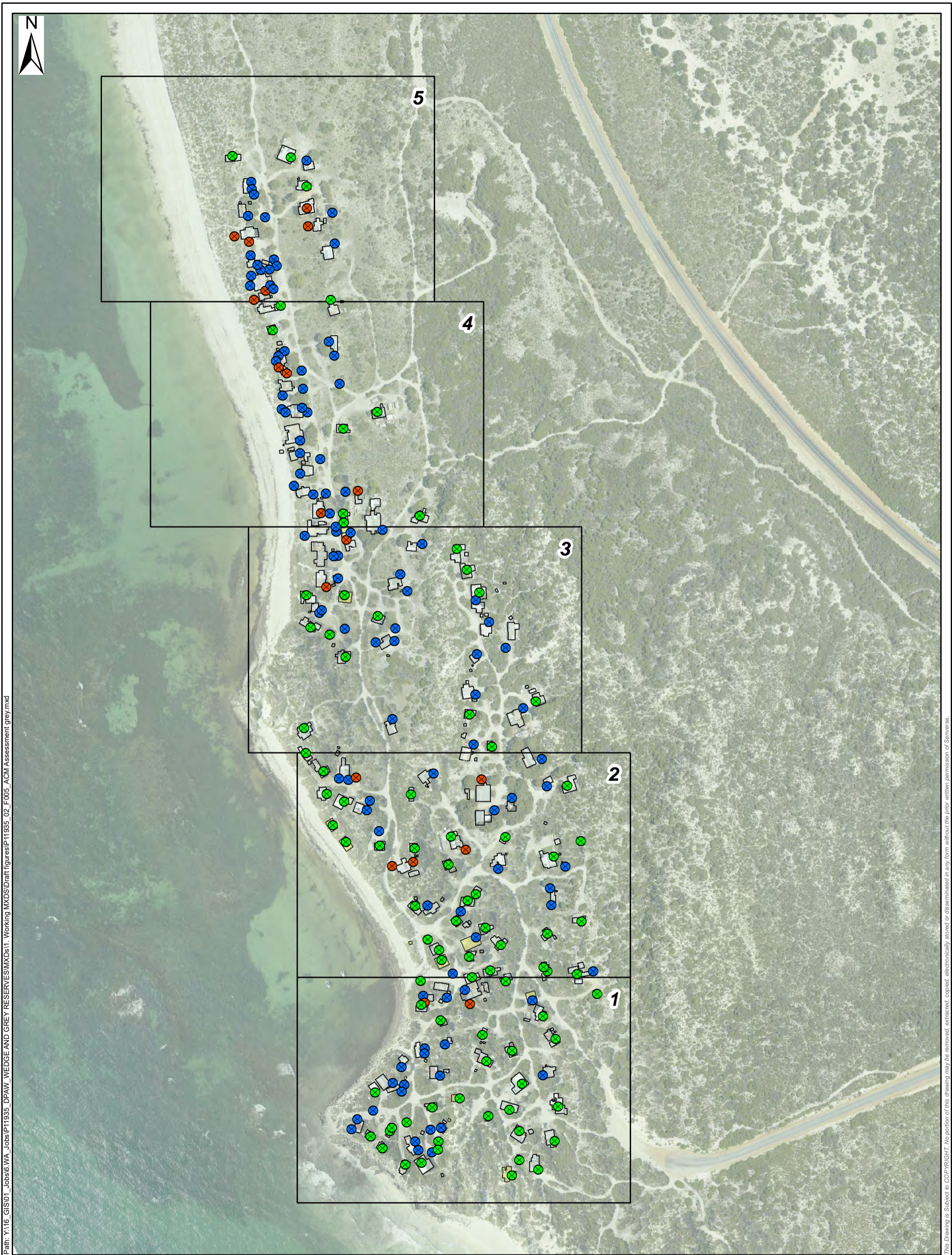


Figure No:	4.18
Title:	Wedge ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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- Legend**
- No ACM identified
 - ACM identified but classified as resolved
 - ACM identified but classified as outstanding
 - Maps 5.1-5.5 Extent
 - Current Shack Location
 - Former Shack Location

Aerial imagery sourced from DPav

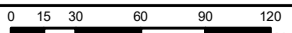
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 Datum GDA 1994, Projection MGA Zone 50			

Figure No:	5
Title:	Grey ACM Assessment
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife

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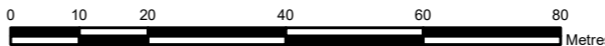
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Fax: (03) 9606 0074
Website: www.senversa.com.au

Legend

- No ACM identified
- ⊗ ACM identified but classified as resolved
- ⊗ ACM identified but classified as outstanding
- Current Shack Location
- Former Shack Location
- ▨ Area Assessed

Notes:
Aerial imagery sourced from Nearmap Pty Ltd

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Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F005-5_ACM Assess and IR maps-grey		



Datum GDA 1994, Projection MGA Zone 50

Figure No:	5.1
Title:	Grey ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife



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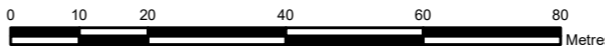
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Phone: (08) 6557 8881
Fax: (03) 9606 0074
Website: www.senversa.com.au

Legend

- No ACM identified
- ⊗ ACM identified but classified as resolved
- ⊗ ACM identified but classified as outstanding
- Current Shack Location
- Former Shack Location
- Area Assessed

Notes:
Aerial imagery sourced from Nearmap Pty Ltd

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Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F005-5_ACM Assess and IR maps-grey		



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Figure No:	5.2
Title:	Grey ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife

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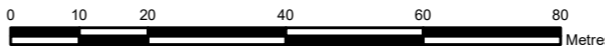
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Legend

- No ACM identified
- ⊗ ACM identified but classified as resolved
- ⊗ ACM identified but classified as outstanding
- Current Shack Location
- ▭ Former Shack Location
- ▨ Area Assessed

Notes:
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	S. Horgan	Date:	14/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F005-5_ACM Assess and IR maps-grey		



Datum GDA 1994, Projection MGA Zone 50

Figure No:	5.3
Title:	Grey ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife

Path: Y:\16_GIS\Jobs\P11935_DPAW_WEDGE AND GREY RESERVES\MXDs\1. Working\MXDs\Draft figures\P11935_02_F005-5_ACM Assess and IR maps-grey.mxd



This Drawing is Subject to COPYRIGHT. No portion of this drawing may be removed, extracted, copied, electronically stored or disseminated in any form without the prior written permission of Senversa.



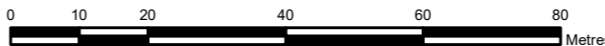
Address: Level 25, 108 St Georges Terrace,
Perth WA 6000
Phone: (08) 6557 8881
Fax: (03) 9606 0074
Website: www.senversa.com.au

Legend

- No ACM identified
- ACM identified but classified as resolved
- ACM identified but classified as outstanding
- Current Shack Location
- Former Shack Location
- ▨ Area Assessed

Notes:
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	S. Horgan	Date:	14/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F005-5_ACM Assess and IR maps-grey		



Datum GDA 1994, Projection MGA Zone 50

Figure No: 5.4

Title: Grey ACM Assessment & Identification Records Maps

Project: Remedial Detailed Site Investigation

Location: Wedge and Grey Shack Settlements

Client: Department of Parks and Wildlife



Path: Y:\16_GIS\Jobs\P11935_DPAW_WEDGE AND GREY RESERVES\IMXD\1. Working\IMXD\Draft figures\P11935_02_F005-5_ACM Assess and IR maps-grey.mxd









This Drawing is Subject to COPYRIGHT. No portion of this drawing may be removed, extracted, copied, electronically stored or disseminated in any form without the prior written permission of Senversa.



Address: Level 25, 108 St Georges Terrace,
Perth WA 6000
Phone: (08) 6557 8881
Fax: (03) 9606 0074
Website: www.senversa.com.au

Legend

-  No ACM identified
-  ACM identified but classified as resolved
-  ACM identified but classified as outstanding
-  Current Shack Location
-  Former Shack Location
-  Area Assessed

Notes:
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	S. Horgan	Date:	14/09/2016
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:1,100 (A3)
File:	P11935_02_F005-5_ACM Assess and IR maps-grey		

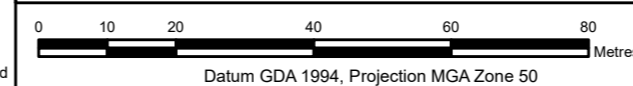


Figure No:	5.5
Title:	Grey ACM Assessment & Identification Records Maps
Project:	Remedial Detailed Site Investigation
Location:	Wedge and Grey Shack Settlements
Client:	Department of Parks and Wildlife

Appendix A - Certificates of Title

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WESTERN



AUSTRALIA

REGISTER NUMBER 4153/DP92263	
DUPLICATE EDITION N/A	DATE DUPLICATE ISSUED N/A

RECORD OF QUALIFIED CERTIFICATE

VOLUME: **LR3064** FOLIO: **200**

OF

CROWN LAND TITLE

UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997

NO DUPLICATE CREATED

The undermentioned land is Crown land in the name of the STATE of WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 4153 ON DEPOSITED PLAN 92263

**STATUS ORDER AND PRIMARY INTEREST HOLDER:
(FIRST SCHEDULE)**

STATUS ORDER/INTEREST: RESERVE VESTED UNDER STATUTE

PRIMARY INTEREST HOLDER: CONSERVATION AND LAND MANAGEMENT EXECUTIVE BODY OF CARE OF DIRECTOR GENERAL, DEPARTMENT OF ENVIRONMENT AND CONSERVATION, LOCKED BAG 104, BENTLEY DELIVERY CENTRE

(XE K502316) REGISTERED 8 FEBRUARY 2008

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)**

1. F816236 RESERVE 43283 FOR THE PURPOSE OF PARKLAND, RECREATION AND THE LETTING OF COTTAGES THEREON ON 14.01.95 REGISTERED 1.1.1995.
2. K502316 VESTED, PURSUANT TO SECTION 33(2) OF THE CONSERVATION AND LAND MANAGEMENT ACT 1984 REGISTERED 8.2.2008.
3. L199697 MEMORIAL, CONTAMINATED SITES ACT 2003 REGISTERED 13.1.2010.

- Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
 Lot as described in the land description may be a lot or location.
 (2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
 (3) The interests etc. shown hereon may have a different priority than shown.

-----END OF CERTIFICATE OF CROWN LAND TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: LR3064-200 (4153/DP92263).
PREVIOUS TITLE: LR3070-633.
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.

END OF PAGE 1 - CONTINUED OVER

ORIGINAL CERTIFICATE OF CROWN LAND TITLE
QUALIFIED

REGISTER NUMBER: 4153/DP92263

VOLUME/FOLIO: LR3064-200

PAGE 2

LOCAL GOVERNMENT AREA: SHIRE OF DANDARAGAN.

RESPONSIBLE AGENCY: DEPARTMENT OF ENVIRONMENT AND CONSERVATION.

NOTE 1: A000001A CORRESPONDENCE FILE 201/1961 V2.

NOTE 2: SUBJECT TO SURVEY - NOT FOR ALIENATION PURPOSES

NOTE 3: LAND PARCEL IDENTIFIER OF MELBOURNE LOCATION 4153 ON SUPERSEDED
PAPER CERTIFICATE OF CROWN LAND TITLE CHANGED TO LOT 4153 ON
DEPOSITED PLAN 92263 ON 23-AUG-02 TO ENABLE ISSUE OF A DIGITAL
CERTIFICATE OF TITLE.

NOTE 4: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE
OF TITLE.

Sundry Document F816237

NO DUPLICATE ISSUED

REGISTER
VOL.
3064

BOOK
FOL.
200

Corr. 201/1961 v2

Vol. Fol.
3870 633

WESTERN



AUSTRALIA



Crown Land Record

The undermentioned land shown on the sketch in the First Schedule hereto is land of the Crown subject to the interests, easements, encumbrances and notices shown in the Second Schedule hereto.

Alan Skinner



Dated 27th February, 1995

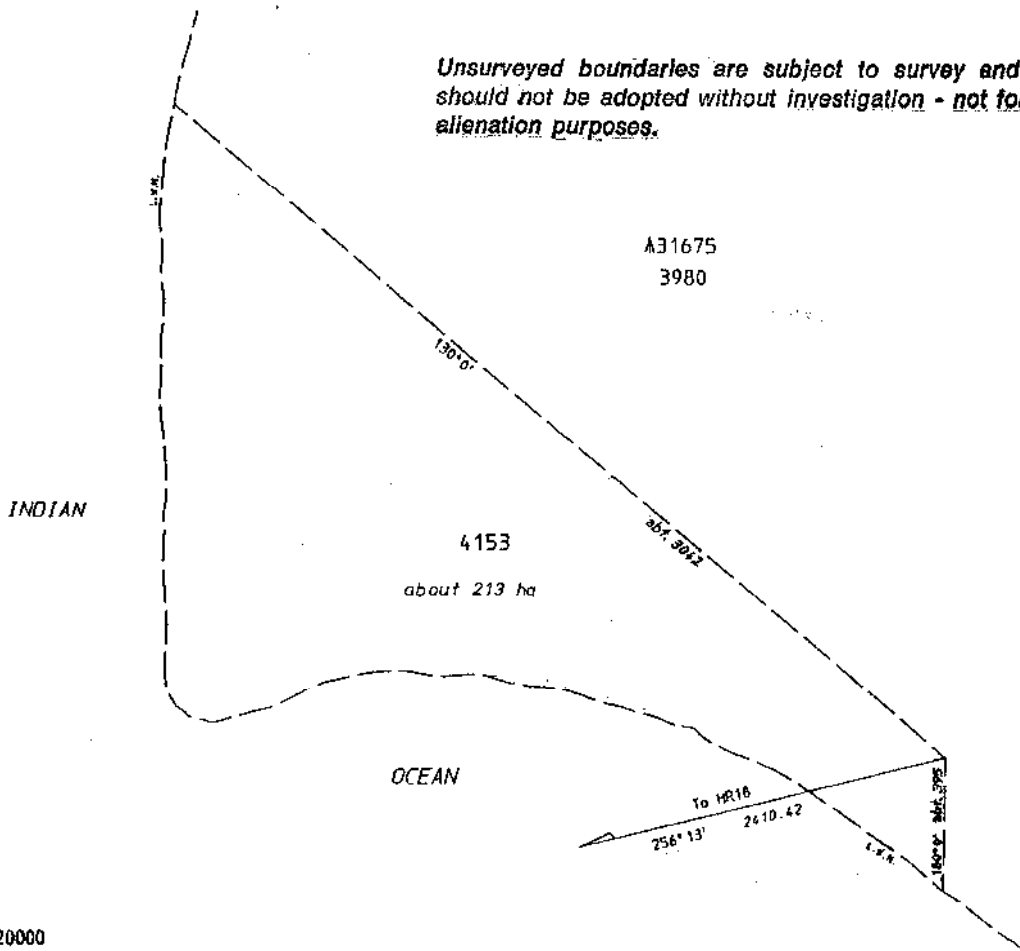
CHIEF EXECUTIVE OFFICER

LAND REFERRED TO

Melbourne Location 4153 on Land Administration Reserve Diagram 1283

FIRST SCHEDULE

Unsurveyed boundaries are subject to survey and should not be adopted without investigation - not for alienation purposes.



FOR ENCUMBRANCES AND OTHER MATTERS AFFECTING THE LAND SEE SECOND SCHEDULE

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS RECORD OR ANY NOTIFICATION HEREON

Superseded - Copy for Sketch Only

Page 1 of 2 pages
3064
Vol. 201
Fol. 633

05901/3/92-44-5/9499


SCALE 1:20000
F.P. WEDGE ISLAND (50)
Shire of Dandaragan

M2 | *(W)*

Superseded - Copy for Sketch Only

SECOND SCHEDULE

NOTE: ENTRIES MAY BE AFFECTED BY SUBSEQUENT ENDORSEMENTS

PARTICULARS	INSTRUMENT		REGISTERED	TIME	SEAL	CERT. OFFICER
	NATURE	NUMBER				
Set apart as Reserve No 43283 for the purpose of "Parkland, Recreation and the letting of Cottages thereon on 14.01.95 in G.G. 24.02.95	Sundry	F816236		15.30		(W)

Sundry Document F816237

NO DUPLICATE ISSUED

REGISTER
VOL.

BOOK
FOL.

Corr. 1492/1972

3070

633

WESTERN



AUSTRALIA



Crown Land Record

CANCELLED

The undermentioned land shown on the sketch in the First Schedule hereto is land of the Crown subject to the interests, easements, encumbrances and notices shown in the Second Schedule hereto.

