

# **Bluff Point Wind Farm and Studland Bay Wind Farm Public Environmental Report 2016-2018**

31 March 2019



**Woolnorth Wind Farm Holding Pty Ltd**

ACN 154 051 617

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# **1. General Manager's Statement**

This is the 3<sup>rd</sup> Public Environmental Report (PER) published for the Bluff Point Wind Farm (BPWF) and the Studland Bay Wind Farm (SBWF) projects. The PER has been prepared following the requirements set out in Section 2.3 and 3.4 of the Annual Fee Remission Guidelines (2010). This PER is also prepared to satisfy Condition G5 of the Environment Protection Notices (BPWF EPN no. 7421/2 and SBWF EPN no. 7423/3) requiring the submission of an Annual Environmental Review (AER), that is publically available ([www.woolnorthwind.com.au/health-safety](http://www.woolnorthwind.com.au/health-safety)), to the Director of the Environment Protection Authority (EPA) by the 31<sup>st</sup> of March of each reporting year. This PER reporting period is January 1 2016 to December 31 2018.

The information contained in this PER has been carefully prepared by our environmental team, in collaboration with project staff.

I acknowledge and endorse this report.

**Chris Sims**  
**Acting General Manager**  
**Woolnorth Wind Farm Holding Pty Ltd**  
**29 March 2019**

## 2. This report and reporting period

This is the third Public Environmental Report (PER) published for the Bluff Point and Studland Bay Wind Farms in accordance with the Annual Fee Remission Guidelines (sec Ed. 2010) produced under Part 7 of the Environmental Management and Pollution Control (general fees) Regulation 2007.

This PER provides a summary of the environmental management activities and works undertaken at the BPWF and SBWF during the period 2016-2018. The reporting requirements relevant to the Commonwealth EPBC (*Environment Protection and Biodiversity Conservation Act*) approval (2000/12) are also included in this document. It also provides additional information to satisfy the reporting requirements of a PER, a summary of additional work undertaken at these sites to address any environmental issues and/or to improve environmental management of the sites. Table 1 contains details of the sections within this report and the specific purpose of each section.

**Table 1 – Sections contained within this report and details of reporting requirements met.**

<b>Sections of this report</b>	<b>Compliance details</b>
<b>Statement from General Manager</b>	Requirement of G5 of EPNs. PER requirement.
<b>Reporting period</b> Section 2	PER requirement
<b>Profile – Woolnorth Wind Farm Holding</b> Section 3	PER Requirement
<b>Environmental Policy – Woolnorth Holding</b> Section 4	PER requirement
<b>Activity Profile</b> Sections 3	PER requirement
<b>Legislative requirements</b> Section 6.2	PER requirement
<b>Permit Conditions</b> Section 6.1	Reporting on commitments contained within EPNs. PER requirement.
<b>Environmental Management Plans – State and commonwealth</b> Sections 8-16	Reporting on commitments contained within EPNs, EPBC Approval and the State Environmental Management Plan
<b>Complaints Received From the Public</b> Section 7.5	PER requirement.
<b>Non-trivial Environmental Incidents</b> Section 7.6	PER requirement.
<b>Infringement Notices, Prosecutions or Enforcements</b> Section 7.10, 7.11	PER requirement.
<b>EMPCA actions</b> Section 7.10, 7.11	PER requirement.
<b>Environmental Monitoring</b> Section 7 & 8	PER requirement.
<b>Environmental Training</b> Section 7.13	PER requirement.
<b>Community Engagement on Environmental Matters</b> Section 7.14	PER requirement.

Sections of this report	Compliance details
<b>Environmental Performance Improvement</b> Section 7.15	PER requirement.
<b>Additional Environmental Actions</b> Section 17	PER requirement.
<b>EPN conditions</b> Appendix 1 and 2	PER requirement.

### 3. Profile – Woolnorth Wind Farm Holding

Woolnorth Wind Farm Holding Pty Ltd (WNH) was formed in 2012 and is a joint venture between Hydro Tasmania and Shenhua Clean Energy Holding. WNH owns and operates the BPWF (65MW) and SBWF (75MW) Wind Farms, as well as the Musselroe Wind Farm (MRWF, 168MW, not reported on herein). In total, WNH has a total installed capacity of 308 MW, and owns and operates around 100km of 110kV transmission line. WNH owns the BPWF and SBWF sites and has agricultural licence arrangements on both properties. The Company's major administrative base is in Launceston, Tasmania.

#### 4. Environmental Policy - Woolnorth Wind Farm Holding



**Woolnorth Wind Farm Holding  
Environmental Policy**

*We aim to minimise the impact of our wind farms on flora and fauna, the land and communities where we operate*

**We are committed to:**

- Understanding and managing our impacts on flora and fauna
- Protecting the natural values of the land on which we operate
- Meeting our legal and compliance commitments
- Improving our management processes and prevent pollution
- Being transparent about our environmental issues and performance

**We do this by:**

- Maintaining a rigorous monitoring program to assess our impacts
- Implementing offsets and other measures to manage impacts
- Implementing measures to protect and improve the natural values of the land we operate on
- Strongly focussing on our compliance, regulatory and other commitments
- Undertaking regular checks on our performance, setting objectives and targets and implementing improvement measures
- Reporting regularly and openly about our environmental issues and performance

Stephen Ross  
General Manager  
10 December 2018



**Woolnorth Wind Farm Holding**

Document Number:  
Version Number:

WNH Q8  
4

## **5. Activity Profile**

### **5.1 Background**

BPWF and SBWF are located in far north-west Tasmania. Woolnorth Bluff Point Wind Farm Pty Ltd (BPWF) and Woolnorth Studland Bay Wind Farm Pty Ltd (SBWF) have been previously owned by Roaring 40s Renewable Energy Pty Ltd (up until 30 June 2011), then Hydro Tasmania, and are now owned by WNH. These two subsidiary companies engage WNH to manage their respective wind farms, including compliance with their obligations under EPNs and other approval conditions. The regulatory compliance obligations of BPWF and SBWF are the main focus of this report.

### **5.2 BPWF and SBWF**

The BPWF and SBWF consist of wind turbines placed on towers at a suitable height to generate electricity, underground cables between turbines, an electrical substation, control room and ancillary buildings, roads, fences and other associated infrastructure and a 110kV transmission line (approximately 43 km in length) to the Smithton substation.

BPWF was developed in two stages over a four-year period. The first stage involved construction of six turbines (Vestas V66, 1.75MW), with a total generation capacity of 10.5 MW and an electrical connection to the Smithton substation via a 22 kV power line. Stage 2 included a further development of 54.25 MW, comprising an additional 31, 1.75 MW Vestas V66 wind turbines, and the construction of a 110 kV transmission line from the wind farm switchyard to the Smithton substation. BPWF was commissioned in its entirety in August 2004. Refer to Figure 1 for the layout of BPWF.

