



# Ramsar Information Sheet

Published on 25 March 2025

Update version, previously published on : 1 January 1998

## Australia Jocks Lagoon



Designation date	16 November 1982
Site number	258
Coordinates	41°20'40"S 148°18'30"E
Area	18,58 ha

## Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

## 1 - Summary

### Summary

Jocks Lagoon is a small dystrophic freshwater lagoon, lying primarily on privately owned land and partly in the St Helens Conservation Area. It is one of a chain of lagoons, swamps and wetlands occurring along St Helens providing a freshwater resource in an otherwise dry coastal area. Jocks Lagoon was considered to have the highest wetland values in the area. The Lagoon is a high-quality representative example of this type of wetland in the region. The aquatic flora of the lagoon is diverse and includes several rare species (Section 3.2).

The dominant vegetation community within the lagoon itself is freshwater aquatic sedgeland and rushland, with several beds of tall sedges and water ribbons as emergent plants. Spreading sword sedge open sedgeland and jointed twig-rush dominate a small edge zone on the south-west side in a mixture with scrub. Melaleuca swamp forest dominates along the eastern side of the lagoon. On higher ground these communities become coastal heathland and acacia coastal scrub with some areas dominated by the introduced marram grass. Most of the vegetation communities on the site are threatened in Tasmania. The site also contains six regionally rare plant species: jointed twig-rush; slender twig-rush, zig-zag bog-sedge, twiggy guinea-flower, yellow onion-orchid and erect marsh-flower.

The lagoon supports microcrustaceans and macrocrustaceans, including burrowing freshwater crayfish. The brown froglet and eastern banjo frog also occur within the site.

Most of the site is private freehold land, with a small section at the south-east end falling within the St Helens Point Conservation Area. The site is mainly used for conservation and recreation.

The Jocks Lagoon Ramsar Site meets two of the nine criteria:

Criterion 1: The Jocks Lagoon Ramsar Site is in the Tasmanian Australian Drainage Division. It is a representative example of a coastal freshwater lagoon in good condition.

Criterion 3: The Jocks Lagoon Ramsar Site is in the Tasmanian Australian Drainage Division. It provides wetland habitat for six threatened flora species considered to be at risk in Tasmania.

The site may also meet criterion 4. Jocks Lagoon is a locally important freshwater aquatic habitat in an otherwise dry and saline area. The site may provide habitat during waterbird breeding and/or as a nursery site. Swans and cygnets have previously been recorded on the wetland. This criterion will be reassessed when information is available.

## 2 - Data & location

### 2.1 - Formal data

#### 2.1.1 - Name and address of the compiler of this RIS

##### Responsible compiler

Institution/agency	Department of Climate Change, Energy, the Environment and Water (DCCEEW)
Postal address	GPO Box 3090 Canberra ACT 2601 Australia

##### National Ramsar Administrative Authority

Institution/agency	Department of Climate Change, Energy, the Environment and Water (DCCEEW)
Postal address	GPO Box 3090 Canberra ACT 2601 Australia

#### 2.1.2 - Period of collection of data and information used to compile the RIS

From year

To year

#### 2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)

#### 2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary Yes  No

(Update) B. Changes to Site area No change to area

(Update) For secretariat only: This update is an extension

#### 2.1.5 - Changes to the ecological character of the Site

(Update) 6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS? Not evaluated

(Update) Optional text box to provide further information

Whilst there has been no notifiable change in ecological character, the Jocks Lagoon Ramsar site has been subject to a changing climate.

Australia has warmed by an average of 1.4°C (higher than the global average of 1°C) since national records began in 1910, leading to an increased frequency of extreme heat waves. Further increases in temperature are projected, with more extremely hot days and fewer extremely cool days over the coming decades under all emissions scenarios (BOM and CSIRO 2020, BOM and CSIRO 2020a).

These conditions will affect the critical components, processes and services of the Ramsar site. The adaptive capacity and resilience of the site will be tested.

Climate projections and information available to guide wetland management under a changing climate is continually evolving. This and other relevant sections of the RIS will be reviewed and updated as significant advances are made.

## 2.2 - Site location

### 2.2.1 - Defining the Site boundaries

b) Digital map/image  
<1 file(s) uploaded>

Former maps

##### Boundaries description

The boundary of Jocks Lagoon Ramsar site includes all of Lot 1 on Central Plan Register (CPR) 5655 (Central Plan Office, Tasmania Department of Natural Resources and Environment). CPR 5655 horizontal datum is Australian Geodetic Datum (AGD66) Universal Transverse Mercator Projection Australian Map Grid (UTM AMG66) and Australian Height Datum (Tasmania) for vertical datum.

Geographical coordinates: Latitude: 41 degrees 20' 41.9" South; Longitude: 148 degrees 18' 29.4" East

2.2.2 - General location

- a) In which large administrative region does the site lie?
- b) What is the nearest town or population centre?

2.2.3 - For wetlands on national boundaries only

- a) Does the wetland extend onto the territory of one or more other countries? Yes  No
- b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes  No

2.2.4 - Area of the Site

- Official area, in hectares (ha):
- Area, in hectares (ha) as calculated from GIS boundaries

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Other scheme (provide name below)	East Coast Region, Tasmanian Drainage Division

Other biogeographic regionalisation scheme

Within Australia, the Australian Hydrological Geospatial Fabric (Geofabric), Integrated Marine Coastal Regionalisation of Australia (IMCRA) and/ or the Interim Biogeographic Regionalisation for Australia (IBRA) are the biogeographic regionalisation schemes typically used.

