RAAF Williams, Laverton & RAAF Base Point Cook

PFAS ONGOING MONITORING PLAN

August 2026

CONTENTS

GLOSSARY

AAFCANS	Army & Air Force Canteen Service
AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure, as amended 2013
Base	RAAF Williams, Laverton & RAAF Base Point Cook
bgl	below ground level
bTOC	below top of casing
CSM	Conceptual Site Model
DQI	Data Quality Indicators
DQO	Data Quality Objectives
DSI	Detailed Site Investigation
EPA	Environment Protection Authority Victoria
ERA	Ecological Risk Assessment
FTA	Fire Training Area
FTC	Fire Training Compound
GEMS	General Engineering and Maintenance Store
ha	hectare
HHRA	Human Health Risk Assessment
km	kilometre/s
LOR	Limit of Reporting
m	metre/s
Management Area	The geographical area subject to Defence risk management actions. May include private or Defence owned detached properties beyond the boundaries of the base.
mm	millimetre/s
OMP	Ongoing Monitoring Plan
PFAS	Per- and poly-fluoroalkyl substances
PFAS NEMP	PFAS National Environmental Management Plan
PFBS	Perfluorobutane sulfonic acid
PFHxS	Perfluorohexane sulfonate
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PMAP	PFAS Management Area Plan
QA	Quality Assurance
QC	Quality Control
RAAF	Royal Australian Air Force

Risk management actions	Remediation and management actions to address potential risks to receptors from PFAS contamination
SAQP	Sampling and Analysis Quality Plan
Source	A source can be primary or secondary. Primary sources are generally areas where AFFF was used or stored. Secondary sources may be an accumulation of contamination in the environment, such as in soil, sediments, or surface water bodies.
STP	Sewage Treatment Plant

1 INTRODUCTION

Defence acknowledges the Traditional Custodians of Country throughout Australia. Defence recognises their continuing connection to traditional lands and waters and would like to pay respect to their Elders both past and present. Defence would also like to pay respect to the Aboriginal and Torres Strait Islander peoples who have contributed to the defence of Australia in times of peace and war.

1.1 Background

In April 2025, Defence prepared a PFAS Management Area Plan (PMAP) for managing risks to human health and the environment from per- and poly-fluoroalkyl substances (PFAS) contamination associated with Royal Australian Air Force (RAAF) Williams, Laverton, RAAF Base Point Cook and the surrounding areas. An important requirement of the PMAP is to undertake ongoing monitoring of PFAS in the environment and to assess for changes in risks to human and ecological receptors from PFAS originating from the base.

This Ongoing Monitoring Plan (OMP) replaces the 2025 OMP Revision.

1.2 Purpose

The OMP sets out requirements for collection of adequate data to identify and evaluate:

- spatial, and temporal (including seasonal) variability of PFAS in the environment
- changes to sources, transport pathways and/or receptors, described as a conceptual site model (CSM) for the base
- whether risks to human and ecological receptors require review
- the influence that risk management activities at the base, as outlined in the 2025 PMAP have had on PFAS in the environment, and
- whether the identified changes trigger an action and/or review.

The data collected may be used to inform where new risk management actions may be required, or to support a determination that remediation has been completed so far as reasonably practicable.

1.3 Supporting information

In developing the OMP, reference has been made to the PFAS National Environmental Management Plan (PFAS NEMP), the National Environment Protection (Assessment of Site Contamination) Measure 2013 (ASC NEPM) and Defence estate, environmental and PFAS-specific strategies and guidance, and other information as provided in the References section of this document.

1.4 Constraints and assumptions

This OMP has been prepared based on information available at the time of writing and relies on the findings of detailed site investigations (DSI), risk assessments, remediation activities, ongoing monitoring program data, and management of risks, as documented in the 2025 PMAP.

Defence recognises that there may still be gaps in information, and if required these will be progressively addressed while impacted sites are being managed.

This document has been developed based on the following constraints and assumptions:

- The state of knowledge presented within the reports listed within **Appendix A**.
- The broader receiving environments surrounding these bases are subject to potential PFAS contamination (and other industrial pollution) from multiple other non-Defence sources. This includes Port Phillip Bay, which receives runoff from a very large catchment of mixed-use urban and industrial areas.
- There is uncertainty regarding PFAS mass migrating off-base from RAAF Williams, Laverton and RAAF Base Point Cook. Including the relative contributions of the different source areas, as well as the specific surface water and groundwater discharge mechanisms.
- The current Government-issued guidelines, advisories and policies.
- Base infrastructure development and access constraints at the time of writing this report.
- The current and ongoing development associated with Williams Landing, which was historically within the extent of RAAF Williams, Laverton.

2 SITE SETTING

RAAF Williams, Laverton and RAAF Base Point Cook are two separate bases and are located approximately 17 km and 20 km respectively to the southwest of the Melbourne central business district. The Bases are approximately 6.4 km from each other in a north-south direction.

This OMP has been prepared for both bases, the site setting information for each are outlined in the following sections.

2.1 RAAF Williams, Laverton

2.1.1 Base description

RAAF Williams, Laverton is approximately 150 hectares (ha) in size and currently consists of a series of administration and former residential buildings, warehousing, open storage areas, and sporting facilities.

The former extent of RAAF Williams, Laverton when established in 1921 was approximately 430 ha. Following the closure of the airfield in 1996, the western half of RAAF Williams, Laverton was sold and subsequently redeveloped as a mixed-use (primarily residential) precinct. This portion of land was formerly part of the base is now known as the suburb of Williams Landing.

The main activities at RAAF Williams, Laverton over time have included flight training, flight programs, general aircraft maintenance and testing, air surveys, and air shows. In recent times, operations at RAAF Williams, Laverton have reduced, with the main functions now being related to training facilities, storage, maintenance and administration buildings, temporary accommodation, a childcare centre and sporting facilities.

2.1.2 Site and management area setting

The RAAF Williams, Laverton PFAS Management Area comprises the current and former base extent and surrounding areas (see Figure 1 in **Appendix B**). The Management Area is the primary region throughout which risk management actions or ongoing monitoring are being applies, and is divides into two sub-areas:

- **On-site Monitoring Area**.
- **Off-site Monitoring Area**, includes private properties and public land to the west (i.e., the former base extent), south-west and south of the base, and lands adjacent to Skeleton Creek and Sanctuary Lakes.

These monitoring areas are shown on Figure 3, **Appendix B**.

A detailed summary of the environmental setting of the RAAF Williams, Laverton is presented in the 2025 PMAP, which is sourced from the Addendum to the DSI (Aurecon 2022a). Key details of this environmental setting are presented below.

Table 1. RAAF Williams, Laverton environmental setting

Aspect	Description
Surrounding land uses	The surrounding land uses include mostly residential suburbs of Laverton to the east, Williams Landing to the west, and Altona Meadows and Seabrook to the south. To the north is the mostly commercial/industrial suburb of North Laverton

Aspect	Description
	and Truganina and to the south is a railway corridor, which includes Aircraft railway station, and light industrial areas. There are also various surrounding public open spaces that may be used for recreational purposes. These include Laurie Emmins Reserve to the north, Skeleton Creek approximately 500 metres (m) south, and several other smaller constructed wetlands (i.e., Ashcroft, Addison and Kingwell wetlands) to the west. No significant changes in land use have been identified since the 2025 OMP, and no material change to the land-use is expected in the future.
Regional climate	Historical climate data from the on-Base weather station, Laverton RAAF (station # 087031), is available from June 1941: ▪ Annual mean maximum temperature of 19.8 °C, with monthly mean maximum temperatures ranging from 13.8 °C in July to 25.8 °C in January. ▪ Mean annual rainfall is 533.1 millimetres (mm), with monthly mean rainfall ranging from 34.2 mm in March to 56.1 mm in October.
Topography	RAAF Williams, Laverton ranges in elevation between 8 and 20 m Australian Height Datum (AHD). There is a gentle slope to the south-east in the direction of the coastline (Port Phillip Bay), reflective of the general regional topography.
Hydrology	Various interconnected networks of drains, swales, creeks and rivers surround the base. The major elements of the regional surface water drainage network include: ▪ Doherty's Drain and Laverton Creek both enter the northern boundary of RAAF Williams, Laverton, which then confluence and exit across the eastern boundary. These watercourses receive surface water from the northern portion of the Base, and eventually discharge into Port Phillip Bay to the south-east. ▪ Skeleton Creek is located approximately 800 m south of the Base and receives surface water flow from the southern portion of the Base via storm water infrastructure. Skeleton Creek flows to the southeast, passing through the Cheetham Wetlands before to discharging into Port Phillip Bay. Surface water is also pumped from Skeleton Creek, via a tidal pool, into Sanctuary Lakes to maintain water levels. ▪ Various drainage channels, constructed wetlands and a large natural wetland, known as Laverton RAAF Swamp, within Williams Landing to the west of the Base. These surface water features are tributaries to Skeleton Creek. Key surface water features in the surrounding area are presented on Figure 3, **Appendix A**.
Geology	The geology of RAAF Williams, Laverton consists of Quaternary to Tertiary-aged Newer Volcanics, consisting of olivine basalt and olivine labradorite basalt. This geological unit consist of up to approximately 50 m of mainly basaltic lava flows and some scoria beds, with the upper 2-8 m being weathered material.
Hydrogeology	The primary aquifer units for RAAF Williams, Laverton are Newer Volcanics, which is a hydrostratigraphic unit comprising a multi-layered fractured rock system. In some areas this aquifer system is semi-confined by the interflow clay layers. Regional groundwater flow is to the south or south-east, and ultimately discharges into Port Phillip Bay. The local hydrogeology consists of two basalt units separated by a discontinuous clay aquitard, referred to as the upper and lower aquifers. The thickness of the upper basalt aquifer ranges from 2.7 m to 13.7 m, while the lower basalt aquifer is approximately 12 m thick in the northern portion of the base.

Aspect	Description
	Depth to groundwater across the base has been measured between 1.38 metres below top of casing (mbTOC) to 9.73 mbTOC in previous investigations. The average depth to groundwater on-base was 5.1 m bgl, whilst off-site wells downgradient of the base have an average depth to groundwater of 4.2 mbgl.

2.2 RAAF Base Point Cook

2.2.1 Base description

RAAF Base Point Cook is approximately 341 ha in size and currently consists of accommodation and administration buildings, a rifle range and former sewage treatment plant (STP), a museum, aircraft hangers, an active airfield, as well as RAAF Lake, coastal dunes and foreshore areas.

RAAF Base Point Cook is the oldest continually operated military airfield in the world, is the birthplace of the Australian Flying Corps and Royal Australian Air Force and was included in the National Heritage List in 2007. The base is currently used for aviation training by RAAF, civilian aircraft and commercial tenants, including Royal Melbourne Institute of Technology Flight Training Centre and the RAAF Museum.

2.2.2 Site and management area setting

The RAAF Base Point Cook Management Area comprises the base extent, the extent of RAAF Lake (which crosses the Base boundary), and a portion of Point Cook Coastal Park immediately east of the base. For the purposes of this OMP, the Management Area can be broken down into two distinct areas:

- **On-site Monitoring Area**.
- **Off-site Monitoring Area**, which includes the parts of RAAF Lake to the north, and a portion of Point Cook Coastal Park to the east.

These monitoring areas are shown on Figure 3, **Appendix B**.

At the time of preparing this OMP, further investigations were underway to understand the extent of PFAS across the identified source areas on the base and the potential for offsite migration of PFAS in surface water and groundwater. Once this has been completed, the potential risks to human and ecological health will be refined and evaluated, and the PMAP and OMP updated accordingly.

A detailed summary of the environmental setting of the RAAF Base Point Cook is presented in the 2025 PMAP, which is sourced from the Addendum to the DSI (Aurecon 2022a). Key details of this environmental setting are presented below.

Table 2. RAAF Base Point Cook environmental setting

Aspect	Description
Surrounding land uses	The surrounding land uses include parkland immediately to the north and east, with the residential suburb of Point Cook approximately 1 kilometre (km) to the north. Werribee Irrigation District is located immediately to the west, which comprises rural residences and market gardens, and Port Phillip Bay is located to the south. No significant changes in land use have been identified since the 2025 OMP, and no material change to the land-use is expected in the future.

Aspect	Description
Regional climate	Climatic conditions are similar to those summarised for RAAF Williams, Laverton. Historical climate data from the on-Base weather station, Point Cook RAAF (station # 87185), is available from December 2021: ▪ Annual mean maximum temperature of 19.2 °C, with monthly mean maximum temperatures ranging from 13.4 °C in July to 24.2 °C in January and February. ▪ Mean annual rainfall is 521.8 mm, with monthly mean rainfall ranging from 12.4 mm in February to 83.4 mm in October.
Topography	The elevation at RAAF Base Point Cook ranges between 7.5 mAHD, in the northwest, to 0 mAHD along the Port Phillip Bay foreshore. Across the base, there is a consistent gentle slope to the east and south-east towards RAAF Lake or Port Phillip Bay.
Hydrology	The base contains a network of above and below ground stormwater infrastructure, which directs surface water to the east into a water body known as RAAF Lake or south into Port Phillip Bay. RAAF Lake is a shallow, ephemeral saltpan approximately 72.5 ha in size, which is bisected by the northern base boundary. RAAF Lake is separated from Port Phillip Bay by a section of coastal dunes, and is likely to received groundwater inflows as well as storm water.
Geology	The near-surface geology at RAAF Base Point Cook is split into two distinct profiles: ▪ Newer Volcanics formation in the western and central portions of the base, consistent with RAAF Williams, Laverton, which is dominated by clays and fractured basalt. ▪ Aeolian sands and silty sands in the eastern portion where the Newer Volcanics formation is not present, in the area occupied by RAAF Lake and coastal dune systems.
Hydrogeology	Groundwater is encountered between 0.5 and 4.0 mbgl on the base and flows in a south to south-eastern direction towards Port Phillip Bay, with some localised radial flow towards RAAF Lake. There are four primary aquifer units across the base detailed below: ▪ **Shallow Sand Aquifer**: an unconfined aquifer typically present within the eastern portion of the Base and along the foreshore. ▪ **Shallow Basalt Aquifer:** a potentially semi-confined aquifer hosted within the Newer Volcanics fractured basalt across western and central portions of the base. ▪ **Intermediate Aquifer**: a confined aquifer hosted within a coarse layer of the interbedded Quaternary-aged sediments in vicinity of the former Fire Training Area (FTA), or the eastern portion. ▪ **Deep Aquifer:** confined to semi-confined aquifer hosted within the Tertiary-aged Brighton Group Formation sediments. From previous investigations, hydrogeological conditions within these aquifers can be summarised as follows: ▪ **Shallow Basalt Aquifer:** across the western and central portions of the base, encountered from approximately 0.3 m bgl, with groundwater elevation typically in the range of 0.484 to 3.069 mbTOC. ▪ **Shallow Sand Aquifer:** across the eastern portion of the base, extends to approximately 5 mbgl, with groundwater elevation typically in the range of 1.135 to 3.499 mbTOC.

Aspect	Description
	▪ **Intermediate Aquifer:** across the eastern portion of the base, extends to approximately 20 mbgl, with groundwater elevation typically in the range of 1.082 to 2.815 mbTOC. ▪ **Deep Aquifer**: underlying aquifer across the entire base, is present between 20 to 40 mbgl. No groundwater wells within this aquifer have been assessed as part of this OMP.

3 EXTENT OF PFAS CONTAMINATION

This section provides a summary of the Conceptual Site model (CSM) for PFAS contamination at RAAF Williams, Laverton and RAAF Base Point Cook, as presented in the 2025 PMAP. A CSM comprises three key elements, which are:

- **Sources areas:** Where PFAS has accumulated into the environment, these can be primary or secondary source areas. Primary source areas are where PFAS have been directly released into the environment, generally where aqueous film forming foam (AFFF) was used, stored, or disposed of (e.g., fire training areas). Secondary source areas contain an accumulation of PFAS in the environment, which has migrated from a primary source area, such as in groundwater, surface water bodies, or sediments.
- **Transport pathways**: Transport pathways describe how PFAS can travel from a source area to humans or ecological receptors. This typically occurs via surface water or groundwater flows.
- **Receptors and risks:** Receptors refers to humans, or plants, animals or ecosystems (collectively considered ecological receptors) that may be exposed to environmental stressors such as PFAS contamination).

These CSMs are regularly reviewed as environmental investigations and PMAP actions progress. An updated CSM will be prepared and published as works are completed.

3.1 RAAF Williams, Laverton

3.1.1 Source areas

The DSI (Aurecon, 2020) identified 31 potential PFAS source areas across RAAF Williams, Laverton and the former base extent. Due to the refined understanding of base history, results from field investigations and the geographical overlap of some source areas, these have been consolidated into four potential source areas, as detailed in **Table 3**.

Table 3. RAAF Williams, Laverton – Known PFAS Source Areas

Source Area ID	Source Area Name	Contaminating Activities	Summary of PFAS Results
SA01	Wet Testing Area	The Wet Testing Area is located on the western boundary and is associated with the former Aircraft Maintenance and Refuelling area. This area was subjected to weekly AFFF usage of fire equipment. Wet testing of equipment involved the discharge of AFFF onto the concrete apron and unsealed ground west of the testing area and hangers. The land to the west of the hardstand has since been divested and developed into residential allotments as part of Williams Landing.	• Soil has been sampled from across SA01, with PFAS concentrations ranging from: ○ PFOA: <0.005 mg/kg ○ PFOS+PFHxS: <0.005-0.515 mg/kg • Surface water samples have not been collected from this source area. • Nine groundwater monitoring wells are located across SA01 in the upper basalt aquifer, with PFAS concentrations ranging from: ○ PFOA: 0.55-1.43 µg/L ○ PFOS+PFHxS: 30-58 µg/L

Source Area ID	Source Area Name	Contaminating Activities	Summary of PFAS Results
SA02	The Western Finger Area	The Western Finger Area is located in the south-western portion of the base and consists of a several discrete source areas, which have been grouped together as SA02. On the northern side of the Western Finger Area, the Air Movements Area was subjected to weekly 'hot wheels' incidents, during which fire trucks extinguished or hosed down aircraft wheels to prevent fires. Several known chemical storage areas and buildings are also included in SA02.	• Soil has been sampled from targeted locations across SA02, with PFAS concentrations ranging from: o PFOA: <0.005 mg/kg o PFOS+PFHxS: <0.005-0.054 mg/kg • Surface water samples have been collected from two surface water locations in the source area (one in-flow and one out-flow locations), with PFAS concentrations ranging from: o PFOA: <0.01-0.01 µg/L o PFOS+PFHxS: 0.15-1.31 µg/L • Fifty groundwater monitoring wells are located across SA02 within multiple basalt aquifers, with PFAS concentrations ranging from: o PFOA - <0.01-0.38 µg/L o PFOS+PFHxS: 0.63-14.9 µg/L
SA03	Former Secondary Fire Training Area	The former Secondary Fire Training Area on the hillside north of Doherty's Drain and Ornamental Lake was used for monthly fire training exercises from approximately 1974 to 1975. The DSI (Aurecon, 2020) reported that rubbish in a landfill was set alight and extinguished with AFFF. Landfilling is known to have occurred in this area until 1989, with the filled areas comprising the balance of SA03.	• Soil has been sampled from targeted locations across select landfill areas in SA03, with PFAS concentrations ranging from: o PFOA: <0.005 mg/kg o PFOS+PFHxS: <0.005-0.054 mg/kg • Surface water has not been collected from this source area, although regular sampling is undertaken at the neighbouring Doherty's Drain where concentrations are below drinking water and recreational water guideline values. • Two groundwater monitoring wells are located in the upper basalt aquifer within the former Secondary FTA, with PFAS concentrations ranging from: o PFOA: <0.01 µg/L o PFOS+PFHxS: 0.04-0.25 µg/L
SA04	Former GEMS Compound Surrounds	The former General Engineering and Maintenance Store (GEMS) Compound was divested in the mid-1990s. It was the location of a range of vehicle and equipment maintenance activities, including repair, painting and fuel and chemical storage. The main workshop was used for fire truck maintenance and was reportedly the location of ad-hoc fire training and a potential area for AFFF disposal and handheld extinguisher use.	• Soil has been sampled from the on-base area immediately surrounding the former GEMS Compound, with PFAS concentrations ranging from: o PFOA: <0.005-0.051 mg/kg o PFOS+PFHxS: <0.005-8.26 mg/kg • Surface water samples have not been collected from this source area. • Two groundwater monitoring wells in the upper basalt aquifer are located in close proximity to the Former GEMS Compound boundary, with PFAS concentrations ranging from: o PFOA: 0.16-3.51 µg/L o PFOS+PFHxS: 8.1-171 µg/L

Historical divestment of the area to the west of the current base extent at RAAF Williams, Laverton occurred over the period from the mid-1990s to 2014. The land formerly contained runways, a primary

fire training area and a firepower demonstration area (refer to Figure 2C). The land is now occupied by the suburb of Williams Landing.