633
FOL.

3070
VOL.

Dated 27th February, 1995

Alan Skinner



CHIEF EXECUTIVE OFFICER

LAND REFERRED TO

Melbourne Location 3980 on Land Administration Reserve Plan 182

FIRST SCHEDULE

Page 1 (of 2 pages)
Cancelled




CANCELLED

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS RECORD OR ANY NOTIFICATION HEREON

05901/3/92-4K-5/9499

FOR ENCUMBRANCES AND OTHER MATTERS AFFECTING THE LAND SEE SECOND SCHEDULE

Cancelled

SECOND SCHEDULE		NOTE: ENTRIES MAY BE AFFECTED BY SUBSEQUENT ENDORSEMENTS				
PARTICULARS	INSTRUMENT		REGISTERED	TIME	SEAL	CERT. OFFICER
	NATURE	NUMBER				
Reserve NO 31675 for the purpose of "Conservation of Flora and Fauna" and vested in <u>Western Australian Wildlife Authority</u>	Sundry	F816237				WS.
Reserve amended to exclude that portion now comprised in Melbourne Location 4153 on Reserve Diagram 1283 in G.G. 24.02.95	Sundry	F816237		15.30		WS.
Cancelled Melbourne Location 4153 to CLR Vol 3064 Fol 200 Balance to CLR Vol 3098 Fol 891	Sundry	F816237	27.02.95	14.54		WS.

WESTERN



AUSTRALIA

REGISTER NUMBER 4152/DP92258	
DUPLICATE EDITION N/A	DATE DUPLICATE ISSUED N/A

RECORD OF QUALIFIED CERTIFICATE

VOLUME: **LR3102** FOLIO: **988**

**OF
CROWN LAND TITLE**

UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997

NO DUPLICATE CREATED

The undermentioned land is Crown land in the name of the STATE of WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 4152 ON DEPOSITED PLAN 92258

**STATUS ORDER AND PRIMARY INTEREST HOLDER:
(FIRST SCHEDULE)**

STATUS ORDER/INTEREST: RESERVE VESTED UNDER STATUTE

PRIMARY INTEREST HOLDER: CONSERVATION AND LAND MANAGEMENT EXECUTIVE BODY OF CARE OF DIRECTOR GENERAL, DEPARTMENT OF ENVIRONMENT AND CONSERVATION, LOCKED BAG 104, BENTLEY DELIVERY CENTRE

(XE K502317) REGISTERED 8 FEBRUARY 2008

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)**

1. K550081 RESERVE 43284 FOR THE PURPOSE OF PARKLAND, RECREATION AND THE LETTING OF COTTAGES EXISTING THEREON ON 14.01.95 REGISTERED 31.3.2008.
K550081 AMENDMENT OF RESERVE. RESERVE AMENDED. REGISTERED 31.3.2008.
2. K502317 VESTED. PURSUANT TO SECTION 33(2) OF THE CONSERVATION AND LAND MANAGEMENT ACT 1984 REGISTERED 8.2.2008.
3. K550079 PORTION COMPRISED IN LOT 4348 ON DP42790 TO VOL. 3153 FOL 728. REGISTERED 31.3.2008.
4. K550080 FOLIO CANCELLED. NEW FOLIOS HAVE BEEN CREATED FOR LOT(S) ON DP54546 TO VOL 3153 FOL 729. REGISTERED 31.3.2008.

- Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
Lot as described in the land description may be a lot or location.
(2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
(3) The interests etc. shown hereon may have a different priority than shown.

-----END OF CERTIFICATE OF CROWN LAND TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

END OF PAGE 1 - CONTINUED OVER

Cancelled

ORIGINAL CERTIFICATE OF CROWN LAND TITLE
QUALIFIED

REGISTER NUMBER: 4152/DP92258

VOLUME/FOLIO: LR3102-988

PAGE 2

SKETCH OF LAND: LR3102-988 (4152/DP92258).
PREVIOUS TITLE: This Title.
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AREA: NO LOCAL GOVERNMENT AUTHORITY INFORMATION AVAILABLE.
RESPONSIBLE AGENCY: DEPARTMENT OF ENVIRONMENT AND CONSERVATION.

NOTE 1: A000001A CORRESPONDENCE FILE 2044/1953 V3.
NOTE 2: SUBJECT TO SURVEY - NOT FOR ALIENATION PURPOSES
NOTE 3: LAND PARCEL IDENTIFIER OF MELBOURNE LOCATION 4152 ON SUPERSEDED
PAPER CERTIFICATE OF CROWN LAND TITLE CHANGED TO LOT 4152 ON
DEPOSITED PLAN 92258 ON 31-AUG-02 TO ENABLE ISSUE OF A DIGITAL
CERTIFICATE OF TITLE.
NOTE 4: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE
OF TITLE.
NOTE 5: J032439 DEPOSITED PLAN 42790 LODGED.

Cancelled

Sundry Document F816232

NO DUPLICATE ISSUED

REGISTER VOL.

BOOK FOL.

Corr. 2044/1953 v3

3102

988

WESTERN



AUSTRALIA



Crown Land Record

The undermentioned land shown on the sketch in the First Schedule hereto is land of the Crown subject to the interests, easements, encumbrances and notices shown in the Second Schedule hereto.

Alan Skenna



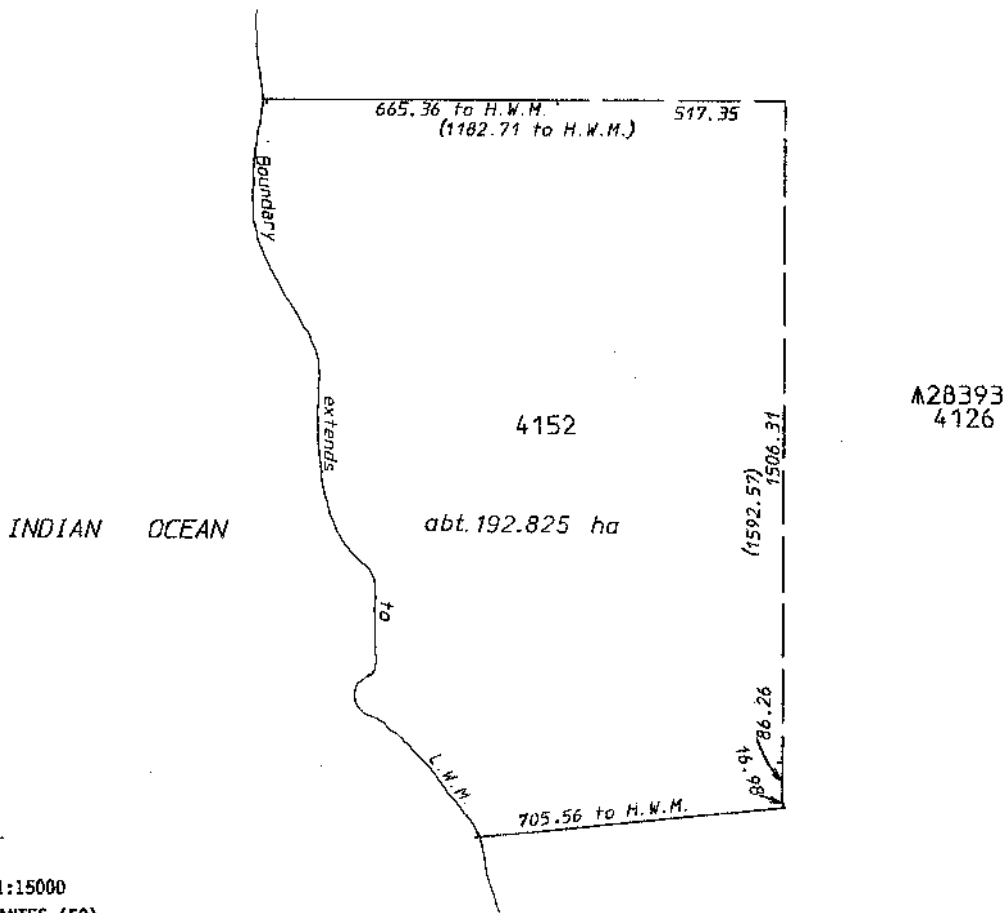
Dated 27th February, 1995

CHIEF EXECUTIVE OFFICER

LAND REFERRED TO

Melbourne Location 4152 on Land Administration Reserve Diagram 1277

FIRST SCHEDULE



Unsurveyed boundaries are subject to survey and should not be adopted without investigation - not for alienation purposes.

FOR ENCUMBRANCES AND OTHER MATTERS AFFECTING THE LAND SEE SECOND SCHEDULE

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS RECORD OR ANY NOTIFICATION HEREON

Superseded - Copy for Sketch Only

Page 1 of 2 pages
3102 VOL. 988

0690173/92-4H-S/7499

SCALE 1:15000

E.P. CERVANTES (50)
Shire of Dandaragan


m2 | *(50)*

Superseded - Copy for Sketch Only

Page 2 (of 3 pages)

SECOND SCHEDULE

NOTE: ENTRIES MAY BE AFFECTED BY SUBSEQUENT ENDORSEMENTS

PARTICULARS	INSTRUMENT		REGISTERED	TIME	SEAL	CERT. OFFICER
	NATURE	NUMBER				
Set apart as Reserve No. 43284 for the purpose of "Parkland, Recreation and the Letting of Cottages Existing Thereon on 14.01.95" in G.G. 24.02.95	Sundry	F816232		15.30		WS

WESTERN



AUSTRALIA

REGISTER NUMBER 302/DP54546	
DUPLICATE EDITION N/A	DATE DUPLICATE ISSUED N/A

RECORD OF QUALIFIED CERTIFICATE

VOLUME: **LR3153** FOLIO: **729**

**OF
CROWN LAND TITLE**
UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997

NO DUPLICATE CREATED

The undermentioned land is Crown land in the name of the STATE of WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 302 ON DEPOSITED PLAN 54546

STATUS ORDER AND PRIMARY INTEREST HOLDER:
(FIRST SCHEDULE)

STATUS ORDER/INTEREST: RESERVE VESTED UNDER STATUTE

PRIMARY INTEREST HOLDER: CONSERVATION AND LAND MANAGEMENT EXECUTIVE BODY OF CARE OF DIRECTOR GENERAL, DEPARTMENT OF ENVIRONMENT AND CONSERVATION, LOCKED BAG 104, BENTLEY DELIVERY CENTRE

(XE K502317) REGISTERED 8 FEBRUARY 2008

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. K550081 RESERVE 43284 FOR THE PURPOSE OF PARKLAND, RECREATION AND LETTING OF COTTAGES REGISTERED 31.3.2008.
2. K502317 VESTED. PURSUANT TO SECTION 33(2) OF THE CONSERVATION AND LAND MANAGEMENT ACT 1984 REGISTERED 8.2.2008.
3. L199695 MEMORIAL, CONTAMINATED SITES ACT 2003 REGISTERED 13.1.2010.

- Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
Lot as described in the land description may be a lot or location.
- (2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
- (3) The interests etc. shown hereon may have a different priority than shown.

-----END OF CERTIFICATE OF CROWN LAND TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP54546.
PREVIOUS TITLE: LR3102-988.
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.

END OF PAGE 1 - CONTINUED OVER

ORIGINAL CERTIFICATE OF CROWN LAND TITLE
QUALIFIED

REGISTER NUMBER: 302/DP54546

VOLUME/FOLIO: LR3153-729

PAGE 2

LOCAL GOVERNMENT AREA: SHIRE OF DANDARAGAN.

RESPONSIBLE AGENCY: DEPARTMENT OF ENVIRONMENT AND CONSERVATION.

NOTE 1: K550080 CORRESPONDENCE FILE 01147-2001-01RO

NOTE 2: SUBJECT TO SURVEY - NOT FOR ALIENATION PURPOSES

INSTRUCTIONS

1. If insufficient space in any section, Additional Sheet Form B1, should be used with appropriate headings. The boxed sections should only contain the words "see page....."
2. Additional Sheets shall be numbered consecutively and bound to this document by staples along the left margin prior to execution by the parties.
3. No alteration should be made by erasure. The words rejected should be scored through and those substituted typed or written above them, the alteration being initialed by the persons signing this document and their witnesses.

NOTES

1. **DESCRIPTION OF LAND**
Lot and Diagram/Plan/Strata/Survey-Strata Plan number or Location name and number to be stated.
Extent - Whole, part or balance of the land comprised in the Certificate of Title to be stated. If this document relates to only part of the land comprised in the Certificate of Title further narrative or graphic description may be necessary. The volume and folio number to be stated.
2. **REGISTERED PROPRIETOR**
State full name and address of the Registered Proprietors as shown on the Certificate of Title and the address / addresses to which future notices can be sent.
3. **INFORMATION CONCERNING SITE CLASSIFICATION**
Include information concerning site classification as either: contaminated - restricted use, contamination - remediation required, remediated for restricted use or possibly contaminated - investigation required.
4. **CHIEF EXECUTIVE OFFICER'S ATTESTATION**
This document must be signed by or on behalf of the Chief Executive Officer, Department of Environment and Conservation under Section 91 of Contaminated Sites Act 2003. An Adult Person should witness this signature. The address and occupation of the witness must be stated.

EXAMINED

6002 1 21 111
 106 AV ...
 ...

OFFICE USE ONLY

L199695 ML

13 Jan 2010 11:44:01 Perth



RED \$ 110.00

**MEMORIAL
CONTAMINATED SITES ACT 2003**

LODGED BY
Department of Environment and Conservation

ADDRESS
Level 4, 168 St Georges Terrace
Perth, WA 6842

PHONE No. 1300 762 982

FAX No. (08) 9333 7575

REFERENCE No. 27226

ISSUING BOX No. 888V

PREPARED BY
Contaminated Sites Section
Department of Environment and Conservation

ADDRESS
Level 4, 168 St Georges Terrace
Perth, WA 6842

PHONE No. 1300 762 982 FAX No. (08) 9333 7575

INSTRUCT IF ANY DOCUMENTS ARE TO ISSUE TO OTHER THAN LODGING PARTY

2/6

TITLES, LEASES, DECLARATIONS ETC LODGED HERewith

1. _____	Received Items Nos. 0
2. _____	
3. _____	
4. _____	
5. _____	
6. _____	

Receiving Clerk *[Signature]*

Lodged pursuant to the provisions of the TRANSFER OF LAND ACT 1893 as amended on the day and time shown above and particulars entered in the Register.



APPROVAL NUMBER

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Client ID 4907

WESTERN AUSTRALIA
TRANSFER OF LAND ACT 1893 AS AMENDED

MEMORIAL

CONTAMINATED SITES ACT 2003

SECTION 58(1) (a) (i) (I) (II) (III) (IV)

DESCRIPTION OF LAND (Note 1)

LOT 302 ON DEPOSITED PLAN 54546

EXTENT

Whole

VOLUME

LR3153

FOLIO

729

REGISTERED PROPRIETOR (Note 2)

STATE OF WESTERN AUSTRALIA


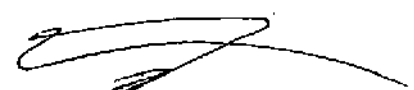
INFORMATION CONCERNING SITE CLASSIFICATION (Note 3)

Under the Contaminated Sites Act 2003, this Site has been classified as "Possibly contaminated - investigation required". For further information on the contamination status of this Site, please contact the Contaminated Sites section of the Department of Environment & Conservation.

OCS

Dated this Seventh day of January Year 2010

CHIEF EXECUTIVE OFFICER'S ATTESTATION (Note 4)

 Kerry Laszig, MANAGER DELEGATE OF THE CHIEF EXECUTIVE OFFICER DEPARTMENT OF ENVIRONMENT AND CONSERVATION UNDER SECTION 91 OF THE CONTAMINATED SITES ACT 2003	 SIGNATURE OF WITNESS Triin-Liis Harma 168 St Georges Tce PERTH WA 6000 Data Management Officer
FULL NAME: ADDRESS: OCCUPATION:	FULL NAME: ADDRESS: OCCUPATION:

INSTRUCTIONS

1. If insufficient space in any section, Additional Sheet Form B1, should be used with appropriate headings. The boxed sections should only contain the words "see page....."
2. Additional Sheets shall be numbered consecutively and bound to this document by staples along the left margin prior to execution by the parties.
3. No alteration should be made by erasure. The words rejected should be scored through and those substituted typed or written above them, the alteration being initialed by the persons signing this document and their witnesses.

NOTES

1. **DESCRIPTION OF LAND**
Lot and Diagram/Plan/Strata/Survey-Strata Plan number or Location name and number to be stated.
Extent - Whole, part or balance of the land comprised in the Certificate of Title to be stated. If this document relates to only part of the land comprised in the Certificate of Title further narrative or graphic description may be necessary. The volume and folio number to be stated.
2. **REGISTERED PROPRIETOR**
State full name and address of the Registered Proprietors as shown on the Certificate of Title and the address / addresses to which future notices can be sent.
3. **INFORMATION CONCERNING SITE CLASSIFICATION**
Include information concerning site classification as either: contaminated - restricted use, contamination - remediation required, remediated for restricted use or possibly contaminated - investigation required.
4. **CHIEF EXECUTIVE OFFICER'S ATTESTATION**
This document must be signed by or on behalf of the Chief Executive Officer, Department of Environment and Conservation under Section 91 of Contaminated Sites Act 2003. An Adult Person should witness this signature. The address and occupation of the witness must be stated.