Bureau of Meteorology (2012). Australian Hydrological Geospatial Fabric (Geofabric): Topographic Drainage Divisions and River Regions – East Coast Region, Tasmania. ([http://www.bom.gov.au/water/geofabric/documents/BOM002\\_Map\\_Poster\\_A3\\_Web.pdf](http://www.bom.gov.au/water/geofabric/documents/BOM002_Map_Poster_A3_Web.pdf)).

The Australian Hydrological Geospatial Fabric (Geofabric) is a specialised Geographic Information System (GIS). It registers the spatial relationships between important hydrological features such as rivers, water bodies, aquifers and monitoring points. The National Topographic Drainage Divisions and River Regions are currently derived from Geofabric version 2. These provide a set of surface water reporting units based on drainage-enforced digital elevation models and are used to depict where water flows and drains across the landscape.

### 3 - Why is the Site important?

#### 3.1 - Ramsar Criteria and their justification

Criterion 1: Representative, rare or unique natural or near-natural wetland types

Hydrological services provided

Jock's Lagoon provides a freshwater resource in a dry coastal area. Little is known of the hydrological values of the site, however the source of water appears to be groundwater and surface flow, derived from a small local catchment which enters the lagoon via a small creek (Lloyd, pers.obs. 2009).

Other ecosystem services provided

Jocks Lagoon is in near natural condition, with minimal disturbance. There is dense vegetation cover within the site and its surrounds, minimising erosion of the site, which is considered to be in good geomorphic condition (Dunn 2005).

Jock's Lagoon contains 4 wetland types:

- coastal freshwater lagoons (Ramsar type K) – this includes open water in the northern half of the lagoon, and reed in the southern half of the lagoon.
- saline water shores (E) – these are primarily exposed areas of sand around the lagoon. There is little vegetation in this area, apart from the occasional tussock of sedge, rush or grass. There may be isolated individual water ribbons. During higher flows, these areas are shallow (5-20cm deep).
- freshwater lakes and pools (of less than 8 ha) (Ts) – this area contains large areas of pithy swordsgedge, with other sedge/ rush species present.
- non-forested freshwater marshes on peat soils (U) – this peatland contains areas with shrubs and ferns, and areas with mats of Sphagnum moss and sundews (Drosera sp.) interspersed with sedges. During dry periods, this area remains a soak and can be waterlogged. Under heavy rainfall it may be 20 -50cm underwater.

Criterion 3 : Biological diversity

<p>Justification</p>	<p>Jocks Lagoon is important for regional biodiversity as it supports species that are rare, poorly reserved and/ or scientifically valuable. It provides wetland habitat for six threatened flora species considered to be at risk in Tasmania. These are:</p> <ul style="list-style-type: none"> <li>• jointed twig-rush (<i>Baumea articulata</i>, accepted name <i>Machaerina articulata</i>) listed as rare under the Tasmanian Threatened Species Protection Act 1995 (TSP Act). Jocks Lagoon is one of the few wetlands in Tasmania containing the jointed twig sedge and is considered a key site for the species (DPIW 2009a). In Tasmania, jointed twig-rush is associated with rivers on the north-east coast (DPIW 2009a);</li> <li>• slender twig-rush (<i>Baumea gunnii</i>) (rare, TSP Act) - inhabits wet moors, creeks and riverbanks in Tasmania (DPIW 2009a). It was first recorded at the site in 2009;</li> <li>• zig-zag bog-sedge (<i>Schoenus brevifolius</i>) (rare, TSP Act) - only occurs in six localities on the Tasmanian rare species database (DPIW 2009a). It was first recorded at the site in a in 2009. In Tasmania, zig-zag bog-sedge grows in shallow water around the fringes of lagoons in the north-east (DPIW 2009a);</li> <li>• twiggy guinea-flower (<i>Hibbertia virgata</i>) (rare, TSP Act) - occurs in sandy heaths and open woodlands in the north-east (DPIPWE 2021). It was first recorded at the site in 2009 ;</li> <li>• yellow onion-orchid (<i>Microtis atrata</i>) (rare, TSP Act) - occurs in habitats subject to periodic inundation such as swamps, depressions and soaks (DPIW 2009a). It was first recorded at the site in a in 2009; and</li> <li>• erect marsh-flower (<i>Villarsia exaltata</i>, accepted name <i>Liparophyllum exaltatum</i>) is listed as rare (TSP Act). This species occurs in the north east of Tasmania and Jocks Lagoon is one of the key sites for the species. It grows in stationary or slow flowing water to a depth of 50cm (DPIW 2009a).</li> </ul> <p>At the time of designation, only the jointed twig-rush and the erect marsh-flower were recorded at the site. The yellow onion-orchid, twiggy guinea-flower, slender twig-rush and the zig-zag bog-sedge were recorded at the site in a 2009 botanical survey undertaken by Micah Visoiu (DPIPWE botanist) and are likely to occur there now.</p> <p>The site includes three threatened native vegetation communities listed on Schedule 3 of the Tasmanian Nature Conservation Act 2002. These are: melaleuca <i>ericifolia</i> swamp forest, freshwater aquatic herbland, and freshwater aquatic sedgeland and rushland (Harris and Kitchener 2005).</p> <p>The dinoflagellate <i>Prorocentrum playfairi</i> is present at the site (Croome and Tyler 1987). The genus <i>Prorocentrum</i> was previously thought to be entirely marine and is therefore of scientific interest. Jocks Lagoon is one of only seven known sites where this species exists.</p>
<p>Optional text box to provide further information</p>	<p>Jock's Lagoon provides a freshwater habitat in an otherwise dry and saline area. As such, it may provide value as a refuge for some species.</p> <p>Large numbers of young birds have been observed at the site, indicating that it may be used for breeding or as a nursery site for waterbird species such as the black swan (<i>Cygnus atratus</i>).</p> <p>Further information is needed to determine the site's importance as a breeding, nursery and/ or drought refuge for waterbirds and/or other species.</p>