Areas of Williams Landing that were divested and redeveloped were subject to a series of six environmental audits. These audits were completed by several environmental auditors, dating from when the base was divested in 1996 until 2014. While fire training was acknowledged as a former base use in the audits, AFFF chemicals and PFAS were not tested as part of these audits, as PFAS was not identified as a group of potential contaminants of concern at that time.

Subsequent to completion of the environmental audits, risk associated with PFAS has been evaluated in stages of the development linked to historical fire training activities. The same environmental auditor undertook the assessment and human health risk assessment support team that prepared three of the previous six audit reports (SLR, 2018). Based on the assessments undertaken, the risk associated with PFAS was considered low and acceptable. In addition, the primary fire training infrastructure was removed during development of the area.

Investigations that are more recent have identified PFAS in the shallow groundwater aquifer (Newer Volcanics) that likely originated from historical fire training practices in the local area. The PFAS identified in this area of Williams Landing is not related to PFAS sources on RAAF Williams, Laverton

Ongoing monitoring of surface water and groundwater across Williams Landing are included in this OMP to assess legacy PFAS sources and any change in understanding the risk profile and CSM while the mass flux investigation is in progress

3.1.2 Transport pathways

Surface water drainage infrastructure across RAAF Williams, Laverton comprises a series of concrete drains and pipes along with vegetated swales and culverts, which direct surface run off from buildings, road, ‘hard stand’ and grassed areas. Surface water is either directed north into Doherty’s Drain and Laverton Creek, which flow through the northern portion of the base, or south towards Skeleton Creek, approximately 700 m to the south of the base. The area north of Doherty’s Drain, including SA03, consists of southerly overland surface water flow, largely without drainage infrastructure, towards the creek. Surface water from the concrete hardstand areas and buildings in the south-western portion of the base, including SA01 and SA02, largely flow to the south.

On a regional level, Doherty’s Drain and Laverton Creek capture surface water from the suburbs north of the base and converge on-base. Laverton Creek and Skeleton Creek both flow southeast, ultimately discharging into Port Phillip Bay. Skeleton Creek flows through the Cheetham Wetlands prior to discharging into the bay. Additionally, it is understood that water is pumped from Skeleton Creek into Sanctuary Lakes to maintain water levels.

Groundwater flow in both the upper and lower basalt aquifers is generally towards the south and southeast towards Port Phillip Bay, with the upper aquifer likely discharging to Skeleton Creek. PFAS affected groundwater has been identified, primarily relating to infiltration of PFAS from affected soils within the identified source areas. PFAS was identified in both the upper and lower basalt aquifers, with higher concentrations reported in the upper aquifer.

3.1.3 Receptors and risks

Based on information collected from stakeholders during consultation within the DSI (Aurecon, 2020), DSI Addendum (Aurecon, 2022a), human health risk assessments (HHRAs) (enRiskS, 2022a and enRiskS, 2022b) and ecological risk assessment (ERA) (Aurecon, 2022b), several key potential exposure scenarios were identified as currently occurring within the Management Area, including the following:

- **Human receptors**:
  - Residents or visitors who consume home-grown produce (vegetables) and poultry eggs at the base childcare centre and within the former base extents.
  - Recreational users (e.g., swimming, boating) within the Skeleton Creek and Sanctuary Lakes.[1]
  - Consumption of fish and eels recreationally caught from Skeleton Creek.
- **Ecological receptors:**
  - Mammalian and avian consumers of terrestrial invertebrates in RAAF Swamp.
  - Direct exposure for ecological receptors to surface water at Laverton RAAF Swamp and the southern ponds of Cheetham Wetlands.
  - Mammalian and avian consumers of fish in all investigated assessment areas.
  - Migratory avian consumers of aquatic invertebrates at RAAF Swamp, Sanctuary Lakes and the southern ponds of Cheetham Wetlands.

The DSI (Aurecon, 2020) concluded that the human health risks to on-base receptors, under the current exposure conditions, are low and acceptable. However, subsequently the HHRAs (enRiskS, 2022a and enRiskS, 2022b) and ERA (Aurecon, 2022b) identified the following elevated risks associated with potential scenarios:

- **Risks linked to human receptors:**
  - Risk ID. R01: Consumption of fish and eels from Skeleton Creek.
- **Risks linked to ecological receptors:**
  - Risk ID. R02: On-base – exposure of terrestrial ecological receptors to impacted soils.
  - Risk ID. R03: Off-base – exposure of terrestrial ecological receptors to impacted soils at the Laverton RAAF Swamp.
  - Risk ID. R04: Off-base – exposure of ecological receptors in surface water, and exposure of higher order avian and mammalian predators in Skeleton Creek, Laverton RAAF Swamp, the southern ponds of Cheetham Wetlands and Sanctuary Lakes.

3.2 RAAF Base Point Cook

3.2.1 Source areas

Previous investigations at RAAF Base Point Cook, including the DSI (Senversa, 2020) identified 10 PFAS source areas. These source areas have been summarised in **Table 4**.

[1] There may be complete Source-Pathway-Receptor linkages for humans accessing surface waters in public open spaces (constructed wetlands) due to exceedances of Tier 1 screening criteria. However, this exposure scenario is considered unlikely and infrequent due to the nature of the surface water bodies.

Table 4. RAAF Base Point Cook – Known PFAS Source Areas

Source Area ID	Source Area Name	Contaminating Activities	Summary of PFAS Results
SA01	Former Fire Training Area (FTA)	Located in the south-eastern corner of RAAF Base Point Cook, the former fire training area consisted of six former burn pits, where various liquid fuels where lit and extinguished for training. Due to the significant contamination identified in the area a voluntary environmental audit commenced in 2012. Subsequent soil and groundwater remediation works focused on chlorinated hydrocarbon contamination were completed in 2016. PFAS mass was likely to have been removed during the remediation works, but this was not assessed.	• Soil sampled from SA01 identified PFAS concentrations ranging from: ○ PFOA: <0.005-0.0067 mg/kg ○ PFOS+PFHxS 0.0054-0.518 mg/kg • Surface water samples have not been collected from this source area. • 45 groundwater monitoring wells have been installed in this area including into the shallow Quaternary Aquifer and Brighton Group Aquifer with PFAS concentrations ranging from: ○ PFOA: <0.01-19.4 µg/L ○ PFOS+PFHxS: <0.01-753 µg/L
SA02	Fire Training Compound (FTC)	Encompassing Building 104, the former Fire Station, along with the concrete pads and grass areas east of Building 104, where AFFF products were stored, and fire training activities occurred. In addition, a constructed surface water feature to the south-east, referred to as the Horizon Tank, has been linked to these fire training activities.	• Soil has been sampled from across the building and storage area footprint, along with around the boundary of the Horizontal Tank, with PFAS concentrations ranging from: ○ PFOA: <0.005-0.16 mg/kg ○ PFOS+PFHxS: <0.005-4.268 mg/kg • Surface water samples have not been collected from this source area. • Four groundwater wells are located in the Quaternary aquifer within the building and storage area footprint, with PFAS concentrations ranging from: ○ PFOA: 9.6-26 µg/L ○ PFOS+PFHxS: 249-400 µg/L
SA03	Fire Fighting Practice Areas	Practice area PS30 is a small concrete pad located immediately north of Building 161, while practice area PS31 is a small open area located to the west and southwest of Building 87. Anecdotal evidence suggests that training was completed in these areas by Defence fire services and other agencies.	• Soil has been sampled from across both SP30 and SP31 of the source area, with all PFAS concentrations being below the laboratory detection limit (LOR). • Surface water samples have not been collected from this source area. • Two groundwater wells are located in, or in the immediate vicinity, of both SP30 and SP31, in the Newer Volcanics aquifer, with PFAS concentrations ranging from: ○ PFOA: <0.01 µg/L

Source Area ID	Source Area Name	Contaminating Activities	Summary of PFAS Results
			○ PFOS+PFHxS: 0.02-0.19 µg/L
SA04	Fire Fighting Practice Area C	This practice area is the concrete pad/apron located southeast of Building 188, where anecdotal evidence suggested that training was completed by the Defence fire services.	• Soil has been sampled along the northern boundary only of the source area, with PFAS concentrations ranging from: ○ PFOA: <0.005 mg/kg ○ PFOS+PFHxS: 0.0058-0.530 mg/kg • Surface water samples have not been collected from this source area. • One groundwater monitoring well is located along the northern boundary of the source area, in the Newer Volcanics aquifer, with the PFAS concentrations being: ○ PFOA: 24 µg/L ○ PFOS+PFHxS: 1,260 µg/L
SA05	The Fuel Farm	As a bulk fuel storage facility, it is likely that AFFF was stored and potentially used here. The Preliminary Site Investigation (Senversa 2017) noted anecdotal evidence of a burst pipe and subsequent spill on the eastern side of the fuel farm in the early 1990s; however, the use of AFFF in response to the incident was not noted.	• Soil and surface water within this source area have not been assessed for PFAS. • One groundwater monitoring well is located in the central portion of the source area, in the Newer Volcanics aquifer, with the PFAS concentrations of: ○ PFOA: 1.6 µg/L ○ PFOS+PFHxS: 55.1 µg/L
SA06	Old Hangers, Aircraft Parking, Refuelling & Maintenance	Aircraft have been maintained, refuelled and parked in this area since 1951; hence, multiple accidental spills are likely to have occurred. It is inferred that these spills may have included AFFF.	• Soil has been sampled from targeted areas of this source area, particularly in the vicinity of the hangers, with PFAS concentrations ranging from: ○ PFOA: <0.005-1.7 mg/kg ○ PFOS+PFHxS: <0.005-186 mg/kg • Surface water samples have not been collected from this source area. • Five groundwater monitoring wells are located in the vicinity of the hangers, in the Newer Volcanics aquifer, with PFAS concentrations ranging from: ○ PFOA: 0.29-4.5 µg/L ○ PFOS+PFHxS: 17.5-107 µg/L

Source Area ID	Source Area Name	Contaminating Activities	Summary of PFAS Results
SA07	The Airfield	The airfield was used for training activities, particularly at the end of the runways, and in areas where various crashes occurred, likely involved the application of AFFF as part of firefighting or emergency response activities.	• Soil has been sampled across this source area, with PFAS concentrations ranging from: o PFOA: <0.005 mg/kg o PFOS+PFHxS: <0.005-0.778 mg/kg • Surface water has been collected and sampled from various surface drains across the source area, with PFAS concentrations ranging from: o PFOA: 0.02-2.7 µg/L o PFOS+PFHxS: 0.36-153 µg/L • Three groundwater monitoring wells are located around the boundary of the airfield, in the Newer Volcanics aquifer, with PFAS concentrations ranging from: o PFOA: 0.04-5 µg/L o PFOS+PFHxS: 2.3-239 µg/L
SA08	STP and Rifle Range, Munitions / Sludge Dump	An STP formerly operated in the southwest corner of RAAF Base Point Cook, with treated effluent discharging to Port Phillip Bay. Residual bio-solids were historically spread to the south of the STP, and the area between the STP and Port Phillip Bay was historically referred to as the “Waste Transit Area”. This area was used for dumping of general waste and sewage sludge. The STP, biosolids and sludge may act as a secondary source of PFAS from AFFF-impacted influent.	• Soil has been sampled across the STP and Sludge Dump portions of this source area, with PFAS concentrations ranging from: o PFOA: <0.005-0.013 mg/kg o PFOS+PFHxS: <0.005-0.899 mg/kg • Surface water samples have not been collected from this source area. • Four groundwater monitoring wells have been installed across the STP and Sludge Dumps portions of this source area, in the Quaternary and Newer Volcanics aquifers, with PFAS concentrations ranging from: o PFOA: <0.01-0.05 µg/L o PFOS+PFHxS: 0.04-0.87 µg/L

Source Area ID	Source Area Name	Contaminating Activities	Summary of PFAS Results
SA09	RAAF Lake and storm water discharge channels	The investigations did not identify evidence of a direct release or disposal of AFFF into RAAF Lake or the storm water network. However, RAAF Lake receives PFAS-affected surface water from the airfield is therefore likely acting as a basin for PFAS impacts. Consequently, the lake and associated surface water discharge channels may act as secondary sources, contributing to off-base discharge.	• Soil has been sampled around the edge of RAAF Lake, with PFAS concentrations ranging from: o PFOA: <0.005-0.078 mg/kg o PFOS+PFHxS: 0.031-10.55 mg/kg • Surface water has also been sampled around the edge of RAAF Lake, with PFAS concentrations ranging from: o PFOA: 0.01-0.32 µg/L o PFOS+PFHxS: 1.39-27.2 µg/L • No groundwater monitoring wells have been installed in this source area.
SA10	Army & Air Force Canteen Service (AAFCANS) Service Station and Car Wash	The former service station included multiple underground tanks and a car wash that were decommissioned in the 1990s. Historical information did not indicate evidence of direct release or disposal of AFFF in the area. However, as a former bulk fuel facility, AFFF was likely stored and potentially used in this area.	• Soils and surface water within this source area have not been assessed for PFAS. • One groundwater monitoring well is located in the source area, in the Newer Volcanics aquifer, with the PFAS concentrations of: o PFOA: 0.04 µg/L o PFOS+PFHxS: 3.26 µg/L

3.2.2 Transport pathways

The current drainage network at RAAF Base Point Cook, consisting of both above and below ground infrastructure, allows movement of surface water from the operational areas of the base, primarily in the northwest and central portions, towards RAAF Lake to the east, and Port Phillip Bay to the south.

Connections with identified PFAS source areas provide potential preferential pathways for PFAS-affected sediment and surface water to be transported from the source areas to these water bodies (receptors). Drainage pathways understood to flow into RAAF Lake are likely SA03, SA04, SA05, SA06, SA07 and SA10. The remaining source areas, SA01, SA02, SA08 and SA09, discharge to Port Phillip Bay, either through surface water infrastructure or via overland flow.

Groundwater in the shallow fractured rock, and Brighton Group aquifer, flows south to southeast, while groundwater in the shallow sand and Quaternary-aged clayey sand aquifers flows to the east. PFAS affected groundwater has been identified in all aquifers, with the exception of the Brighton Group aquifer where it has only been identified beneath SA01 – the Former Fire Training Area. PFAS identified in groundwater is linked to infiltration from affected soils within the identified source areas.

3.2.3 Receptors and risks

The DSI (Senversa, 2020) identified PFAS sources, transport pathways, and potential receptors, including human and ecological, that may be exposed to PFAS from RAAF Base Point Cook. The potential exposure pathways include:

- **Human Receptors:**
  - Incidental ingestion through direct contact with soil, sediment, surface water and/or groundwater.
  - Extractive use of groundwater (currently, no known users on-base or downgradient).
  - Ingestion of marine biota (e.g., recreationally caught seafood, including fish and crustaceans).
- **Ecological Receptors:**
  - Direct contact and uptake from soil, sediment, surface water and/or groundwater by terrestrial and aquatic biota.
  - Indirect contact via bioaccumulation, i.e., ingestion of terrestrial and aquatic biota by higher order species.

Current and potential future on-base human receptors based on the draft redevelopment 2040 Zone Plan include Defence personnel, intrusive maintenance workers, contractors, residents, and visitors. Current and potential future off-base receptors include residents at neighbouring properties to the west, recreational users of Port Phillip Bay and RAAF Lake (including the foreshore and coastal park), intrusive maintenance workers, and users of extracted groundwater (stock, domestic and irrigation). Due to its shallow depth and ephemeral nature, there is limited biota observed within RAAF Lake.

The DSI (Senversa, 2020) completed a Tier 1 screening level risk assessment, and a detailed Tier 2 HHRA (AECOM, 2022a) and ERA (AECOM, 2022b) were completed for PFAS impacts within and associated with the former FTA only (SA01). Based on these investigations, the following potential elevated risks were identified:

- **Risks linked to human receptors:**
  - Risk ID. R01: On-base – direct contact (dermal contact and incidental ingestion) with soil.
  - Risk ID. R02: On- and off-base – direct contact (dermal contact and incidental ingestion) with surface water.

- Risk ID. R03: On- and Off-base – direct contact (dermal contact and incidental ingestion) with shallow (between 0-2 mbgl) groundwater.
- Risk ID. R04: Off-base – consumption of marine biota (seafood) recreationally caught in Port Phillip Bay.

- **Risks linked to ecological receptors:**
  - Risk ID. R05: On- and off-base- direct exposure of ecological receptors to soil, sediment and surface water.
  - Risk ID. R06: On- and off-base - indirect exposure of ecological receptors via consumption of lower order species by higher order species.

At the time of preparing this OMP revision, further investigation is underway to understand the extent of PFAS across the identified source areas on the base. Once this has been completed, the potential risk to human and ecological health will be refined and evaluated.

4 ONGOING MONITORING PLAN

This section sets out the data quality objectives, monitoring scope and assessment requirements. Changes made to the 2025 OMP are summarised in the following sections, and supporting rationale is provided in **Appendix D**.

4.1 Sampling and Analysis Quality Plan

A Sampling, Analysis and Quality Plan (SAQP) will be developed prior to implementation of the OMP. The SAQP provides information on data quality assurance procedures and measures, including data quality indicators (DQI), sampling methodologies and analytical methods. The SAQP will be updated as required.