EXAMINED

SEARCHED
INDEXED
SERIALIZED
FILED

OFFICE USE ONLY

L199697 ML

13 Jan 2010 11:44:01 Perth



REG \$ 110.00

**MEMORIAL
CONTAMINATED SITES ACT 2003**

LODGED BY
Department of Environment and Conservation

ADDRESS
Level 4, 168 St Georges Terrace
Perth, WA 6842

PHONE No. 1300 762 982

FAX No. (08) 9333 7575

REFERENCE No. 27231

ISSUING BOX No. 888V

PREPARED BY
Contaminated Sites Section
Department of Environment and Conservation

ADDRESS
Level 4, 168 St Georges Terrace
Perth, WA 6842

PHONE No. 1300 762 982 FAX No. (08) 9333 7575

INSTRUCT IF ANY DOCUMENTS ARE TO ISSUE TO OTHER THAN LODGING PARTY

4/6

TITLES, LEASES, DECLARATIONS ETC LODGED HEREWITH

1. _____	Received Items
2. _____	Nos. 0
3. _____	
4. _____	
5. _____	
6. _____	Receiving Clerk <i>W</i>

Lodged pursuant to the provisions of the TRANSFER OF LAND ACT 1893 as amended on the day and time shown above and particulars entered in the Register.



APPROVAL NUMBER

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Client ID 4910

WESTERN AUSTRALIA
TRANSFER OF LAND ACT 1893 AS AMENDED

MEMORIAL

CONTAMINATED SITES ACT 2003

SECTION 58(1) (a) (i) (I) (II) (III) (IV)

DESCRIPTION OF LAND (Note 1)

LOT 4153 ON DEPOSITED PLAN 92263

EXTENT

Whole

VOLUME

LR3064

FOLIO

200

REGISTERED PROPRIETOR (Note 2)

STATE OF WESTERN AUSTRALIA

INFORMATION CONCERNING SITE CLASSIFICATION (Note 3)

Under the Contaminated Sites Act 2003, this Site has been classified as "Possibly contaminated - investigation required". For further information on the contamination status of this Site, please contact the Contaminated Sites section of the Department of Environment & Conservation.

OCS

Dated this Seventh day of January Year 2010

CHIEF EXECUTIVE OFFICER'S ATTESTATION (Note 4)

Kerry Laszig, MANAGER

DELEGATE OF THE CHIEF EXECUTIVE OFFICER
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
UNDER SECTION 91 OF THE
CONTAMINATED SITES ACT 2003

SIGNATURE OF WITNESS

FULL NAME: **Triin-Liis Harma**
ADDRESS: **168 St Georges Tce PERTH WA 6000**
OCCUPATION: **Data Management Officer**

Appendix B – Form I Auditors Declaration

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Contaminated sites auditor scheme

Contaminated Sites Act 2003 section 73(a)

Form I: Mandatory auditor's report—auditor's statement

This form is to be prepared by **the contaminated sites auditor**.

Part 1 Details of accredited auditor

Full name	Tony Scott
Contact address	Level 19, Tower B Citadel Tower, 799 Pacific Highway, Chatswood NSW 2067
Postal address (if different from above)	
Telephone	(02) 9406 1195
Mobile	0439 080 856
Fax	
Email	Tony.Scott@coffey.com
Current employer: (company name)	Coffey Services Australia Pty Ltd
In accordance with s 73(b) of the <i>Contaminated Sites Act 2003</i> I formally advise the CEO of the Department of Water and Environmental Regulation that I have prepared the attached mandatory auditor's report in respect of the following site.	
Site address	Wedge Reserve: Part Reserve 43283, Grey Reserve: Part Reserve 43284
Certificate of title details (parcel/lot number)	Lot 4153 on Deposited Plan 92263 and Lot 302 on Deposited Plan 54546
Site description (attach site plan as appropriate)	Both Wedge and Grey are local reserves for parks and recreation.
Name of person engaging the auditor to provide a mandatory auditor report	Colin Ingram
Date of engagement	11/04/2016

Part 2 Declaration and signature

Under s 73(b) of the *Contaminated Sites Act 2003*, a mandatory auditor's report cannot be accepted unless it is accompanied a statement identifying, and signed by the auditor to the effect that the report is accurate.

I declare that

I, **Tony Scott** (the auditor described in this statement)

am the auditor engaged to prepare this mandatory audit report, relating to

certificate of title details (parcel/lot number)

Lot 4153 on Deposited Plan 92263 and Lot 302 on Deposited Plan 54546

site description

Both Wedge and Grey are reserves for the purpose of parkland, recreation and letting of cottages.

site address

Wedge Reserve: Part Reserve 43283, Grey Reserve: Part Reserve 43284

and, that

- I have not provided information in the report that I know is false or misleading in a material particular;
- I have not provided information in the report with reckless disregard as to whether or not the information is false or misleading in a material particular; and
- I have disclosed in the report all information that I know is materially relevant.



Date 18/10/2017

(Accredited auditor's signature)

ANTHONY (TONY) SCOTT

(Full name in block capitals)

Appendix C – Form H Commissioners Declaration

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Contaminated sites auditor scheme

Contaminated Sites Act 2003 section 73(a)

Form H: Mandatory auditor's report—commissioner's statement

This form is to be prepared by the person commissioning the mandatory auditor's report.

Part 1 Details of person commissioning auditor's report	
Full name	COLIN INGRAM
Contact address	17 DICK PERRY AVE, KENSINGTON 6151
Postal address (if different from above)	LOCKED BAG 104 BENTLEY DELIVERY CENTRE 6983
Telephone	08 - 9219 9938
Mobile	0477 328 857
Fax	-
Email	colin.ingram@dbca.wa.gov.au
Current employer: (company name)	Dept of Biodiversity, Conservation & Attractions
In accordance with s 73(a) of the Contaminated Sites Act 2003 I formally advise the CEO of the Department of Water and Environmental Regulation that I have engaged an accredited auditor to prepare a mandatory auditor's report in respect of the following site.	
Site address	Wedge Reserve (R.43283) & Grey Reserve (R 43284)
Certificate of title details (parcel/lot number)	
Site description (attach site plan as appropriate)	SEE ATTACHED
Name of accredited auditor engaged to provide a mandatory auditor's report	Mr TONY SCOTT COFFEY.
Date of engagement	4 APRIL 2016

Part 2 Declaration and signature

Under s 73(a) of the *Contaminated Sites Act 2003*, a mandatory auditor's report cannot be accepted unless it is accompanied by a statement identifying and signed by the person who engaged the auditor to prepare the mandatory auditor's report.

I declare that

I COLIN INGRAM (the person described in this statement)

am the person who engaged the auditor to prepare this mandatory auditor's report, relating to

certificate of title details (parcel/lot number) Reserve numbers.

site description

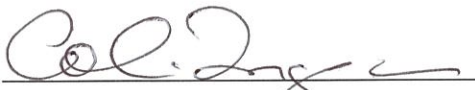
WEDGE RESERVE & GREY RESERVE

site address

150 & 170 km north of Perth respectively,
accessible from Indian Ocean Drive.

and, that

- I have not provided information to the auditor that I know is false or misleading in a material particular;
- I have not provided information with reckless disregard as to whether or not the information is false or misleading in a material particular; and
- I have disclosed to the auditor all information that I know is materially relevant.



(Signature—person who commissioned the mandatory auditor's report)

Date 13 September 2017

COLIN . B. INGRAM

(Full name in block capitals)



Aerial image Wedge Reserve, February 2012

Scale 1:15 000 0 100 200 300 M



Aerial image Grey Reserve, February 2012

Scale 1:12 000 0 100 200 M

Appendix D – Auditor Correspondence

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Electronic Transmission

To	Colin Ingram	From	Tony Scott
Email address	Colin.Ingram@DPaW.wa.gov.au	Date	13 July 2016
Company	DPaW	Reference	ENAUPERT05451AA-E01
cc	Jeremy Hogben & Ashton Betti	Pages	1 of 7
Subject	WEDGE & GREY SITE AUDIT – AUDITORS COMMENTS ON SAMPLING AND ANALYSIS QUALITY PLAN (SAQP)		

The advice presented in this email represents interim advice only, and does not constitute a Site Audit Report or Site Audit Statement. The advice provides the opinion of the Auditor based on the knowledge that is available at the time of this advice. A Site Audit Report and Site Audit Statement will be issued at the end of the Audit process, when the Auditor is satisfied all relevant matters have been adequately addressed. Interim audit advice does not pre-empt or constrain the final outcome(s) of the audit or any conditions that may be placed by the Auditor in the audit report.

1. Introduction & Background

The Western Australia Department of Parks and Wildlife (DPaW) have engaged Tony Scott¹ of Coffey Environments Australia Pty Ltd (Coffey) to undertake a contaminated sites audit of investigations being undertaken by Senversa Pty Ltd (Senvorsa) at the Wedge and Grey shack settlements. The Wedge and Grey shack settlements are located Wedge Reserve and Grey Reserve (Wedge and Grey, and collectively referred to as the Site), respectively, to the north of Perth, Western Australia.

Wedge and Grey have been subject to construction of recreational shacks in an uncontrolled and unregulated manner from the 1950s to 1990s. Wedge consists of approximately 360 shacks and Grey consists of approximately 135 shacks. The shacks were constructed from various building materials, predominantly those that were cheap and easily transportable, including asbestos containing materials (ACM).

Since early 2012 an assessment and planning exercise has been undertaken to determine an appropriate level of shack retention and the location and form of possible public recreation and tourism infrastructure at Wedge and Grey. As part of the planning exercise it was identified that significant volumes of ACM are present across the reserves, both within buildings and weathered fragments (including fibres) in shallow

¹ A WA DER accredited contaminated sites auditor.

surface soils, which may pose a risk to human health associated with the current and future use of the area.

An Asbestos Assessment and Preliminary Management Plan was prepared by Aurora Environmental (Aurora 2015) to gain a clearer picture of the nature and extent of ACM in and around buildings at Wedge and Grey as a first step to understand the risks and requirements for the safe management or removal of ACM. The assessment found that there are multiple locations of soils impacted by ACM fragments around shacks and frequently accessed areas (e.g. common areas and tracks) and within the dedicated waste disposal areas. Specifically, Aurora identified 206 shack locations with ACM within the building structure or ACM impacted soils in their immediate vicinity. Aurora concluded that the issue of asbestos in soils was widespread and the estimated ACM concentration in soil at numerous locations exceeded the Department of Health (DoH) criterion for the protection of human health and consequently warranted some form of management or remediation.

DPaW has subsequently commissioned Senversa to undertake the next phase of works to assess and manage ACM at Wedge and Grey, comprising works described as a Remedial Detailed Site Investigation (DSI) as recommended by Aurora. The Remedial DSI is being audited by Mr Tony Scott of Coffey, a Department of Environment Regulation (DER) Accredited Contaminated Sites Auditor ('the Auditor').

As the initial part of their works Senversa have prepared the following document:

- Sampling and Analysis Quality Plan Wedge and Grey Shack Settlements dated 20 June 2016 (the SAQP).

At the request of DPaW the Auditor has reviewed the Senversa SAQP and provides his comments on the SAQP herein.

2. Context

It is indicated in the Senversa SAQP that the the proposed "works form a preliminary and discrete stage in the overall progress toward satisfactory remediation and management of asbestos issues at the Site. As such, the works represent an opportunity to assess the presence of ACM and fibres in soil (the latter referred to hereafter as Asbestos Fines (AF)) at the Site in greater detail and to opportunistically remove identified ACM where it is practical to do so.

The works will result in an improved understanding of the contamination status of the Site by asbestos and in the reduction of ACM in soil in the most frequented areas of the Site. It is important to appreciate that whilst the identification and removal of ACM as an outcome of these works will inevitably reduce the risk represented by ACM in soils at the Site in broad terms, it is not the intention of this stage of works to conclusively reduce this risk below a specified (or acceptable) threshold."

The Auditor has reviewed the SAQP in this context and the fact that of the works are part of a short-medium term plan by DPaW to manage the risk asbestos poses to the shack owners, their visitors, reserve visitors and DPaW staff.

The Auditor also understands these works will contribute to DPaWs longer term goal to have asbestos removed from much of the site, but that this is work will contribute to this longer term outcome.

3. Auditor review comments

Overall the Auditor considers the report is well written, and presents a logical sampling program within the SAQP which is of an appropriate quality for a report of this type. However, the Auditor did have minor comments on the SAQP which are contained within the attached Audit Review Register. We have also supplied the Audit Review Register in electronic format to enable Senversa to directly respond to the Auditors comments.

Generally speaking, the comments within the Audit Review Register are minor in nature and often are suggestions that may assist in better achieving the study objectives.

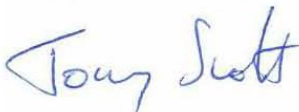
Senversa are proposing to undertake a Pilot Trial to provide an opportunity for fine tuning or modifying the methodology outlined in the SAQP to achieve the project objectives. Senversa also indicate that “should the data collected during the Remedial DSI indicate that the objectives are not being met the sampling design may be adjusted, including additional sampling locations to characterise the contamination.” The Auditor agrees with the undertaking of the Pilot Trial and supports the idea of adjusting the program and recognises the importance of flexibility, particularly with field teams, to make such changes where they will enhance the project outcomes. The Auditor recommends that major changes to the program are discussed with the Auditor prior to implementation.

4. Closing remarks

We trust that the attached comments are of benefit and that this review meets your requirements.

Should DPaW or Senversa have any queries in relation to the comments presented herein please do not hesitate to contact me to discuss further.

For and on behalf of Coffey



Tony Scott
Senior Principal / NSW EPA Accredited Site Auditor

cc Jeremy Hogben and Ashton Betti Senversa

Attachments: Audit Review Register

AUDIT REVIEW REGISTER - Report Review Summary and Response Form

Report: Senversa (2016) Sampling and Analysis Quality Plan, Wedge and Grey Shack Settlements. Dated 20 June 2016.

Sample and Analysis Quality Plan (NEPM, 2013 and WA DER Assessment & Management of Contaminated Sites 2014)	Assessor report section	Auditor Review Comments SAQP (Rev 0)	Assessor Response
Executive Summary	-	Not included. SAQP would benefit from an Executive Summary	
Introduction	1.1, 1.2, 1.3, 1.4 and 1.5	The objectives of the work are indicated to: 1) build on the works already completed by Aurora and others to improve confidence in the characterisation of asbestos impacts to inform future remedial planning; and 2) reduce the amount of the identifiable ACM (to the extent practical), particularly within the most accessed areas, such that risk represented is reduced. The proposed investigations also represent an opportunity to assess the presence of fibres in soil in greater detail. Further it is indicated that whilst the identification and removal of ACM as an outcome of these works will inevitably reduce risks represented by ACM in soils at the site in broad terms, it is not the intention of this stage of works to conclusively reduce this risk below a specified (or acceptable) threshold. The Auditor's review of the SAQP has been based on these objectives and assumptions and on this basis it is considered acceptable by the Auditor.	
Scope of Work	-	Not included as a heading per se; however a brief outline of the scope of works being undertaken was included in the Project Appreciation which is considered acceptable by the Auditor.	
Site Identification and general information	2.1 - 2.3	Generally acceptable. It is understood the assessment is focussed on those areas frequently accessed and that these areas are to be defined. The Audit will also focus on these areas.	
Previous Environmental Investigations	1.4	No comment	
Site History	3.0	A brief summary provided based on the GHD PSI from 2014.	
Topography	2.4	No comment	
Site Inspection and Interviews with site personnel		Detailed site inspections and interviews with settlement representatives were undertaken in August 2013 as part of GHD PSI. Senversa have also drawn on site inspection and extensive knowledge of DPaW. This is considered acceptable.	
Geology and hydrogeology (including topography)	2.4 - 2.7	Summary information provided considered acceptable. It is noted a limited groundwater investigation previously undertaken by GHD identified the presence of several heavy metals exceeding adopted guidelines with elevated ammonia and EC also recorded. However it is understood these works are part of a preliminary stage working towards remediation and management of asbestos issues at the site. The focus of the SAQP and the Audit is on asbestos and hence the Audit will not consider issues related to groundwater impacts.	
Background Soil and Groundwater Quality	-	No information provided but as the focus of the Remedial DSI investigations and Audit are focused on asbestos in soil contamination this is considered acceptable.	
Conceptual Site Model	4.0	Conceptual site model is considered acceptable but should be updated in the Remedial DSI report when additional results available.	
Assessment Levels	6.0	The text refers to the relevant WA guidelines and then notes the project context represents a preliminary stage of assessment and remediation and as such DoH assessment criteria will be utilised as tools to guide works and aid assessment and remediation only. This is considered acceptable although the title of reference 2 should be Regional Public Areas rather than Regional Parks. Please amend reference here and elsewhere in the SAQP.	
		In relation to assessment of AF it is indicated that the WA DoH criteria of 0.001% w/w will be used to assist with reporting clarity and understanding risk but then indicates that it will more likely lend itself to discussion in terms of presence / absence of AF. The Auditor is confused as to what is proposed in both criteria and form of laboratory results i.e. use of WA DoH criteria and laboratory methods or simply reporting presence of absence of AF. Please clarify.	