SBWF was constructed in 2006 with a nominal capacity of 75 MW. The development of SBWF included construction of a spur transmission line, connecting to the existing 110 kV transmission line between BPWF and the substation at Smithton. SBWF consists of 25, 3MW Vestas V90 wind turbines and was commissioned by 1 June 2007. Refer to Figure 2 for the layout of SBWF and Figure 3 for the alignment of the transmission line.

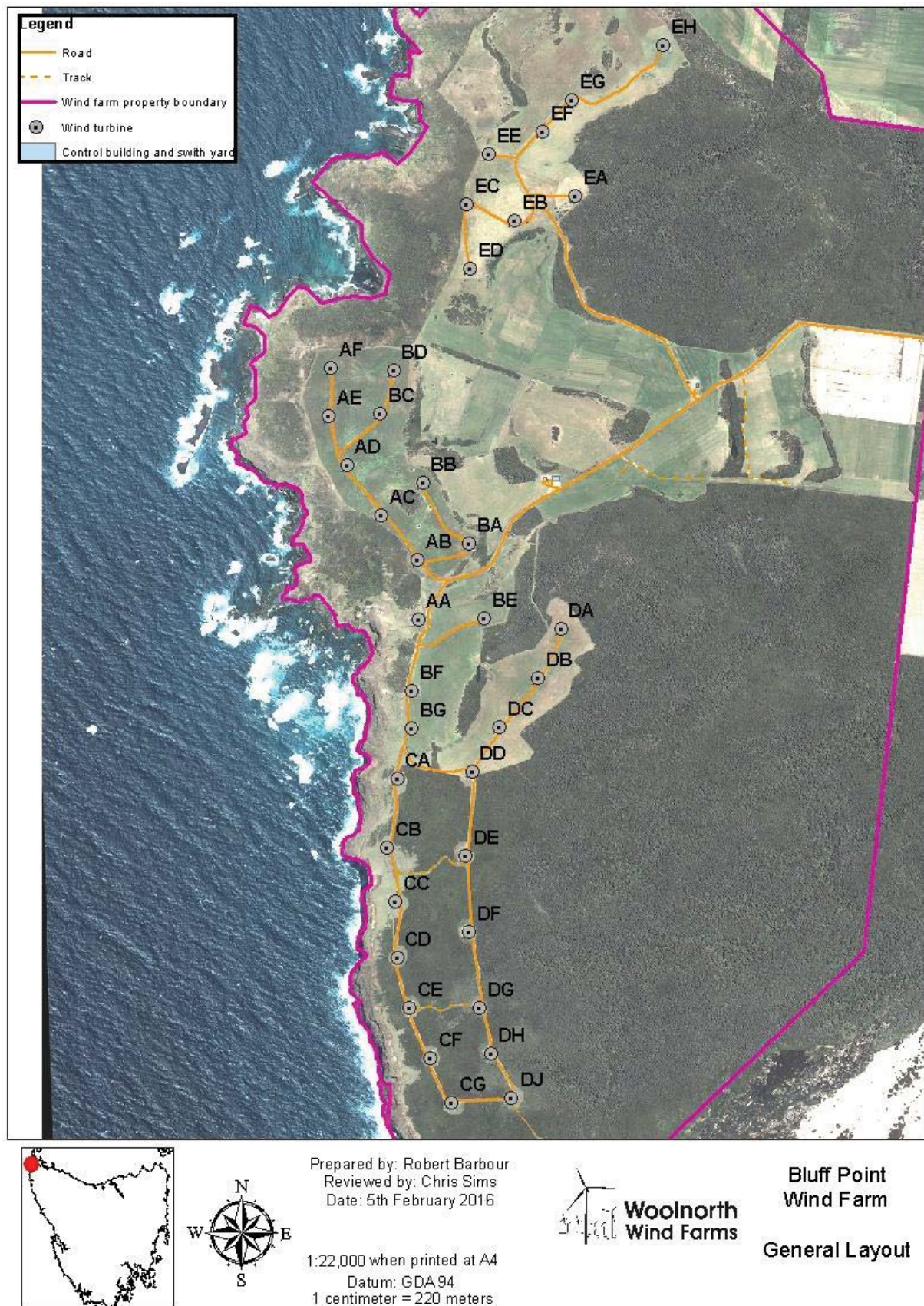


Figure 1. Bluff Point Wind Farm layout

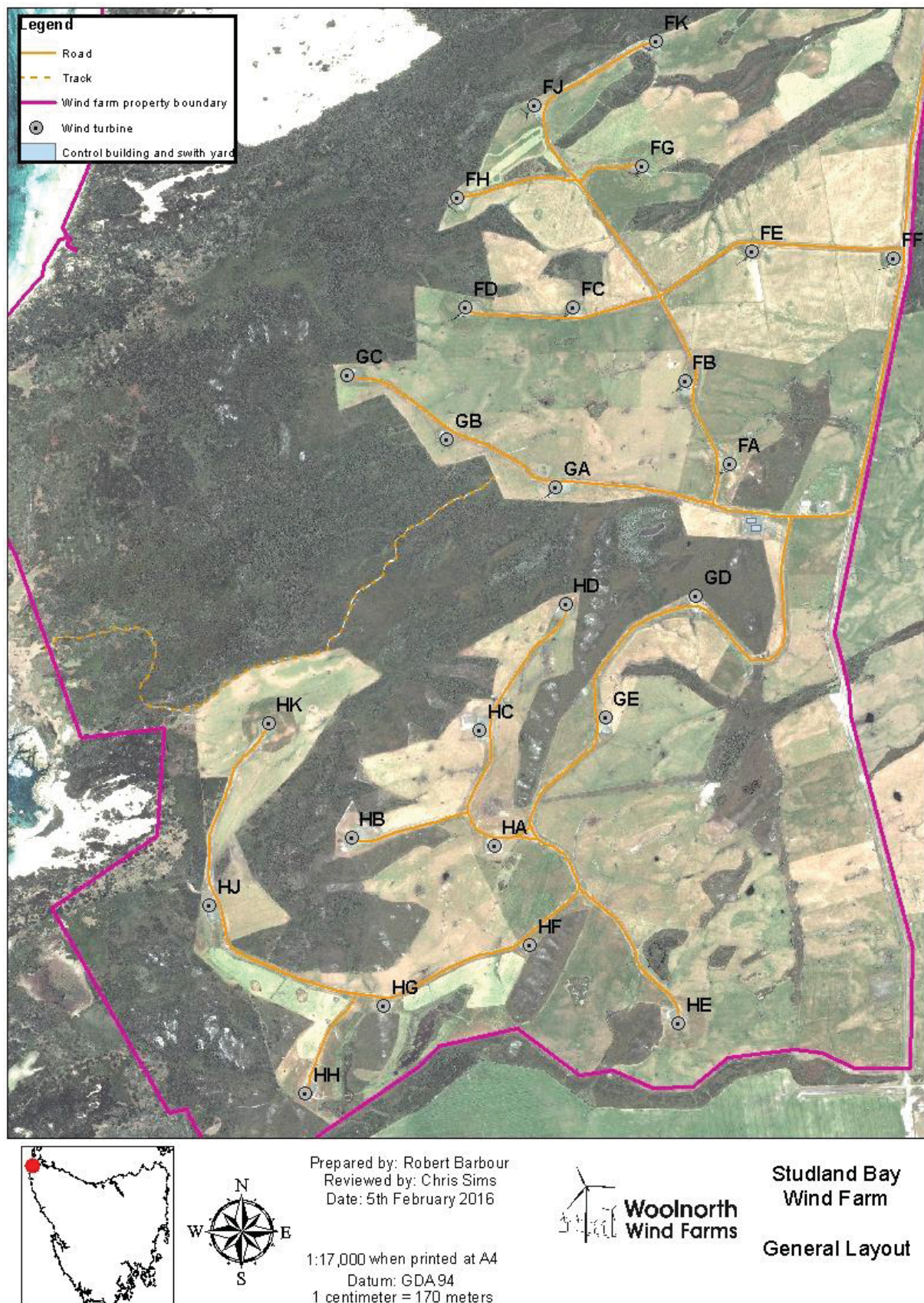
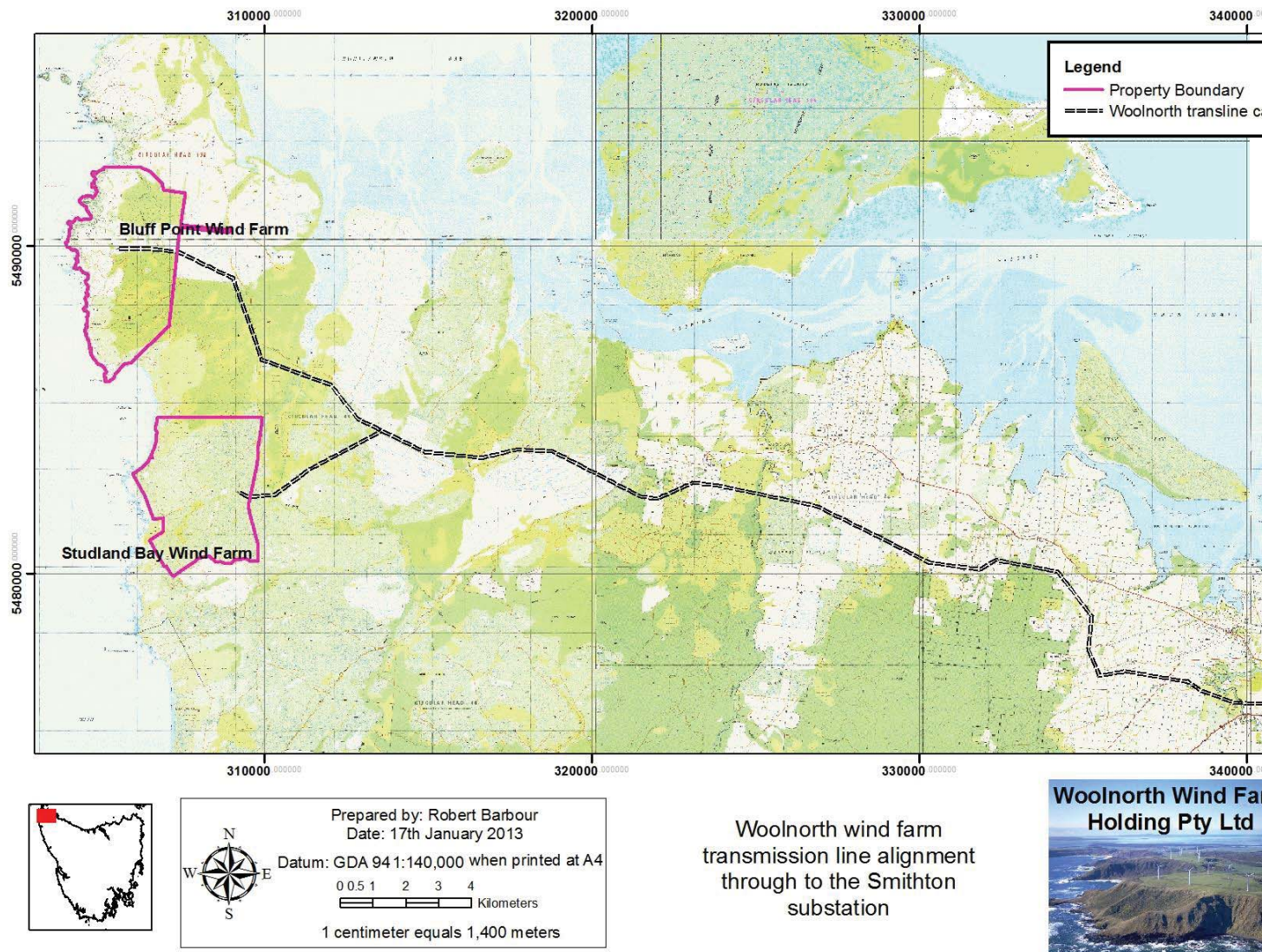


Figure 2. Studland Bay Wind Farm layout



**Figure 3. Transmission line alignment**

### 5.3 Plant and operations

Both wind farms are operated continuously and to full capacity (unless constrained by the market operator or network managers). Wind turbines generate electricity when the wind speed is between 4 and 25 m/s. The three blades of each turbine are connected to the hub. A main shaft connects the hub to a gearbox which in turn drives a generator producing electricity. The electricity is passed through a transformer and is converted to 22kV before being transmitted by an underground power reticulation system to the wind farm switch room and switch yard. The electricity is then passed through another transformer and is transmitted along the 110kV transmission line to the Smithton sub-station. The electricity is distributed from this location into the national electricity grid.

The operation of both the wind farms and the transmission line includes scheduled and unscheduled maintenance activities performed largely by WNH. Table 2 summarises the infrastructure at the wind farms while Table 3 summarises the transmission line infrastructure.