4.2 Data Quality Objectives

The Data Quality Objective (DQO) process is an iterative planning approach used to define the type, quantity and quality of data that is needed to inform decisions relating to the environmental condition of a site. The seven-step DQO process:

- clarifies the study objective,
- defines the most appropriate collection of data as relevant to the study objective,
- determines the conditions from which to collect data, and
- specifies tolerable limits on decision errors, which will be used as the basis for establishing the quantity and quality of data, needed to support the decision.

The DQOs for monitoring are presented in **Table 5**. They have been prepared in line with the DQO process outlined in the ASC NEPM (Schedule B2).

Table 5. Data Quality Objectives

Process	Description
Step 1: State the problem	Previous investigations have identified PFAS associated with the use, storage and disposal of AFFF at RAAF Williams, Laverton and RAAF Base Point Cook. This has affected soil, surface water, groundwater, sediment, pore water and biota within and beyond the Management Areas, as presented in Figure 1, **Appendix B**. **RAAF Williams, Laverton** Assessment of human and ecological risk associated with the identified PFAS have been undertaken. Where necessary, the outcome of the risk assessments have been used to identify and implement controls such as precautionary advice and signage along some areas of Skeleton Creek. These areas and exposures with potentially elevated risks include: - Consumption of fish and eels from Skeleton Creek (to the south of Princes Freeway, M1). - Ecological receptors in surface water and higher-order predators exposed in Skeleton Creek, Laverton RAAF Swamp, Cheetham Wetlands (southern ponds), and Sanctuary Lakes. **RAAF Base Point Cook** A risk assessment of the former FTA (Source Area 1), located on the south-eastern side of the base, has been undertaken to assess potential human health and ecological risks. Further assessment of PFAS contamination was recommended to be undertaken. Detailed human health and ecological risk assessments for PFAS contamination at RAAF Base Point Cook are currently underway. The problem is that a contemporary understanding of the nature and extent of PFAS contamination at each base is required to confirm that adequacy of risk management actions (e.g., precautionary advice for consumption of fish from Skeleton Creek). This contemporary understanding of conditions and trends will also inform future remediation and / management action decisions, so that risks associated with PFAS contamination can be minimised so far as reasonably practicable..
Step 2: Identify the decision / goal of the study	The principal study question is: *Do the analytical results and field observations provide sufficient information for the interpretation of the spatial and temporal variation in PFAS concentrations in the Management Areas? In addition, do these trends warrant a re-evaluation of management actions in the PMAP?* The alternative actions of the principal study question are: • The analytical results and field observations provide sufficient interpretation of the spatial and temporal variation in PFAS concentrations, and this warrants a re-evaluation of management actions. The analytical results and field observations provide sufficient interpretation of the spatial and temporal variation in PFAS concentrations, but do not warrant a re-evaluation of management actions.
Step 3: Identify the	The following information inputs will apply to this OMP:

Process	Description
information inputs	• Findings from the previous investigations and reports listed in **Appendix A**. • CSM, including potential sources, pathways, and receptors. • Media to be sampled (including surface water and groundwater), and location of samples (on/off-base, up/down-hydraulic gradient, up/down-stream). • Adopted assessment criteria from the PFAS NEMP (HEPA 2025, or as amended). • Changes in applicable regulatory requirements and other recent advances / updates in the industry. • Field data (including water quality parameters, groundwater elevation measurements and visual/olfactory observations) and analytical results from the laboratory analysis. • Data from other sources (e.g., ESdat), including data collected for the design or assessment of remediation activities.
Step 4: Define the boundaries of the study	The OMP includes sampling locations at RAAF Williams, Laverton and RAAF Base Point Cook, as well as surrounding areas. The sampling will include surface water and groundwater, including locations both on and off-base, including up- and down-hydraulic gradient and up- and down-stream locations. The lateral extent of the study is defined by the Management Areas identified in Figure 1, **Appendix B**. The vertical boundary of the investigation will be dependent on the target aquifer at each site, which is described in **Sections 2.1.2** and **2.2.2** above. For both RAAF Williams, Laverton and RAAF Base Point Cook the temporal boundary is ongoing from the date of publishing this OMP for an initial two- year period, with routine program reviews and revisions as required.
Step 5: Develop the analytical approach / decision rules	The purpose of this step is to define the parameters of interest, specify action levels, and combine the outputs of the previous DQO steps to develop a series of options if certain trigger events occur. The analytical approach is as follows: • All samples analysed for the PFAS suite (**Appendix E**, as amended) will be assessed for data suitability, ensuring laboratory quality assurance/quality control (QA/QC) is within acceptable ranges. • PFAS concentrations in surface water and groundwater will be compared against screening criteria (refer to **Section 6**) for both human and ecological receptors. • PFAS concentrations in surface water and groundwater will also be compared against previous results to determine any temporal or spatial trends or variations in concentrations.

Process	Description
	Specific 'triggers for action and review' have been developed as 'decision rules' for this Ongoing Monitoring Program. These triggers are detailed in **Section 7**, which consider each step of the analytical approach outlined above (e.g., data quality assurance compliance, screening criteria exceedances, or identified trends). The decision on the acceptance of the analytical data should be made based on the DQIs, as follows: • **Precision**: A quantitative measure of the variability (or reproducibility) of data. • **Accuracy**: A quantitative measure of the closeness of reported data to the "true" value. • **Representativeness**: The confidence (expressed qualitatively) that data are representative of each media present on-base. • **Completeness**: A measure of the amount of useable data from a data collection activity. • **Comparability**: The confidence (expressed qualitatively) that data may be considered equivalent for each sampling and analytical event.
Step 6: Specify performance or acceptance criteria	Acceptance limits on field and laboratory data collected for this investigation will be in accordance with ASC NEPM 2013, and PFAS NEMP (2025, as amended). The acceptable limits on decision errors to be applied in the investigation and the manner of addressing possible decision errors have been developed based on the DQIs of precision, accuracy, representativeness, comparability and completeness, and are presented below. The potential for major decision errors will be minimised by implementing a robust QA/QC program and ensuring that the investigation includes appropriate sampling and analytical density and sufficient flow measurement accuracy for the purposes of the investigation. To determine potential adverse effects on sensitive receptors and the appropriate response measures, the baseline condition has been established as 'concentrations are above the adopted screening criteria or LOR (whichever is relevant)', while the alternative condition is 'the concentrations are below the adopted screening criteria or LOR (whichever is relevant)'. The statistical hypotheses are then: *H_0: the maximum contaminant concentration in the media sampled is at or above the adopted screening criteria or LOR (whichever is relevant).* *H_1: the maximum contaminant concentration in the media sampled is below the adopted screening criteria or LOR (whichever is relevant).* The acceptable limits on the likelihood of making decision errors are: *Type I error: $\alpha \leq 0.05$ (represents the probability of determining that the media is uncontaminated, when it is in fact contaminated)* *Type II error: $\beta \leq 0.2$ (represents the probability of determining that the media is contaminated, when it is in fact uncontaminated)*
Step 7: Develop the plan for	The scope and methodology for data collection is defined within this OMP document. The SAQP, to be developed specific to implementing this OMP, will define the manner in which data will be collected to achieve the study goals defined above.

Process	Description
obtaining data	

4.3 Proposed monitoring intervals

Groundwater and surface water sampling from across the Management Areas of RAAF Base Point Cook and RAAF Williams, Laverton will be undertaken on a six-monthly and annual basis respectively.

Six-monthly monitoring at RAAF Base Point Cook aims to capture potential variability in groundwater and surface water conditions due to seasonal rainfall (if any), with sampling during both the wetter (winter) and the drier (summer) portions of the year.

A reduced monitoring frequency (annual) at RAAF Williams Laverton is due to the availability of an extensive temporal dataset. Monitoring will occur during the wetter portion of the year (winter) so that surface water can collected at as many ephemeral sampling locations as possible.

This OMP will be periodically reviewed and the rationale for monitoring frequency and duration will be re-evaluated. The review will be based on the data collected to date and established trends, the behaviour of the groundwater plume and any changes to the CSM or risk profile. The review will also address the extent of the monitoring network and the frequency of monitoring.

The proposed monitoring intervals for the initial implementation period of the OMP is summarised in the following **Table 6**.

Table 6. Proposed monitoring intervals – RAAF Williams, Laverton and RAAF Base Point Cook

Base	Interval [a]	Monitored parameters
RAAF Base Williams, Laverton	Annual – winter	**Field**: • Groundwater elevation • Water quality parameters [b] **Laboratory**: PFAS suite
RAAF Base Point Cook	Biannual – winter and summer	

Table notes:
a – winter and summer, or as close to these seasons as reasonably practicable noting the timing of prior sampling.
b – water quality parameters include pH, electrical conductivity, dissolve oxygen, temperature and oxidation-reduction potential.

4.4 Monitoring locations

The monitoring locations within the PFAS Management Area are detailed in the following sections. The locations are categorised as on- and off-base. Off-base monitoring locations require the agreement of the landholder or leaseholder. A separate stakeholder engagement plan has been prepared to manage this process.

It should be noted that the monitoring locations have been revised since the 2022 and 2025 OMPs. The changes from these superseded OMPs primarily relate to:

- **2022 OMP:** the addition of RAAF Base Point Cook in this OMP, as well as off-base monitoring wells surrounding RAAF Williams, Laverton. Detailed rationale for these adjustments are presented in the 2025 OMP.
- **2025 OMP:** the reduction in monitoring frequency to annual, and removal of extensive gauging event at RAAF Williams, Laverton. Some rationalisation of the proposed monitoring locations has

also been included of each base. Detailed rationale for these adjustments are presented in **Appendix D**.

4.4.1 RAAF Williams, Laverton

Overall monitoring location rationale

The key PFAS migration pathways were identified in the DSI (Aurecon, 2020) and DSI Addendum (Aurecon, 2022a) as surface water connections from the base and former base areas to Skeleton Creek, along with groundwater discharging to Skeleton Creek. PFAS is then transported via surface water in Skeleton Creek to downstream connected surface water bodies, including Sanctuary Lakes and Cheetham Wetlands.

Additionally, the PFAS migration by surface water runoff into Laverton Creek also requires monitoring, though to a lesser extent, to assess any changes in the risk profile.

Surface water monitoring

Long term surface water monitoring will be conducted to provide ongoing information on PFAS concentrations migrating off-base into Skeleton and Laverton Creeks. The sampling objective is to assess spatial and temporal trends in PFAS concentrations at surface water outlets and to evaluate the effectiveness of any management measures implemented.

Groundwater monitoring

The groundwater well network will monitored to provide temporal PFAS concentration data for groundwater, in addition to the groundwater quality parameters and elevation.

At RAAF Williams, Laverton select on-base groundwater monitoring wells, along with targeted off-Base groundwater monitoring wells are proposed to be monitored under this OMP. Groundwater monitoring locations have been determined based on the following criteria:

- Locations that provide sufficient coverage to assess PFAS migration and spatial/temporal variations.
- Locations where groundwater is a known secondary source of PFAS (i.e., contains higher PFAS concentrations).

Groundwater and surface water monitoring locations in and around RAAF Williams, Laverton are detailed in the following **Table 7** and shown on Figures 4A and 4B in **Appendix B**. The groundwater well table included in **Appendix F** provides well screen intervals data and information on whether wells target the shallow, intermediate or deep aquifer

Table 7. Ongoing monitoring locations – RAAF Williams, Laverton

Area	Monitoring Locations:		Rationale
	Surface Water	Groundwater	
On-Base Source Areas			
SA01 – Wet Testing Area	SW034, SW111 SW112, SW113, SW114.	-	Location targets surface water within the engineered drainage system at and downgradient of the source area.
	-	MW211	Location targets groundwater upgradient of source area.
	-	MW117, MW118, MW163, MW208	Locations target groundwater within and downgradient of the source area migrating towards Skeleton Creek.
	-	MW207	Location targets groundwater downgradient of the source area migrating towards Skeleton Creek.
SA02 – Western Finger Area	-	MW102, MW120	Locations target groundwater upgradient of the source area.
	-	MW155, MW185, MW200	Locations target groundwater within the source area.
	-	MW149, MW151, MW178, MW181, MW188, MW192, MW201	Location targets groundwater downgradient of the source areas.
	SW043	-	Location targets surface water discharge from the southern boundary of the base and this source area.
SA03 – Former Secondary FTA	SW005	-	Location targets surface water within Doherty's Drain/Laverton Creek at and downgradient of the source area.
	SW006, SW008	-	Locations target surface water entering the base and upgradient of the source area.
	-	MW115	Location targets groundwater upgradient of the source area and entering the base.
	-	MW217	Location targets groundwater within the source area.
	-	MW144, MW146	Location targets groundwater downgradient of the source area.

Area	Monitoring Locations:		Rationale
	Surface Water	Groundwater	
	-	MW103, MW105, MW107, MW109, MW152, MW182	Locations act as a transect to monitor groundwater at the southern base boundary and downgradient of SA01, SA02 and SA03.
SA04 – Former GEMS Compound	-	MW140, MW110	Locations target groundwater upgradient (MW140) and cross-gradient (MW110), of the source area.
	-	MW139	Location targets groundwater within and downgradient of the source area (refer also to off-base location MW229).
	-	MW138	Location targets groundwater upgradient, within and downgradient of the source area (refer also to off-base location MW229).
Off-Base Areas and Water Bodies [a]			
Skeleton Creek	SW012, SW013, SW020, SW024, SW049, SW073, SW078	-	Locations target surface water conditions in Skeleton Creek, capturing conditions at point of entry of surface water drainage captured cumulatively from SA01 and SA02, and subsequent locations downgradient along the waterway.
	-	MW124, MW126, MW228	Locations target groundwater downgradient of the base, particularly SA01 and SA02.
	-	MW121, MW123	Location targets down gradient groundwater and monitors extent of identified PFAS plume off-base and near point of discharge to Skeleton Creek.
	SW041	-	Location targets surface water upstream of the former base; this serves as a background monitoring point.
Laverton Creek	SW015	-	Location targets surface water in Laverton Creek at the point of discharge from SA03, in an accessible location near the point of migration off-base.
Downgradient of on-site source – SA04	-	MW229, MW230, MW245, MW249	Location targets groundwater downgradient of the SA04.
Laverton RAAF Swamp and Former	SW027, SW030	-	Locations target off-base surface water downgradient of former Primary Fire Training Area on a divested part of the Base.

Area	Monitoring Locations:		Rationale
	Surface Water	Groundwater	
Primary Fire Training Area	SW045		Locations target off-base surface water upgradient of former Primary Fire training Area.
	SW042	-	Locations target off-base surface water downgradient of RAAF Lake, potential secondary source area.
	-	MW137	Location targets groundwater upgradient of RAAF Swamp and Former Primary Fire Training Area.
	-	MW130, MW131, MW250, MW256, MW257	Locations target groundwater upgradient of RAAF Swamp and within location of Former Primary Fire Training Area in the divested part of the base.
	-	MW252, MW253	Location target groundwater downgradient of RAAF Swamp.
Sanctuary Lakes	SW052, SW085, SW086, SW087, SW088	-	Locations target surface water in a downgradient receptor from on-base source areas.

Table note:

a – off-base monitoring locations will require the agreement of the landowner.

4.4.2 RAAF Base Point Cook

Overall monitoring location rationale

Based on the current understanding of the site and PFAS distribution, the key PFAS transport is via the surface water drainage network that runs across the base.

As for RAAF Williams, Laverton, the overall approach for both surface water and groundwater monitoring is to provide long term monitoring of PFAS concentrations at locations that are upgradient (i.e., background), within the source areas, and downgradient, where possible.

Surface water monitoring

Long term surface water monitoring will be conducted to provide ongoing information on PFAS concentrations migrating to RAAF Lake and off-base into Port Phillip Bay. The sampling objective is to assess the spatial and temporal trends in PFAS concentrations at the surface water outlets and the potential effectiveness of any surface water management measures implemented.

Groundwater monitoring

The groundwater well network will be gauged and monitored over time to refine our understanding of groundwater quality parameters and PFAS concentration data.

A selection of RAAF Base Point Cook on-base groundwater monitoring wells, as well as targeted off-base locations, are proposed to be gauged and monitored under this OMP. Groundwater gauging and monitoring locations have been selected based on the following criteria:

- Locations that will provide sufficient coverage to assess PFAS migration across the base and spatial / temporal variations.
- Locations where groundwater is a known secondary source of PFAS (i.e. contains higher PFAS concentrations).

Surface water and groundwater monitoring locations on and around RAAF Base Point Cook are summarised in **Table 8**, shown on Figures 5A and 5B, **Appendix B**, with detail of monitoring location coordinates provided in Table C-2 of **Appendix C**.

The groundwater well table included in **Appendix F** provides well screen intervals data and information on whether wells target the shallow, intermediate or deep aquifer.

Table 8. Ongoing monitoring locations –RAAF Base Point Cook

Area	Monitoring Locations:		Rationale
	Surface Water	Groundwater	
On-Base Source Areas			
SA01 – Former Fire Training Area (FTA)	SW001, SW002, SW004, SW006, SW215	-	Locations targeting surface water discharging into or towards RAAF Lake from SA01.
	-	MW025, MW039, MW041, MW042, MW045	Locations targeting shallow groundwater beneath the northern flank of the former FTA to form two well transects to assess groundwater and interaction between SA01 and SA09.
	-	MW141, MW142, MW154	Locations targeting shallow groundwater beneath the southern flank of the former FTA and Port Phillip Bay.
	-	MW120, MW125	Locations targeting shallow groundwater beneath the eastern flank of the former FTA and discharging off-base towards Point Cook Coastal Park.
	-	MW047, MW129, MW158	Locations targeting shallow groundwater beneath the western flank of the former FTA and discharging towards Port Phillip Bay.
	-	MW119, MW134, MW160	Locations targeting shallow groundwater beneath the central portion of the Former FTA.
	-	MW044, MW172, MW179, MW180, MW182, MW183, MW184, MW185	Locations targeting the intermediate aquifer within/beneath the Former FTA.
SA02 – Former FTC / Former Fire Station / Storage Area / Solid Waste Horizon Tank	SW217	-	Location targeting the surface water discharging from the Former Fire Station area.
	-	MW021, MW022, MW023, MW034	Locations targeting the shallow groundwater beneath the Former Fire Station area / FTC.
	-	MW107	Location targets groundwater between Former Fire Station / FTC and Port Phillip Bay.
	-	MW201	Location targeting shallow groundwater discharging into Port Phillip Bay from the Solid Waste Horizon Tank.