3.2 - Plant species whose presence relates to the international importance of the site

Phylum	Scientific name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
<b>Plantae</b>								
TRACHEOPHYTA/ MAGNOLIOPSIDA	<i>Hibbertia virgata</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	State Listed Threatened species (TSP Act): Rare	State Listed Threatened species. Jock's Lagoon provides habitat for this species.
TRACHEOPHYTA/ MAGNOLIOPSIDA	<i>Liparophyllum exaltatum</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	State Listed Threatened species (TSP Act): Rare	State listed threatened species. Jocks Lagoon is a key site for the species. This species was formerly known as Villarsia exaltata
TRACHEOPHYTA/ LILIOPSIDA	<i>Machaerina articulata</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	State Listed Threatened species (TSP Act): Rare	Jocks Lagoon is a key site for the species
TRACHEOPHYTA/ LILIOPSIDA	<i>Machaerina gunnii</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	State Listed Threatened species (TSP Act): Rare	Jocks Lagoon is a key site for the species
TRACHEOPHYTA/ LILIOPSIDA	<i>Microtis atrata</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	State Listed Threatened species (TSP Act): Rare	Jocks Lagoon is a key site for the species
TRACHEOPHYTA/ LILIOPSIDA	<i>Schoenus brevifolius</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	State Listed Threatened species (TSP Act): Rare	State listed threatened species, only found in 6 locations in Tasmania. Jock's Lagoon is a key site for the species

The site supports vegetation species that are rare in Tasmania.

The six rare wetland-dependent species that occur in Jocks Lagoon have specific habitat requirements, including hydrological regime and substrate characteristics.

During a technical experts' workshop, the giant spike rush (*Eleocharis sphacelata*) was noted as being able to tolerate deeper waters than the rare jointed twig-rush (*Machaerina articulata*) and the jointed twig-rush was able to tolerate more saline substrate (though still only slightly saline) than the giant spike rush.

The giant spike rush occupies areas of the reed habitat (Ramsar wetland type K) up to one metre deep, with jointed twigsedge around the margin. Although the giant spike rush may tolerate more shallow waters, the substrate may be slightly saline in the shallows. The jointed twigsedge therefore occupies the periphery of the reed habitat, bordering the peat habitat (Ramsar wetland type U)

The substrate of the giant spike rush and jointed twig sedge is typically sandy, grading into peat below the erect marsh -flower (*Liparophyllum exaltatum*). The erect marsh-flower also thrives around the transition of the reed and peat habitat, but more so into the peat.

The zig-zag bog-sedge (*Schoenus brevifolius*) is described as growing in shallow water around the fringes of lagoons in northeast Tasmania (DPIW 2009a) although it is noted in New South Wales as ranging from swamps through to damp heath (National Herbarium of NSW 2010) and in wet heathland in Victoria (State of Victoria 2010). At the site, this species was noted as occurring in the sedgeland (Ramsar wetland type Ts).

In Tasmania, the yellow onion-orchid (*Microtis atrata* / *Microtidium atratum*) is uncommon and localised in coastal and near-coastal lowland areas, almost exclusively in the northeast and the Furneaux islands (DPM 2009a). It occurs in habitats that are poorly drained, such as swamps, depressions and soaks. It has been recorded from herbfield, sedgeland, grassland, and heathland on peats, as well as roadside drains and winter-wet pastures (DPIW 2009a). The base of the plant is usually in water and can be wholly submerged in wet years. It is possible that this species occurs in the sedgeland (wetland type Ts), peat (wetland type U) and/or the wet heath habitat of the site.

Jocks Lagoon also contains the dinoflagellate *Prorocentrum playfairi* (Croome and Tyler 1987). The genus *Prorocentrum* was previously thought to be entirely marine and is therefore of scientific interest. Jocks Lagoon is one of only seven known sites where this species exists. The presence of this species at the site provides further justification for the site supporting populations important for regional biodiversity. Jock's Lagoon provides key habitat for this species in an otherwise dry/ saline landscape.

### 3.3 - Animal species whose presence relates to the international importance of the site

1) Percentage of the total biogeographic population at the site

<no data available>

### 3.4 - Ecological communities whose presence relates to the international importance of the site

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
Melaleuca ericifolia swamp forest	<input type="checkbox"/>	Melaleuca ericifolia swamp forest typically occurs as pure or almost pure stands of Melaleuca ericifolia with trees generally 10 – 12 m in height (but reaching 20 m) forming a dense canopy.	Listed threatened native vegetation community under Tasmanian Nature Conservation Act 2002
Freshwater aquatic herbland	<input type="checkbox"/>	Freshwater aquatic herbland is characterised by the presence of standing permanent or semipermanent freshwater that supports aquatic and/or emergent herbaceous vegetation.	Listed threatened native vegetation community under Tasmanian Nature Conservation Act 2002
Freshwater aquatic sedgeland and rushland	<input type="checkbox"/>	Freshwater aquatic sedgeland and rushland includes wetlands dominated by sedges and rushes, with salinity ranging from fresh to brackish that occupy a diverse array of habitats from coastal to subalpine areas.	Listed threatened native vegetation community under Tasmanian Nature Conservation Act 2002