**Table 2. Wind Farm Infrastructure**

	<b>Bluff Point</b>	<b>Studland Bay</b>
Installed capacity	65 MW (37 x 1.75 MW turbines)	75 MW (25 x 3 MW turbines)
Number of turbines	37	25
Tower height (m)	60	80
Rotor diameter (m)	66	90
Wind speed range (m/s)	4-25	4-25
Year commissioned	2002 and 2004	2007
Access roads	25 Km	25 Km
Underground power collection system	22kV	22kV
Control building including switch room (high voltage circuit breakers), administration offices, and work shop	Yes	Yes
Hazardous material stores	Yes	Yes
High voltage switchyard including transformers, disconnectors, circuit breakers, overhead gantry	Yes	Yes
Reactive support equipment	No	Yes
General storage facility	Yes	No
Visitors Centre	Yes	No

**Table 3. Summary of Transmission line infrastructure**

	Notes
Configuration	Overhead monopole construction, single circuit comprising 3 conductors and an OPGW (optic fibre ground wire)
Main transmission line length	37 km
No. monopole/towers	148
SBWF connecting spur length	5km
No. monopole/towers	18
Length underground cable from pole 148 to Smithton sub-station	1.5 km

#### 5.4 Production capacity and actual production level

Tables 4 and 5 document the amount (in Gigawatt hours) of electricity each wind farm produced during the 2016 – 2018 calendar years.

**Table 4. Annual production (GWHrs) at the Bluff Point Wind Farm**

Calendar year	Electricity production (GWHR)
2016	240
2017	237
2018	239

**Table 5. Annual production (GWHrs) at the Studland Bay Wind Farm**

Calendar year	Electricity production (GWHR)
2016	259
2017	247
2018	261

Output from each of the wind farms has been consistent over the reporting period. The wind farms have operated close to production capacity by maintaining high wind turbine availability and a high resource utilisation.

#### 5.5 Raw material consumption

The BPWF and SBWF EPNs do not specify or limit the consumption of any raw materials. WNH tracks and report on various waste streams. See section 5.7. The operation of BPWF and SBWF does not require consumption of any raw materials.

Energy and water consumption is minimal. The site consumes a small amount of energy to provide services during periods of low wind or outages. Energy is either produced on site or sourced from a 110 or 22kV supply. Water consumption is for domestic purposes only and is supplied from onsite rainwater tanks. Both BPWF and SBWF have a 60,000L tank supply.

## 5.6 Product markets and sources of raw material

The energy produced by the wind farms is supplied into the National Energy Market. The energy is metered (measured) at the Smithton sub-station and distributed into the Tasmania grid and potentially to the mainland via Basslink.

As outline above, the operation of BPWF and SBWF does not require consumption of any raw materials.

## 5.7 Pollution, greenhouse gas emissions and waste, and their control measures

While the wind farms are industrial facilities, they are not significant sources of air, water or noise pollution. With the exception of exhaust emissions and dust generated from vehicles used to travel around the facilities, no significant losses of gasses used or stored on site were recorded. This includes sulphur hexafluoride (SF6) which is stored within switchgear in most wind turbines and the switchyard main circuit breakers. The volumes held on site are relatively minor. Control measures are in place to minimise emissions to air from equipment containing SF6. Dust emissions are not specifically controlled, but regular road maintenance ensures all site roads have stable running surfaces.

Emissions to water have not been recorded during operations of either wind farm and there have been no complaints regarding noise emissions from the wind farms. Noise emissions are generated through the operation of wind turbines and the switchyards. Noise compliance assessments of both wind farms were completed following construction, which demonstrated both wind farms were compliant with the noise emission requirements.

Solid wastes are produced at each wind farm and waste streams are monitored and waste volumes recorded. Solid wastes are disposed of at a municipal waste facility by Veolia Environmental Services (under contract). All recyclable materials are recycled where possible. Waste effluent from the control buildings (domestic wastewater) is disposed of onsite through a mini treatment plant. Stormwater is directed to drinking water tanks or to the sites drainage system.

The breakdown of the types and quantities of solid wastes generated on each site during the reporting period is provided in Table 6.

**Table 6. Waste stream volumes**

Waste	BPWF Volume (m <sup>3</sup> )			SBWF Volume (m <sup>3</sup> )		
Year	2016	2017	2018	2016	2017	2018
General waste	108	108	108	16.5	39.6	54
Recycling	6.5	7.5	3.5	1.2	1.2	1.2

Hazardous materials used on the wind farm sites generate a relatively small quantity of waste including oils and oily wastes and coolant from turbine servicing. Oil and grease laden rags are disposed of as general waste (accepted by waste facility).

Chemical inventories and safety data sheets (SDS) (and registers) are held on each site and are regularly updated and audited. Hazardous materials associated with the servicing and maintenance of turbines and other machinery are managed by Vestas and WNH, held in hazardous materials stores and any wastes disposed of by a licenced waste disposal contractor. All hazardous materials such as oils, general materials such as paints, solvents, glues, herbicides etc. are retained on site at the lowest practical stock levels and if possible and practical only brought to site when needed.

The hazardous wastes produced at each of the wind farms over the 2016 – 2018 periods is provided in Table 7.

**Table 7. Hazardous waste stream volumes**

Waste	BPWF Volume (m <sup>3</sup> or L or kg)			SBWF Volume (m <sup>3</sup> or L or kg)		
Year	2016	2017	2018	2016	2017	2018
Liquid waste including hydrocarbon and coolant (L)	3000	1000	1000	4050	2030	1000

## 5.8 The local environment

Both wind farms are located in Tasmania's far north-west. Cape Grim, Tasmania's most North West tip (of the main island), is less than 5km from the northern boundary of the BPWF site. The area is dominated by strong and consistent westerly winds, which also bring substantial rain to the region. The yearly rainfall average is 800mm.

Both wind farm sites and the land immediately around them is reasonably representative of the local environment. The local landscape has been progressively cleared to make way for sheep, beef and dairy enterprises resulting in a mosaic landscape comprising relatively large expanses of cleared pasture areas dissected and split up by large patches of native vegetation.

BPWF is located on a flat-topped bluff with a steep coastal cliff to the west (Southern Ocean side) and moderately steep slopes to the east, north and south. The BPWF site is 1,524 hectares in size with approximately 40% of the land cleared for cattle grazing (with some fodder cropping). The remainder (60%) being high quality remnant vegetation (including closed melaleuca forest and wet coastal shrubby eucalypt forest). All vegetation is fenced to exclude cattle. The wind farm occupies a very small component of the total property.

SBWF is on less elevated terrain and consists of flat undulating land with isolated rocky outcrops and large consolidated dunes with some small ephemeral fresh water lagoons close to the coast (and to the north of the site). The SBWF site is 1,410 hectares in size with approximately 60% of the land cleared for cattle grazing (with some fodder cropping). The remaining land (comprising coastal swamp forest, coastal heath and pockets of wet coastal shrubby eucalypt forest) is fenced to exclude stock. The wind farm occupies a very small component of the total property.

The local environment provides a range of habitats for fauna species including the Tasmanian wedge-tailed eagle (WTE), white-bellied sea-eagle (WBSE), woodland birds and seabirds, the Tasmanian devil, quolls, bandicoots and large populations of wallabies (Bennetts and Rufous).