Sampling and Analysis Quality Plan	1.0 and 7.0	See comments above relation to objectives and introduction and comments below related to DQOs in this review.	
Data Quality Objectives	5.0		
Step 1 State the Problem	5.1	No comment	
Conceptual Site Model (source-pathway-receptor linkages)	4.0	See comments above.	
Review of existing data (indicating reliability and usability)	Not included	The auditor expects the assessor has reviewed previous environmental investigation report, as such the inclusion of a statement regarding the reliability and useability of data would be beneficial. A summary presenting findings of previous investigations undertaken on the site would assist in understanding current data gaps.	
Step 2 Identify the Decision	5.2	The Auditor agrees with information provided. The Auditor notes there could be benefit in doing the AF assessment early in the program to enable review of results and assessment of hypothesis and requirements for any additional sampling whilst the field team are still onsite. The Auditor also notes in relation to AF point 4 it will be advantageous to review results as you go to again assess the hypothesis.	
Step 3 Identify Inputs into the Decision	5.3	The Auditor notes keeping of good accurate records is critical to a high quality survey.	
		The Auditor notes that when selecting background / control sample locations for AF assessment consideration should be given to the historic uses in the selected areas to confirm they indeed represent locations that can be considered background / control sites.	
Step 4 Define the Study Boundaries	5.4	No comment. The Auditor notes that any evidence or suggestion of deeper (> 10cm) ACM impact should be recorded.	
Step 5 Develop a Decision rule	5.5	No comment. The Auditor notes that in relation to ACM under Point 1 no ACM identified at the surface does not necessarily translate to the area being free of ACM. In relation to AF Assessment the Auditor notes in relation to Point 1) that this may be conservative but this is acceptable for screening purposes and agrees with sentiments in Point 2).	
Step 6 Specify Limits on Decision Errors	5.6	No comment	
Step 7 Optimise the Design for Obtaining Data	5.7	The Auditor agrees with the need for flexibility in the design of the program. Minor comment - there is reference to a Section 1.23 (bottom of Page 10) which seems to be a typo - please correct.	
Sampling and Analysis Procedures	7.0		
		Note - The Auditor accepts that the SAQP may be revised following the pilot trial and as such the following comments provided may be considered as preliminary in nature.	
Overview	7.1	The Auditor recognises the rationale for vegetated areas being unlikely to be frequented regularly and the need for judgement in the field and the fact these areas will not be subjected to the same level of assessment as more accessible areas. The Auditor considers that it is important to clearly document these areas and the level of effort for future reference.	
Preliminary Site Walkover	7.2	No comment.	
ACM Identification and Removal	7.3	No comment. The auditor notes in relation to Point 1) it is important to document the condition of the ACM.	

AF Assessment	7.4	The Auditor agrees with the proposed approach of selecting sample locations around structures constructed from different material types. However, the Auditor does not understand the rationale for the number of buildings to be sampled. Having said this the Auditor recognises the number of samples proposed for each location (up to 15) and can see benefit in undertaking this amount of sampling. The Auditor also understands that the results from the testing will provide an indication as to the hypothesis proposed and that it might be premature to question the proposed approach. Nevertheless, can Senversa please provide further rationale justifying the selection of sample numbers as an appropriate number of samples and if results can be extrapolated across the sites and future remediation/management decisions made with confidence.	
	7.4	Further to the above comments the Auditor considers undertaking these works earlier in the program and then reviewing the data may be beneficial in assessing the Senversa hypothesis and also whether any additional sampling is proposed.	
	7.4	It is also noted within Appendix 3 of the Aurora (2015) Asbestos Assessment and Preliminary Management Plan report AF was detected in soil sample G107. It is unclear why this location has not been selected for investigation as part of the sampling program.	
	7.4	When selecting sampling areas consideration should be given to evidence of, or potential evidence of disturbance and any such evidence should be documented.	
	7.4	When collecting the 500ml sample the samplers should note the presence of any ACM, its approximate size and its condition.	
	Appendix B - Procedure 1	As noted above it is very important that an accurate record of the area is documented. It is noted that the field transects are proposed to be no more than 3m apart which is considered may be slightly to wide and could lead to missing observations of ACM (although this will be a bit dependent upon ground conditions). The Auditor considers a narrower spacing would be appropriate but considers this is something that could be better assessed during the pilot trial. Additionally, the WA DoH guidelines recommend when undertaking picking that at least 2 passes of picking (and of raking if appropriate) made with 90o direction change between each - which should be adopted for this works.	
	Appendix B - Procedure 2	Refer to comments above re spacing of transects. Where ACM is identified will the field supervisor also check other areas not flagged as part of QA/QC.	
	Appendix B - Procedure 3	No comment	
	Appendix B - Procedure 4	<u>Table 1</u> Under High Effort in the Description column there is reference to fragments in 'reasonable' condition. It is not clear what is meant by 'reasonable' and this terminology does not seem consistent with terms used in the Asbestos Field Record. Please clarify what is meant by 'reasonable' or use the same terminology in the Asbestos Field Record. Also under High Effort in Description column it is indicated that this will not result in more than approx. 1m2 of ACM to be collected. Please clarify if this means 1m2 of soil will be raked or if up to 1m2 of ACM (sheet) will be collected. Under Delayed Effort and Assess the Works Required should include recording the location and flagging or some other way of marking the area for future reference. If these areas are to be left for a prolonged period should erection of warning signs consistent with DoH Guidance Note on Identification, Assessment and Management of Asbestos Contamination in Regional Public Areas? Similarly, for piles of dumped material should these be provided with a temporary covering? <u>Table 2</u> Under Resolved should the Works Required also include updating Asbestos Register and future checking? Under Delayed the Works Required should also include recording location, flagging and covering as per comments above.	
	Appendix B - Procedure 5	Point 8) - As noted previously recording information is important. Point 9) - Please clarify what is meant by push-piled soil?	
Data Management and Naming	Appendix B - Procedure 6	No comment	
Waste Management and decontamination	Appendix B - Procedure 7	No comment	

Personnel	7.5	No comment	
QA/QC	8	<p>It is agreed collecting duplicates and triplicates QA/QC is not required as it is considered AF/FA within soils are not directly comparable to allow calculation of the relative percent difference (RPD) due to the heterogeneous nature and occurrence of asbestos.</p> <p>The QA/QC program should include a program of checking areas surveyed and raked for ACM works. By having an independent person (e.g. the field supervisor and/or the Senversa field manager) undertaking independent checking of a small percentage of surveyed and remediated areas will provide an additional level of confidence to the field program.</p>	
Community consultation & Appendix D	9	No comment	
Appendix C Example Field Forms	Asbestos Field Record	<p>ACM Description - users terms Good / Fair / Poor. These should be defined. Also it would be appropriate to use the term "Friable" in accordance with the definition of WA DoH.</p> <p>Classification - users terms Resolved / Outstanding but the text users the term Delayed rather than Outstanding. Please use consistent terminology.</p> <p>Terminology in forms should be consistent with that in the text of the SAQP.</p>	
	Asbestos Fibre Sampling	No comment - but the form should be modified based on the results of Pilot Trial, as appropriate.	
Air Monitoring		Noted that at this stage, control of dusts is being implemented as best practice and no monitoring for asbestos fibres in air is proposed. However, should risks be identified and/or stakeholder expectations warrant monitoring then this will be revised by the Assessor.	

Bunbury, Richelle

From: Tony Scott
Sent: Friday, 15 July 2016 1:35 PM
To: Ashton Betti
Cc: Richelle Bunbury; Katie Goss; Jeremy Hogben; Ingram, Colin
<Colin.Ingram@DPaW.wa.gov.au> (Colin.Ingram@DPaW.wa.gov.au); Rushforth, Brad
Subject: RE: WEDGE AND GREY / SAQP / AUDITOR COMMENTS
Attachments: ENAUPERT05451AA R1a - DPAW - Audit Review Register SAQP - Senversa Response -tsreview.pdf

Hi Ashton,

Thanks for providing the revised documentation.

I have completed my review and am satisfied the amendments have adequately addressed my comments and from my point of view works for the pilot trial can commence.

I have updated the Audit Review Register which I have attached for your records. I note the following from the register:

- AF Assessment: The response clarifies the approach. On the basis that the proposed work is an initial stage of assessment the Auditor considers the proposed works are appropriate for this purpose. Thus, the Auditor considers that these works will provide additional data which will assist in planning future assessment / management options. Issue closed
- Appendix B – Procedure 1: The response clarifies the approach. The Auditor agrees that the adequacy of the methodology will be tested during the pilot phase and recommends methodology be modified, based on the results of the pilot trial. The Auditor also notes the revised QA checking will assist in assessing the adequacy of the methodology during the works. Issue closed.

I understand from your emails earlier today that the Pilot Trial will commence next Tuesday. Can you please keep me apprised of the results of the Pilot Trial.

Can you please advise me of the expected period of the full scale works so that I can plan my site visit – which should coincide with a time when ACM remediation works is occurring. Currently I had envisaged that the timing of my visit might be the 1st week of August but I will await your advice on the timing before confirming.

I trust the review and above comments meets your requirements.

Should you have any queries in relation to this email or the attached updated Audit Review Register, please do not hesitate to contact me.

Thanks

Warm Regards

Tony Scott CP SAM
Senior Principal Environment

t: +61 2 9406 1195
m: +61 439 080 856
w: coffey.com

From: Ashton Betti [mailto:Ashton.Betti@senversa.com.au]
Sent: Friday, 15 July 2016 10:58 AM
To: Tony Scott
Cc: Richelle Bunbury; Katie Goss; Jeremy Hogben; Ingram, Colin <Colin.Ingram@DPaW.wa.gov.au>

(Colin.Ingram@DPaW.wa.gov.au); Rushforth, Brad
Subject: RE: WEDGE AND GREY / SAQP / AUDITOR COMMENTS

Hi Tony,

Thank you for your comment on the SAQP for Wedge and Grey. Please see attached our response table and a revised version of the SAQP.

Regards
Ashton

From: Tony Scott [<mailto:Tony.Scott@coffey.com>]
Sent: Wednesday, 13 July 2016 5:34 PM
To: Ingram, Colin <Colin.Ingram@DPaW.wa.gov.au> (Colin.Ingram@DPaW.wa.gov.au)
<Colin.Ingram@DPaW.wa.gov.au>; Jeremy Hogben <Jeremy.Hogben@senversa.com.au>
Cc: Ashton Betti <Ashton.Betti@senversa.com.au>; Richelle Bunbury <Richelle.Bunbury@coffey.com>; Katie Goss <Katie.Goss@coffey.com>
Subject: WEDGE AND GREY / SAQP / AUDITOR COMMENTS

Hi Colin, Jeremy and Ashton,

Please find attached our comments on the Senversa SAQP for Wedge and Grey.

If you have any queries please don't hesitate to contact me.

Warm Regards

Tony Scott CP SAM
Senior Principal Environment



NSW, SA and WA accredited contaminated sites auditor
Exemplar Global Lead Auditor Environmental Management Systems

Level 19, Tower B, Citadel Tower
799 Pacific Highway Chatswood NSW 2067
Australia

t: +61 2 9406 1195
m: +61 439 080 856



>>> Ingenuity@coffey – it's the ideas that count

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AUDIT REVIEW REGISTER - Report Review Summary and Response Form				
Report: Senversa (2016) Sampling and Analysis Quality Plan, Wedge and Grey Shack Settlements. Dated 20 June 2016.				
Sample and Analysis Quality Plan (NEPM, 2013 and WA DER Assessment & Management of Contaminated Sites 2014)	Assessor report section	Auditor Review Comments SAQP (Rev 0)	Assessor Response	Auditor Assessment of Response
Executive Summary	-	Not included. SAQP would benefit from an Executive Summary	An Executive Summary has been included in the report.	Adequate - Issue closed
Introduction	1.1, 1.2, 1.3, 1.4 and 1.5	The objectives of the work are indicated to: 1) build on the works already completed by Aurora and others to improve confidence in the characterisation of asbestos impacts to inform future remedial planning; and 2) reduce the amount of the identifiable ACM (to the extent practical), particularly within the most accessed areas, such that risk represented is reduced. The proposed investigations also represent an opportunity to assess the presence of fibres in soil in greater detail. Further it is indicated that whilst the identification and removal of ACM as an outcome of these works will inevitably reduce risks represented by ACM in soils at the site in broad terms, it is not the intention of this stage of works to conclusively reduce this risk below a specified (or acceptable) threshold. The Auditor's review of the SAQP has been based on these objectives and assumptions and on this basis it is considered acceptable by the Auditor.		Closed
Scope of Work	-	Not included as a heading per se; however a brief outline of the scope of works being undertaken was included in the Project Appreciation which is considered acceptable by the Auditor.		Closed
Site Identification and general information	2.1 - 2.3	Generally acceptable. It is understood the assessment is focussed on those areas frequently accessed and that these areas are to be defined. The Audit will also focus on these areas.		Closed
Previous Environmental Investigations	1.4	No comment		Closed
Site History	3.0	A brief summary provided based on the GHD PSI from 2014.		Closed
Topography	2.4	No comment		Closed
Site Inspection and Interviews with site personnel		Detailed site inspections and interviews with settlement representatives were undertaken in August 2013 as part of GHD PSI. Senversa have also drawn on site inspection and extensive knowledge of DPaW. This is considered acceptable.		Closed
Geology and hydrogeology (including topography)	2.4 - 2.7	Summary information provided considered acceptable. It is noted a limited groundwater investigation previously undertaken by GHD identified the presence of several heavy metals exceeding adopted guidelines with elevated ammonia and EC also recorded. However it is understood these works are part of a preliminary stage working towards remediation and management of asbestos issues at the site. The focus of the SAQP and the Audit is on asbestos and hence the Audit will not consider issues related to groundwater impacts.		Closed
Background Soil and Groundwater Quality	-	No information provided but as the focus of the Remedial DSI investigations and Audit are focused on asbestos in soil contamination this is considered acceptable.		Closed
Conceptual Site Model	4.0	Conceptual site model is considered acceptable but should be updated in the Remedial DSI report when additional results available.	A comment to this effect has been included in the report.	Adequate - Issue closed
Assessment Levels	6.0	The text refers to the relevant WA guidelines and then notes the project context represents a preliminary stage of assessment and remediation and as such DoH assessment criteria will be utilised as tools to guide works and aid assessment and remediation only. This is considered acceptable although the title of reference 2 should be Regional Public Areas rather than Regional Parks. Please ammend reference here and elsewhere in the SAQP.	Reference has been corrected throughout the report.	Adequate - Issue closed
		In relation to assessment of AF it is indicated that the WA DoH criteria of 0.001% w/w will be used to assist with reporting clarity and understanding risk but then indicates that it will more likely lend itself to discussion in terms of presence / absence of AF. The Auditor is confused as to what is proposed in both criteria and form of laboratory results i.e. use of WA DoH criteria and laboratory methods or simply reporting presence of absence of AF. Please clarify.	The laboratory analysis will include quantification for AF, which will be compared to DoH guidelines as appropriate. The commentary included in Section 6.3 simply highlights the anticipated limitations of this in the context of the assessment to be undertaken in that it is considered unlikely the assessment will meaningfully utilise a level of assessment beyond the presence (ie > 0.001% w/w) and absence (assumed to be <0.001% w/w) in individual samples to identify areas of impact (identified AF) and areas of delineation (no AF identified).	The response clarifies the approach and is acceptable to the auditor. Issue closed