Area	Monitoring Locations:		Rationale
	Surface Water	Groundwater	
	SW202	-	Locations targeting the surface water discharging into Port Phillip Bay from the southern drainage network that captures runoff from SA02
SA03 – Fire Fighting Practice Areas PS30 & PS31	-	MW002, MW005	Targeting shallow groundwater upgradient of the source areas (PS30 and PS31, respectively).
	-	MW203	Locations targeting shallow and intermediate groundwater, respectively beneath and in the vicinity of Fire Fighting Practice Areas (PS30).
	-	MW010, MW202	MW010 targets shallow groundwater beneath and in the near vicinity of Fire Fighting Practice Areas (PS31). MW202 targets the intermediate aquifer in this area.
	-	MW004, MW026	Targeting shallow groundwater downgradient of the source areas (PS30 and PS31, respectively).
SA04 – Fire Fighting Practice Area	SW222, SW223, SW291	-	Locations targeting surface water migrating from SA04
	-	MW018, MW019, MW027, MW204	Locations targeting groundwater migrating to and from SA04, with: • MW027 located upgradient. • MW018 targeting the shallow aquifer and MW204 target the intermediate aquifer within the SA04. • MW019 located downgradient of the source area.
SA05 – The Fuel Farm	-	MW017, MW057, MW205, MW212	Location MW017 targets the shallow aquifer and MW205 and MW212 target the intermediate aquifer in the footprint of the fuel farm. MW057 is downgradient of the source area.
SA06 – Old Hangers, Aircraft Parking, Refuelling & Maintenance Areas	SW216, SW219, SW220	-	Locations targeting the surface water runoff from paving in this source area.
	-	MW007, MW008, MW220	Locations targeting shallow groundwater cross/upgradient of this source area
	-	MW015, MW016, MW062, MW104, MW206, MW211, MW219	Locations targeting shallow groundwater beneath or near vicinity of SA06. MW206 and MW211 targeting the intermediate aquifer.

Area	Monitoring Locations:		Rationale
	Surface Water	Groundwater	
SA07 – The Airfield, Aircraft maintenance areas and aircraft Crash Sites	SW205, SW206	-	Locations target surface water discharging from the airfield to the north into RAAF Lake.
	SW208, SW210, SW218	-	Locations target surface water discharging from the northern part of the airfield to the east into RAAF Lake.
	-	MW035	Location target groundwater on the eastern flank of the airfield, discharging into RAAF Lake.
	SW213, SW214	-	Locations target surface water discharging into, or towards Port Phillip Bay from this source area.
	-	MW106, MW221	Locations target groundwater on the southern flank of the airfield, discharging towards Port Phillip Bay.
	-	MW207	Location targeting groundwater migrating from SA04 and SA06 to SA02 from these sources towards Port Phillip Bay.
	SW221, SW225	-	Location targeting surface water drainage from the central and southern portions of the Airfield, which ultimately feed into drainage that discharges to Port Phillip Bay. It is noted that SW225 is located in the vicinity of a crash site (PS45).
	SW224	-	Location targeting surface water drainage from the western portion of the Airfield, and down gradient of SA04.
SA08 – STP and Rifle Range, Munitions / Sludge Dump	SW233, SW234	-	Locations targeting the surface water discharges into and from the STP and Munitions / Sludge Dump area
	-	MW033, MW218	Locations up and/or cross-gradient of source area.
	-	MW032	Location targeting shallow groundwater beneath the STP and Munitions / Sludge Dump area
	-	MW031, MW112	Locations target groundwater on southern flank of SA08 towards Port Phillip Bay. MW031 targets the shallow aquifer and MW112 targets the intermediate aquifer.
SA09 – RAAF Lake and storm water discharge channels	SW212, SW227, SW228, SW229	-	Locations targeting surface water within RAAF Lake to understand seasonal influence of PFAS concentrations.

Area	Monitoring Locations:		Rationale
	Surface Water	Groundwater	
SA06 (part), SA07, SA03, SA10	SW260, SW292	-	Locations capturing cumulative surface water drainage directed to the north of the site that ultimately discharges to RAAF lake via drainage that runs around the northernmost point of the airfield.
Boundary Conditions			
Southern Base Boundary	-	MW020, MW105, MW215, MW216	Locations targeting the shallow groundwater discharging into Port Phillip Bay along southern base boundary.
Eastern Base boundary	-	MW110	Location targets eastern base boundary with Point Cook Coastal Park.
Western Base Boundary	-	MW013	Targeting groundwater conditions at the eastern base boundary, also upgradient of SA08. Note MW005 which monitors up gradient groundwater conditions at SA03 also assesses this base boundary.
Off-Base Areas [a]			
South/southeast of SA01 – FTA	-	MW166, MW167, MW168	Locations targeting shallow groundwater discharging to Port Phillip Bay beneath Point Cook Coastal Park.

Table note:

a – off-base monitoring locations will require the agreement of the landowner.

4.5 Sample analysis

Samples will be analysed by a NATA accredited laboratory for a suite of PFAS as outlined in **Appendix E**, using NATA accredited methods.

Laboratory levels of reporting (LORs) must be selected to achieve the OMP objectives (**Section 1.2**) and the DQOs. The rationale for selecting LORs below the standard LOR must be provided.

Quality control and quality assurance measures will be outlined within the SAQP.

In addition to PFAS, field measurement of water quality parameters such as pH, electrical conductivity, redox potential, dissolved oxygen, temperature, total dissolved solids, salinity, and turbidity (where feasible) will be undertaken on all surface and groundwater samples.

5 OTHER ASPECTS

To achieve the objectives of this OMP (**Section 1.2**), inform the CSM, and allow assessment of the site risk profile, a review of additional aspects will also be undertaken. The other aspects review requirements are summarised included in **Table 9**.

Table 9. Other Aspects Review

Aspect	Review requirements
Information sources	The OMP will consider other sources of information, such as: • Data obtained from works associated with PMAP implementation, namely further characterisation of source areas or areas of interest (i.e., catchments), Mass Flux Studies and ultimately remedial actions. • Potential changes may result from the specific or cumulative impact of remediation or containment actions, existing transportation trends, changes to hydrogeology. • Investigations associated with estate planning or works as well as remediation works (non-PFAS) which may also result in changes to existing transportation trends or changes to hydrogeology.
Development works or changes in on-base land use	The OMP will consider development works and/or changes in on-Base land use that may have the potential to impact the nature and/or extent of PFAS including: • Capture projects planned for the next 12-month monitoring period, particularly if the works are related to source areas. • Significant changes of land use in source areas may require review of this OMP, including whether additional monitoring will be required (such as installing new monitoring wells or adding new surface water locations).
Development works or changes in off-base land use	For off-base land use, this OMP will consider changes that may have the potential to impact the nature and/or extent of PFAS including: • A significant change of land use within the PFAS Management Area or adjoining land may require review of this OMP.
Significant weather events	Significant weather events, such as prolonged wet weather or long dry periods, where rainfall is significantly deviates from the monthly averages for the area. Review of these aspects will include: • Potential for variability on PFAS concentrations. • Potential for surface water or groundwater interaction with source areas could become a significant contributor.
WUSs	The OMP will consider any data collected through WUSs to identify any changes in water use or land use activities that may affect the respective risk profiles.
Changes in EPA Victoria Precautionary Advice	The OMP will consider any changes made by EPA to the geographical extents of the existing Management Area associated with the precautionary advice relating to fish and/or eel consumption from Skeleton Creek.
Changes in nationally endorsed PFAS screening criteria	The OMP will consider any updates to the current human health and ecological screening criteria for PFAS, such as those presented in the PFAS NEMP Version 3.0 (HEPA, 2025).

6 PFAS SCREENING CRITERIA

PFAS screening criteria have been adopted for groundwater and surface water from PFAS NEMP (HEA 2025) and the Australian Drinking Water Guidelines (NHMRC 2025). The adopted screening criteria for groundwater and surface water to protect environmental values are presented in **Table 10**.

The maintenance of ecosystems screening criteria was adopted based on the following rationale:

- **On-base – built drainage channel, swale or pipework:** No maintenance of ecosystems screening criteria are adopted, as protection of Environmental Values in artificial surface water drains is not required.
- **On-base – surface water pond, dam or depression:** 95% species protection is adopted, as vegetation is generally present in and around these moderately to highly modified features, which supports a freshwater ecosystem.
- **On- and off-base water bodies (i.e., rivers, creeks, lakes and wetlands):** Groundwater has the potential to discharge to surface water receptors and surface water has the potential to migrate into off-base creeks, lakes, wetlands and retention basins, the environmental setting around each base results in the following application of ecosystem criteria:
  - **RAAF Williams, Laverton:** The inland waters surrounding the base are highly modified ecosystems, with a stream quality rating of poor (ERS 2021). 95% species protection screening criteria have been adopted to account for bioaccumulation.
  - **RAAF Base Point Cook:** Potential surface water receptors include RAAF Lake and Port Phillip Bay. Based on salinity and classification under the ERS, RAAF Lake and Port Phillip Bay adopt 99% species protection screening criteria. As this is the most sensitive guideline value, this also accounts for the potential for bioaccumulation and site setting.

Table 10. Groundwater and surface water screening criteria (µg/L)

Analytes	Ecosystems [#, a, b]	Human recreation [c]	Drinking water [d]
PFOS	0.02 (99%) 0.9 (95%)	2	0.008
PFHxS	-		0.03
PFOA	19 (99%) 220 (95%)	10	0.2
PFBS	-		1.0

Table notes:
– Percentage displayed in brackets represents the level of species protection applicable to each criterion.
a – ANZG 2025, Table 2: Toxicant default guideline values for aquatic ecosystem protection: PFOS in freshwater.
b – NEMP (HEPA 2025), Table 8: Ecological water quality guideline values – interim marine.
c – NHMRC (2019), Recreational water quality guideline for human health exposure.
d – NHMRC (2025), Australian Drinking Water Guidelines, updated June 2025. Adopted to assess agricultural and irrigation environmental values (i.e., irrigation and stock watering).

It is acknowledged that in January 2025, NHMRC released draft recreational water quality guidelines for public consultation. As per advice from NHMRC, whilst this consultation period is underway, the current recreational guideline values (NHMRC 2008) remain in place. However, when the updated Australia Recreational Water Quality Guidelines are finalised, these will be adopted.

7 TRIGGERS FOR ACTION AND REVIEW

Data collected during this OMP is reviewed after each sampling event annually against historical data to assess potential reasons for changes in PFAS concentrations. PFAS analytical data is to be reviewed holistically with environmental, field and laboratory data to understand whether external factors (for example rainfall) could be influencing the data and compared to criteria provided in Section 6 to assess potential impacts.

Changes in the understanding of the risks, triggered by data assessment, may provide an early warning that additional management of PFAS contamination may be warranted in areas not currently affected by PFAS. Changes detected through the implementation of this OMP may inform a number of risk-management decisions, including:

- Additional investigations or consideration of the requirement for additional sampling.
- Implementation of one or more remediation or management actions.
- Adjustment to risk management actions at receptor level (e.g., provision or cessation of precautionary advice).

Performance measures for monitoring the environmental impacts to groundwater and surface water have been assigned based on the following definitions:

- **Screening criteria**: a water quality standard identified as being appropriate for a contaminant in a water body to assess the overall impact on water quality (as summarised in Section 6).
- **Trigger level**: a specific assessment criterion applied to a contaminant to assess whether there have been possible adverse trends in environmental monitoring data. Trigger levels alert stakeholders and regulators to these changes. The trigger levels and responses are described in **Table 11**.

It is noted that prior to considering any trigger responses outlined in Table 10, the following must be initially confirmed:

- Analytical results have met appropriate quality assurance and quality control requirements as outlined in Step 5 of the Data Quality Objectives (Section 4). This should include consideration of whether field sampling QA/QC results are acceptable - for example, rinsate blanks should not suggest that cross contamination has occurred.
- In the case of first-time detections, initial exceedances of screening criteria or new maximum concentrations, the analytical laboratory has been contacted to verify the result. If discrepancies are found, then either reanalysis of the sample (if sufficient is available) or resampling is considered.

Once these initial checks are completed, the trigger levels and responses can be considered as outlined in the following **Table 11**. Trigger data should consider a range of factors prior to action being undertaken.

A review of available sampling locations must be completed following each OMP sampling event. If an OMP sampling location is found to be inaccessible, damaged or destroyed, a review on alternative locations must be completed. Recommendations should be made to Defence regarding repair the location, replacement, decommissioning or removing the location from the OMP.

7.1 Trigger Point – Action Considerations

Triggers and responses are provided in **Table 11**.

Table 11. Trigger levels and responses

Trigger	Response	Applicable Base
First time detection of PFAS in groundwater / surface water	**On-base:** • Review the CSM to assess groundwater and surface water pathways and the potential for migration to off-site receptors. • If receptors are identified on-site, evaluate potential completeness of exposure pathways identified through CSM. • Where considered complete, identify further monitoring (i.e., increased frequency) or controls based on identified potential receptor exposure. **Off-base:** • Evaluate potential off-site migration of PFAS via groundwater or surface water pathways as identified in the CSM. • Consider additional monitoring of off-site wells or surface water bodies to assess potential receptor exposure.	Both bases
First time exceedance of the agriculture and irrigation stock (drinking) water guideline in groundwater	**On-base:** • Calculate the rolling average over a three-year period (where available) for sample results from the same location and compare with the irrigation screening criteria. If three years of data is not available, calculation of rolling averages using the available data set. • Evaluate groundwater flow direction and velocity to assess the potential for PFAS migration towards off-site receptors. **Off-base:** • Conduct off-site monitoring if an irrigation water receptor is in the potential migration pathway. • If PFAS is detected off-site above irrigation water guidelines, notify relevant stakeholders (e.g., regulators, property owners) and consider management measures or more frequent monitoring to monitor risk.	Both bases
First time exceedance of the recreational water guideline in groundwater / surface water	**On-base:** • Water-based Recreation (Primary Contact Recreation) is considered unlikely on each base, therefore not relevant as a trigger, as groundwater is not being extracted to fill swimming pools and surface water is not being used for recreational purposes (swimming). **Off-base:** • Assess potential migration pathways to off-site recreational water bodies based on CSM. • Calculate rolling average over the three most recent sample results (where available) from the same location and compare with the recreational water screening criteria. If three rounds of data are not available, comparison of the results against the available data set. • Review risk profile for identified potential receptors including confirmation of exposure pathways based on consideration of CSM.	Both bases

Trigger	Response	Applicable Base
First time exceedance of adopted ecological screening criteria in groundwater / surface water.	**On- and Off-base:** • Calculate the rolling average over a three-year period for sample results (where available) from the same location and compare with the relevant ecological screening criteria for adopted for that particular Base or area. If three years of data is not available, calculation of rolling averages using the available data set. • Compare with historical results and assess degree of change with reference to current understanding of site-specific risk assessment where available.	Both bases
Increasing PFAS trends	**On-base:** • Conduct further assessment to determine whether the CSM and risk profile require updating, focusing on migration pathways. • Investigate potential sources contributing to the trend (e.g., legacy contamination, leaching from soil). • Evaluate the need for additional control measures if migration towards sensitive on-site receptors are identified. **Off-base:** • Assess off-site receptor risks based CSM and consideration of surface water or groundwater pathway. Monitor trend and risk in subsequent rounds. • Consider expanding off-site monitoring programs if increasing trends indicate a migration toward sensitive receptors.	Both bases
Decreasing PFAS trends	**On-base:** • Assess whether reduced risks warrant changes to on-site controls (e.g., frequency of monitoring, groundwater/surface water use restrictions). • Consider reducing on-site monitoring frequency or locations if the trend is stable. **Off-base:** • If decreasing trends are observed off-site, assess whether further monitoring of off-site receptors is necessary. If risks have sufficiently reduced, recommend scaling back monitoring efforts at next OMP review.	Both bases
Detection of new maximum concentrations	**On-base:** • Review historical data trends to understand if the increase is part of a longer-term trend or a temporary anomaly. • Review concentration against risk assessments (where available). Reassessing potential risks in the context of the CSM to on-site receptors (workers, visitors, ecosystems). • Evaluate whether the new maximum concentration requires additional mitigation measures on-site (e.g. precautionary advice or restricting access/use). **Off-base:** • Assess whether the new maximum concentration is indicative of PFAS migration towards off-site receptors (e.g., irrigation water sources, ecological receptors).	Both bases

Trigger	Response	Applicable Base
	• Consider modification to off-site monitoring if necessary to track further migration. • Communicate findings to affected stakeholders, if necessary, based on CSM and understanding of risk based on previous risk assessment undertaken at each Base. • Evaluate and implement off-site mitigation measures if required, such as precautionary advice or restricting access to contaminated areas.	
Development works or changes in land use	**On- and Off-base:** • Review change in land use and assess for proposed changes that may introduce additional receptors. Consider linkage with source areas, proposed land use and likely PFAS concentrations in environmental media. • Consider preceding Trigger Point Action Considerations - points 1 – 3, prior to engaging with stakeholders relevant to the works to identify (where appropriate) potential actions to mitigate potential exposure risk.	Both bases

Water Use Surveys	**On- and Off-base:**
	• Consider data collected from new water use survey or other information that may indicate a change of surface water or groundwater use, location of that use and likelihood of that water being:
	  ○ Already PFAS affected.
	  ○ Abstraction changing potential migration pathways for PFAS in surface water or groundwater.
	  ○ Future migration of identified PFAS from identified source areas.
	• Consider preceding Trigger Point Action Considerations - points 1 – 3 prior to engaging with stakeholders that may be linked to the identified potential change in risk of harm to identify (where appropriate) potential actions to mitigate potential exposure risk.
		Both bases

Changes in EPA Precautionary Advice	• If the Environment Protection Agency Victoria (EPA) modifies the geographical extent of the existing Management Area associated with the precautionary advice relating to fish consumption from Skeleton Creek, review available data across different media to assess relevance and changes to existing management measures. • Consider preceding Trigger Point Action Considerations - points 1 – 3, prior to engaging with EPA and other relevant stakeholders to identify (where appropriate) potential actions to mitigate potential exposure risk.	RAAF Williams, Laverton
OMP Sampling Location is Inaccessible, Damaged or Destroyed	• Review potential alternative sampling locations. • Provide recommendations to Defence regarding repair, replacement, decommissioning or removing the sampling location from the OMP.	Both bases

Updates to this OMP may be required for several reasons. Data on changes in the distribution, concentration, transport (pathways and flow rates) and transformation of the contaminants and assessment against appropriate guideline values provides an evidence base for targeted and effective risk management of PFAS contamination to protect human and environmental receptors currently impacted by PFAS. Update to this OMP may be required if sampling locations are found to be inaccessible, damaged or destroyed.

An update to this OMP may also be triggered by policy changes or through stakeholder engagement activities including:

- Changes to State Government advice on types of exposure-minimisation behaviours (e.g., consumption of home produce).
- Changes or refinements to the monitoring network, frequency and parameters.
- Feedback and information received from on-going community consultation.
- Any significant changes of land use within the PFAS Management Area or adjoining land.
- Changes to Defence's strategic approach to managing PFAS contamination.

8 REPORTING REQUIREMENTS

8.1 Reporting

After each monitoring event, information, field and laboratory data will be documented in a Sampling Event Report.

At the end of a specified monitoring period (typically 12 months but may vary) the whole data set (including the current and historical data) will be reviewed, and an Ongoing Monitoring Report prepared.

The Ongoing Monitoring Report will report on the objectives of the OMP, which are to identify and evaluate:

- Spatial, and temporal (including seasonal) variability of PFAS in the environment.
- Changes to sources, transport pathways or receptors, described as a CSM for the base.
- Changes in risks to human and environmental receptors.
- The influence that risk management activities at the base, as outlined in the 2025 PMAP have had on PFAS in the environment.
- Whether the identified changes trigger a prescribed action and/or review (**Section 7**).

8.2 Stakeholder engagement

Engagement with a range of stakeholders, such as EPA, Parks Victoria, Councils, other agencies, and the community will be undertaken. A stakeholder engagement plan will be prepared and/or updated to manage the engagement process.