The majority of surrounding land is owned and operated by Moon Lake Investments (trading as Van Dairy). Van Dairy also operate on the wind farm sites under grazing licences.

There are no significant local sources of pollution within the vicinity of the wind farms. The Cape Grim Baseline Air Pollution Monitoring Station is located a few kilometres north of BPWF.

There are numerous records of Aboriginal heritage on both wind farm sites. There are no records of heritage from European or other ethnicities on the wind farm sites.

## **5.9 The regional environment**

The regional environment can be described in the same manner as the local environment. Land use across the region is focussed on agricultural enterprises and in particular dairy and beef production. Large parts of the region are therefore cleared for grazing. Within the region however, commercial forestry activities also occur within native forest and plantation estates. There are significant stands of native forest and plantation to the south east of the wind farm sites. The land in the region is mostly private freehold, with few reserves and other state owned land. The region is generally flat with the only point of significant relief being Mt Cameron West which is south of the SBWF. Given the varied landscape, the region offers a diverse range of flora and fauna species and habitats. The region is considered by DPIPW to be particularly important for Tasmanian devil conservation.

A larger portion of the wind farms are situated in the Welcome River catchment which is a small flat catchment. A portion of BPWF is situated in a small unnamed catchment. Both catchments include both cleared land and extensive patches of native vegetation.

The closest population centre is Smithton (population approximately 3,881 – 2016 Census data) which comprises urban, commercial and industrial areas. Major industries include sawmills, a vegetable processing facility, a milk processing plant and an abattoir. Smithton is approximately 40km east of the wind farm sites.

## **5.10 Changes to wind farm operations over the reporting period**

There have been no major changes to the plant, operation, production, pollution, waste or impacts on the local and regional environment at either of the wind farms over the 2016 – 2018 period.

## 6. Legislative requirements

### 6.1 Permit conditions

BPWF and SBWF operate under separate EPNs issued under the *Environmental Management and Pollution Control Act (Tas.) 1994* by the Director of the EPA. As outlined these EPNs are:

- Bluff Point Wind Farm - EPN 7421/2 (see Appendix 1)
- Studland Bay Wind Farm - EPN 7423/3 (see Appendix 2).

BPWF and SBWF also operate under an environmental approval issued by the Australian Government Department of the Environment and Heritage (now the Department of Environment - DoE) under the *Environment Protection and Biodiversity Conservation Act 1999*.

Attached to these legal instruments are environmental conditions with which the wind farms must comply. The preparation of this AER is a requirement of each wind farms' EPN. Environmental Management Plans (EMPs) approved in accordance with the EPNs and Commonwealth approval conditions outline reporting commitments and requirements. This report therefore contains the relevant reporting requirements for the BPWF, SBWF and the associated 110kV Transmission Line (including the SBWF 'spur line').

### 6.2 Relevant Environmental legislation

The following legislation and policy documentation is applicable to the operation and maintenance of BPWF and SBWF.

#### TASMANIAN LEGISLATION AND REGULATIONS

- Aboriginal Relics Act 1975
- Agricultural and Veterinary Chemicals (Control of Use) Act 1995
- Agricultural and Veterinary Chemicals (Control of Use) Order 2001
- Animal Welfare Act 1993
- Animal Welfare Regulations 1993
- Building Act 2000
- Building Regulations 2004
- Plumbing Regulations 2007
- Crown Lands Act 1976
- Crown Lands Regulations 2001
- Dangerous Substances (Safe Handling) Act 1995
- Dangerous Substances (Safe Handling) Regulations 2009
- Dangerous Goods (Safe Transport) Act 1998
- Dangerous Goods (Road and Rail Transport) Regulations 1998
- Electricity Supply Industry Act 1995
- Electricity Supply Industry Regulations 2008
- Electricity Wayleaves and Easements Act 2000
- Environmental Management and Pollution Control Act 1994
- Environmental Management and Pollution Control (Atmospheric Emissions) Regulations 2007
- Environmental Management and Pollution Control (Environment Improvement Programme Fees) 2004
- Environmental Management and Pollution Control (General Fees) Regulation 2007
- Environmental Management and Pollution Control (Infringement Notices) Regulations 1996

- Environmental Management and Pollution Control (Miscellaneous Noise) Regulations 2004
- Environmental Management and Pollution Control (Waste Management) Regulations 2000
- Fire Service Act 1979
- Forest Practices Act 1985
- Forest Practices Regulations 2007
- Forest Practices Code 2000
- Historic Cultural Heritage Act 1995
- Historic Cultural Heritage Regulations 2006
- Land Acquisition Act 1993
- Land Use Planning and Approvals Act 1993
- Land Use Planning and Approvals Regulations 2004
- Local Government Act 1993
- Natural Resource Management Act 2002
- Nature Conservation Act 2002
- Resource Management and Planning Appeal Tribunal Act 1993
- State Policies and Projects Act 1993
- Movement of Controlled Wastes Between States and Territories 1998
- State Coastal Policy 1996
- Draft State Policy on the Protection of Agricultural Land 2009
- State Policy on Water Quality Management 1997
- Threatened Species Protection Act 1995
- Water and Sewerage Industry Act 2008
- Water and Sewerage Industry (General) Regulations 2009
- Weed Management Act 1999
- Weed Management Regulations 2000

#### **COMMONWEALTH LEGISLATION AND REGULATIONS NAME**

- Environment Protection and Biodiversity Conservation Act 1999
- Environment Protection and Biodiversity Conservation Regulations 2000
- Civil Aviation Act 1988
- Civil Aviation Safety Regulations 1998
- National Environment Protection Council Act 1994
- National Greenhouse and Energy Reporting Act 2007
- National Greenhouse and Energy Reporting Regulations 2008
- Native Title Act 1993
- Renewable Energy (Electricity) Act 2000
- Renewable Energy (Electricity) Regulations 2001

#### **OTHER CODES AND STANDARDS**

- Australian Dangerous Goods Code
- OBP Recovery Plan (current ed.)
- Eagle Recovery Plan (current ed.)

## 7. Environmental Management and Monitoring

### 7.1 Environmental Management Plans

Environmental monitoring at the wind farms is conducted in accordance with the approved EMPs. The results of the monitoring are detailed in the following sections “State Environmental Management Plans” and the “Commonwealth Environmental Management Plans”.

All necessary EMPs for BPWF and SBWF were prepared and approved prior to commissioning as required by the approval conditions, permit and/or EPNs. In 2010, 2013 and 2016 reviews of the State EMPs were conducted. The revised documents from the 2016 review were approved early in that year (2016). This PER reporting period therefore focusses on these revised versions of the plans, for which there is just one per wind farm. The review in 2016 resulted in limited change to the content of the plans (sections) but the included content was consolidated into logical subject topics. Further details on this review are provided in following sections of this report.