Sampling and Analysis Quality Plan	1.0 and 7.0	See comments above relation to objectives and introduction and comments below related to DQOs in this review.		Closed
Data Quality Objectives	5.0			
Step 1 State the Problem	5.1	No comment		Closed
Conceptual Site Model (source-pathway-receptor linkages)	4.0	See comments above.		Adequate - Issue closed
Review of existing data (indicating reliability and usability)	Not included	The auditor expects the assessor has reviewed previous environmental investigation report, as such the inclusion of a statement regarding the reliability and useability of data would be beneficial. A summary presenting findings of previous investigations undertaken on the site would assist in understanding current data gaps.	A comment regarding the data usability has been included in the report. A summary of previous reports has been included as Section 3.2.	Adequate - Issue closed
Step 2 Identify the Decision	5.2	The Auditor agrees with information provided. The Auditor notes there could be benefit in doing the AF assessment early in the program to enable review of results and assessment of hypothesis and requirements for any additional sampling whilst the field team are still onsite. The Auditor also notes in relation to AF point 4 it will be advantageous to review results as you go to again assess the hypothesis.	The AF investigation has been scheduled for the first two weeks of the investigation. This should allow sufficient time for assessment of the results against the hypothesis, in case any further sampling is warranted.	Adequate - Issue closed
Step 3 Identify Inputs into the Decision	5.3	The Auditor notes keeping of good accurate records is critical to a high quality survey. The Auditor notes that when selecting background / control sample locations for AF assessment consideration should be given to the historic uses in the selected areas to confirm they indeed represent locations that can be considered background / control sites.	A comment to this effect has been included in the report.	Closed Adequate - Issue closed
Step 4 Define the Study Boundaries	5.4	No comment. The Auditor notes that any evidence or suggestion of deeper (> 10cm) ACM impact should be recorded.	A comment to this effect has been included in the report.	Adequate - Issue closed
Step 5 Develop a Decision rule	5.5	No comment. The Auditor notes that in relation to ACM under Point 1 no ACM identified at the surface does not necessarily translate to the area being free of ACM. In relation to AF Assessment the Auditor notes in relation to Point 1) that this may be conservative but this is acceptable for screening purposes and agrees with sentiments in Point 2).	Noted.	Adequate - Issue closed
Step 6 Specify Limits on Decision Errors	5.6	No comment		Closed
Step 7 Optimise the Design for Obtaining Data	5.7	The Auditor agrees with the need for flexibility in the design of the program. Minor comment - there is reference to a Section 1.23 (bottom of Page 10) which seems to be a typo - please correct.	Cross-referencing error corrected.	Adequate - Issue closed
Sampling and Analysis Procedures	7.0			
		Note - The Auditor accepts that the SAQP may be revised following the pilot trial and as such the following comments provided may be considered as preliminary in nature.		Closed
Overview	7.1	The Auditor recognises the rationale for vegetated areas being unlikely to be frequented regularly and the need for judgement in the field and the fact these areas will not be subjected to the same level of assessment as more accessible areas. The Auditor considers that it is important to clearly document these areas and the level of effort for future reference.	A comment to this effect has been included in the report.	Adequate - Issue closed
Preliminary Site Walkover	7.2	No comment.		Closed
ACM Identification and Removal	7.3	No comment. The auditor notes in relation to Point 1) it is important to document the condition of the ACM.	A comment to this effect has been included in the report.	Adequate - Issue closed
AF Assessment	7.4	The Auditor agrees with the proposed approach of selecting sample locations around structures constructed from different material types. However, the Auditor does not understand the rationale for the number of buildings to be sampled. Having said this the Auditor recognises the number of samples proposed for each location (up to 15) and can see benefit in undertaking this amount of sampling. The Auditor also understands that the results from the testing will provide an indication as to the hypothesis proposed and that it might be premature to question the proposed approach. Nevertheless, can Senversa please provide further rationale justifying the selection of sample numbers as an appropriate number of samples and if results can be extrapolated across the sites and future remediation/management decisions made with confidence.	A rationale for the selection of sample numbers has been included in Section 7.4 that notes the somewhat nominal nature of the choices (being largely to work within existing budget and scope constraints). The total number of locations selected to form this aspect of the assessment is somewhat nominal and has been conceived as appropriate for the initial stage of this assessment, taking account of budget and scope limitations. Within these constraints, utilising two background locations and a minimum of three locations for the three other circumstances to be assessed (noting a bias toward the highest risk circumstances) is considered suitable to provide a reasonable opportunity for the collection of representative and useful data.	The response clarifies the approach. On the basis that the proposed work is an initial stage of assessment the Auditor considers the proposed works are appropriate for this purpose. Thus, the Auditor considers that these works will provide additional data which will assist in planning future assessment / management options. Issue closed
	7.4	Further to the above comments the Auditor considers undertaking these works earlier in the program and then reviewing the data may be beneficial in assessing the Senversa hypothesis and also whether any additional sampling is proposed.	Noted, as per previous response.	Adequate - Issue closed
	7.4	It is also noted within Appendix 3 of the Aurora (2015) Asbestos Assessment and Preliminary Management Plan report AF was detected in soil sample G107. It is unclear why this location has not been selected for investigation as part of the sampling program.	The objective of the investigation was not to assess every site where AF was identified by Aurora, but rather to assess representative sites from each category. The data will be extrapolated to other areas of the site, including other locations assessed by Aurora.	Adequate: refer to comments above - Issue closed

	7.4	When selecting sampling areas consideration should be given to evidence of, or potential evidence of disturbance and any such evidence should be documented.	A comment to this effect has been included in the report.	Adequate - Issue closed
	7.4	When collecting the 500ml sample the samplers should note the presence of any ACM, its approximate size and its condition.	A comment to this effect has been included in the report.	Adequate - Issue closed
	Appendix B - Procedure 1	As noted above it is very important that an accurate record of the area is documented. It is noted that the field transects are proposed to be no more than 3m apart which is considered may be slightly to wide and could lead to missing observations of ACM (although this will be a bit dependent upon ground conditions). The Auditor considers a narrower spacing would be appropriate but considers this is something that could be better assessed during the pilot trial. Additionally, the WA DoH guidelines recommend when undertaking picking that at least 2 passes of picking (and of raking if appropriate) made with 90o direction change between each - which should be adopted for this works.	The nominated 3m is considered to be sufficiently narrow (ie each individual only has to inspect an area 1.5m around them at any one time), noting that this is only a nominal distance and the actual distance two assessors will stand apart will be based on practical constraints and what actually works (this will be tested in the pilot phase). Any where that ACM is identified will be subject to the assessment comprising two passes, as outlined in Procedure 4.	The response clarifies the approach. The Auditor agrees that the adequacy of the methodology will be tested during the pilot phase and recommends methodology be modified, based on the results of the pilot trial. The Auditor also notes the revised QA checking will assist in assessing the adequacy of the methodology during the works. Issue closed
	Appendix B - Procedure 2	Refer to comments above re spacing of transects. Where ACM is identified will the field supervisor also check other areas not flagged as part of QA/QC.	Additional verification added to QA procedures.	Adequate - Issue closed
	Appendix B - Procedure 3	No comment		Closed
	Appendix B - Procedure 4	<u>Table 1</u> Under High Effort in the Description column there is reference to fragments in 'reasonable' condition. It is not clear what is meant by 'reasonable' and this terminology does not seem consistent with terms used in the Asbestos Field Record. Please clarify what is meant by 'reasonable' or use the same terminology in the Asbestos Field Record. Also under High Effort in Description column it is indicated that this will not result in more than approx. 1m2 of ACM to be collected. Please clarify if this means 1m2 of soil will be raked or if up to 1m2 of ACM (sheet) will be collected. Under Delayed Effort and Assess the Works Required should include recording the location and flagging or some other way of marking the area for future reference. If these areas are to be left for a prolonged period should erection of warning signs consistent with DoH Guidance Note on Identification, Assessment and Management of Asbestos Contamination in Regional Public Areas? Similarly, for piles of dumped material should these be provided with a temporary covering? <u>Table 2</u> Under Resolved should the Works Required also include updating Asbestos Register and future checking? Under Delayed the Works Required should also include recording location, flagging and covering as per comments above.	Clarifications have been included in Table 1 and Table 2 (now Table 2 and Table 3) to ensure consistency and clarity of items raised by the Auditor.	Adequate - Issue closed
	Appendix B - Procedure 5	Point 8) - As noted previously recording information is important. Point 9) - Please clarify what is meant by push-piled soil?	Amended to state "stockpiled" soil.	Adequate - Issue closed
Data Management and Naming	Appendix B - Procedure 6	No comment		Closed
Waste Management and decontamination	Appendix B - Procedure 7	No comment		Closed
Personnel	7.5	No comment		Closed
QA/QC	8	It is agreed collecting duplicates and triplicates QA/QC is not required as it is considered AF/FA within soils are not directly comparable to allow calculation of the relative percent difference (RPD) due to the heterogeneous nature and occurrence of asbestos. The QA/QC program should include a program of checking areas surveyed and raked for ACM works. By having an independent person (e.g. the field supervisor and/or the Senversa field manager) undertaking independent checking of a small percentage of surveyed and remediated areas will provide an additional level of confidence to the field program.	Additional verification added to QA procedures.	
Community consultation & Appendix D	9	No comment		Closed
Appendix C Example Field Forms	Asbestos Field Record	ACM Description - users terms Good / Fair / Poor. These should be defined. Also it would be appropriate to use the term "Friable" in accordance with the definition of WA DoH. Classification - users terms Resolved / Outstanding but the text users the term Delayed rather than Outstanding. Please use consistent terminology. Terminology in forms should be consistent with that in the text of the SAQP.	The report has been amended to ensure consistency in nomenclature.	Adequate - Issue closed
	Asbestos Fibre Sampling	No comment - but the form should be modified based on the results of Pilot Trial, as appropriate.		Closed
Air Monitoring		Noted that at this stage, control of dusts is being implemented as best practice and no monitoring for asbestos fibres in air is proposed. However, should risks be identified and/or stakeholder expectations warrant monitoring then this will be revised by the Assessor.		To be monitored by Senversa and field team onsite.

Electronic Transmission

To	Colin Ingram	From	Tony Scott
Email address	Colin.Ingram@dpaw.wa.gov.au	Date	30 November 2016
Company	Department of Parks and Wildlife	Reference	ENAUPERT05451AA-E02
cc	Jeremy Hogben and Ashton Betti	Pages	1 of 4
Subject	WEDGE & GREY SITE AUDIT – AUDITORS COMMENTS ON REMEDIAL DETAILED SITE INVESTIGATION		

The advice presented in this email represents interim advice only, and does not constitute a Mandatory / Voluntary Audit Report. The advice provides the opinion of the Auditor based on the knowledge that is available at the time of this advice. A Mandatory / Voluntary Audit Report will be issued at the end of the Audit process, when the Auditor is satisfied all relevant matters have been adequately addressed. Interim audit advice does not pre-empt or constrain the final outcome(s) of the audit or any conditions that may be placed by the Auditor in the audit report.

1. Introduction

The Western Australia Department of Parks and Wildlife (DPaW) have engaged Tony Scott of Coffey Environments Australia Pty Ltd (Coffey) to undertake a contaminated sites audit of investigations being undertaken by Senversa Pty Ltd (Senvorsa) at the Wedge and Grey shack settlements. The Wedge and Grey shack settlements are located in Wedge Reserve and Grey Reserve (Wedge and Grey, and collectively referred to as the Site), respectively, to the north of Perth, Western Australia.

Wedge and Grey have been subject to construction of recreational shacks in an uncontrolled and unregulated manner from the 1950s to 1990s. Wedge consists of approximately 360 shacks and Grey consists of approximately 135 shacks. The shacks were constructed from various building materials, predominantly those that were cheap and easily transportable, including asbestos containing materials (ACM).

In early 2012, following the outcome of a Parliamentary Inquiry into shacks sites in Western Australia in 2010, DPaW commenced an assessment and planning exercise to determine an appropriate level of shack retention and the location and form of possible public recreation and tourism infrastructure at the Wedge and Grey Settlements. As part of the planning exercise it was identified that significant volumes of ACM are present across the Wedge and Grey reserves, both within buildings and weathered fragments in shallow surface soils, which may pose a risk to human health associated with the current and future use of the area.

2. Context

An Asbestos Assessment and Preliminary Management Plan was prepared by Aurora Environmental (Aurora 2015) to gain a clearer picture of the nature and extent of ACM in and around buildings at Wedge and Grey. This study was a first step to understand the risks and requirements for the safe management or removal of ACM.

The Aurora (2015) assessment found that there are multiple locations of soils impacted by ACM fragments around shacks and frequently accessed areas (e.g. common areas and tracks) and within the dedicated waste disposal areas. Specifically, Aurora identified 206 shack locations with ACM within the building structure or ACM impacted soils in their immediate vicinity. Aurora concluded that the issue of asbestos in soils was widespread and the estimated ACM concentration in soil at numerous locations exceeded the Department of Health (DoH) criterion for the protection of human health and consequently warranted some form of management or remediation.

The Auditor understands DPaWs longer term goal is to have much of the Wedge and Grey sites free of asbestos and those areas decontaminated and in the short to medium term characterise and manage risks to human health.

DPaW subsequently commissioned Senversa to undertake the next phase of works to assess and manage ACM at Wedge and Grey, comprising works described as a Remedial Detailed Site Investigation (RDSI) as recommended by Aurora.

As the initial part of their works Senversa prepared a Sampling and Analysis Quality Plan Wedge and Grey Shack Settlements dated 20 June 2016 (the SAQP). The SAQP was reviewed and endorsed by Mr Tony Scott of Coffey, a Department of Environment Regulation (DER) Accredited Contaminated Sites Auditor ('the Auditor') on 5th July 2016.

The Auditor notes that previous studies have identified the potential presence of other contaminants within the Wedge and Grey sites but that the focus of the proposed studies was on asbestos (mostly ACM) only.

The Senversa RDSI was focussed on two distinct aspects of at the site being:

- Identification of ACM in soil (and its practical removal); and
- Characterisation of Asbestos Fines (AF) in soil that may have resulted from degradation of ACM within built structures (e.g. run-off from asbestos rooves), with the main objectives of the RDSI including:
 - Build on works previously conducted on the site to provide further confidence in the characterisation of impacts to inform future remediation works;
 - Reduce visible ACM impacts to the extent practicable such that risk represented is reduced.

The implementation of the SAQP commenced with a preliminary site walkover and scope / methodology pilot trial which was undertaken by Senversa on the 18th and 19th July 2016. The purpose of the pilot trial was to ground truth the proposed methodology presented in the SAQP and assist in identification of any additional issues that may need addressing. Upon completion of the pilot trial Senversa determined the ACM removal and sampling methodology as outlined in the SAQP appropriate for implementation across both the Wedge and Grey sites, this was subsequently communicated to DPaW and the Auditor.

The SAQP was then implemented at Wedge Settlement between the 19th July and 3rd August 2016 and then at Grey Settlement between 4th and 19th August 2016. Senversa has presented results of fieldwork within the following report:

- Senversa (2016) Remedial Detailed Site Investigation. Prepared for Department of Parks and Wildlife. Dated 13th August 2016.

At the request of DPaW the Auditor has reviewed the Senversa RDSI, which is the subject of the comments presented herein.

3. Auditor review

Overall the purpose of the RDSI (Senversa 2016) was to present the data collected from the asbestos assessment and remediation works for the Wedge and Grey Reserves to improve on characterisation of asbestos impacts at the site and reduce (to extent practicable) the amount of identifiable ACM.

The Auditor's review of the report has taken into consideration the regulatory reporting guidance under the DoH (2009) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, DoH (2011) *Guidance Note on Identification, Assessment and Management of Asbestos Contamination in Regional Public Areas*, and particularly the DER guideline 'Assessment and Management of Contaminated Sites' (DER, 2014).

The Auditor does have several comments on the RDSI contained within the attached Audit Review Register. The auditors comments are contextualised as to whether the comment of 'issue' is considered low (overall completeness), medium (potentially outcome-related) or high significance (outcome-related). We have also supplied the Audit Review Register in electronic format to enable Senversa to directly respond to the Auditors comments. Depending upon the clarification provided by the assessor the level of significant is subject to further review.

Overall the Auditor considers that a substantial amount of data was collected during the RDSI works but considers that the analysis does not take advantage of the available data. In particular, it is considered the analysis currently presented in the critical sections of the RDSI including risk assessment, conceptual site model, conclusions and recommendations fall short of that normally expected in a DSI report.

By giving further consideration to the available data, the CSM (post the RDSI) and a more detailed assessment of risks (with particular reference to the DoH (2011) *Guidance Note on Identification, Assessment and Management of Asbestos Contamination in Regional Public Areas*) it should be possible to reach more substantial conclusions and recommendations for future actions and/or management / remediation requirements. This should include consideration of any immediate short term remediation / management requirements that may need to be implemented prior to the summer holiday period when there would be expected to be a large amount of visitors to both Wedge and Grey sites.

For example is it possible to divide the site into zones based on the various forms of asbestos present such as risk of ACM (high, medium, or low risk), outstanding areas of ACM (high, medium or low risk) areas not investigated for ACM, and risks for AF / FA (high, medium, or low risk) etc giving consideration of the issues discussed in the DoH 2011 guidelines; or some other similar risk based approach / outcome. In relation to risks there should be a strong focus on assessing the risks posed by AF / FA.

Lastly based on this, or similar re-evaluation, draw conclusion and prioritise recommended actions and timeframes for actions for implementation by DPaW.

4. Closing remarks

We trust that the attached comments are of benefit and that this review meets your requirements. Should DPaW and/or Senversa have any queries in relation to the comments presented herein please do not hesitate to contact me to discuss further.

For and on behalf of Coffey

A handwritten signature in blue ink that reads "Tony Scott". The signature is written in a cursive style with a large initial 'T'.

Tony Scott
Senior Principal / WA DER Accredited Site Auditor

cc Jeremy Hogben and Ashton Betti

Attachment:

Audit Review Register

TABLE 2A: Auditor Review Register: Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements (Senvera 2016).