Where off-site monitoring is undertaken a separate letter will be provided to the stakeholder presenting the results of the monitoring event.

The OMP will be published on the Defence website, along with the current PMAP and Ongoing Monitoring Report.

APPENDIX A REFERENCES

Key documents:

Both Bases –

Defence, 2022. RAAF Williams, Laverton PFAS Ongoing Monitoring Plan, dated August 2022.

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RAAF Williams, Laverton –

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Golder, 2017. Preliminary Site Investigation for PFAS RAAF Base Williams Laverton VIC (0927), September 2017.

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Stantec, 2024. PFAS Ongoing Monitoring Report, March 2023 & July/August 2023, RAAF Williams (Laverton). 16 July 2024.

RAAF Base Point Cook –

Aecom, 2021. Stage 5 Interpretive Report: Groundwater and Soil Vapour, RAAF Base Point Cook (0932): Former Fire Training Area, December 2021.

Aecom, 2022a. Stage 3 Human Health Risk Assessment, RAAF Base Williams Point Cook (0932): Former Fire Training Area. March 2022.

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Other References:

Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG), 2025: Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater.

CRC CARE, 2017. Assessment, management and remediation guidance for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) – Part 4: application of HSLs and ESLs, CRC CARE Technical Report no. 38. CRC for Contamination Assessment and Remediation of the Environment, Newcastle, Australia.

Defence, 2024. Defence Safety Manual (SafetyMan), 2024. URL: https://www.defence.gov.au/about/governance/work-health-safety/policy. Accessed 10 July 2024.

Defence, 2021. Defence PFAS Construction and Maintenance Framework - Guidance for managing the risks of PFAS contamination for works on the Defence Estate. Department of Defence. Version 3.0, August 2021.

Environment Protection and Biodiversity Conservation Act 1999 (Cth).

Environmental Protection Act 2017 (Victoria).

HEPA (2025) PFAS National Environmental Management Plan Version 3.0, Heads of EPA Australia and New Zealand (HEPA), dated 2025.

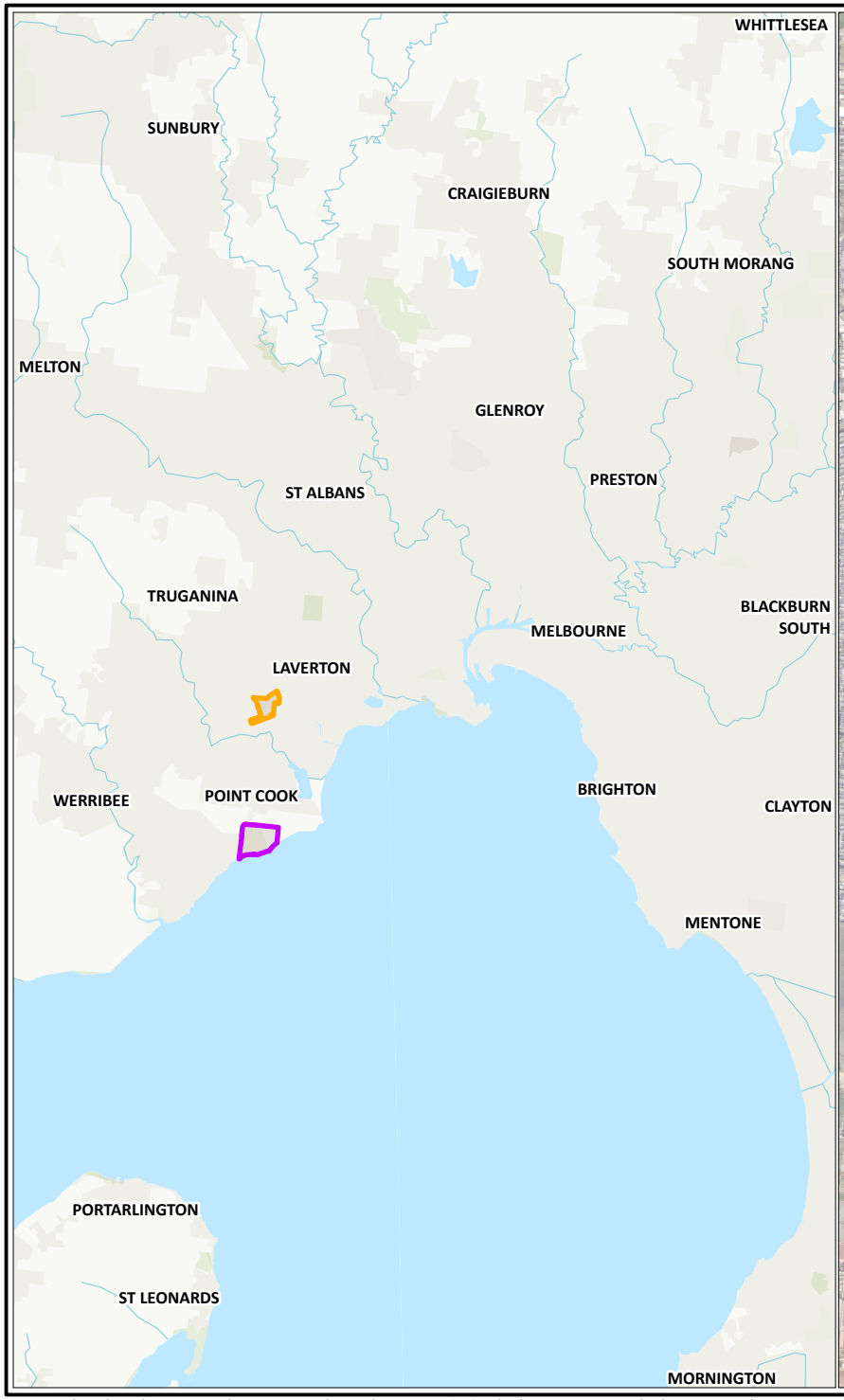
National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended in 2013. (NEPM 2013).

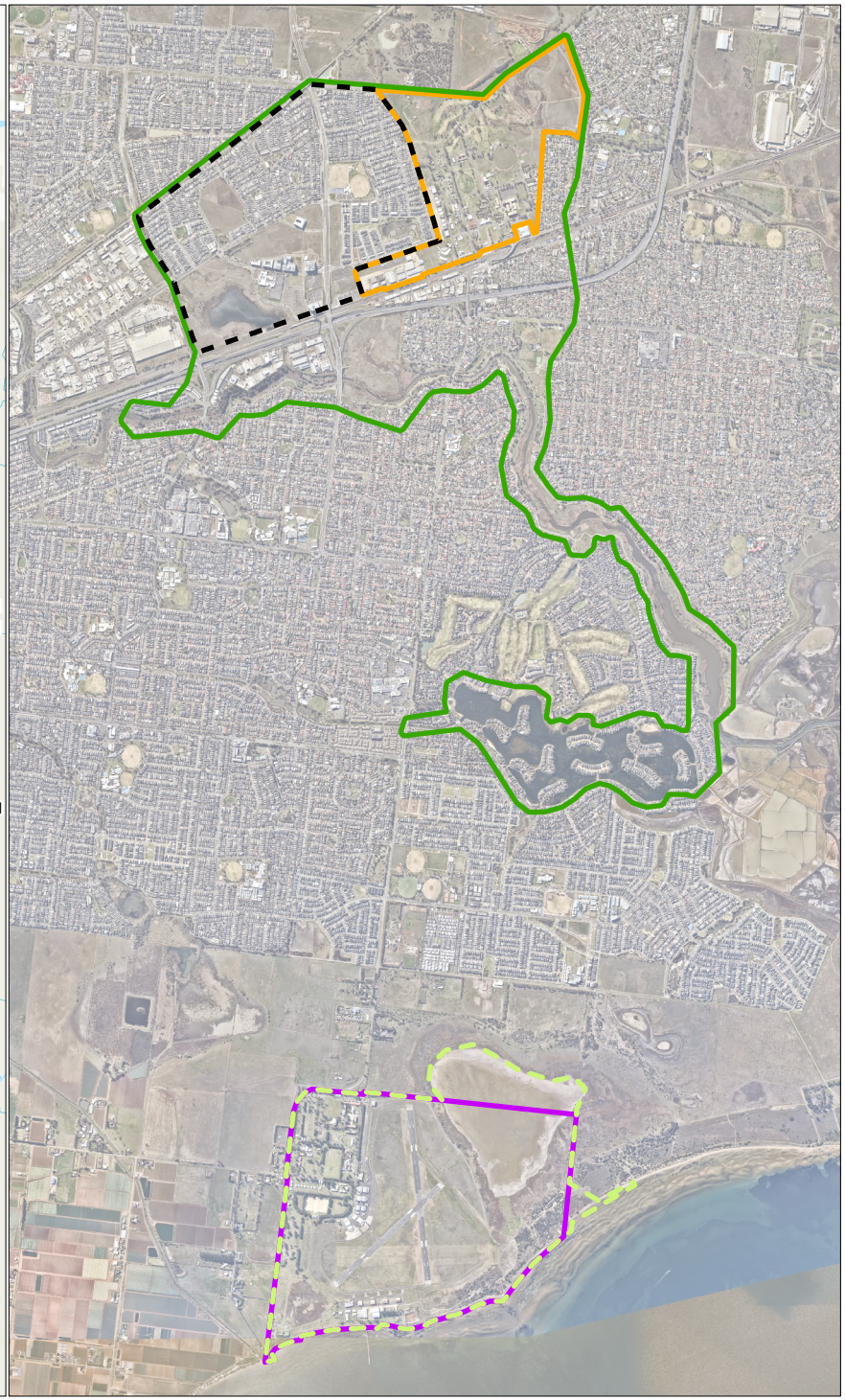
National Health and Medical Research Council (NHMRC), 2019. Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water. August 2019 (NHMRC 2019).

National Health and Medical Research Council (NHMRC), 2025. Australian Drinking Water Guidelines – version 4.0. June 2025 (NHMRC 2025).

Victorian Government, 2021. Environmental Reference Standard No. 245 26 May 2021.

APPENDIX B FIGURES





Legend

- Laverton Site Boundary
- Point Cook Site Boundary
- Laverton Management Area
- Point Cook Management Area
- Former Extent of RAAF Williams

JBS&G

Job No: 66022

Client: Department of Defence

Version: Rev 0	Date: 24-Mar-2026
Drawn By: AL	Checked By: GM

Scale 1:55,000

0 1,200 2,400

metres

Coord. Sys. GDA2020 MGA Zone 55

RAAF Williams, Laverton and RAAF Base Point Cook

RAAF WILLIAMS, LAVERTON & RAAF BASE POINT COOK MANAGEMENT AREAS

FIGURE 1

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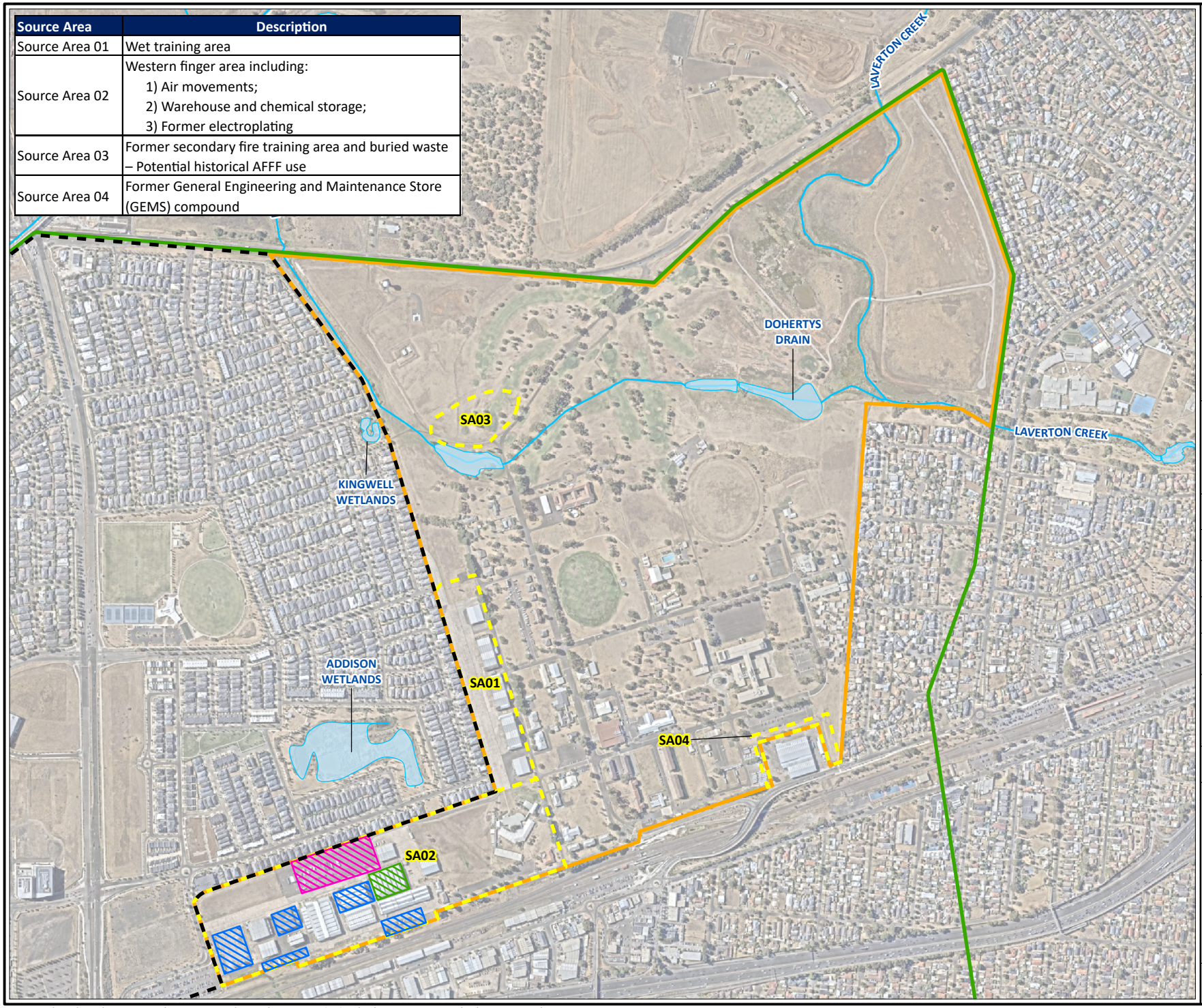
Reference: ESRI Topographic Basemap - Accessed Imagery: 24/03/2026 & www.nearmap.com - Imagery Date: 10/08/2025

Source Area	Description
Source Area 01	Wet training area
Source Area 02	Western finger area including: 1) Air movements; 2) Warehouse and chemical storage; 3) Former electroplating
Source Area 03	Former secondary fire training area and buried waste – Potential historical AFFF use
Source Area 04	Former General Engineering and Maintenance Store (GEMS) compound



Legend

- Laverton Site Boundary
- Laverton Management Area
- Former Extent of RAAF Williams
- Laverton Source area
- Air Movements
- Former Chemical Storage Area
- Former Electroplating Area
- Waterbodies
- Watercourse

JBS&G

Job No: 66022

Client: Department of Defence

Version: Rev 0 | Date: 24-Mar-2026

Drawn By: AL | Checked By: GM

Scale 1:11,000

0 200 400
metres

Coord. Sys. GDA2020 MGA Zone 55

RAAF Williams, Laverton

LAVERTON SOURCE AREAS

FIGURE 2A

File Name: C:\Users\aliddy\JBS&G Australia\DCS - Internal - V2\Projects\Department of Defence\GIS\66022 - RAAF Williams\GIS\02_MapProjects\66022_RAAF_Laverton&PointCook_OMP_2026.aprx; Name:66022_02a_Laverton Source Areas
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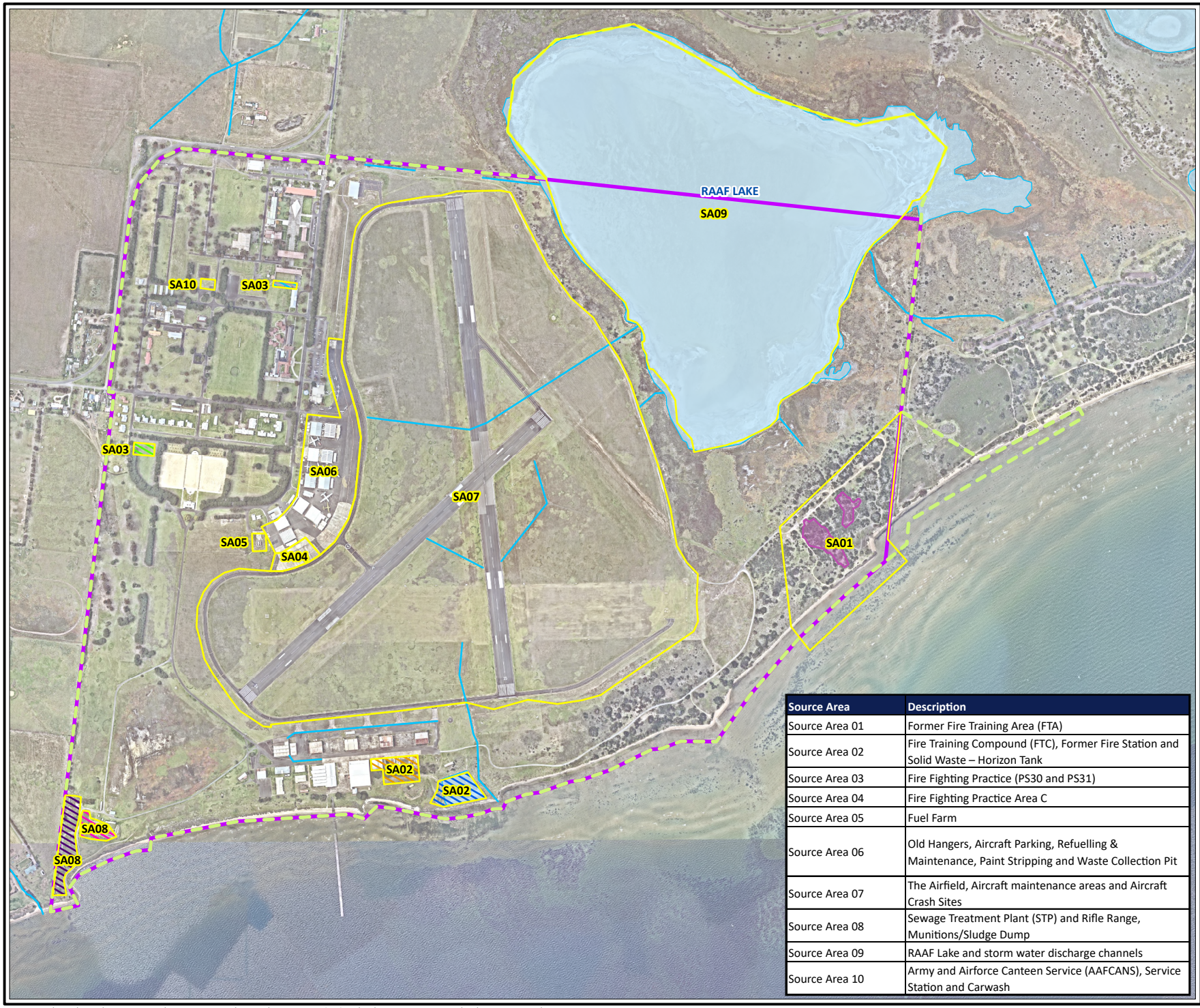