The following tables (Tables 8 and 9) summarise the relevant management plans and details (the current Departmental names are used) for both the wind farms and the transmission line.

**Table 8. Status of EMPs for BPWF and SBWF**

Environmental Management Plan	Approved by	Last approved Version	Status
State Environmental Management Plan	EPA	2016	Active
Vegetation Management Plan	EPA	2013	Superseded
	DoE	2005	Active but commitments completed
Bird and Bat Monitoring Plan	EPA	2013	Superseded
	DoE	2005	Active but commitments completed
Turbine Shutdown Contingency Plan	EPA	2013	Superseded
Orange-bellied Parrot Management Plan	EPA	2013	Superseded
Wedge-tailed Eagle and White-bellied Sea Eagle Management Plan	EPA	2013	Superseded
Tasmanian Wedge-tailed Eagle and White-bellied Sea-Eagle Nesting Habitat Management Plan	DoE	2007	Completed
Studland Bay Wind Farm Operational Commencement Plan for Eagle Monitoring	EPA	2007	Completed

**Table 9. Status of EMPs for the 110kV Transmission Line**

<b>Environmental Management Plan</b>	<b>Approved by</b>	<b>Last approved</b>	<b>Status</b>
Transmission Line Bird Strike Mitigation Plan	EPA	2003	Completed
	DoE	2003	Active
Transmission Line Vegetation Management Plan	EPA	2003	Completed
Transmission Line Vegetation Management to Deter the Orange-bellied Parrot	EPA	2003	Completed
	DoE	2003	Active
Transmission Line Bird Strike Monitoring Plan	DoE	2003	Active
	EPA	2003	Completed

## 7.2 Environmental Management System

WNH (including operations at BPWF and SBWF) operates its business under a Health, Safety and Environmental management system. WNH was certified to ISO 14001 in 2013 and has maintained its certification since.

The HSE system includes Policies, Procedures, Forms and other documents that assist to establish and set high-level directives to all areas of the business. This includes defining document accountabilities and responsibilities, effectively outlining business and operational risks, developing procedures and protocols to effectively control and manage these risks. In addition, the system includes methods to check and review system performance and implementation and ensure a systematic continuous improvement cycle is established and implemented.

## 7.3 Annual audit reports

Internal and external audits of the two wind farm sites are conducted in accordance with an audit schedule. The audit schedule is drawn up at the commencement of each calendar year and reviewed on a regular basis to ensure the schedule is being followed. Internal audits are conducted in accordance with system procedures. All audit findings are entered into a dedicated database and audit actions tracked. Table 10 includes a summary of the audits conducted during the PER period.

**Table 10. Summary of significant audits and audit findings 2016-2018**

Year	Audit focus	Summary of audit actions
2016	Operational audit at BPWF	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>1, Safety related</li> </ul> <u>Opportunities for improvement</u> <ul style="list-style-type: none"> <li>11, safety related</li> </ul>
2016	Operational audit at SBWF	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>1, Safety related</li> <li>1, Safety related</li> </ul> <u>Opportunities for improvement</u> <ul style="list-style-type: none"> <li>7, safety related</li> </ul>
2016	Site Environmental audit at BPWF	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>2, spill kits contents, bunding</li> </ul> <u>Opportunities for improvement, Observation</u> <ul style="list-style-type: none"> <li>2, gas storage, documentation</li> </ul>
2016	Site Environmental audit at SBWF	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>4, chemical management/storage (v.minor quantities)</li> </ul> <u>Opportunities for improvement</u> <ul style="list-style-type: none"> <li>0</li> </ul>
2016	Bushfire Preparedness audit	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Opportunities for improvement</u> <ul style="list-style-type: none"> <li>0</li> </ul>
2016	External audit against ISO 14001	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Opportunities for improvement/ observations</u> <ul style="list-style-type: none"> <li>8, range of minor opportunities for improvement</li> </ul>
2017	Operational audit at BPWF	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>1, safety related</li> </ul> <u>Opportunities for improvement</u> <ul style="list-style-type: none"> <li>6, safety related</li> </ul>
2017	Operational audit at SBWF	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>2, safety related</li> </ul> <u>Opportunities for improvement</u> <ul style="list-style-type: none"> <li>6, safety related</li> </ul>
2017	Site Environmental audit at BPWF	<u>Major Non-Conformance</u> <ul style="list-style-type: none"> <li>0</li> </ul> <u>Minor Non-Conformances</u> <ul style="list-style-type: none"> <li>2, chemical management</li> </ul>

		<u>Opportunities for improvement, Observation</u> • 7, various
2017	Site Environmental audit at SBWF	<u>Major Non-Conformance</u> • 0 <u>Minor Non-Conformances</u> • 3, chemical management <u>Opportunities for improvement</u> • 3, various
2017	External audit against ISO 14001	<u>Major Non-Conformance</u> • 0 <u>Minor Non-Conformances</u> • 1, system scope requires extension <u>Opportunities for improvement/ observations</u> • 6, minor opportunities for improvement
2018	Operational audit at BPWF	<u>Major Non-Conformance</u> • 0 <u>Minor Non-Conformances</u> • 0 <u>Opportunities for improvement</u> • 11, 2 minor enviro opportunities for improvement
2018	Workplace inspection at SBWF	<u>Major Non-Conformance</u> • 0 <u>Minor Non-Conformances</u> • 4, 3 minor enviro relating to chemical storage compliance <u>Opportunities for improvement</u> • 0
2018	HSE system audit against ISO14001	<u>Major Non-Conformance</u> • 0 <u>Minor Non-Conformances</u> • 0 <u>Opportunities for improvement</u> • 0
2018	EPBCA external audit	<u>Major Non-Conformance</u> • 0 <u>Minor Non-Conformances</u> • 0 <u>Opportunities for improvement</u> • 0

#### **7.4 Report on any changes made or intended to the activity or EMS in response to the annual audits**

Audits conducted over the PER period continue to check environmental performance and drive continuous improvement in environmental management at both sites. All audit actions including opportunities for improvement have been evaluated and where possible actions developed to address them. Implementation of actions is tracked at various levels.

There have been no material changes made or intended to be made to the activity. All audit issues have been addressed promptly.

#### **7.5 Public Complaints**

There were no public complaints regarding environmental matters received by WNH during the 2016-2018 reporting period. A free-call 1800 number was established during the reporting period.

## **7.6 Environmental Incidents (non-trivial) and non-compliances**

### **Environmental Occurrences**

It is a requirement that all reportable incidents are reported to the EPA and sections of Tasmanian Department of Primary Industry, Parks, Water and Environment (DPIPWE) as per the EPNs and the reporting procedure prescribed in the BPWF and SBWF EMPs. Bird and bat related incidents are reported in Section 5 of this report.