[Optional text box to provide further information](#)

Whilst not nationally listed as threatened, the site includes three ecological communities that are listed at the state level:

- Melaleuca ericifolia swamp forest - typically occurs as pure or almost pure stands of Melaleuca ericifolia with trees generally 10 – 12 m in height (but reaching 20 m) forming a dense canopy. This community is listed as a threatened native vegetation community under Tasmanian Nature Conservation Act 2002.
- Freshwater aquatic herbland - is characterised by the presence of standing permanent or semipermanent freshwater that supports aquatic and/or emergent herbaceous vegetation. This community is listed as a threatened native vegetation community under Tasmanian Nature Conservation Act 2002.
- Freshwater aquatic sedgeland and rushland - includes wetlands dominated by sedges and rushes, with salinity ranging from fresh to brackish that occupy a diverse array of habitats from coastal to subalpine areas. This community is listed as a threatened native vegetation community under Tasmanian Nature Conservation Act 2002.

Listed threatened native vegetation communities cannot be cleared without formal approval, and only then in exceptional circumstances.

## 4 - What is the Site like? (Ecological character description)

### 4.1 - Ecological character

The critical components and processes for the Jocks Lagoon Ramsar site are:

- **Wetland vegetation habitat types:** Wetland vegetation is a critical component of the site, contributing substantially to its ecological character and providing the habitat and species that form the basis of the site’s ecological services. Unfortunately, there has been no systematic sampling of the site and therefore little information can be provided. There are four Ramsar wetland habitat types present at the site; K, U, Ts and E.
- **Rare plant species:** The six rare, wetland-dependent plant species that occur in the Jocks Lagoon Ramsar site have specific habitat requirements, including hydrologic regime and substrate characteristics.
- **Water quality:** Very few water quality assessments have been conducted at Jocks Lagoon and those that have focus on pH, turbidity, conductivity and selected nutrients. Jocks Lagoon is described as a dystrophic coastal lagoon, which is consistently acidic; with a pH of between 4.6-6.28 (Blackhall et al. 2003, Bowling et al. 1993, Croome and Tyler 1987, Horwitz 1992 and Walsh et al. 2002). The lagoon is typically clear, with a very low turbidity of 0.6 nephelometric turbidity units measured by Horwitz (1992). The site can be slightly brackish, as it ranges between 310 and 580 µS/ cm (at 25°C ) (Bowling et al. 1993, Croome and Tyler 1987 and Horwitz, 1992) and is identified by Walsh et al. (2002) as having higher salinity levels than most west coast lagoons.
- **Hydrology:** There are no known studies on any aspect of the hydrology of Jocks Lagoon. However, the lagoon regularly fills to at least the top of the berm separating the open water from the sedgeland marsh, occurring approximately every two to three years (landholder, personal communication). The source of water appears to be local groundwater and surface flow, derived from a local catchment which enters the lagoon via a small drainage line (Lloyd, pers.obs. 2009). The lagoon has a maximum water depth of between two and three metres (from LiDAR mapping), though after the drought it may have only been one and half metres deep (Blackhall et al 2003; authors’ observations). Walsh et al. (2002) suggest it is too shallow to stratify. The tannin staining of the lagoon suggests significant groundwater input (Polly Buchhorn, NRM Facilitator, Break O’Day Council, personal communication), through the peat layer noted to be underlying the lagoon bed sands. The source of the tannin colour is the polyhumic acids (Croome and Tyler 1987) from the peat and organic soils of the slopes (particularly the peat sedgeland and tea tree vegetation types) and under the lagoon bed. There are also significant surface inflows which are also tannin-stained from the inflow creek (and the upstream dams; author’s observation and Polly Buchhorn, NRM Facilitator, Break O’Day Council, personal communication).

The paucity of aquatic life observed in the lagoon waters at the end of a very prolonged drought, juxtaposed against the abundant aquatic life observed following the lagoon’s reconnection with the adjacent sedgeland, support the importance of the hydrological regime as a critical component of the site.

The critical benefits and services of the site are:

- **Supporting representative wetland types:** the site supports coastal freshwater lagoons; sandy shores and dune slacks; intermittent sedge marsh; and non-forested peatlands.
- **Supporting regionally rare/threatened species:** the range of wetland habitats, from open water through sand to peatland and marsh, provide the variation in environments required to support regionally threatened flora.
- **Supporting biodiversity:** the provision of the range of habitats supports a range of biota. The presence of freshwater habitat within the dune system, provides freshwater in an otherwise dry and saline environment.

### 4.2 - What wetland type(s) are in the site?

#### Marine or coastal wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
E: Sand, shingle or pebble shores	Freshwater, aquatic herbland	2	2.2	Representative
K: Coastal freshwater lagoons	Freshwater, aquatic herbland	1	4.4	Representative

#### Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Fresh water > Marshes on inorganic soils >> Ts: Seasonal/ intermittent freshwater marshes/ pools on inorganic soils	Freshwater aquatic sedgeland and rushland	3	1	Representative
Fresh water > Marshes on peat soils >> U: Permanent Non-forested peatlands	Wetland heath (SHW)	4	0.8	Representative

#### Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Wet heath, coastal woodland, Melaleuca scrub,	
coastal woodland	
Melaleuca scrub	

(ECD) Habitat connectivity

Jocks Lagoon is one of a chain of lagoons, swamps and wetlands occurring along St Helens Point.