Source Area	Description
Source Area 01	Former Fire Training Area (FTA)
Source Area 02	Fire Training Compound (FTC), Former Fire Station and Solid Waste – Horizon Tank
Source Area 03	Fire Fighting Practice (PS30 and PS31)
Source Area 04	Fire Fighting Practice Area C
Source Area 05	Fuel Farm
Source Area 06	Old Hangers, Aircraft Parking, Refuelling & Maintenance, Paint Stripping and Waste Collection Pit
Source Area 07	The Airfield, Aircraft maintenance areas and Aircraft Crash Sites
Source Area 08	Sewage Treatment Plant (STP) and Rifle Range, Munitions/Sludge Dump
Source Area 09	RAAF Lake and storm water discharge channels
Source Area 10	Army and Airforce Canteen Service (AAFCANS), Service Station and Carwash

Legend

- Point Cook Site Boundary
- Point Cook Management Area
- Point Cook Source Area
- Remediated Area

Source Area 2, 3 and 8 Components

- Fire Training Compound and Former Fire Station
- PS30
- PS31
- Rifle Range
- STP
- Soild Waste - Horizon Tank
- Waterbodies
- Watercourse

JBS&G

Job No: 66022

Client: Department of Defence

Version: Rev 0 | Date: 24-Mar-2026

Drawn By: AL | Checked By: GM

Scale 1:14,000

0 300 600

metres

Coord. Sys. GDA2020 MGA Zone 55

RAAF Base Point Cook

POINT COOK SOURCE AREAS

FIGURE 2B

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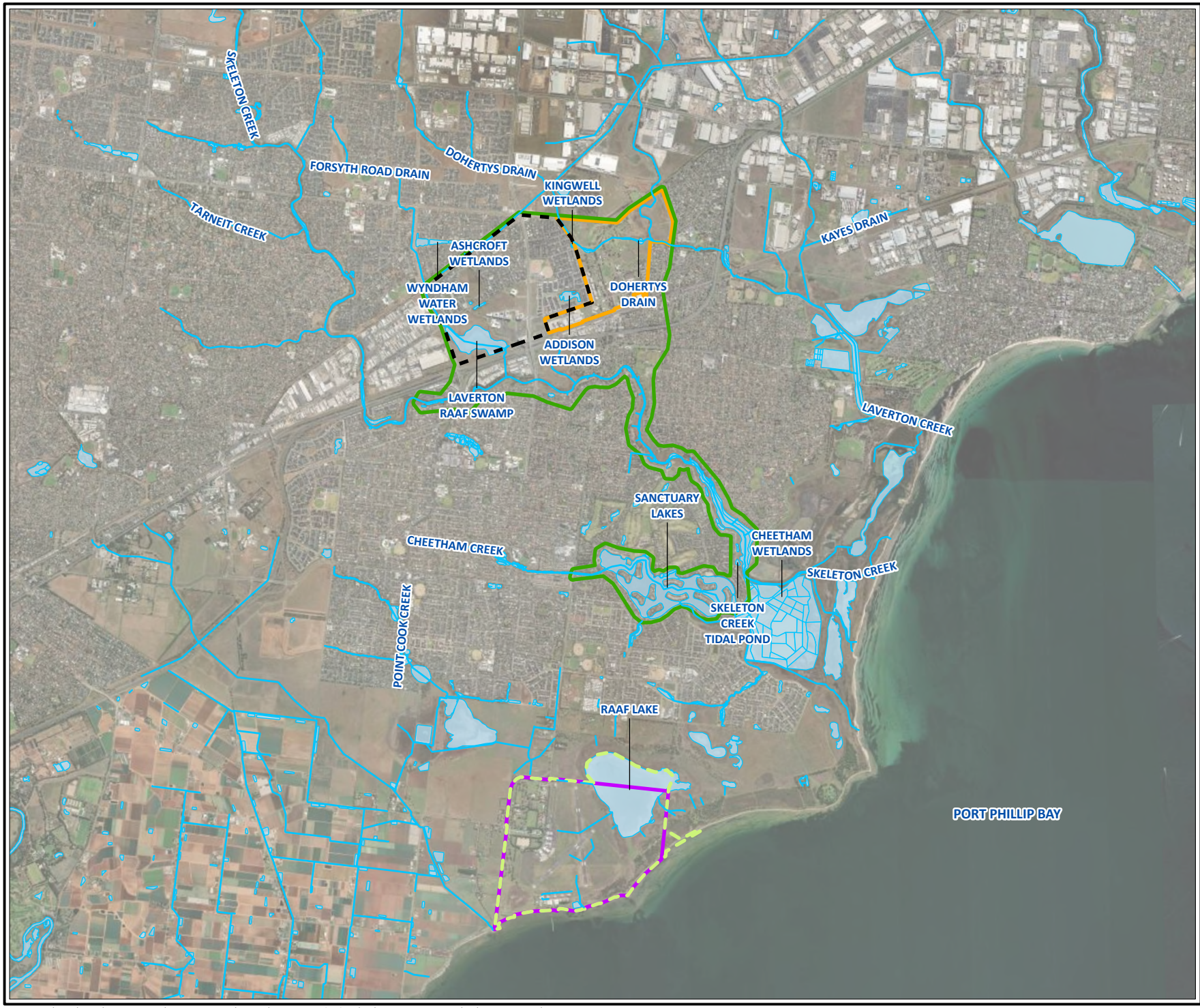

Legend

- Laverton Site Boundary
- Point Cook Site Boundary
- Laverton Management Area
- Point Cook Management Area
- Former Extent of RAAF Williams
- Waterbodies
- Watercourse

JBS&G

Job No: 66022

Client: Department of Defence

Version: Rev 0	Date: 24-Mar-2026
Drawn By: AL	Checked By: GM

Scale 1:70,000

0 1.5 3

Kilometres

Coord. Sys. GDA2020 MGA Zone 55

RAAF Williams, Laverton and RAAF Base Point Cook

ON-BASE AND REGIONAL WATER BODIES

FIGURE 3

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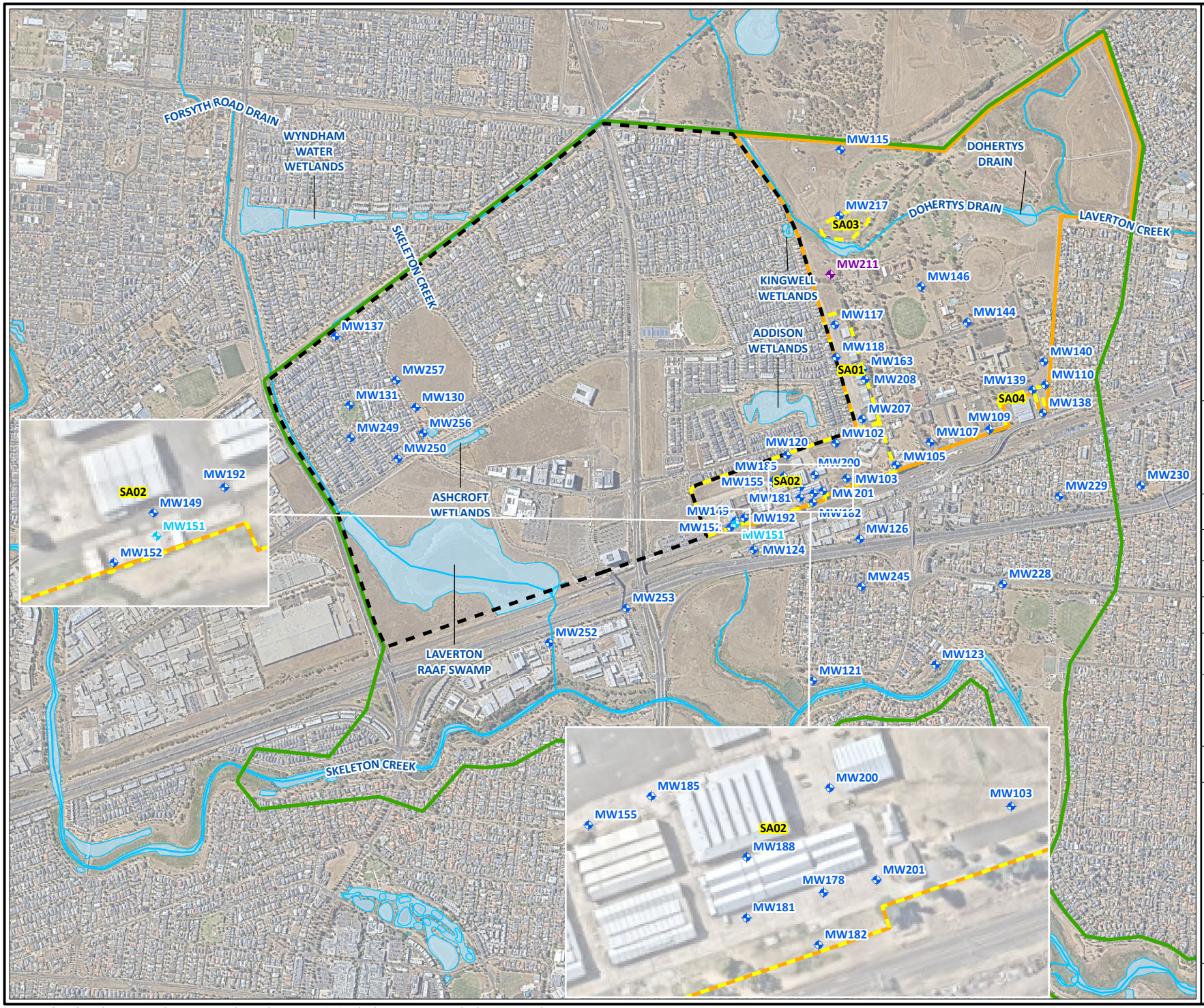
Reference: ESRI Topographic Basemap - Accessed Imagery Accessed. Date: 23/04/2024



Legend

- Laverton Site Boundary
- Laverton Management Area
- Former Extent of RAAF Williams
- Laverton Source Area
- Waterbodies
- Watercourse

Groundwater Sampling Locations

- Shallow aquifer
- Intermediate aquifer
- Deep aquifer

JBS&G

Job No: 66022

Client: Department of Defence

Version: Rev A	Date: 06-May-2026
Drawn By: AL	Checked By: JS/ EH

Scale 1:20,000

0 450 900

metres

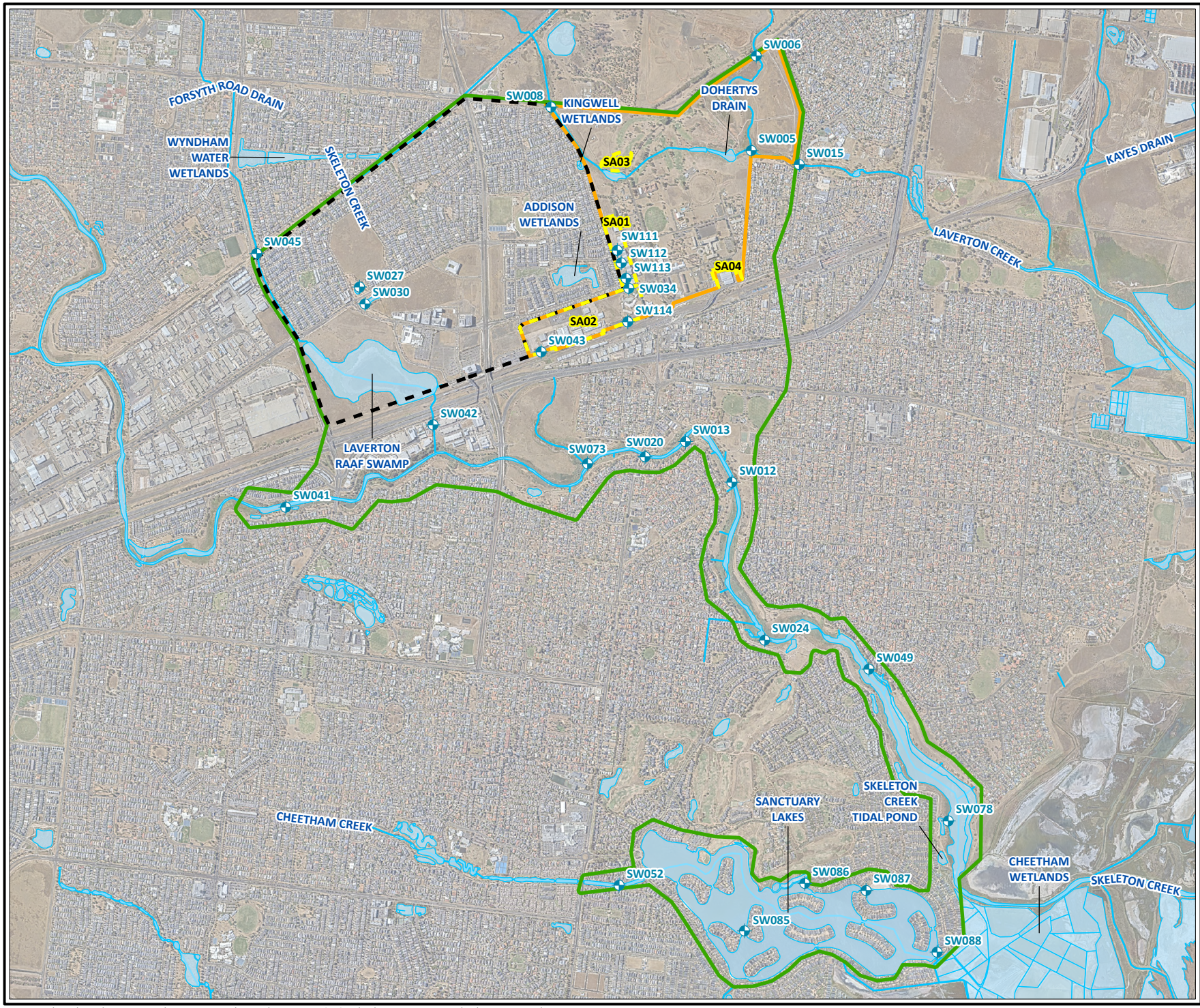
Coord. Sys. GDA2020 MGA Zone 55

RAAF Williams, Laverton

RAAF WILLIAMS, LAVERTON GROUNDWATER SAMPLING LOCATIONS

FIGURE 3

File Name: C:\Users\alliddy\JBS&G Australia\DCS - Internal - V2\Projects\Department of Defence\GIS\66022 - RAAF Williams\GIS\02_MapProjects\66022_RAAF_Laverton&PointCook_OMP_2026.aprx; Name:66022_04a_Laverton_GW_SamplingLocations 01
Reference: www.nearmap.com - Imagery Date: 14/02/2026



Legend

- Laverton Site Boundary
- Laverton Management Area
- Former Extent of RAAF Williams
- Laverton Source Area
- Waterbodies
- Watercourse
- Surface Water Sampling Location

JBS&G

Job No: 66022

Client: Department of Defence

Version: Rev A	Date: 06-May-2026
Drawn By: AL	Checked By: JS/ EH

Scale 1:32,000

0 700 1,400

metres

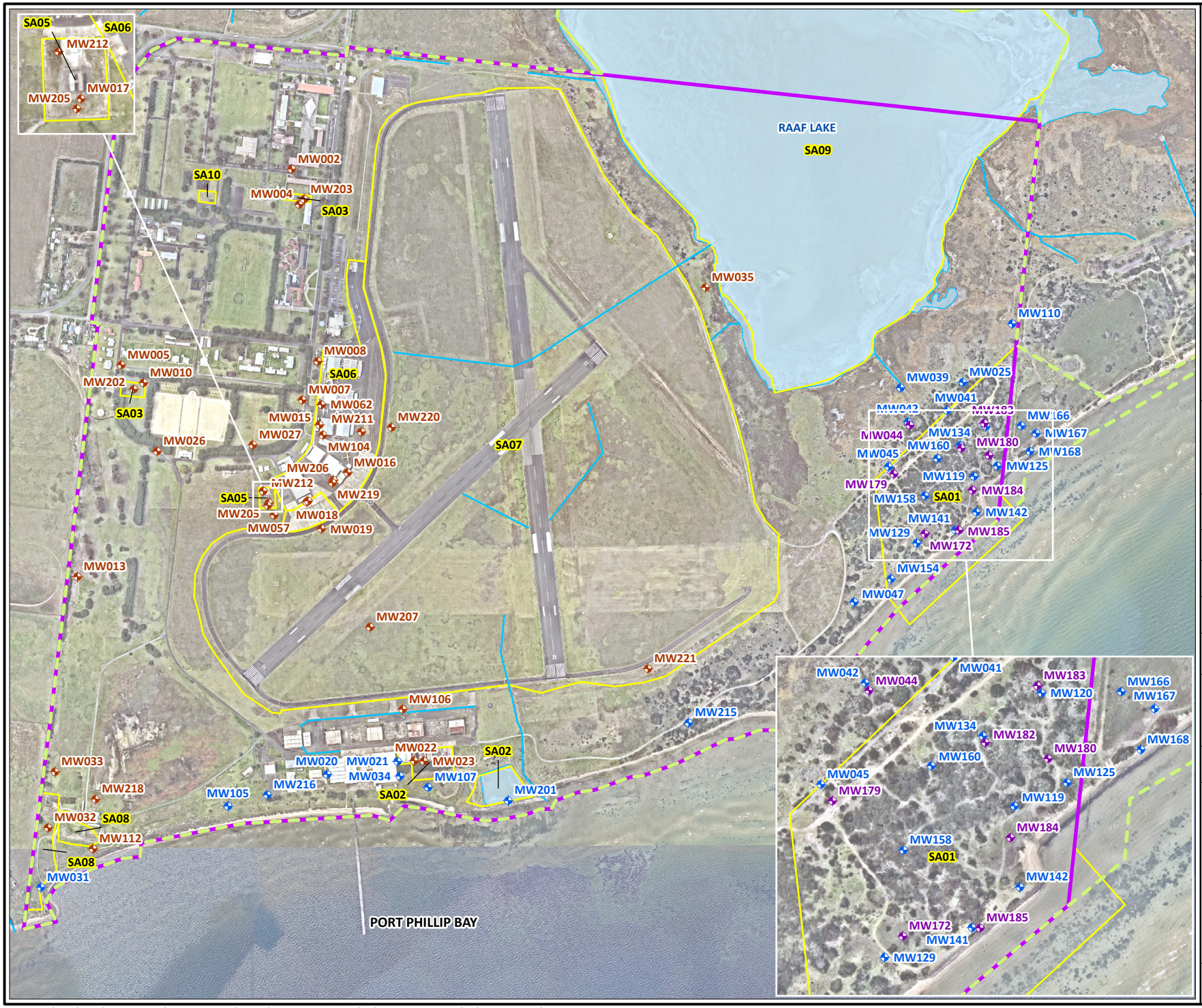
Coord. Sys. GDA2020 MGA Zone 55

RAAF Williams, Laverton

RAAF WILLIAMS, LAVERTON SURFACE WATER SAMPLING LOCATIONS

FIGURE 4

File Name: C:\Users\alliddy\JBS&G Australia\DCS - Internal - V2\Projects\Department of Defence\GIS\66022 - RAAF Williams\GIS\02_MapProjects\66022_RAAF_Laverton&PointCook_OMP_2026.aprx; Name:66022_04b_Laverton_SW_SamplingLocations 01
Reference: www.nearmap.com - Imagery Date: 17/03/2024