There were no reportable environmental incidents identified at BPWF and SBWF during the 2016-2018 reporting period. Other non-reportable/trivial incidents were documented and managed by WNH through internal procedures.

### **Occurrence follow-up, mitigation and preventative measures**

As there were no reportable/ non-trivial incidents (bird and bat strikes have been reported to the EPA as they occur as general advice), there are no follow up, mitigation or preventative measures to report.

### **Non-compliance**

WNH continued to comply with the latest approved State and Commonwealth EMPs.

There were no non-compliances with the EPNs or other approval conditions identified. Internal audits conducted as a part of WNH internal audit schedule found no EPN or other approval condition related non-compliances. External audits against ISO 14001 found the sites to be maintaining the standard required to continue their certification, and audits by both the Commonwealth and State regulators also found no non-compliances.

### **Infringement and environment protection notices**

No legal proceedings such as infringement notices or EPNs were served on the wind farms during the reporting period.

## **7.7 Environmental procedure or process changes**

During the 2016 to 2018 reporting period, the only significant changes to procedures or processes pertaining to the management of the wind farms was the review and subsequent approval of the five EMPs held within the State Environmental Management Plan, as described above. The changes associated with this review have been described in Section 8 in the overview of each plan. In general, however, most amendments were of a minor and administrative nature. The most significant amendment was the consolidation of all Plans into a single EMP.

In addition, the company's environmental policy was reviewed and changed to better reflect the the WNH business, its risks and management approaches.

## **7.8 Environmental Management activities and meetings**

A summary of environmental management activities and meetings for the period 2016-2018 is provided in Table 11.

**Table 11. Summary of environmental management activities and meetings during the reporting period (2016-2018)**

Date	Activity or meeting	Comment
<b>Activities undertaken and outlined in the approved EMPs are outlined in the relevant sections of this report. Other management activities and meetings held in conjunction or addition to the approved EMPs are listed in this table.</b>		
Regularly throughout all 3 years	Visitor tours of BPWF by Woolnorth Tours	Woolnorth Tours ( <a href="http://www.woolnorthtours.com.au">www.woolnorthtours.com.au</a> ) conducts tours of the BPWF.
As required throughout all 3 years	EPA discussions	General catch-up
Regularly throughout all 3 years	Audits and emergency preparedness sessions	Various audits and training sessions conducted throughout the year in accordance with WNH's internal schedules.
<b>2016</b>		
February	Annual meeting with Van Dieman's Land Company	Annual meeting to discuss property issues and licence requirements.
March	Earth Sciences and CODES	Field surveys for PhD and departmental study programs
June	Complaints handling forum for wind farms	Clean Energy Council forum
July	Save the Tasmanian Devil Program surveys	Annual trapping surveys conducted across BPWF and neighbouring VDL Farms' properties
August	Meeting with Western Advance	Meeting with Western Advance to discuss remote sensing technologies, cameras and deterrents.
September	Patsy Cameron and Circular Head Aboriginal Corporation site visit	Site tour and visitor's centre upgrade discussions.
October	Emergency Services Workshop	Workshop with the local Tasmanian Fire Service, Police and State Emergency Service branches
November	Tas. Fire Service tour	Preparation for fire season with services
December	External Audit	External audit by BSI for ISO 14001 certification
December	Earth Sciences and CODES	Field surveys for PhD and departmental study programs
<b>2017</b>		
February	Annual meeting with Van Dieman's Land Company	Annual meeting to discuss property issues and licence requirements.
February	EPA meeting	General meeting

Date	Activity or meeting	Comment
June	EPA Site Inspection	Assessment of compliance against the site environmental permit conditions
July	Annual devil trapping surveys	Property access and support for the DPIPWE devil team
September	Tasmanian Devil Local Workshop	Coordination meeting between local businesses, Circular Head Council and the Save the Devil team to discuss roadside collision management
October	EPA meeting	Meeting with EPA about eagle management, mitigation (Musselroe Wind Farm focus)
December	External Audit	External audit by BSI for ISO 14001 certification
December	EPA site visit	General visit from EPA Assessment
December	Woolnorth Wind Farm Springboard to Higher Education Bursary presentation	Present University of Tasmania Woolnorth Wind Farm Springboard to Higher Education Bursary at Smithton High School and Circular Head Christian School
<b>2018</b>		
February	Meeting with VDL	Grazing Licence meeting
July	Annual devil trapping surveys	Property access and support for the DPIPWE devil team
April	Geology conference site tour	Held by the University of Tasmania's Earth Sciences and CODES department
August	EPA meeting	Meeting with EPA about eagle management, mitigation (Musselroe Wind Farm focus)
August-October	Technology discussions/meetings	Various meetings with Identiflight and Robin Radar
November	Van Dairy meeting	Grazing Licence meeting
November	Noise deterrent testing	Testing of Hyperspike as a potential noise deterrent (MRWF)
November	ESA Conference	Presentation at Woolnorth bird impact data
December	External Audit	External audit by BSI for ISO 14001 certification

## 7.9 Specific actions under EMPCA

There were no specific actions under EMPCA in relation to the activity

### **7.10 Any proceedings under Tasmanian or Commonwealth environmental legislation**

There were no proceedings under Tasmanian or Commonwealth environmental legislation during the reporting period.

### **7.11 Any other enforcement actions**

There were no enforcement actions in place during the reporting period.

### **7.12 Breaches of permit conditions or relevant limits in legislation and results that vary significantly from predictions contained in any relevant EMP**

There were no breaches of the permit conditions or other relevant limits during the reporting period.

### **7.13 Staff and contractor environmental training**

WNH maintains a training plan for the employees and contractors working at BPWF and SBWF. The training plan is an output of the Health, Safety and Environmental system that governs the BPWF and SBWF operations. The training plan documents all employees and lists the mandatory and recommended training requirements for each person. Training packages have been developed in line with the training plan and are delivered both internally and externally by suitably qualified personnel. In addition to training sessions, emergency preparedness exercises have been undertaken to prepare and train site personnel for site emergency events. Table 12 documents the training sessions and emergency preparedness exercises undertaken during 2016-2018.

**Table 12. Training sessions and emergency preparedness exercises**

<b>Year</b>	<b>Training or exercise</b>	<b>Activity type</b>
2016	Bushfire incident covering prep, during, clean-up	Desktop
2016	Up tower trauma	Field, practical
2016	Nacelle mock evacuation	Desktop, practical
2016	HV cable incident	Desktop
2016	Site TFS tours	Site tour, field
2016	Emergency risk assessment 1	Desktop
2016	Emergency risk assessment 2 (incl. Tasmanian Fire Service, Police and State Emergency Service)	Desktop
2017	Field worker doesn't return home	Desktop
2017	Worker in hub become unconscious	Desktop
2017	Injured eagle	Desktop
2017	Quad bike rollover	Desktop
2017	Height rescue	Field, practical

2018	Zero Harm Training	Practical, theory
2018	Nacelle evac - Supervised	Field, practical
2018	Nacelle evac - Supervised	Field, practical
2018	Nacelle evac rigging	Field, practical
2018	Emergency response (crushed worker)	Desktop

### **7.14 Community engagement**

There has been limited community engagement beyond the activities and meetings detailed in Table 12 above. During the PER period, WNH has maintained funding for a University of Tasmania Springboard to Higher Education Bursary for Smithton High School and Circular Head Christian School. WNH has also sponsored various community and council events such as the Duck River Festival, Australia Day events and other larger events such as 10 Days on the Island.