### 4.3 - Biological components

### 4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTA/LILIOPSIDA	<i>Cynogeton procerum</i>	covers a significant area of wetland type K
TRACHEOPHYTA/LILIOPSIDA	<i>Eleocharis sphacelata</i>	covers a significant area of wetland type K. Reeds provide shelter for waterbirds at the site.
TRACHEOPHYTA/LILIOPSIDA	<i>Lepidosperma longitudinale</i>	covers a significant area of wetland type K. Reeds provide shelter for waterbirds at the site.

Invasive alien plant species

Phylum	Scientific name	Impacts	Changes at RIS update
TRACHEOPHYTAMAGNOLIOPSIDA	<i>Hypochoeris radicata</i>	Potential	unknown

Optional text box to provide further information

**Noteworthy flora:**

Jocks Lagoon includes populations of the following novel or endemic protists:

- *Lecane* sp. nov. (R)
- *Testudinella unicomuta* Koste & Shiel (R)
- *Alona rusticoides* Smirnov & Timms (C)
- *Prorocentrum playfairi* (Pp)
- *Thecadiniopsis tasmanica* (Tt)
- *Pleurotaenium tridentatum* forma (Pt)
- *Staurastrum* sp. (Ss)

**Other flora of note include:**

Giant spike rush (*Eleocharis sphacelata*) which occupies the southern half of the lagoon. (RNE 1999). There have been no systematic surveys of the site's vegetation. However, a survey of Shaft Lagoon (3 km north of the site) in 1999 described *Eleocharis sphacelata* sedgeland dominating the lagoon, changing to pithy sword sedge (*Lepidosperma longitudinale*) sedgeland in better drained areas (Glazik 1999). Reed habitat within the site is known to provide shelter for waterbirds

The peatland contains areas of shrubs and ferns and areas with mats of *Sphagnum* moss and sundews (*Drosera* spp.) interspersed with sedges. Wetland field survey records (undated) note the presence of *Leptospermum* species at the site (*L. scoparium* var. *scoparium* and *L. lanigerum*), and scented paperbark (*Melaleuca squarrosa*). The dominant shrub species in the peatland is *Leptospermum scoparium* var. *scoparium* with lesser amounts of *Melaleuca* present.

The sedgeland contains large areas of pithy sword sedge, with other sedge/ rush species present. Species identified during site inspections included common sword sedge (*Lepidosperma filiforme*), little clubrush (*Isolepis marginate*), slender twig-rush (*Baumea gunnii*) and the regionally rare zigzag bog sedge (*Schoenus brevifolius*). Species of rope rush (*Restionaceae*) were also common, including the slender twine rush (*Leptocarpus tenax*) and common scale-rush (*Lepyrodia muelleri*).

**Invasive species:**

The introduced species, cats ear, *Hypochoeris radicata* was found at the site during a survey in 2009. The potential impact of this species at the site is a knowledge gap. No aquatic weeds have been identified at the site to date.

### 4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/AMPHIBIA	<i>Crinia signifera</i>				Wetland dependent species that contributes to the character of the site.
CHORDATA/AMPHIBIA	<i>Limnodynastes dumerilii</i>	100			Wetland dependent species that contributes to the character of the site.
ARTHROPODA/MALACOSTRACA	<i>Amarinus lacustris</i>				Wetland dependent species that contributes to the character of the site.
ARTHROPODA/MALACOSTRACA	<i>Engaeus laevis</i>				Wetland dependent species that contributes to the character of the site.
CHORDATA/AVES	<i>Anas castanea</i>				Wetland dependent species that contributes to the character of the site.
CHORDATA/AVES	<i>Anas superciliosa</i>				Wetland dependent species that contributes to the character of the site.
CHORDATA/AVES	<i>Cygnus atratus</i>				Wetland dependent species that contributes to the character of the site.
CHORDATA/AVES	<i>Egretta novaehollandiae</i>				Wetland dependent species that contributes to the character of the site.
CHORDATA/AVES	<i>Haliaeetus leucogaster</i>				Wetland dependent species that contributes to the character of the site.

Invasive alien animal species

Phylum	Scientific name	Impacts	Changes at RIS update
CHORDATA/ACTINOPTERYGII	<i>Salmo trutta</i>	Potential	No change

Optional text box to provide further information

**Noteworthy fauna**  
 Although not critical to the ecological character of the site, the fish, frogs and macroinvertebrates (including freshwater burrowing crayfish) contribute to the character of the site. These biotic groups help sustain each other through the food chain (fish and frogs preying on macroinvertebrates, fish preying on tadpoles) as well as all providing prey for various waterbirds. There is limited data about fauna present at the site, or its importance for these species.

**Endemic species**  
 Jocks Lagoon includes microfauna species, including *Lacane* sp.nov, *Testudinella unicornuta* and *Alona rusticoides* (Walsh et al 2004).

**Invasive species**  
 Introduced species have the potential to degrade the site's fauna. The major landholder introduced brown trout (*Salmo trutta*) to the lagoon approximately 30 years ago. Brown trout are voracious feeders and have the potential to severely impact on the fish and invertebrate fauna of a waterbody. However, the fish were apparently 'fished out' by locals within a few years (landholder, personal communication). The landholder also introduced 300 brown trout in approximately 2008, but these may have been washed out with the heavy rains and floods of November 2009. There is also a distinct possibility that the dystrophic nature of the lagoon is not conducive to maintaining a trout population for long, given the high energy needs of the species and the typically low nutrient status of dystrophic waters. Trout typically need large invertebrate species and small fish for food, and these may not be sustained in sufficient numbers between replenishing floods.  
 Another species that does not naturally occur at the site, the yabby (*Cherax destructor*), has the potential to impact on the macroinvertebrate fauna of the site. During one site inspection, a yabby claw was seen, indicating this species may be present at the site.