Legend

- Point Cook Site Boundary
- Point Cook Management Area
- Point Cook Source Area
- Waterbodies
- Watercourse

Target Aquifers

- Shallow Newer Volcanics Aquifer
- Shallow Sand Aquifer
- Intermediate Aquifer

JBS&G

Job No: 66022

Client: Department of Defence

Version: Rev A | Date: 12-May-2026

Drawn By: AL | Checked By: JS/ EH

Scale 1:12,000

0 250 500

metres

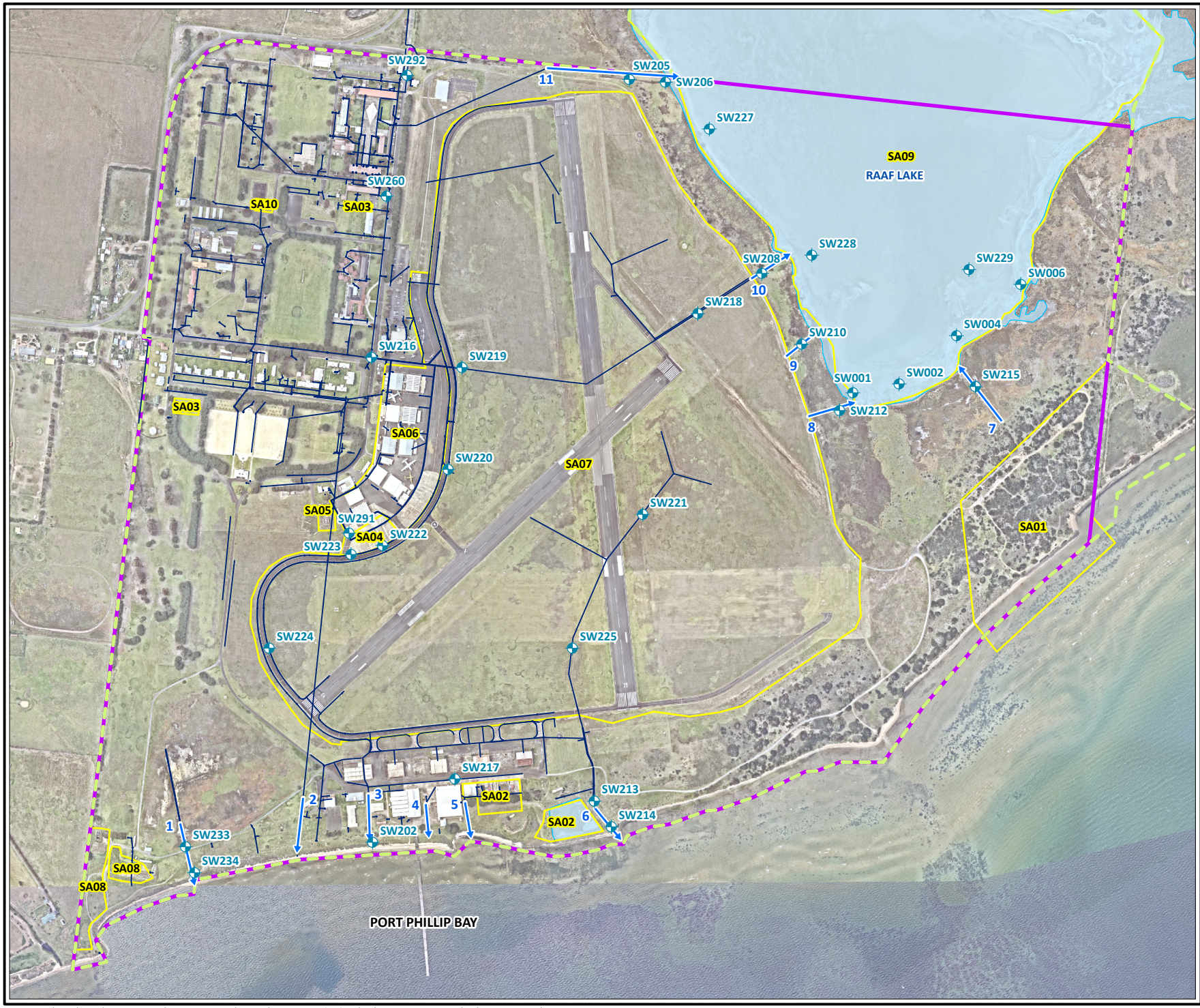
Coord. Sys. GDA2020 MGA Zone 55

RAAF Base Point Cook

RAAF BASE POINT COOK GROUNDWATER SAMPLING LOCATIONS

FIGURE 5A

File Name: C:\Users\aliddy\JBS&G Australia\DCS - Internal - V2\Projects\Department of Defence\GIS\66022 - RAAF Williams\GIS\02_MapProjects\66022_RAAF_Laverton&PointCook_OMP_2026.aprx; Name:66022_05a_PC_GW Locations_TA 01
Reference: www.nearmap.com - Imagery Date: 10/12/2025



Legend

- Point Cook Site Boundary
- Point Cook Management Area
- Point Cook Source Area
- Waterbodies
- Stormwater Drain
- Stormwater Infrastrucutre Flow Direction
- Surface Water Sampling Locations
- 1 Discharge Point

JBS&G

Job No: 66022

Client: Department of Defence

Version: Rev A	Date: 11-May-2026
Drawn By: AL	Checked By: GM

Scale 1:11,500

0 250 500

metres

Coord. Sys. GDA2020 MGA Zone 55

RAAF Base Point Cook

RAAF BASE POINT COOK SURFACE WATER SAMPLING LOCATIONS

FIGURE 5B

File Name: C:\Users\aliddy\JBS&G Australia\DCS - Internal - V2\Projects\Department of Defence\GIS\66022 - RAAF Williams\GIS\02_MapProjects\66022_RAAF_Laverton&PointCook_OMP_2026.aprx; Name:66022_05b_PC_SW_Sampling_Locations 01
Reference: www.nearmap.com - Imagery Date: 01/12/2025

APPENDIX C SAMPLE LOCATION INFORMATION

Note all coordinates are in projection 'GDA2020 MGA Zone 55', and coordinates have not been presented for off-Base sample locations.

Table C-1. RAAF Williams, Laverton – Sample Locations

Location ID	Location Type	Property	Easting	Northing
MW102	Groundwater - Shallow	On-Base	302687.38	5806734.66
MW103	Groundwater - Shallow	On-Base	302729.82	5806598.99
MW105	Groundwater - Shallow	On-Base	302921.77	5806649.94
MW107	Groundwater - Shallow	On-Base	303054.13	5806738.37
MW109	Groundwater - Shallow	On-Base	303283.85	5806787.69
MW110	Groundwater - Shallow	On-Base	303500.83	5806961.55
MW115	Groundwater - Shallow	On-Base	302706.34	5807872.56
MW117	Groundwater - Shallow	On-Base	302685.11	5807194.17
MW118	Groundwater - Shallow	On-Base	302689.62	5807069.21
MW120	Groundwater - Shallow	On-Base	302498.30	5806688.12
MW121	Groundwater - Shallow	Off-Base	-	-
MW123	Groundwater - Shallow	Off-Base	-	-
MW124	Groundwater - Shallow	Off-Base	-	-
MW126	Groundwater - Shallow	Off-Base	-	-
MW130	Groundwater - Shallow	Off-Base	-	-
MW131	Groundwater - Shallow	Off-Base	-	-
MW137	Groundwater - Shallow	Off-Base	-	-
MW138	Groundwater - Shallow	On-Base	303491.26	5806852.41
MW139	Groundwater - Shallow	On-Base	303450.40	5806941.05
MW140	Groundwater - Shallow	On-Base	303495.33	5807050.82
MW144	Groundwater - Shallow	On-Base	303197.91	5807203.44
MW146	Groundwater - Shallow	On-Base	303019.42	5807342.75
MW149	Groundwater - Shallow	On-Base	302299.32	5806432.96
MW151	Groundwater - Deep	On-Base	302300.89	5806421.73
MW152	Groundwater - Shallow	On-Base	302280.15	5806408.9
MW155	Groundwater - Shallow	On-Base	302443.03	5806586.26
MW163	Groundwater - Shallow	On-Base	302793.48	5807022.21
MW178	Groundwater - Shallow	On-Base	302602.571	5806540.43
MW181	Groundwater - Shallow	On-Base	302550.25	5806523.31
MW182	Groundwater - Shallow	On-Base	302599.21	5806504.93

Location ID	Location Type	Property	Easting	Northing
MW185	Groundwater - Shallow	On-Base	302485.67	5806605.94
MW188	Groundwater - Shallow	On-Base	302550.34	5806564.50
MW192	Groundwater - Shallow	On-Base	302333.74	5806445.40
MW200	Groundwater - Shallow	On-Base	302606.71	5806611.53
MW201	Groundwater - Shallow	On-Base	302638.49	5806549.10
MW207	Groundwater - Shallow	On-Base	302791.10	5806828.55
MW208	Groundwater - Shallow	On-Base	302802.22	5806982.58
MW211	Groundwater - Intermediate	On-Base	302667.38	5807389.40
MW217	Groundwater - Shallow	On-Base	302703.17	5807616.61
MW228	Groundwater - Shallow	Off-Base	-	-
MW229	Groundwater - Shallow	Off-Base	-	-
MW230	Groundwater - Shallow	Off-Base	-	-
MW245	Groundwater - Shallow	Off-Base	-	-
MW249	Groundwater - Shallow	Off-Base	-	-
MW250	Groundwater - Shallow	Off-Base	-	-
MW252	Groundwater - Shallow	Off-Base	-	-
MW253	Groundwater - Shallow	Off-Base	-	-
MW256	Groundwater - Shallow	Off-Base	-	-
MW257	Groundwater - Shallow	Off-Base	-	-
SW111	Surface Water - On-Base Drains	On-Base	302731.69	5807030.90
SW112	Surface Water - On-Base Drains	On-Base	302756.02	5806953.04
SW113	Surface Water - On-Base Drains	On-Base	302786.14	5806856.84
SW114	Surface Water - On-Base Drains	On-Base	302796.73	5806587.42
SW005	Surface Water - Doherty's Drain	On-Base	303563.00	5807650.00
SW006	Surface Water - Laverton Creek	On-Base	303594.00	5808237.00
SW008	Surface Water - Doherty's Drain	On-Base	302320.00	5807920.00
SW012	Surface Water - Skeleton Creek	Off-Base	-	-
SW013	Surface Water - Skeleton Creek	Off-Base	-	-
SW015	Surface Water - Laverton Creek	Off-Base	-	-
SW020	Surface Water - Skeleton Creek	Off-Base	-	-
SW024	Surface Water - Skeleton Creek	Off-Base	-	-
SW027	Surface Water - Urban Stormwater	Off-Base	-	-
SW030	Surface Water - Urban Stormwater	Off-Base	-	-
SW034	Surface Water - On-Base Drains	On-Base	302803.00	5806795.00
SW041	Surface Water - Skeleton Creek	Off-Base	-	-
SW042	Surface Water - Urban Stormwater	Off-Base	-	-

Location ID	Location Type	Property	Easting	Northing
SW043	Surface Water - On-Base Drains	On-Base	302259.00	5806401.00
SW045	Surface Water - Forsyth Road Drain	Off-Base	-	-
SW049	Surface Water - Skeleton Creek	Off-Base	-	-
SW052	Surface Water - Cheetham Creek	Off-Base	-	-
SW073	Surface Water - Skeleton Creek	Off-Base	-	-
SW078	Surface Water - Skeleton Creek	Off-Base	-	-
SW085	Surface Water - Sanctuary Lakes	Off-Base	-	-
SW086	Surface Water - Sanctuary Lakes	Off-Base	-	-
SW087	Surface Water - Sanctuary Lakes	Off-Base	-	-
SW088	Surface Water - Sanctuary Lakes	Off-Base	-	-

Table C-2. RAAF Base Point Cook – Sample Locations

Location ID	Location Type	Property	Easting	Northing
MW002	Groundwater: Shallow - NV	On-Base	302068.04	5800041.86
MW004	Groundwater: Shallow - NV	On-Base	302085.39	5799959.59
MW005	Groundwater: Shallow - NV	On-Base	301671.16	5799586.16
MW007	Groundwater: Shallow - NV	On-Base	302092.54	5799504.57
MW008	Groundwater: Shallow - NV	On-Base	302128.81	5799594.87
MW010	Groundwater: Shallow - NV	On-Base	301723.30	5799544.84
MW013	Groundwater: Shallow - NV	On-Base	301569.17	5799093.27
MW015	Groundwater: Shallow - NV	On-Base	302132.57	5799446.76
MW016	Groundwater: Shallow - NV	On-Base	302198.23	5799335.63
MW017	Groundwater: Shallow - NV	On-Base	302014.80	5799265.07
MW018	Groundwater: Shallow - NV	On-Base	302102.75	5799267.66
MW019	Groundwater: Shallow - NV	On-Base	302136.98	5799204.87
MW020	Groundwater: Shallow - sand	On-Base	302150.80	5798633.38
MW021	Groundwater: Shallow - sand	On-Base	302314.55	5798663.58
MW022	Groundwater: Shallow - NV	On-Base	302353.33	5798665.15
MW023	Groundwater: Shallow - NV	On-Base	302375.45	5798664.21
MW025	Groundwater: Shallow - sand	On-Base	303630.19	5799545.78
MW026	Groundwater: Shallow - NV	On-Base	301754.76	5799385.24
MW027	Groundwater: Shallow - NV	On-Base	301977.51	5799400.28
MW031	Groundwater: Shallow - sand	On-Base	301484.12	5798370.52
MW032	Groundwater: Shallow - NV	On-Base	301500.76	5798509.13
MW033	Groundwater: Shallow - NV	On-Base	301517.18	5798639.33

Location ID	Location Type	Property	Easting	Northing
MW034	Groundwater: Shallow - sand	On-Base	302319.89	5798629.38
MW035	Groundwater: Shallow - NV	On-Base	303031.12	5799766.62
MW039	Groundwater: Shallow - sand*	On-Base	303499.60	5799511.40
MW041	Groundwater: Shallow - sand	On-Base	303593.52	5799480.13
MW042	Groundwater: Shallow - sand	On-Base	303502.20	5799451.70
MW044	Groundwater: Intermediate	On-Base	303503.10	5799450.20
MW045	Groundwater: Shallow - sand	On-Base	303455.10	5799350.50
MW047	Groundwater: Shallow - sand	On-Base	303376.69	5799034.31
MW057	Groundwater: Shallow - NV*	On-Base	302027.17	5799236.90
MW062	Groundwater: Shallow - NV*	On-Base	302353.33	5798665.15
MW104	Groundwater: Shallow - NV	On-Base	302140.71	5799422.87
MW105	Groundwater: Shallow - sand	On-Base	301919.83	5798559.48
MW106	Groundwater: Shallow - NV	On-Base	302326.28	5798784.83
MW107	Groundwater: Shallow - sand	On-Base	302385.62	5798603.45
MW110	Groundwater: Shallow - sand	On-Base	303744.87	5799681.96
MW112	Groundwater: Shallow - NV	On-Base	301605.55	5798460.19
MW119	Groundwater: Shallow - sand	On-Base	303656.10	5799327.00
MW120	Groundwater: Shallow - sand	On-Base	303684.46	5799444.59
MW125	Groundwater: Shallow - sand	On-Base	303710.30	5799350.90
MW129	Groundwater: Shallow - sand	On-Base	303522.70	5799171.50
MW134	Groundwater: Shallow - sand	On-Base	303623.70	5799398.90
MW141	Groundwater: Shallow - sand	On-Base	303612.60	5799202.10
MW142	Groundwater: Shallow - sand	On-Base	303661.80	5799243.70
MW154	Groundwater: Shallow - sand*	On-Base	303462.70	5799088.20
MW158	Groundwater: Shallow - sand*	On-Base	303542.10	5799281.60
MW160	Groundwater: Shallow - sand*	On-Base	303570.80	5799368.30
MW166	Groundwater: Shallow - sand*	Off-Base	-	-
MW167	Groundwater: Shallow - sand*	Off-Base	-	-
MW168	Groundwater: Shallow - sand*	Off-Base	-	-
MW172	Groundwater: Intermediate	On-Base	303541.40	5799193.20
MW179	Groundwater: Intermediate	On-Base	303469.20	5799332.30
MW180	Groundwater: Intermediate	On-Base	303690.70	5799375.60
MW182	Groundwater: Intermediate	On-Base	303626.30	5799392.30
MW183	Groundwater: Intermediate	On-Base	303679.90	5799450.60
MW184	Groundwater: Intermediate	On-Base	303652.10	5799294.50
MW185	Groundwater: Intermediate	On-Base	303620.80	5799201.60

Location ID	Location Type	Property	Easting	Northing
MW201	Groundwater: Shallow - NV	On-Base	302572.55	5798573.83
MW202	Groundwater: Shallow - NV	On-Base	301699.52	5799533.39
MW203	Groundwater: Shallow - NV	On-Base	302100.85	5799969.29
MW204	Groundwater: Shallow - NV	On-Base	302104.88	5799268.27
MW205	Groundwater: Shallow - NV	On-Base	302012.79	5799256.63
MW206	Groundwater: Shallow - NV	On-Base	302167.33	5799313.91
MW207	Groundwater: Shallow - NV	On-Base	302252.11	5798959.78
MW211	Groundwater: Shallow - NV	On-Base	302230.04	5799430.33
MW212	Groundwater: Shallow - NV	On -Base	302001.62	5799292.69
MW215	Groundwater: Shallow - sand	On-Base	302992.40	5798754.81
MW216	Groundwater: Shallow - sand	On-Base	302011.88	5798587.01
MW218	Groundwater: Shallow - NV	On-Base	301611.78	5798577.07
MW219	Groundwater: Shallow - NV	On-Base	302163.30	5799313.34
MW220	Groundwater: Shallow - NV	On-Base	302300.81	5799442.34
MW221	Groundwater: Shallow - NV	On-Base	302897.59	5798880.64
SW001	Surface Water: RAAF Lake	On-Base	303184.86	5799559.82
SW002	Surface Water: RAAF Lake	On-Base	303287.99	5799579.62
SW004	Surface Water: RAAF Lake	On-Base	303416.10	5799687.07
SW006	Surface Water: RAAF Lake	On-Base	303559.35	5799801.44
SW202	Surface Water: PPB Discharge	On-Base	302113.53	5798557.38
SW205	Surface Water: RAAF Lake discharge	On-Base	302686.12	5800258.68
SW206	Surface Water: RAAF Lake discharge	On-Base	302766.75	5800252.62
SW208	Surface Water: RAAF Lake discharge	On-Base	302981.71	5799826.14
SW210	Surface Water: RAAF Lake	On-Base	303070.78	5799668.24
SW212	Surface Water: RAAF Lake discharge	On-Base	303155.35	5799520.34
SW213	Surface Water: PPB Discharge	On-Base	302608.17	5798649.20
SW214	Surface Water: PPB Discharge	On-Base	302646.12	5798591.99
SW215	Surface Water: RAAF Lake	On-Base	303458.18	5799573.69
SW216	Surface Water: On-Base Drains	On-Base	302111.20	5799638.81
SW217	Surface Water: On-Base Drains	On-Base	302297.21	5798698.83
SW218	Surface Water: On-Base Drains	On-Base	302839.01	5799736.44
SW219	Surface Water: On-Base Drains	On-Base	302313.04	5799616.16
SW220	Surface Water: On-Base Drains	On-Base	302281.86	5799389.02
SW221	Surface Water: On-Base Drains	On-Base	302716.19	5799288.70
SW222	Surface Water: On-Base Drains	On-Base	302136.07	5799218.91
SW223	Surface Water: On-Base Drains	On-Base	302065.63	5799199.34