Detailed Site Investigation Report Assessment Checklist and recommended information to be included if relevant (Appendix A DER 2014).	NEPM Assessment of Site Contamination (2013)	Department of Health (2009) Reporting Requirements	Assessor Report Section	Auditor Review Comments Report: Senvera (2016) Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements.	DOH/DPAW Comments	Significance	Action Required	Assessor Response to Auditor Comments	Assessor Response to DOH comments	Auditor review of responses to Auditor comments
Executive Summary			Executive Summary	Please update the Executive Summary to reflect any changes in the report relevant to this section.		Low for completeness	Update Report	<i>The ES will be updated to reflect other agreed amendments.</i>		Closed out.
Introduction		Why was the DSI conducted as necessary as part of the remediation and management process.	Section 1.0 Introduction	The site investigation boundary at both Wedge and Grey differs somewhat to the boundaries presented on the respective Certificate of Title documents. This will need to be considered in the future as part of the site reclassification process. Refer to comment on Section 2.2 below.		Low for completeness	This discrepancy should be noted in the report.	<i>A relevant comment will be included to define the boundaries.</i>		Comment included in Section 2.1 - closed out
			Section 1.1 Background	It is stated that Senvera were commissioned to undertake the next phase of works to assess and manage ACM at Wedge and Grey. See comments later in relation to recommendations.		High Outcome related	No comment required	<i>Noted - refer later comments.</i>		
			Section 1.2	It is indicated in the last paragraph of this section that the outcomes of the outcomes of work must not be construed to include: 3) reduction of risk related to asbestos to recognised acceptable levels. Whilst it is understood that this is from the SAQP prepared prior to works, given the results achieved it is considered the conclusions in relation to "reduction in risk" can be commented upon in the conclusions of the report.		High Outcome related	Update conclusions in report to consider what or if there has been a reduction in risk profile.	<i>The following comment was provided in the ES and conclusions with reference to the "reduction in risk" - "The removal of 360 kg of ACM from the most frequented areas of the settlements has greatly reduced the risk of exposure to asbestos for relevant receptors (current check residents, recreational visitors and Parks and Wristle workers and contractors)." The appropriateness of further expansion upon this statement is addressed elsewhere in related Auditor comments and cover letter.</i>		Comment included in ES and conclusions - closed out
			Section 1.3 Objectives	An objective of the project was also to obtain additional information on AF / FA and assess if the hypothesis included in the SAQP was supported by results of the RDSI. A point in relation to the objectives for the AF / FA investigations should be included.	It is stated within the report that work ...cannot be construed to include ...3) reduction of risk related to asbestos to recognised acceptable levels. Therefore, there is a need for the report to adequately represent and communicate residual (exposure) risk to client, users and stakeholders and provide for future decision making and management. This is an important function of the report, as discussed at initial contract engagement. Also applies to Sections 8, 10 and 12.		Low for completeness	Update Report	<i>This is covered within the broad based objective at point 1) but additional detail will be included within this point to highlight the AF component distinct from the ACM component.</i>	<i>Refer to various relevant responses to Auditor comments in relation to this general issue (to the extent to which this work was designed to assess risk and to what level of detail). Note also the point made in the final paragraph of Section 10 of the SAQP where the manner in which this issue would be considered in the report is described and which pretty clearly sets the agreed context for how the report would approach this issue. Aside from the obvious notion that removal of identified ACM to the extent that occurred has reduced risk associated with it, the limitations of the work (that include the dynamic nature of the environment - both natural and associated with human activity) and the variability of scenarios within the settlements means there is probably not much more that can be meaningfully stated with confidence in this regard. In the auditor response we have suggested some additional wording that could be included to address this issue. We would be pleased to discuss this suggestion or alternatives.</i>
Site Identification and general information	Schedule B2: Site Characterisation § 3.1 - 3.3	2.2 Site Inspection 2.2.1 Visual Indicators 2.2.2 Characteristics of Contamination	Section 2.2 Site Description	Note: It is indicated in the 3rd paragraph that to former clay pigeon shooting range was present on part of Wedge. While the auditor understands it is outside the scope of this study, previous experience has indicated that clay pigeon shooting ranges can be contaminated with PAHs (from clay pigeons) and lead (from lead shot). Note: The Auditor acknowledges the statement "The investigation areas for Wedge and Grey exclude Aboriginal Heritage Zone D1 and sp sites (T1 and T2). The Auditor is aware of the previous investigation conducted on the sps site detected AF. In the absence of conducting appropriate investigation and remediation within the excluded locations, based on the current understanding of the investigation areas reclassification of both the Wedge and Grey sites now require development of an IDQP.			Note: no action required			
Previous environmental investigations and remediation	Schedule B2: Site Characterisation § 3.3	2.1 Site History Investigation	Section 3.1 Previous Investigations	A summary of previous investigations undertaken by Aurora is presented in Section 3.2.1 Asbestos assessment and preliminary management plan. As the Assessor is referencing information from the GHD (2014) PSI report this section would benefit from the inclusion of a summary regarding the investigation scope and findings. Note the Auditor has not reviewed this document in detail. The report would benefit from figures showing the locations and results of sampling undertaken by Aurora, particularly the AF results. This would assist in understanding the context of the results of this study.	The AF Assessment should consolidate all information relating to AF sampling and assessment, including the data collected by Aurora	Low for completeness	Update Report	<i>Brief summary of the GHD (2014) PSI to be included in report.</i>	<i>To be discussed. It is not clear how this would fit in the decision rule and data input process detailed in the DQOs but if there is a demonstrable benefit then this can be reviewed and considered.</i>	Response included in Section 3.2.1 - closed out
Site history	Schedule B2: Site Characterisation § 3.3		Section 2.3 Site history	No comment.			No action required			
Site inspection and interviews with site personnel	Schedule B2: § 3.4, § 3.6		Section 7.0 Community Consultation	No comment.			No action required			
Geology and Hydrogeology	Schedule B2: Site Characterisation § 3.5		Section 2.6 Hydrogeology	Note: The Auditor notes a limited groundwater investigation has been conducted on the site with results showing heavy metals exceeding the adopted guidelines. Additionally elevated electrical conductivity and ammonia was also recorded. The Auditor has not reviewed this report and is aware the current investigation scope is focussed on asbestos only. However based on this information restrictions may apply to groundwater as part of site reclassification if groundwater is not investigated further.			Note: no action required			
Background soil and groundwater quality	Background soil quality (e.g. literature / reference site Schedule B1 § 2.5.7 Ambient and up-gradient groundwater quality, Schedule B6: § 3.2		Section 2.6 Hydrogeology	In the absence of details on site specific geology please clarify if there was any evidence of fill material on the site - it is recognized that locally there may be small areas of fill but in particular any evidence of significant fill. Refer to comment above.		Low for completeness	Update Report	<i>A relevant comment regarding the absence of imported fill will be included.</i>		Response included in Section 2.5 - closed out

TABLE 2A: Auditor Review Register: Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements (Senversa 2016).

Detailed Site Investigation Report Assessment Checklist and recommended information to be included if relevant (Appendix A DER 2014).	NEPM Assessment of Site Contamination (2013)	Department of Health (2009) Reporting Requirements	Assessor Report Section	Auditor Review Comments Report: Senversa (2016) Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements.	DOH/DPAW Comments	Significance	Action Required	Assessor Response to Auditor Comments	Assessor Response to DOH comments	Auditor review of responses to Auditor comments
Preliminary conceptual site model	Schedule B2 Site Characterisation: s 4 and s 9		Section 3.3 Preliminary Conceptual site model	Note: The Auditor notes the preliminary CSM presented within this section is limited to asbestos only and that there are other potential sources of contamination identified within the Preliminary Site Investigation (PSI) report developed by GHD (2014) and/or noted in the above comments which may require consideration in the future. Based on the current investigation areas of both the Wedge and Grey sites, the auditor understands that the Preliminary CSM does not include the waste collection sites. In which the rubbish tips (T1 and T2) could be considered potential off-site sources of AF. Please clarify.				Note: no action required		Comment included as a footnote to Section 2.2, dot point 3 - closed out.
Assessment levels	Schedule B1	Section 1.2.4 Investigation criteria and clean-up goals	Section 5.2 Assessment Criteria	The Auditor acknowledges that relevant investigation criteria were used at the site.	The criteria were not adopted in assessing contamination prior to remediation works or to describe residual risks from unremediated areas.				This aspect has been extensively dealt with in responses to the Auditor. Section 6.2 of the SAQP explicitly concerns itself with this issue.	Noted. Section 6.3 of the SAQP (Senversa 2016) states "With respect to ACM in soils identification and remediation, a broad approach will be adopted that seeks to identify all ACM in surficial soils (nominal top 10 cm) within accessible areas and to remove this material where practical. With reference to the calculation presented in Section 6.2, given that it is proposed to remove all identified ACM to the extent practical it is not anticipated that risk assessment applying the equation will be utilised" and "The assessment of AF will similarly utilise the DoH criteria of 0.001% w/w to assist with reporting clarity and understanding risk whilst recognising the limited nature of assessment will more likely tend itself to discussion in terms of the presence / absence of AF and related risk implications rather than a detailed risk assessment applying a quantitative threshold criterion".
				It is understood from the SAQP (Senversa 2016) it was not the intention of this stage of works to decrease risk below an acceptable threshold, however it is understood the DoH assessments are used to guide and aid assessment and remediation. The Auditor acknowledges these statements however given consideration to the results of the investigations it is unclear to what extent the DoH assessment criteria has been applied and how it was used to aid assessment and remediation works. Please provide clarification.	Information on the quantification and delineation of bulk ACM impacts in remediated and outstanding areas should include flow/water asbestos and GPS coordinates for extent of impact and likely depth of impacts. This also needs to occur for AF, i.e. in the Investigation/Remediation Works section the first paragraph states "There are a number of locations where AF or FA may be present including drip lines from non-guttered asbestos cement roofs, downpipes outflows and waste disposal areas. The following strategy will be adopted for investigation of these areas 1) Areas of potential AF/FA will be marked up using a GPS and locations recorded on a site 2) 500 mL wetted samples for AF/FA laboratory analysis will be collected at locations within and surrounding the likely impacted area to facilitate delineation of the extent of impact such that this record may be usefully applied in future remedial effort.	Medium - Potentially outcome related	Update Report	DoH assessment criteria have been utilised only to the extent that the visual presence within the top 10cm has been applied for ACM in areas where ACM was identified and removed and the 0.001%w/w criteria was applied in the context that where AF/FA was identified above LOR (which is greater than 0.001%w/w) it is assumed to exceed this threshold and therefore potentially represent a risk.	With respect to the quantification of ACM - this has largely been dealt with through responses to the auditor comments and as per related comment above. It is not clear where the reference to "Investigation/Remediation Works section (final paragraph)" refers. This will need to be clarified to provide a thorough response although the point made above likely covers this issue also.	
			Section 5.3 Project context	Further to the above it is understood from the SAQP Senversa 2016) that the application of DoH criteria of 0.001% was used to assist in understanding risk associated with AF at the site and for reporting clarity. However, given the result of the investigations please clarify if the results were compared to assessment criteria?	Some quantification of the magnitude of contamination in remediated areas may allow better understanding of the quantity of residual contamination. See other comments.	Medium - Potentially outcome related	Update Report	Since the LOR is higher than the adopted criteria, the identification of AF/FA in an individual sample has been assumed to represent exceedance of the criteria at the sampled location. This point is made in Section 10.2 but will be further clarified within text for avoidance of doubt.	Resolved (remediated) areas were free of identified ACM within the limitations of the works and as per the relevant procedures.	Laboratory reports show LOR for AF/FA in soil as 0.001% (w/w). No application of guidance to assess risk or remediation works undertaken.
				In addition, as stated within this section, "the use of the criteria has lent itself to discussion in terms of related risk implications rather than a detailed risk assessment applying a quantitative threshold criteria." In accordance with the NEPM (2013) available Tier 1 criteria are applied as a initial screening to determine whether or not there is a potential risk associated with contaminants of concern and to determine if further assessment or management is required. Based on the statement above, and the results of the investigations presented in the RDSI, the Auditor is unclear within the report if the criteria was used in the context of the NEPM. Please clarify. Note: it is the Auditor's understanding that undertaking a Tier 1 assessment with the use of available quantitative threshold criteria does not comprise a detailed risk assessment.		Medium - Potentially outcome related	Update Report	No assessment or residual asbestos using the 'w/w' formula was applied as discussed in Section 5.3. See comment above in relation to the manner in which DoH criteria were considered for ACM and AF/FA.		Noted
				The Auditor notes the guidance provided in the DoH Guidance Note On Identification, Assessment and Management of Asbestos Contamination in Regional Public Areas (May 2011) include additional guidance particularly in relation to assessing risks and management measures for asbestos present at sites like Wedge and Grey. Given that following the investigations there are a substantial number of 'outstanding' records of identified ACM and the results of the AF / FA sampling the Auditor considers that use and application of guidance in these DoH (May 2011) guidelines should also be a consideration when assessing results, conclusions and recommendations in the RDSI. The project context section should be updated to recognise this guidance and results, conclusions and recommendations sections of the RDSI should be updated appropriately.		High Outcome related	Update Report including Results, Conclusions and Recommendations sections	This project was not outcome focussed in terms of establishing a final site contamination status or assessing risk in relation to residual asbestos present following the works. To this extent, application of the specific considerations within the guidance cited is not considered directly applicable and therefore not appropriate. Some further commentary providing relevant explanation in this regard will be included in Section 5.1 and/or Section 5.3.		A response has been developed in Section 5.3 focussed on how the guidelines have been applied to the project. It is noted further assessment of risk has not been undertaken.
Sampling and analysis quality plan (SAQP)	Schedule B2: Site Characterisation s 5-6, Appendix B and B3	4. Sampling, Monitoring, and Analytical Methods	Section 4.0 Data Quality Objectives	No comment. The Auditor notes the DQOs are those presented in the Auditor approved SAQP (Senversa 2016).				No action required		
				It is stated Aurora sampled seven of the 52 locations identified on the asbestos register where asbestos covers and gutters are present with detections of AF at all sampled locations. Could the Assessor please clarify the whereabouts of these seven locations (i.e. are they all from shacks G028 and W099)? A figure would assist in this. Additionally, were the detections above relevant assessment criteria?	Results obtained by Aurora, together with additional AF samples taken, should be reviewed to better characterise AF risks.	Low for completeness	Update Report	Report to be updated to identify the locations where Aurora sampled. Aurora did not report the concentrations of asbestos detected.	Refer previous comment on this issue.	Refer to response in call K12. Aurora states within their report results were above LOR and therefore were considered above DoH guidance. There are laboratory results in back of report. The inclusion of this information may be addressed within a subsequent phase of works - closed out.
			Section 6.6 AF Assessment	Could the Assessor please confirm if any additional decontamination procedures (i.e. in addition to clean nitrile gloves already mentioned) between were performed between samples collected within the report.	It was understood that sampling design would be adjusted during site investigations to ensure adequate characterisation of risks. The limited survey undertaken associated AF assessment, together with the track of clear distinction between two of the scenarios tested (high and medium risk) and the results achieved means confidence in inferences capable of being made in relation to broader characterisation of shacks and future planning is somewhat reduced.	Low for completeness	Update Report	Procedure 7 in Appendix B describes the decontamination procedures used. The report will be updated to identify that the trowel used for collection of soil samples was also decontaminated between each sampling location.	The data collected associated with the AF assessment was considered adequate for its purpose and on review there was not considered to be a need to amend the scope to achieve its objective.	Closed out.
				Please include the depth from which soil samples were collected from.		Low for completeness	Update Report	Report to be updated accordingly, noting that all samples were surface samples (0 m bgl to 0.1 m bgl).		Section 6.6 has been updated - closed out
	The Auditor notes both the shack and track investigations involved the systematic walkover in grid based fashion. Could the Assessor please confirm the methodology associated with the walkover (e.g. the DoH (2009) guidelines recommends at least three passes across the site during picking with 90 degree direction change between each). Noting departures from DoH (2009) guidelines should be justified.		Describe the methodology for obtaining 500mL samples to ensure they best represent the exposed soil surface.	Low for completeness	Update Report	Procedures 1-3 in Appendix B describe the methodology adopted for the grid based walkover.	This is described in points 1) and 2) of Seton 6.6.	Noted. Procedure 5 states "raking using a rake with teeth <7mm spacing and >10cm long, with at least two passes with a directional change" - closed out		

TABLE 2A: Auditor Review Register: Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements (Senvensa 2016).