#### 4.4 - Physical components

##### 4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cfb: Marine west coast (Mild with no dry season, warm summer)

The climate at Jock’s Lagoon is generally cool to mild with temperatures having a smaller annual range than other parts of Tasmania. St Helens, 5km north west of the site, experiences annual average summer temperature minima and maxima of 11.5 and 22.6 °C and average winter minima and maxima of 3.3 and 14.3 °C (BOM 2009).

The area receives an average annual rainfall of 775.1 mm with major rain bearing winds arising from the south east and north east quarters. Rainfall is variable, with recorded annual extremes of 374.3 and 1258.3 mm (BOM 2009).

During the last 30 years, changes to the climate and weather of the Southern Tasmania region have included:

- A shift in monthly rainfall – summer rainfall has decreased by 10 mm per year and winter rainfall has decreased by 40 mm per year.
- More hot days – in the last 30 years eight days per year above 30°C compared to six days in the previous 30 years. (BOM Regional Weather and Climate Guide 2019).

#### 4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

- Entire river basin
- Upper part of river basin
- Middle part of river basin
- Lower part of river basin
- More than one river basin
- Not in river basin
- Coastal

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

Jock’s Lagoon is one of a chain of lagoons, swamps and wetlands occurring along St Helens Point. Jock’s Lagoon lies 200 - 300 m inland (westward) of the east coast of Tasmania and the Tasman Sea (Pacific Ocean).

#### 4.4.3 - Soil

Mineral

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Organic

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

No available information

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes  No

Please provide further information on the soil (optional)

The site is located within Quaternary alluvium swamp and marsh deposits and partially consolidated Tertiary deposits comprised of conglomerates and sand (Glazik 1999). The Quaternary sands and clays are highly erodible. Longshore drift has created an extensive beach and sand dune system, which separates Jocks Lagoon from the seas (Blackhall et al. 2003). The Holocene and recent flank the ocean beach while the older Pleistocene dunes lie inland and parallel (Harris 1999). The backbone of the peninsula is an outcrop of Devonian granite, which forms the headland of St Helens Point to the north of Jocks Lagoon. Wetlands in the area are not considered to be in any danger of inundation by the transgressive dune field, due to established vegetation cover of the dunes (Watt 2001). At depths of approximately 10-20 cm the sand was underlain by a peat layer, suggesting mobile sands in the past, covering former areas of marshland/ swamp and causing marginal infilling of the lagoon.

#### 4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from surface water	<input checked="" type="checkbox"/>	unknown
Water inputs from groundwater	<input checked="" type="checkbox"/>	unknown

Water destination

Presence?	Changes at RIS update
Marine	unknown

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology.

Jock's Lagoon receives surface water from a small inlet stream with a catchment approximately 3 km wide and 1 km long and from local groundwater. The extent of groundwater input from beyond the local area is unknown. However, the maintenance of a permanent freshwater lagoon during the extended drought indicates significant groundwater inputs (Newall et al 2011).

The lagoon has a maximum water depth of between 2 to 3 m, though after the long drought (1999 to 2009) it may have been only 1.5 m deep (Blackhall et al 2003; Newall, P.R, Lloyd, L.N. and Atchison, E.E., pers. obs). The water level in the lagoon varies considerably and connects to other local waterways when levels are high. At levels of 5 m, the water from Jock's Lagoon can discharge through the northern end of the lagoon, to Windmill Lagoon and beyond to Moriarty Lagoon. At levels of 6.5 m, water can discharge from the southern end of the lagoon in a northeasterly direction and a south-easterly direction, to the Tasman Sea. At levels between 6.5 to 7 m, water can discharge into Shaft Lagoon and then into Georges Bay (Newall et al 2011).

The marked increase in aquatic life following the rise in water levels and the connection of the lagoon with its intermittent sedgeland marsh highlights the importance of this hydrological variation. Connection of waterbodies to their catchments via floodwaters is an important process, contributing nutrients, including dissolved organic carbon, along with plant matter (Croome and Tyler 1987; Qiu and McComb 1994). The plant matter and dissolved carbon provide the nutrient requirements for the base of the food chain.

The paucity of aquatic life observed in the lagoon waters at the end of a very prolonged drought, juxtaposed against the abundant aquatic life observed following the lagoon's reconnection with the adjacent sedgeland, support the importance of the hydrological regime as a critical component of the site (Newall et al 2011).

(ECD) Connectivity of surface waters and of groundwater	The tannin staining suggests significant groundwater input through the peat layer underlying the lagoon bed sands (P.Buckhorn, pers. comm.). Significant surface inflows are tannin stained from the inflow creek (Newall et al 2011).
(ECD) Stratification and mixing regime	Walsh et al. (2002) suggest that Jock's Lagoon is too shallow to stratify.

#### 4.4.5 - Sediment regime

Sediment regime unknown

Please provide further information on sediment (optional):

Vegetation cover contributes to the water quality of the site, with well vegetated slopes slowing down overland flow thereby increasing infiltration of rainfall. Infiltration of rainfall decreases the overland transport of particulates and nutrients to receiving waters while increasing the filtering of rainfall through the catchment soils, generally leading to clearer and lower nutrient waters (Newall et al 2011).