Location ID	Location Type	Property	Easting	Northing
SW224	Surface Water: On-Base Drains	On-Base	301882.90	5798990.31
SW225	Surface Water: On-Base Drains	On-Base	302559.24	5798990.29
SW227	Surface Water: RAAF Lake	On-Base	302864.70	5800148.10
SW228	Surface Water: RAAF Lake	On-Base	303093.18	5799866.62
SW229	Surface Water: RAAF Lake	On-Base	303443.79	5799834.63
SW233	Surface Water: On-Base Drains	On-Base	301696.32	5798547.41
SW234	Surface Water: PPB Discharge	On-Base	301716.40	5798489.44
SW260	Surface Water: On-Base Drains	On-Base	302144.92	5799999.97
SW291	Surface Water: On-Base Drains	On-Base	302061.54	5799248.25
SW292	Surface Water: On-Base Drains	On-Base	302190.95	5800269.27

APPENDIX D OMP REVIEW

Table D-1. OMP monitoring location and frequency review

Location	Does the location inform the nature of PFAS at the site?	Does the location inform the extent of PFAS at the site?	Does the location inform the risk profile at the site?	Does the sampling frequency inform the risk profile?	OMP Review Outcome	Reason
RAAF Williams, Laverton:						
All locations	No	No	Yes	No	Reduce frequency of monitoring from six-monthly to annually	Groundwater and surface water monitoring has been underway for the Management Area since 2019. Based on recent review of data, there does not appear to be material seasonal variability in PFAS concentrations. Whilst temporal variability is observed at select locations, these variances have not resulted in a material change to the risk profile for the Management Area. On this basis, reduction of monitoring frequency to annually is considered appropriate.
All "gauge only" locations	No	No	Yes	N/A	Remove from OMP	A good understanding of groundwater flow direction has been established from previous monitoring, and it has been observed to be relatively stable. Gauging of only monitoring wells that are sampled is considered sufficient to assess material changes in groundwater flow direction.
MW149, MW151	Yes	Yes	Yes	N/A	Add locations to OMP	Improve understanding of PFAS concentrations in the vicinity of a former chemical drum storage area.

Location	Does the location inform the nature of PFAS at the site?	Does the location inform the extent of PFAS at the site?	Does the location inform the risk profile at the site?	Does the sampling frequency inform the risk profile?	OMP Review Outcome	Reason
MW178, MW181, MW188, MW201	Yes	Yes	Yes	N/A	Add locations to OMP	Assess extent of PFAS contamination downgradient of Building 7A – former electroplating area.
MW245, MW249	No	Yes	Yes	N/A	Add locations to OMP	Improve understanding of off-base PFAS contamination, downgradient of on-base source areas.
MW256, MW257	No	Yes	No	N/A	Add locations to OMP	Improve understanding of temporal variability in PFAS concentrations down and cross-gradient of the Former Primary Fire Training Area, now within the off-base area known as Williams Landing.
SW111, SW112, SW113, SW114.	Yes	Yes	No	N/A	Add locations to OMP	Improve understanding of PFAS concentrations within the stormwater drainage network of Source Area 1.
RAAF Base Point Cook:						
MW197, MW198, MW199, MW200, MW208, MW209, MW210	N/A	N/A	N/A	N/A	Remove from OMP	Proposed monitoring locations could not be installed due to access restrictions. Further assessment of groundwater interactions between Source Area 1 and RAAF Lake is to be considered outside of the OMP.
MW011	No	No	Yes	N/A	Remove from OMP	Two wells within the shallow aquifer are located in close proximity to one another adjacent this firefighting practice area PS31. A review of data

Location	Does the location inform the nature of PFAS at the site?	Does the location inform the extent of PFAS at the site?	Does the location inform the risk profile at the site?	Does the sampling frequency inform the risk profile?	OMP Review Outcome	Reason
						shows that PFAS concentrations at these two locations are consistent. MW010 is considered sufficient to monitor any change in conditions.
MW038, MW133, MW174	No	Yes	No	N/A	Remove from OMP	Rationalise the total number of groundwater monitoring wells within and in the vicinity of Source Area 01. 2025 OMP listed 17 and 8 locations targeting the shallow and intermediate aquifer respectively. A review of the data identified select locations with relatively low and stable PFAS concentrations that could be removed, whilst retaining a robust monitoring network. Note that further assessment of groundwater interactions between Source Area 1 and RAAF Lake is to be considered outside of the OMP.
MW003, MW024	N/A	N/A	N/A	N/A	Remove from OMP	These monitoring wells have not been able to be located in several mobilisations to site.
MW150, MW169	N/A	N/A	N/A	N/A	Remove from OMP	Monitoring wells were compromised due to coastal erosion in this area. These locations have now been decommissioned.
MW049, MW051, MW054, MW061,	N/A	N/A	N/A	N/A	Update OMP with replacement monitoring wells	These wells were observed to be compromised, and replacement monitoring well have been installed. These new locations are respectively: MW215, MW216, MW220, MW219, MW221, and MW218.

Location	Does the location inform the nature of PFAS at the site?	Does the location inform the extent of PFAS at the site?	Does the location inform the risk profile at the site?	Does the sampling frequency inform the risk profile?	OMP Review Outcome	Reason
MW064, MW103						
SW291	Yes	Yes	Yes	N/A	Add location to OMP	Improve understanding of PFAS concentrations within the stormwater drainage network of Source Area 4.
SW003, SW005, SW207, SW209, SW230	No	No	No	N/A	Remove from OMP	Rationalise total number of surface water locations from within RAAF Lake. 2025 OMP listed twelve surface water-monitoring locations within RAAF Lake, as well as seven locations targeting tributary drains. A review of the data shows limited spatial variability in PFAS concentrations within RAAF Lake. Reduction in total locations within RAAF Lake, whilst maintaining spatial coverage.
SW232, SW263, SW264, SW265	No	Yes	No	N/A	Remove from OMP	These locations were proposed to target specific stormwater drainage outlets that flow towards Port Phillip Bay. However, these stormwater assets were unable to be located after several inspections.
SW203	No	No	No	N/A	Remove from OMP	Two locations were proposed in close proximity to one another within the stormwater drainage network. A review of data shows that PFAS concentrations at these two locations are consistent. SW202 is considered sufficient to monitor any change in conditions.

APPENDIX E PFAS ANALYTICAL SUITE

Target analytes	
Perfluoroalkane sulfonic acids	
PFBS	Perfluorobutane sulfonic acid
PFPeS	Perfluoropentane sulfonic acid
PFHxS	Perfluorohexane sulfonic acid
PFHpS	Perfluoroheptane sulfonic acid
PFOS	Perfluorooctane sulfonic acid
PFDS	Perfluorodecane sulfonic acid
Perfluoroalkyl carboxylic acids	
PFBA	Perfluorobutanoic acid
PFPeA	Perfluoropentanoic acid
PFHxA	Perfluorohexanoic acid
PFHpA	Perfluoroheptanoic acid
PFOA	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFDA	Perfluorodecanoic acid
PFUnDA	Perfluoroundecanoic acid
PFDoDA	Perfluorododecanoic acid
PFTrDA	Perfluorotridecanoic acid
PFTeDA	Perfluorotetradecanoic acid
Perfluoroalkyl sulfonamides	
FOSA	Perfluorooctane sulfonamide
MeFOSA	N-Methyl perfluorooctane sulfonamide
EtFOSA	N-Ethyl perfluorooctane sulfonamide
MeFOSE	N-Methyl perfluorooctane sulfonamidoethanol
EtFOSE	N-Ethyl perfluorooctane sulfonamidoethanol
MeFOSAA	N-Methyl perfluorooctane sulfonamidoacetic acid
EtFOSAA	N-Ethyl perfluorooctane sulfonamidoacetic acid
(n:2) Fluorotelomer sulfonic acids	
4:2 FTS	4:2 Fluorotelomer sulfonic acid
6:2 FTS	6:2 Fluorotelomer sulfonic acid
8:2 FTS	8:2 Fluorotelomer sulfonic acid
10:2 FTS	10:2 Fluorotelomer sulfonic acid

APPENDIX F GROUNDWATER WELL DETAILS

Table F-1. RAAF Williams, Laverton – Groundwater Well Details

Well ID	Target Aquifer	Screen Interval (mbgl)	Well Depth (mbTOC)	TOC (mAHD)	Construction
MW102	Shallow	9.2-10.2	10.69	10.986	Monument
MW103	Shallow	4.7-6.7	6.78	10.785	Monument
MW105	Shallow	3.2-6.2	7.11	10.477	Monument
MW107	Shallow	4-8	8.57	11.628	Monument
MW109	Shallow	4-7	7.86	11.054	Monument
MW110	Shallow	4-9	9.92	11.41	Monument
MW115	Shallow	9-15	15.64	21.118	Monument
MW117	Shallow	4-9	9.72	14.118	Monument
MW118	Shallow	5-8	7.51	13.073	Flush mount
MW120	Shallow	4-9	8.85	11.316	Flush mount
MW121	Shallow	7.3-10.3	9.8	4.842	Flush mount
MW123	Shallow	5.5-7.5	8.495	5.97	Flush mount
MW124	Shallow	5-7	7.2	10.79	Flush mount
MW126	Shallow	3.3-6.3	6.96	9.224	Flush mount
MW130	Shallow	6.86-9.85	9.5	15.824	Flush mount
MW131	Shallow	7.1-10.1	9.89	17.146	Flush mount
MW137	Shallow	7.2-10.2	10.03	18.026	Flush mount
MW138	Shallow	5-8	8.77	10.72	Flush mount
MW139	Shallow	6.5-9.5	9.31	11.076	Flush mount
MW140	Shallow	6.5-9.5	9.24	10.437	Flush mount
MW144	Shallow	2-5 #	9	12.656	Monument
MW146	Shallow	6-12	12	13.145	Monument
MW149	Shallow	5.0-9.0	9	11.41	Flush mount
MW151	Deep	14.5-18.5	18.5	11.346	Flush mount
MW152	Shallow	5-7.8	8.039	11.338	Flush mount
MW155	Shallow	5-8	8.1	11.646	Flush mount
MW163	Shallow	5-11.5	11.54	12.87	Flush mount
MW178	Shallow	4.3-7.1	7.3	11.096	Flush mount
MW181	Shallow	3.5-7.4	7.9	11.171	Flush mount
MW182	Shallow	5-7	8.01	12.036	Flush mount
MW185	Shallow	5-8	7.75	11.338	Flush mount
MW188	Shallow	4.2-6.8	6.71	11.223	Flush mount

Well ID	Target Aquifer	Screen Interval (mbgl)	Well Depth (mbTOC)	TOC (mAHD)	Construction
MW192	Shallow	5-8.8	8.79	11.559	Flush mount
MW200	Shallow	4-7	7	10.733	Flush mount
MW201	Shallow	5-7	7.2	11.06	Flush mount
MW207	Shallow	4.8-7.7	7.8	11.681	Flush mount
MW208	Shallow	5-8.8	9.3	12.91	Flush mount
MW211	Intermediate	7-13	13.41	14.37	Monument
MW217	Shallow	8-12	13.5	17.236	Flush mount
MW228	Shallow	4-7	7.5	5.71	Flush mount
MW229	Shallow	8.1-10.1	10.1	7.66	Flush mount
MW230	Shallow	4-7	7.5	8.4	Flush mount
MW245	Shallow	6.5-9.5	9.5	8.166	Flush mount
MW249	Shallow	4.5-9.5	9.5	14.4	Flush mount
MW250	Shallow	2.3-6.8	6.8	15.51	Flush mount
MW252	Shallow	4.6-7.6	7.6	9.96	Flush mount
MW253	Shallow	5.5-9.9	9.9	12.2	Flush mount
MW256	Shallow	4.6-7.6	7.348	14.912	Flush mount
MW257	Shallow	5.5-10	9.927	16.13	Flush mount

Table note:

– suspect well construction details, to be confirmed by down well inspection during the next sampling event.

Table F-2. RAAF Base Point Cook – Groundwater Well Details

Well ID	Target Aquifer	Screen Interval (mbgl)	Well Depth (mbTOC)	TOC (mAHD)	Construction
MW002	Shallow - NV	0.7-2.7	2.78	4.704	Flush mount
MW004	Shallow - NV	2.2-5.2	5.02	4.315	Flush mount
MW005	Shallow - NV	2.4-4.4	4.42	5.972	Flush mount
MW007	Shallow - NV	1.5-3.5	3.43	3.602	Flush mount
MW008	Shallow - NV	1.5-4.5	3.85	3.661	Flush mount
MW010	Shallow - NV	2.5-5.0	4.95	5.412	Flush mount
MW013	Shallow - NV	1.4-4.4	4.31	3.481	Monument
MW015	Shallow - NV	1.5-4.0	4.02	3.425	Flush mount
MW016	Shallow - NV	2.0-5.0	4.49	3.292	Flush mount
MW017	Shallow - NV	1.5-4.0	4.01	3.719	Flush mount
MW018	Shallow - NV	1.5-4.0	3.9	3.31	Flush mount
MW019	Shallow - NV	1.5-4.5	4.46	3.091	Flush mount
MW020	Shallow - sand	1.3-2.6	3.6	2.178	Monument
MW021	Shallow - sand	1.4-4.2	4.02	2.566	Flush mount
MW022	Shallow - NV	3.6-5.6	5.53	2.361	Flush mount
MW023	Shallow - NV	2.4-5.15	5.1	2.465	Flush mount
MW025	Shallow - sand	1.45-4.45	4.95	2.751	Monument
MW026	Shallow - NV	2.6-6.3	7.31	5.973	Monument
MW027	Shallow - NV	1.0-5.0	5.85	4.55	Monument
MW031	Shallow - sand	0.7-2.0	2.64	2.036	Monument
MW032	Shallow - NV	0.5-3.1	3.62	3.404	Monument
MW033	Shallow - NV	1.1-5.6	6.34	3.035	Monument
MW034	Shallow - sand	0.9-3.9	4.57	3.507	Monument
MW035	Shallow - NV	0.8-3.8	3.81	3.415	Monument
MW039	Shallow - sand*	1.9-4.6	4.58	2.193	Monument
MW041	Shallow - sand	0.75-7.5	6.86	2.355	Monument
MW042	Shallow - sand	1.2-6	5.02	2.901	Monument
MW044	Intermediate	7-9	9.94	2.888	Monument
MW045	Shallow - sand	1-6	5.845	2.466	Monument
MW047	Shallow - sand	2-3	3.04	2.415	Monument
MW057	Shallow - NV*	2.5-5.8	5.83	3.439	Monument
MW062	Shallow - NV*	3.6-5.6	5.53	2.361	Monument
MW104	Shallow - NV	1.9-4.9	4.83	3.477	Monument
MW105	Shallow - sand	0.6-1.8	2.799	2.327	Monument

Well ID	Target Aquifer	Screen Interval (mbgl)	Well Depth (mbTOC)	TOC (mAHD)	Construction
MW106	Shallow - NV	1.5-3.0	2.98	2.272	Monument
MW107	Shallow - sand	2.0-4.0	5.029	2.974	Monument
MW110	Shallow - sand	0.5-2.0	3.52	2.312	Monument
MW112	Shallow - NV	2.5-4.5	5.49	2.578	Monument
MW119	Shallow - sand	0.5-4	4.65	2.09	Monument
MW120	Shallow - sand	1-4.5	5.4	2.402	Monument
MW125	Shallow - sand	0.7-3.7	4.5	2.353	Monument
MW129	Shallow - sand	0.4-3.4	4.41	2.725	Monument
MW134	Shallow - sand	6.25-9.25 #	3.865	2.353	Monument
MW141	Shallow - sand	0.7-3.1	3.64	2.6	Monument
MW142	Shallow - sand	0.7-3	3.56	2.851	Monument
MW154	Shallow - sand*	1.0-3.0	2.91	2.24	Monument
MW158	Shallow - sand*	1.5-3.8	3.88	2.034	Monument
MW160	Shallow - sand*	1.6-3.3	3.32	2.503	Monument
MW166	Shallow - sand*	1.6-3.7	3.67	2.726	Monument
MW167	Shallow - sand*	1.5-3.8	3.83	2.018	Monument
MW168	Shallow - sand*	1.6-3.7	3.67	2.408	Monument
MW172	Intermediate	5.5-8	8.41	2.271	Monument
MW179	Intermediate	5.7-8.3	8.32	2.809	Monument
MW180	Intermediate	4-6.8	6.77	2.342	Monument
MW182	Intermediate	2-4.2	4.14	2.603	Monument
MW183	Intermediate	3.0-9.0 #	9.04	1.762	Monument
MW184	Intermediate	7-9.9	9.86	1.602	Monument
MW185	Intermediate	6.2-9.2 #	3.72	2.412	Monument
MW201	Shallow - NV	1.5-3.0	3	4.32	Monument
MW202	Shallow - NV	3-6	6	5.81	Flush mount
MW203	Shallow - NV	4-7	7	4.374	Flush mount
MW204	Shallow - NV	5-8	8	7.405	Flush mount
MW205	Shallow - NV	7-10	10	7.642	Flush mount
MW206	Shallow - NV	7-10	10	7.382	Flush mount
MW207	Shallow - NV	5.5-8.5	8.5	2.613	Flush mount
MW211	Shallow - NV	10.5-13.5	13.5	3.241	Flush mount
MW212	Shallow - NV	6.3-9.3	9.3	7.83	Flush mount
MW215	Shallow - sand	1.0-2.0	2.95	2.328	Monument
MW216	Shallow - sand	0.5-2	1.698	1.073	Flush mount

Well ID	Target Aquifer	Screen Interval (mbgl)	Well Depth (mbTOC)	TOC (mAHD)	Construction
MW218	Shallow - NV	0.5-4	3.938	1.942	Flush mount
MW219	Shallow - NV	1.5-3	3.005	3.335	Flush mount
MW220	Shallow - NV	2-3.5	3.5	2.82	Flush mount
MW221	Shallow - NV	2.7-4.2	4.2	2.46	Flush mount

Table notes:

–well construction details confirmed by down well inspection during an OMP sampling event.

Bore logs were unavailable to confirm the Target Aquifers denoted with an "*". These target aquifers have been assigned based on a review of the surrounding wells and known screen interval depth.