Detailed Site Investigation Report Assessment Checklist and recommended information to be included if relevant (Appendix A DER 2014).	NEPM Assessment of Site Contamination (2013)	Department of Health (2009) Reporting Requirements	Assessor Report Section	Auditor Review Comments Report: Senvensa (2016) Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements.	DOH/DPAW Comments	Significance	Action Required	Assessor Response to Auditor Comments	Assessor Response to DOH comments	Auditor review of responses to Auditor comments
Field Procedures including QA/QC	Schedule B2: Site Characterisation s 5	4.5 Quality Assurance/Quality Control	Section 6.3 Record Keeping, Section 8.0 Quality Assurance/Quality Control	The example Asbestos field records (uncompleted) presented in Appendix C appear to allow detailed set of field data to be recorded. Please provide the Auditor with a file of the records for review, and include in the RDSI several examples of completed Asbestos field forms for each of the three types of investigations undertaken at the site (including shacks ACM investigation, track investigation and other accessible areas investigation). Does the Assessor consider data from the field forms could be assessed to ascertain any trends or used to inform a qualitative assessment of residual risk?	Strongly support Auditor comments.	Medium - Potentially outcome related	Update Report	Completed field records to be provided (noting that due to the electronic nature of field forms this exists as an excel spreadsheet rather than as individual forms). Use of the data for further risk assessment may be possible but outside existing scope and noting it was not what the data was collected for and therefore application may be limited.	Refer response to Auditor comments.	Field records provided - closed out.
Laboratory analysis including QA/QC	Schedule B2: Site Characterisation s 5, B3		Section 8.2 Laboratory QA/QC Section 9.1 Quality Assurance/Quality Control Elements	No comment. It is understood the lead scientist undertook an independent review of a selected number of locations on a weekly basis to verify the works and field records and the results from verification were recorded on daily field sheets. Please include example records of remediation verification in the RDSI and provide a file of the sheets to the Auditor for review.		Low for completeness	Update Report	Independent review records to be provided.		Review records provided - closed out.
Data evaluation	Schedule B2: Appendix C		Section 6.9 Variations from SAQP	It is understood W130 and W245 have been observed to be fully constructed from steel. The asbestos register does not appear to have been updated to reflect these observations. Were there any other instances where recent observations did not reflect the findings presented within the asbestos register?	The process of verification should be better described. It is noted that the consultant was not often present at the site during remedial works.	Medium - Potentially outcome related	Update Report	These were observations only and the structures were not formally surveyed for the purposes of updating the asbestos register. For this reason it is not considered appropriate to update the register based on these observations alone.	Refer response to Auditor comments. Additional detail regarding the verification process will be provided, noting that this included reviewing field records and inspecting the site to confirm that the status of the site reconciles with field records. This was completed consistent with the SAQP (and as originally presented in the proposal).	Noted - closed out
Site plans	Schedule B2 Site Characterisation: s 14.4		Appendix A Figures	Refer to comments in text below.		Medium - Potentially outcome related	Update Report			
			Section 8.0 Investigation Results	It is understood the RDSI is concerned with two distinct aspects being identification of ACM in soil (and its practical removal) and characterisation of AF in soil that may have resulted from degradation of ACM within built structures (e.g. runoff from asbestos rooves). It is understood laboratory analysis of friable asbestos is reported as AF+FA. Please clarify the use of AF describing all laboratory findings within the report. The DoH "Guidance Note on Identification, Assessment and Management of Asbestos Contamination in Regional Public Areas" provides details on management of asbestos impacted sites and states "the implementation of management measures should aim to achieve a very low risk rating". The guidance goes on to state "if the impact is <20 cm ² of fragment areas per m ² over the whole affected exposed surface (i.e. after camouflage/vegetation cover is subtracted) and the fragments are in sound condition this is defined as very low risk". Please clarify if the action level in this guideline can be or has been applied in the outstanding areas? Provide further detail around the key decision "where identified, has its extent been meaningfully delineated?" (presented within Section 4.2.2 AF Assessment). Additionally can areas of concern be identified? Further to the above if findings relating to G009 are not related to the structure the data generally supports the hypothesis. It is unclear how the findings relate to the proposed future landuse ('Management Zones'). Please clarify.	Trial sampling for a limited number of "representative" areas plus controls will only work if those selected sites are fully characterised with good contextual information. This would include sampling around the full boundary of the building. Samples also need to be adequately representative of the exposed surface soils.	Medium - Potentially outcome related	Update Report	Definitional clarity will be provided in Section 15 that indicates that for the purposes of the AF assessment AF includes AF or FA or both (as may have been reported by the laboratory but not noted in the field) for clarity only and on the basis that a distinction at this level has no bearing on this aspect of the assessment.		Noted - closed out.
			Section 8.0 Investigation Results	It is unclear why 37 locations and 16 locations at Wedge and Grey were not remediated, particularly as some appear to be surficial ACM fragment contamination (on tracks, which relate to the type of contamination that was to be remediated as part of the scope of work, (nominal '10m' area related to individual shack investigation area). It is unclear whether items from 1481 onwards on the register were remediated. If not, why not?		High Outcome related	Update Report	The action levels in these guidelines has not been applied. Please refer to project objectives, limitations (as per Section 1.2) and DOOs in relation to this aspect. It was not an objective of this project (and therefore not reflected in DOOs or scope - including as reflected in the field procedures forms) to undertake risk assessment of unresolved materials at this level. Were this an objective, the DOOs would reflect the need to collect this data (Step 2 and 3) in order to make the relevant decisions (Step 5). The result would be field forms prepared based on these requiring certain relevant information to be recorded and field rankings applied. With respect to ACM, the project scope was limited to identifying ACM and removing it to the extent practical and describing (refer forms and DOOs) and logging material not removed such that it could be addressed at a later date. Should future actions in relation to this material consider that a risk assessment of the type contemplated by the guidelines referred to be worthwhile (such that the material could potentially remain if assessed as low risk) then this may be appropriate although it is understood that DPAW's broader objective is to remove asbestos rather than leave it unsupported by more detailed risk assessment (based on public perception issues).	Noted. It is understood it is not the intent of the report to quantitatively apply assessment criteria but to assist in the assessment of presence/absence and related risk implications. However the Auditor considers the identified potential risk and associated could be discussed providing further clarity around findings.	
			Section 8.0 Investigation Results	It is unclear how the findings relate to the proposed future landuse ('Management Zones'). Please clarify.		High Outcome related	Update Report	This simply refers to whether or not (at the preliminary level of assessment undertaken) it is possible to infer an extent of impact associated with AF from buildings. It was and this was described in the results section and conclusions. Additional explanation will be provided to further clarify this aspect.	Noted. The purpose of this aspect of project was to assess whether a distinction could be made based on AFEFA presence between shack types. The data collected enabled this distinction to be assessed and was therefore considered fit for purpose.	Noted - closed out.
			Section 8.0 Investigation Results	It is unclear how the findings relate to the proposed future landuse ('Management Zones'). Please clarify.		Low for completeness	Update Report	Consideration of this aspect was not within the project frame.		Noted. This may be addressed within a subsequent phase of work.
			Sections 8.1.1 and 8.1.2 Wedge Settlement and Grey Settlement	It is unclear why 37 locations and 16 locations at Wedge and Grey were not remediated, particularly as some appear to be surficial ACM fragment contamination (on tracks, which relate to the type of contamination that was to be remediated as part of the scope of work, (nominal '10m' area related to individual shack investigation area). It is unclear whether items from 1481 onwards on the register were remediated. If not, why not?		High Outcome related	Update Report	Please refer to the limitations in Section 1.2. "It is important to appreciate that whilst the identification and removal of ACM as an outcome of these works will inevitably reduce the risk represented by ACM in soils at the Site in broad terms, it is not the intention of this stage of works to conclusively reduce this risk below a specified (or acceptable) threshold. This limitation is both a function of and compounded by: 1) the dynamic nature of the Site's environment (shifting and disturbance of the sandy soils); 2) ongoing use of the Site; and 3) practical constraints such as access issues (including the presence of structures and vegetation) and what can be practically achieved within the project's staging, scope, timing and budget. With this in mind, the outcomes of this stage of works must not be construed to include: 1) identification of all ACM present in soil at the Site; 2) removal of all ACM present at the Site or identified through this assessment; or 3) reduction of risk related to asbestos to recognised acceptable levels." The provision of clearance certificates in any form is not compatible with these limitations. As such, the provision of clearance certificates or validation confirmation certificates was not an objective nor an aspect of the scope of work.	The decision criteria as to which areas would not be remediated as part of the scope of work is set out in the procedures guiding the work (ie as a key decision rule). There was a two step process in this regard - the first was 'delay' to allow the information to be reviewed in consultation with DPAW and decisions regarding possible remediation to be made and where the decision was made to not remediate they were subsequently identified as 'outstanding'. In relation to the last question regarding the register - all items relevant to the work Senvensa conducted that are in the register have not been remediated (i.e. they remain 'outstanding'). In this respect, the register is an up to date record of identified asbestos remaining at the two settlements.	Noted. Issues may be the report is called a Remedial DSI and secondly that the procedures used to remove ACM on the site are considered a 'remediation' approach endorsed by the DoH. As such it sets up expectations that remediation of the site will occur when in fact the objectives of investigation in regards to ACM (ie to reduce the amount of identifiable ACM (to the extent practical) particularly within the most accessed areas, such that the risk represented is reduced".
Results	Schedule B2: s 13, s 14.5 - 14.7	8. Reporting	Section 8.1.3 ACM Removed	The Auditors notes a total of 360 kg of ACM was removed from the site during the remedial DSI however the majority of ACM removed from the site appears to have come from other sources with only ~59 kg removed from Wedge and ~94 kg removed from Grey. Could the Assessor please provide any details to where the remainder of ACM was from? The figures presented would benefit from the inclusion of a plan showing how the figures fit together. Consideration should also be given to overlaying the proposed future land use to assist in determining priority areas for management actions.	Section 8.1.3 states that remaining ACM, which equates to 207kg and is more than half the material disposed, was "opportunistically" disposed in the locked bin. Was this by project workers or others? Is the origin of the material known or unknown? Does the material come from soil? This needs to be clarified throughout the report where 360 kg is reported. As investigation criteria are expressed in 'swab asbestos, it is recommended that quantification of ACM in remediated areas is expressed in the same way to better understand the extent of ACM impact present prior to remediation/removal.	Medium - Potentially outcome related	Update Report	Please refer to Section 8.1.3 - "The data recorded electronically has indicated that approximately 59 kg was removed from Wedge and 94 kg was removed from Grey. It should be noted that the weight removed from the entire Site varies from the figures recorded for the two Sites, as some quantities of ACM (beyond the commissioned scope of work - including some large sheets) were opportunistically disposed associated with Senvensa's field audits (and not formally recorded)."	The report will be updated to improve clarity regarding this aspect. It is understood that a single sheet was opportunistically removed from the beach (not weighed) during a Senvensa field inspection and the balance (majority) of the discrepancy in weight is associated with several large sheets being disposed associated with a 'resolvent' area that were not able to be electronically weighed on site (but were otherwise formally documented as per procedures). It is with a minor exception the discrepancy in the two weights is a result of some removed material not being weighed on site (because it couldn't be). In terms of the remediated areas - ACM was not quantified in this way pre-remediation consistent with procedures.	Closed out.
			Section 8.1.3 ACM Removed	The figures presented would benefit from the inclusion of a plan showing how the figures fit together. Consideration should also be given to overlaying the proposed future land use to assist in determining priority areas for management actions.		Low for completeness	Update Report	A figure showing how the various plans fit together will be provided. An overlay of proposed future land use will not since this aspect is not dealt with elsewhere in the report. See previous comment in relation to this.		Closed out.

TABLE 2A: Auditor Review Register: Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements (Senversa 2016).

Detailed Site Investigation Report Assessment Checklist and recommended information to be included if relevant (Appendix A DER 2014).	NEPM Assessment of Site Contamination (2013)	Department of Health (2009) Reporting Requirements	Assessor Report Section	Auditor Review Comments Report: Senversa (2016) Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements.	DOH/DPAW Comments	Significance	Action Required	Assessor Response to Auditor Comments	Assessor Response to DOH comments	Auditor review of responses to Auditor comments
				The Auditor notes on the figures there are additional areas that form part of the overall site but are not clearly defined tracks or shack areas, that appear to have limited vegetation and could be accessible. The Assessor should mark on figure(s) open accessible areas not subject of the investigative program and provide comment on the potential for ACM to be present and provide recommendations for these areas e.g. conducting a walkover of these areas to evaluate presence/ absence of asbestos at these locations, particularly near ocean dunes.		Medium - Potentially outcome related	Update Report	Only areas shaded in orange have been subject to the survey meaning there are other areas within the site (including those that may appear accessible on the aerial photos) that were not surveyed. An additional comment will be provided in Section 5.4 (bullet 2) making the limitations of the survey clearer.		Closed out.
			Section 8.2 Representative ACM Sampling	It is noted that ~30% of ACM samples sent for laboratory analysis at both Wedge and Grey were confirmed not to contain asbestos. What are the implications of these results to future management?	It is noted that for one of these results at G4_409 the register still refers to "asbestos present" under other column entries. This should be updated to "fibre content". All entries where material has been found to be non-asbestos should be checked to ensure that any reference to "asbestos" is amended to reflect updated findings.	Medium - Potentially outcome related	Update Report	Choices were and will need to be made regarding the practicality and desirability of seeking to discriminate between ACM and cement sheet that does not contain asbestos. It is likely that to at least some extent such judgement will beneficially be made on a case by case bases (ie sometimes it may make sense to do this and other times not). This consideration is touched upon in Section 8.2. Further consideration in this regard is probably not appropriate or valuable within this report but should be taken account of in future works.	This will be reviewed as suggested.	Comment noted - may be considered during a future scope of work.
				Table 4 where samples of scattered or buried suspect ACM - no asbestos detected and are considered outstanding. The majority of these sample locations refer to a large amount of suspected ACM being scattered around the shacks and within the dune the shack has been built on. It is unclear to the Auditor, due to the large amount of suspect ACM being referred to in these areas and the varied nature of material present, why these areas would not be remediated. Are these areas proposed for remediation in the near future?	Current clean up status and residual risk needs to be clarified within the report.	High Outcome related	Update Report	These areas meet the decisions rules defined in the procedures (refer Appendix B, Procedure 4, Table 2) as areas that will not be remediated as part of this work scope. A recommendation has been made to consider remediating these areas and this will be a decision for DPaw. Commentary included in Procedure 4 (preceding Table 3) provides some details as to how this was envisaged to occur. Please also refer to recommendation 1) in Section 12.2.	Refer previous comments.	Noted. It is understood, in accordance with Procedure 4, Table 2 that under several scenarios and after consultation with DPaw that works would be delayed. The clean up of these areas may be addressed in a subsequent phase of work.
			Section 8.3		While some attempt has been made to categorise various scenarios, improved description of high, medium and low scenarios are needed. It may be better to use a number of different category systems as reference to high, medium and low may be confused with risk-characterisation terms used to other parts of the document, rather than on characteristics relating to each scenario. As there is a high community interest, there needs to be a high level of clarity in terms selected regarding product condition, exposure risk or potential for health impact used throughout the document.				The scenarios are described in Section 6.6. Some additional text will be added here to further describe the scenarios and a note will be included to be clear that the terms should not be confused with assessment of risk.	Closed out.
			Section 8.3.1		It would be prudent to include records for W253 (identified and sampled by Aurora in previous investigations).				The sampling at W253 will be referenced in the report as per the response to previous auditor comments relevant to this issue. Aurora has not reported the concentrations of asbestos detected.	Closed out.
			Section 8.3.2	Section 8.3.2 Medium Potential ACM within structure but not within roof. The Assessor has made the comment that "it is possible that the AF identified at G009 was associated with ACM other than that within the build structure." Could the Assessor please provide clarification and expand on this comment.		High Outcome related	Update Report	The explanation provided in Section 8.3.2 is that the samples were collected within an area where numerous ACM fragments were identified (ie. it was speculated that the AF may be associated with the ACM on the ground rather than the built structure). This will be further clarified within this section to explicitly make this inference.		Closed out.
				Further to the above if findings relating to G009 are not related to the structure the Auditor notes that the original hypothesis nominated in the SAQP may be supported.		Low for completeness	Update Report	Comment in relation to this is made in paragraph 3 of Section 10.2.		Closed out.
			Site remediation and validation documentation arising from the disposal of asbestos or ACM at a	In locations recorded as having no ACM or concluded within the report as 'resolved' please clarify if during the final inspection was any surface ACM detected. As mentioned previously please provide records of final inspections of areas for Auditor review.		Low for completeness	Update Report	All areas identified as resolved meet the specified criteria for this category that includes the absence of visible asbestos. This was verified for a selection of sites by the lead scientist for quality assurance purposes. Relevant field records prepared by the field scientists will be provided.		Provided - closed out.
			Section 8.3.4		The relative quantity of AF found needs to be discussed. ie. there is no indication of the magnitude of AF present. Further interpretation of the findings needs to be provided, relating to the source and distribution of AF at Wedge and Grey.				This isn't really consistent with DDOs for this aspect. See also Section 6.2. We will review and include appropriate detail (likely to be a general statement regarding the relative quantity unless there is something particularly worthy of note).	Closed out.
			Section 10.0 Risk Assessment	As an overall comment the risk assessment currently presented is very basic and not helpful in identifying future actions and management / remediation requirements. It is considered that a significant amount of data, particularly in relation to ACM, that can be used to undertake a more detailed assessment of risk related to both ACM and AF / FA. Reference to the DER "Guidance Note on Identification, Assessment and Management of Asbestos Contamination in Regional Public Areas" provides useful guidance in assessing the risks, along with the DoH 2009 guidelines. From the available information it is considered that it should be possible to complete a more detailed assessment of risks across each of the sites for example identifying high, medium or low risk areas which presented graphically would provide a very useful tool in providing recommendations for future actions and/or management requirements. The Auditor considers that a more detailed analysis of risks should be presented in this section, even when allowing for limitations of the investigations. The risk assessment should also include a discussion of uncertainty.	The quantity and extent of AF found needs to be better contextualised, particularly with regard to risks associated with existing ACM structures. Some important Contextual information <ul style="list-style-type: none"> Site/shack circumstances Different sides, drip vs non drip Ground surface type Outflow pipes and contours Droppings, dodgy gutters Whiskers, roof condition Weather side non weather side Age, history Where in structure, did I previously have a roof Photos and location plans 	High Outcome related	Update Report	Senversa deliberately (and transparently) - refer SAQP, DDOs, project objectives, content and limitations) keep scope and risk assessment very limited as per objectives and DDOs due to stated project limitations, our understanding of the client requirements, the sensitive nature of the work (ie over extended or contestable conclusions may not be in the interest of the broader project) and we framed and scoped the project accordingly. Whilst it may be possible to draw some qualified broad assessments of relative risk by area there is a risk of these being misinterpreted and misused and an explicit choice was made to not extend the assessment into this realm at this stage. It is noted that as per the DDOs the scope and methodology was not designed for this purpose so whilst it may be possible to apply it to a different purpose (ie further risk assessment as suggested) this would need to be done with some caution and explicit qualifiers lest it be subject to the criticism of not being fit for purpose. There are really only two types of distinction that can be made: 1) areas where ACM was removed vs areas where it remains - clearly the risk for for the former is less than the latter; and 2) between areas where it remains although it is our understanding that the intention was to simply remove these - hence further assessment of risk in relation to them appeared largely moot. This also may be a difficult (and potentially controversial) undertaking and may not be in DPaw's interests. If this is something DPaw would like to pursue using existing data then it may be possible to prepare something under a separate cover/commission. In terms of AF - the assessment sought to distinguish the manifestation of AF between shack types rather than relative risk per se. The presence of AF is indicative of a potential risk and it is not considered more detailed distinction between areas was meaningful or useful at this stage (particularly taking account the DDOs). The distinctions that were sought (possible risk associated with shack types) has been clearly made.	Additional description will be provided where available although the scope didn't contemplate this level of detail (hence it may not be available) and the value needs to be considered in terms of DDOs and intended outcome.	Response Noted.
	Schedule B1, B2, B4, B5, B6 and B7	Section 5 Risk Assessment, Remediation and Management		Further to the previous point consideration of issues such as estimates of likelihood of disturbance to impacted area by people and vehicles, soil materials, vegetation cover and erosional factors will assist in better assessing the risks related to each of the scenarios of residual impact. For example, the risk related to 'outstanding' ACM will be different in vegetated areas with poor access compared to outstanding ACM within or in very close proximity to existing vehicle tracks.		High Outcome related	Update Report	Refer above comment. It may be possible to make some broad assumptions regarding this but (with the exception of examples where immediate unacceptable risk may have been identified - none in this case), it was understood that such distinctions were not necessarily significant to DPaw since removal of all unresolved issues was the intention and other considerations, such as accessibility, volumes, ease of removal, stakeholder views etc may be more relevant - this detail is largely covered in the descriptions (for this purpose).		as above
				Aligned with the DER, the DoH (2009) guidelines recommend a staged approach for risk assessment is undertaken with the initial stage being a Tier 1: screening risk assessment. In order to assess risk as part of a Tier 1 assessment, contamination concentrations are compared against the soil asbestos criteria levels. Please clarify why the action criteria of 0.02% or 0.0001% has not been applied to assist in determining level of risk?		High Outcome related	Update Report	This is covered in previous response.		as above