(ECD) Water turbidity and colour	The waters of Jocks Lagoon are characteristically tannin-stained. This is due to polyhumic acids (Croome and Tyler 1987)
(ECD) Light - reaching wetland	Deeply coloured water modifies the light environment very quickly, creating a shallow, dominantly red euphotic zone.

#### 4.4.6 - Water pH

Acid (pH<5.5)

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Unknown

Please provide further information on pH (optional):

Very few water quality assessments have been conducted at Jocks Lagoon. It is described as a dystrophic coastal lagoon, which is consistently acidic; recording a pH of between 4.6 - 6.28 (Blackhall et al. 2003, Bowling et al. 1993, Croome and Tyler 1987, Horwitz 1992 and Walsh et al. 2002).

#### 4.4.7 - Water salinity

Fresh (<0.5 g/l)

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Mixohaline (brackish)/Mixosaline (0.5-30 g/l)

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Unknown

Please provide further information on salinity (optional):

The site can be brackish, ranging between 310 and 580 µS/cm. Walsh et al. (2002) identified it as having higher salinity levels than most Tasmanian west coast lagoons (Bowling et al. 1993, Croome and Tyler 1987 and Horwitz, 1992).

#### 4.4.8 - Dissolved or suspended nutrients in water

Dystrophic

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Unknown

Please provide further information on dissolved or suspended nutrients (optional):

Nutrient levels were sampled by Horwitz in 1992, with oxidised Nitrogen below the detectable limit (<0.1mg/L). Total Phosphorus was 0.03mg/L and chlorophyll a was recorded as 2.26 µg/L. More recent sampling data is not available for the site.

#### 4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the site itself. i) broadly similar  ii) significantly different

- Surrounding area has greater urbanisation or development
- Surrounding area has higher human population density
- Surrounding area has more intensive agricultural use
- Surrounding area has significantly different land cover or habitat types

Please describe other ways in which the surrounding area is different:

The majority of the Jocks Lagoon Ramsar Site is privately owned. The crown land within the site is adjacent to the eastern boundary and is situated within the St Helens Point Conservation Area, and therefore under the management of the Parks and Wildlife Service, Tasmania. The Jocks Lagoon Ramsar Site is located almost entirely on private land, mostly owned by one landholder. The site is not operated for any extraction of products such as food, fuel or water. There are two separate freehold titles within the site. In general, the site is only occasionally used by the major landholder for passive recreation. However, this use has included occasional clearing of a small part of the 'coastal woodland and cleared patches'. Use of recreational vehicles was also evident at the site, with tyre tracks observed in the sand and shoreline vegetation of the lagoon. Private property adjacent to the property has been the subject of several development proposals for accommodation and a golf course.

### 4.5 - Ecosystem services

#### 4.5.1 - Ecosystem services/benefits

##### Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Fresh water	Drinking water for humans and/or livestock	not relevant for site

##### Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Recreational hunting and fishing	Low
Recreation and tourism	Picnics, outings, touring	Low
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	Low
Scientific and educational	Major scientific study site	Low

##### Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	Medium

Optional text box to provide further information

The critical ecosystem services for Jock's Lagoon are:

- supporting representative wetland types – the near-natural condition, minimal disturbance, geomorphic stability and water quality of the site contributes to its support of representative Ramsar wetland type.
- supporting regionally rare/ threatened species – the site supports six plant species, all listed as rare within the bioregion.
- supporting biodiversity – as part of a chain of lagoons, the site supports a range of species dependent upon coastal freshwater lagoon habitat, including waterbirds, fish, invertebrates (for their intrinsic value and as food for fish and waterbirds), aquatic macrophytes and an algal species found at only six other sites.

Other (non-critical) ecosystem services include:

- scientific/ educational services – the site has been the subject of several limnological studies, particularly in relation to algal endemism.
- cultural services – the site could potentially be of indigenous cultural significance.

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes  No  Unknown

#### 4.5.2 - Social and cultural values

- i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland
- ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland
- iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples
- iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland

<no data available>

#### 4.6 - Ecological processes

<p>(ECD) Nutrient cycling</p>	<p>Surface flows move elemental nutrients and organic carbon from the intermittent sedgeland marsh into the lagoon. Without the occasional flooding of the sedgeland, the lagoon would have substantially lower nutrient concentrations.</p>
<p>(ECD) Animal reproductive productivity</p>	<p>During site inspections, large numbers of young birds were observed at the site, including swans with cygnets, indicating that the site may be used for breeding or as a nursery.</p>

## 5 - How is the Site managed? (Conservation and management)

### 5.1 - Land tenure and responsibilities (Managers)

#### 5.1.1 - Land tenure/ownership

##### Public ownership

Category	Within the Ramsar Site	In the surrounding area
Public land (unspecified)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

##### Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Provide further information on the land tenure / ownership regime (optional):

Most of the site is on private land (two landholders totaling 88%), with a small section at the south-east end falling within St Helen's Conservation Area (Crown Land total 12%).

#### 5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

This site is managed by a private landowner. For more information contact Department of Natural Resources and Environment Tasmania.