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Tier 1 and / or 2 risk assessment (human health and ecological)				Please provide further detail on those areas classified as 'resolved' of ACM and what this means in regards to locations of shacks that have high, medium or low potential 'risk' associated with their built structure. Can this information then be used to formulate areas of potential environmental concern (APECs)? This information would be beneficial if presented on a figure.	It is unclear on how areas that were remediated were resolved to be clear of ACM. i.e. visual surface walkover or other verification. It was expected, based on prior discussions, that the consultants would have a stronger presence on the site during remediation works than what was reported (five visits).	Medium - Potentially outcome related	Update Report	<i>Refer previous comments in relation to this aspect. Such an assessment may be possible and potentially useful (maybe) and we would be pleased to consider how this might be approached, what value it may realise as part of a separate commission should DPAW consider this of potential value associated with their broader objectives and imperatives.</i>	<i>Refer to responses to Auditor. The detailed procedures, the experience of the field team, the pilot work and the verification works were considered to provide adequate confidence. The number of consultant visits for verification purposes was consistent with the proposal and as detailed in Table 3 of the SAQP and was considered adequate.</i>	Report has not included reporting on verification of works.
				Have areas of concern been identified and what is the risk associated with these areas? For example areas where observations of asbestos have been classified as outstanding and are located adjacent to tracks, would these be considered a high priority?		High Outcome related	Update Report	<i>Refer to response provided above (Section 10).</i>		Noted. Differentiation between areas containing good to fair condition and risk profile may form part of a subsequent phase of works.

TABLE 2A: Auditor Review Register: Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements (Senversa 2016).

Detailed Site Investigation Report Assessment Checklist and recommended information to be included if relevant (Appendix A DER 2014).	NEPM Assessment of Site Contamination (2013)	Department of Health (2009) Reporting Requirements	Assessor Report Section	Auditor Review Comments Report: Senversa (2016) Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements.	DOH/DPaW Comments	Significance	Action Required	Assessor Response to Auditor Comments	Assessor Response to DOH comments	Auditor review of responses to Auditor comments
			Section 10.1 ACM Identification and Removal	It is noted there is a single localised occurrence of friable asbestos identified at the Wedge site (W012). It is noted the DoH 2009 guidance states FA may be handled with care taken although additional work should be undertaken to assess and manage likely free fibres associated with it. Please clarify risks and recommended actions related to this material	There is insufficient information available on the type and extent of friable contamination at W012. The information provided is insufficient to determine appropriate follow up action. Summary is referring to 356kg of asbestos. The quantity of asbestos should be expressed with respect to investigation criteria and material known to be from soil impacts.	Medium - Potentially outcome related	Update Report	A decision was made in the field (including considering the concerns and role of the stakeholders) that this material would not be removed and would be classified as 'likely' and subsequently 'outstanding' in accordance with documented procedures. This material is recommended to be removed consistent with the recommendation for all 'outstanding' cases. No further or specific risk assessment was undertaken or was considered appropriate. As previously noted, should this material have been considered of such an immediate or serious risk that to not specifically address it may represent a breach of a normal duty of care, relevant action would have been taken.	Additional detail will be provided in relation to W012 if available. In terms of the total weight and investigation criteria - refer previous responses.	Closed out.
					Paragraph 5 Section 10.1 needs rewriting with regard to risks present. This section needs to be consistent with current risk characterisation of existing ACM structures within urban environments.				This paragraph refers to the specific decision criteria contained within the procedures (in the categories by which issues to be 'delayed' would be based).	Noted.
			Section 10.2		Reference is made to "medium risk". As mentioned in other comments, it is difficult to determine how high, medium, low and very low ratings have been used. These terms are mixed with regard to exposure risk, potential for health impact and condition of in situ ACM. The presence of AF in soils in the vicinity of shacks has been stated to "represent a potentially unacceptable risk". How so? How does the AF in soil associated with structures compare with AF that may be present for structures accepted to be in use in urban environments generally? Is the quantity and distribution of AF in soil associated with structures expected or unexpected? Further characterisation based on current state of knowledge needs to occur.				These terms simply refer to the hypothesised potential for the shack type to result in AF/FA in soil. It is just a categorisation system for the different shack types subject of the assessment (this is explained in Section 6.4 and 8.3). No other meaning or application is implied or intended. As per previous comment - these sections will be strengthened for avoidance of doubt. It is noted that Paragraph 5 of 10.2 inadvertently includes the word 'risk' when it should just say 'potential' so this will be amended for clarity.	Closed out.
	Schedule B2 Site Characterisation: s 4 and s 9		Section 11.0 Conceptual Site Model	While it is stated the Conceptual Site Model presented in this section of the report has been updated based on the results of the work undertaken it is considered the CSM presented is identical to that presented as the Preliminary CSM. It is considered the CSM can be further updated giving consideration to the results of the studies. For example there are areas where remediation has been undertaken where there has been significant removal of the ACM source, while there are other areas where ACM has been identified but the source remains, and there has been the identification of the AF/FA in other areas. Thus, it is considered by going to a lower level of detail it is possible to develop a more detailed CSM that can then be combined with the risk assessment to draw deeper conclusions and provide more substantial recommendations for future actions and/or management/ remediation requirements.	A more complete conceptual site model should be provided. A pictorial CSM would assist lay readers of the document and aid in risk communication.	High Outcome related	Update Report	Due to the nature of work undertaken the fundamental aspects of the CSM inevitably remained unchanged (ie all sources, receptors and pathways still exist and the relationships between them has not been altered in a way that significantly changes the overall risk profile - from unacceptable to acceptable). Presentation of the CSM in this way was designed to emphasise this point. However, it is possible to provide some additional detail (by way of explanation) to illustrate that risk has been better characterised and in the case of ACM in soil, reduced. The CSM will be amended in this way as suggested.	Refer response to Auditor comments - additional commentary will be added. The CSM is pretty basic so not sure of the value of a figure but we will review and consider if this is worthwhile.	Senversa provided some additional information regarding how RDSI activities refined the CSM. Senversa have stated refinement of the CSM did not result in significant refinement in terms of identifying or eliminating pollutant linkages.
Community Consultation	Schedule B8: Community Engagement and Risk Communication		Section 13 Community consultation	No comment.			No action required			
				There has been a significant amount of data collected during the RDSI investigations but it is considered the conclusions and recommendations currently included in the report do not take full advantage of the available data. It is considered that by giving further consideration to the CSM after the RDSI and the Risk Assessment as outlined above should give rise to more substantial conclusions and recommendations for future actions and/or management/ remediation requirements. This should include consideration of any immediate short term remediation/ management requirements to be implemented prior to the summer holiday period when there would be expected to be a large amount of visitors to both Wedge and Grey sites. This section should be revised in light of the more detailed analysis of the CSM and RDSI. For example from the data it is possible to divide the site into high, medium and low risk and not investigated areas for ACM or some other similar outcome. Showing such information graphically will provide a powerful tool for future management, particularly when giving consideration to the proposed future land uses.	Agreed. Original scope included providing conclusions in an appropriate risk assessment framework. Careful consideration needs to be given to the use of the terms high, medium, low risk. These terms need to be adequately defined (in terms of either exposure potential or health impact, preferably both) and used consistently. In some instances high, medium and low is used to refer to exposure risk and in others to health risk. This may cause confusion for stakeholders and shack owners who will be reading the report.	High Outcome related	Update Report	Senversa has discussed the pros and cons of the level of detail that is meaningful or helpful in conclusions and recommendations and has already amended the report based on feedback from DPaW and DoH in this regard. It may be possible to use the existing information to begin formulating detailed plans for further assessment and remediation/management efforts and this is beyond the scope of this project and best served through a separate exercise that accounts for the range of factors that influence progress of this project (including stakeholder considerations and DPaW imperatives).	Refer to responses to Auditor and comment above regarding categories.	Noted. This may be addressed within a subsequent phase of work.
				In relation to ACM considerable amount of remediation works have been completed however it is unclear if these areas are considered remediated and validated. In addition to what extent is it considered that the risk of exposure in remediated areas has been reduced?	The report needs to demonstrate that ACM has been adequately identified and delineated with respect to DOH guidelines and that the level of remediation has been sufficient.	High Outcome related	Update Report	This issue has been largely addressed in previous responses. Refer to limitations Section 1.2. These areas have been 'resolved' (ie subject to remediation) but no decision has been made (refer decision rules in DOH) whether an acceptable risk based end point has been achieved (ie reduction of risk to acceptable levels) - this is a stated limitation in Section 1.2. Validation in Section 1.2. Validation has been undertaken to the extent that the procedures detailed in Appendix B describe them only.	Through the detailed description of scope, methodology and results, the report clearly demonstrates that ACM has been adequately identified and delineated in accordance with DOH guidelines (and within the project's specific objectives and limitations). Similarly, remediation was demonstrably sufficient to meet the stated project objectives (within the project specific limitations). Refer also to responses to Auditor comments.	Noted. Asbestos was removed to inherently reduce risk of exposure.
				the conclusions should include comment on whether the objectives of the project were achieved and in relation to AF/FA whether the results supported the hypothesis includes in the SAGP.	A conclusion is made that AF may represent an unacceptable health risk. More information needs to be provided on how this conclusion has been made in relation to the type and extent of AF contamination found and the likelihood of health impacts occurring. It is noted that the key problem to be addressed for the AF assessment was testing the hypothesis that shacks with an apparently high potential to give rise to AF in soils (based on visual condition) may have an observable increase in AF than shacks with low potential in order to make inferences on remaining untested shacks.	High Outcome related	Update Report	Paragraphs 1 and 2 and bullet 2) in the AF section of Section 10.2 address this question but a more explicit statement will be included for avoidance of doubt.	Senversa confirm that the project included a 'risk based' sampling strategy and identified the extent of ACM impact in accordance with DOH guidelines and that the investigation is sufficient to usefully inform future decision making. Responses regarding sp	Closed out.
Conclusions and Recommendations	Schedule B2 s 14		Section 12.0 Conclusions and recommendations	A figure presenting areas 'remediated' or no asbestos detected would benefit the report.		High Outcome related	Update Report	The figures (Figure 4.0, 4.1, 5.0, 5.1) provided show all areas where no asbestos was detected (by exclusion - ie where the areas was surveyed (orange shade) and for shacks illustrated by a green dot) and identifiers of the presence of asbestos (blue or red dots) are absent. All areas where asbestos was detected were remediated (blue dots) except those areas classified as outstanding (red dots). The figure referred to is really these four figures (where all surveyed areas other than the ones marked as outstanding (red dots) were either 'no asbestos detected' or 'resolved'. On this basis no further figures are considered of value in portraying the information noted.		Noted.
				Based on the results of the re-evaluation of the CSM and the risk assessment a priority (based on risks) of actions should be compiled for each site along with a recommendation for the timeframe for action on each.	The DSI should produce prioritised actionable remediation recommendations.	High Outcome related	Update Report	Refer previous responses.	Refer to responses to Auditor comments. Senversa is clearly very well placed to assist DPaW/DoH with detailed planning associated with the next stages of this project that should include considerations other than risk such as budgets, timing, planned related works, stakeholder management, opportunities for efficiency, DPaW commercial/strategic imperatives etc but this would be best served associated with a separate aspect of work. At a broad level if there are particular recommendations beyond those already made that will better serve the overall project then these can be discussed and included as appropriate.	Noted.
				As per the DER (2014) guidelines based on the available data are there any recommendations that can be made regarding any limitations or constraints on the use of the site?		High Outcome related	Update Report	This is a sensitive area that we deliberately didn't delve into. With DPaW approval, it may be possible to say something along the lines of "Following remediation undertaken (and recognising the limitations of the works in terms of ability to draw confident risk based conclusions) it seems likely that risk to users of the two settlements associated with ACM in soil is generally low (this conclusion is not to detract from the possibility that in discrete areas or situation specific circumstances the risk may be considerably higher. It is likely that the overall risk to settlement users from asbestos is relatively higher in relation to degraded materials within built structures than ACM in soil."		Noted - not addressed.

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Detailed Site Investigation Report Assessment Checklist and recommended information to be included if relevant (Appendix A DER 2014).	NEPM Assessment of Site Contamination (2013)	Department of Health (2009) Reporting Requirements	Assessor Report Section	Auditor Review Comments Report: Servensa (2016) Remedial Detailed Site Investigation, Wedge and Grey Shack Settlements.	DOH/DPAW Comments	Significance	Action Required	Assessor Response to Auditor Comments	Assessor Response to DOH comments	Auditor review of responses to Auditor comments
				Could the Assessor please confirm if any additional decontamination procedures (i.e. in addition to clean nitrile gloves already mentioned) between were performed between samples collected within the report.				Table 2 will be updated to include this information		Closed out.
				The discussion around the soil sample results would benefit from the inclusion and consideration of the form of asbestos (e.g. ACM, fibre bundles, free fibres etc) detected.				A comment will be added to the results section to describe the type of asbestos identified and any relevant implications.		Closed out.
				This information could then be combined with the results in order to assist in evaluating the AF/FA risk profile of the site and then the conclusions and recommendations.				Amendment to conclusions will be made as appropriate based on review of the above (noting that its unlikely the conclusions will be modified given the implications of any distinction between asbestos type identified is unlikely to be significant in terms of either risk or the objectives of the AF assessment).		Amendment to conclusions made based on Servensa approach in addressing comments.
								Servensa response acceptable		
								Moderate - but not significant		
								Key Issue - further discussion with Servensa		
								DoH Issue - Servensa to discuss further with DoH		

Bunbury, Richelle

From: Bunbury, Richelle
Sent: Monday, 15 May 2017 12:41 PM
To: 'Ashton Betti (Ashton.Betti@senversa.com.au)'
Cc: Jeremy Hogben; Scott, Tony; 'colin.ingram@dpaw.wa.gov.au'
Subject: Senversa Remedial DSI report

Hi Ashton,

Thank you for providing the revised documentation.

Tony has completed a brief review of the Senversa (2016) Remedial Detailed Site Investigation – Wedge and Grey Shack Settlements report and is of the opinion that the Auditor and Department of Health (DoH) comments have been addressed to the extent possible based on the project limitations presented within the report and Auditor response register.

In this regard, although the report has not fully addressed all comments provided, it is understood Senversa wish to finalise the Remedial Detailed Site Investigation report for distribution. In the overall context of the project, finalising the report will support progression of the project and the development of a Mandatory Auditors Report (MAR) to provide to the Department of Environment Regulation. The MAR will present the DER with a summary of investigation findings as well as details of any residual issues and make recommendations for further works.

Should you have any queries in relation to this email please do not hesitate to contact Tony or myself.

For and behalf of
Tony Scott
Auditor

Kind Regards
Richelle

Richelle Bunbury
Senior Environmental Scientist
Part-time: available Monday - Thursday

Suite 2, 53 Burswood Road
Burswood WA
t: +61 8 9269 6200
m: +61 488 770 056



>>> Ingenuity@coffey – it's the ideas that count