Provide the name and/or title of the person or people with responsibility for the wetland:

No direct contact available. Enquiries to the Tasmanian government can be made at: [nre.tas.gov.au/contact-us](http://nre.tas.gov.au/contact-us)

Postal address:

c/o Department of Natural Resources and Environment Tasmania:

GPO Box 44  
HOBART, Tasmania 7001, Australia  
Telephone: +61 1300 368 550

## 5.2 - Ecological character threats and responses (Management)

### 5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

#### Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Mining and quarrying	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

#### Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Unspecified	unknown impact	unknown impact	<input checked="" type="checkbox"/>	unknown	<input type="checkbox"/>	No change

#### Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Recreational and tourism activities	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

#### Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Fire and fire suppression	unknown impact	unknown impact	<input checked="" type="checkbox"/>	unknown	<input type="checkbox"/>	No change

#### Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Invasive non-native/ alien species	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

#### Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Household sewage, urban waste water	unknown impact	unknown impact	<input type="checkbox"/>	unknown	<input checked="" type="checkbox"/>	unknown

#### Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Unspecified	unknown impact	unknown impact	<input checked="" type="checkbox"/>	unknown	<input checked="" type="checkbox"/>	unknown

Please describe any other threats (optional):

**Threats:**

- Off-road vehicles: private vehicles can access the site, potentially causing loss of wetland habitat, loss of individuals of rare species, soil erosion and/or compaction.
- Neighbouring developments: could result in lowering the groundwater table through water extraction; eutrophication of surface or groundwater; weed infestation; and the discharge of toxicants to surface or groundwater.
- Sand mining: although it is unlikely that mining would be permitted within the Ramsar site, mining in adjoining areas may impact the site. An existing sand mining tenement covers areas outside of Jocks Lagoon. Increased groundwater extraction from mining may lower groundwater levels, spread root rot, introduce weeds, and/ or discharge of toxicants to surface or groundwater.
- Phytophthora cinnamomi (root rot): is a soil-borne water mould that attacks the roots of susceptible plants, in many cases killing large numbers of plants. It spreads with the movement of infected soil (including dirt adhering to vehicles, or footwear) or plant material, and may be transported by water percolating through the soil or in creeks. It is present in many areas around the site and is a threat to the site’s vegetation.
- Chytrid fungus (Batrachochytrium dendrobatidis): currently threatens Tasmania’s native amphibians. It is primarily spread through the movement of infected frogs, tadpoles and water although it can also be spread by people with mud on their boots, camping equipment and vehicle tyres. It has been identified in north east Tasmania, therefore poses a clear threat to the brown froglets and eastern banjo frogs found at the site (DPIW 2009c).
- Slashing: occurs in part of the site, with the landholder seeking to maintain a comparatively clear area for passive recreation. Regular slashing has the potential to eliminate some species while promoting opportunist species such as bracken (Pteridium esculentum).
- Fire: is potentially a very high risk to all components of the site. Potential loss of vegetation cover through very hot or frequent burning would impact landform stability, and therefore ultimately the site’s hydrology.
- Introduction of invasive species (including weed species): has the potential to degrade the site’s fauna and flora. Weeds have been recorded at the site and are a potential threat from surrounding land uses.
- Acid sulphate soils: the exposure and oxidation of potential acid sulfate soils has the potential to impact biotic and abiotic elements of the wetland.
- Climate change: may result in reduced inflows and rainfall and increased evaporation rates. These will result in changes to all water dependent ecosystems.

### 5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
State Conservation Area	St Helens Conservation Area	<a href="https://parks.tas.gov.au/about-us/managing-our-parks-and-reserves/reserve-listing">https://parks.tas.gov.au/about-us/managing-our-parks-and-reserves/reserve-listing</a>	partly

### 5.2.3 - IUCN protected areas categories (2008)

- la Strict Nature Reserve
- lb Wilderness Area: protected area managed mainly for wilderness protection
- II National Park: protected area managed mainly for ecosystem protection and recreation
- III Natural Monument: protected area managed mainly for conservation of specific natural features
- IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention
- V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation
- VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

### 5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Other:

In Australia, the ecological character of a designated Ramsar site is protected as a matter of national environmental significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999).

### 5.2.5 - Management planning

Is there a site-specific management plan for the site? No

Has a management effectiveness assessment been undertaken for the site? Yes  No

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes  No

### 5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No need identified

### 5.2.7 - Monitoring implemented or proposed

<no data available>

## 6 - Additional material

### 6.1 - Additional reports and documents

#### 6.1.1 - Bibliographical references

This RIS has been prepared based on information from the Ecological Character Description of the Jock's Lagoon Ramsar site, and past Ramsar Information Sheets. Additional references are included in an attachment under Section 6.1.2 vi.

#### 6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

<no file available>

ii. a detailed Ecological Character Description (ECD) (in a national format)

<1 file(s) uploaded>

iii. a description of the site in a national or regional wetland inventory

<no file available>

iv. relevant Article 3.2 reports

<no file available>

v. site management plan

<no file available>

vi. other published literature

<1 file(s) uploaded>

#### 6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



The Ramsar listed wetland of Jocks Lagoon near St Helens in Tasmania ( Department of Agriculture, Water and the Environment, 17-05-2009 )



The Ramsar listed wetland of Jocks Lagoon near St Helens in Tasmania ( Department of Agriculture, Water and the Environment, 17-05-2009 )



The Ramsar listed wetland of Jocks Lagoon near St Helens in Tasmania ( Department of Agriculture, Water and the Environment, 17-05-2009 )



The Ramsar listed wetland of Jocks Lagoon near St Helens in Tasmania ( Department of Agriculture, Water and the Environment, 17-05-2009 )

#### 6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation 1982-11-16