WNH's procurement strategy aims to support as many local businesses as possible through purchasing goods locally and employing local contractors.

WNH provides site access to Woolnorth Tours to conduct site tours of BPWF. This allows local and international visitors to view and receive information about the two wind farms at a purpose built visitors centre and viewing platform. Over the PER period approximately 10 500 people visited BPWF.

### **7.15 Commitments to improve future environmental performance**

#### **Adaptive Management**

The commitment to continual improvement is demonstrated by the use of an embedded adaptive management process. This approach provides a structured evaluation of complex environmental issues at the wind farms. It was initially formally applied to evaluate the effectiveness of management actions (including surveys) relating to WTE collisions at BPWF and SBWF, and was fundamental in the EMP review in 2010 and 2013. However, the process is now being applied to any environmental management strategy where appropriate, some of which are not complex in their nature. The approach is predicated on evidence-based management, which leads to robust and defensible decision making in environmental management. The approach has been described in previous Annual and Public Environmental Reports.

#### **Other methods of ensuring continuous improvement**

WNH is committed to the continuous improvement principles that underpin both the ISO 14001 standard and the HSE system applied to the operations and maintenance of BPWF and SBWF. Opportunities to improve environmental performance are identified and evaluated through systematic processes such as management reviews, corporate level planning, internal and external auditing, site inspections, monthly site HSE meetings and weekly toolbox meetings. The commitment to continuous improvement is outlined in the WNH Environmental Policy included on page 7.

Other evidence of WNH's commitment to continual improvement is the attendance at relevant national and international conferences (to keep abreast of the latest research and management strategies), the continual tracking of scientific literature on various topics, and the publication and presentation of data from these sites.

# State Environmental Management Plans

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## **8. General Management**

### **8.1 2016 EMP review**

The review of the Bird and Bat Monitoring Plan in 2016 resulted in the consolidation of the majority of its commitments into two sections of the plan; General Management and Eagle Management. Commitments relating to studies on local bat populations were removed, as they had been completed. More specifically, the commitments relating to the reporting of dead or injured birds or bats were left largely unchanged and transferred in to the current section, described below.

### **8.2 Reporting of bird and bat collisions**

Ten observations (both sites combined) were reported and managed as incidents in the WNH HSE (Health Safety and Environment) Management System. Bird/bat strike forms were provided (within a few days of the observation) to the EPA as general advice of the observation. There were no incidences related to listed species.

## **9. Orange-bellied Parrot Management**

### **9.1 2016 EMP review**

The review of the Vegetation Management Plan, the Orange-bellied Parrot (OBP) Management Plan and the Turbine Shutdown Contingency Plan in 2016 resulted in no material change to scope or objectives of the 2013 versions, beyond their consolidation in to the current plan (under the section heading 'Orange-bellied Parrot Management'.

### **9.2 Vegetation Management**

#### **Site vegetation assessment and control program**

Both wind farms sites were inspected for the presence of OBP foraging weeds in late January of each reporting period. The inspection focussed on the following species:

- Wireweed
- Fat hen
- Nettle-leaved goosefoot
- Water buttons
- Chickweed

The inspections focus on identifying the presence of the above weed species with spraying (or other actions) undertaken where necessary. Other weed species, if relevant, are identified and noted during the surveys. The specific methods used are detailed below.

#### **Methods**

In late January each year, prior to the OBP northward migration, a verification survey was conducted at BPWF and SBWF to assess if there are any areas that may attract OBPs. The survey assessed:

- Turbine areas
- Roads and hardstands areas
- General pastures.

The objective of the survey was to confirm that the average ground cover of known OBP foraging species (listed above) either flowering or producing seed, did not exceed an average of 10% across the total site, and that no localised area (close to a wind turbine) exceeded 30%. A staged design was used. This involved:

#### **Turbine selection**

Six turbines were chosen at random across the site.

#### **Turbine surveys – PASS/FAIL triggers**

- At each turbine (out to 50m from the turbine base), seven 1m x 1m quadrats were randomly selected, and the species contained in each quadrat estimated.
- If the combined average of OBP foraging species (listed above) of these quadrats was less than 20%, the turbine zone was deemed a PASS.

- If the combined average of OBP foraging species (listed above) of these quadrats is greater than 20%, another seven quadrats were randomly selected, and the average of all 14 taken.
- If the new average is above 22%, the turbine zone was a FAIL and required treatment/management actions and another turbine was selected at random to be tested.

#### Site wide calculations – PASS/FAIL triggers

- If the combined average of all PASS quadrats was less than 7.0%, then the site was a PASS.
- If the combined average of all PASS quadrats was greater than 7.0%, then another two turbines were selected (and the turbine survey methodology described above applied).
- Following the additional two turbine surveys, the combined average of all PASS quadrats had to be less than 7.5%. Greater than this indicated a FAIL for the site and a thorough inspection of all cleared areas within close proximity of turbines was undertaken to identify areas that required treatment/management actions.

A PASS indicated a less than 5% likelihood of the site having a genuine average greater than the trigger level. A FAIL indicates that there was greater than 5% likelihood that the plant coverage may be greater than the trigger level.

#### **Roads and Hardstands**

Roads and hardstands have previously been identified as areas where OBP species can commonly exist. The random quadrat surveys at each turbine (described above) may sample road and hardstand areas. Outside of this, all roads within 200m of any turbine and all hardstands were inspected for the presence of known OBP food species (see list above) and treatment/management actions undertaken where necessary.

#### **General pastures**

Over the past sixteen years no OBPs have been recorded foraging at the BPWF or SBWF site. Grazing management, fertiliser regimes and pasture species composition are managed by the grazing licensee (VDL Farms) and assessed by BPWF and SBWF on an as needs basis. The random quadrat surveys at turbines (described above) sampled general pastures across the site (according to the turbines selected) and management intervention is undertaken when triggers are exceeded (described above).

#### **Results**

The findings from the turbine surveys conducted in January 2016, 2017 and 2018 at BPWF and SBWF are displayed in Figures 5 and 6 respectively. These Figures outline the average percentage cover of OBP foraging species at each turbine location per year. As can be seen from the results, with one exception none of the five OBP weed species were identified in any of the surveyed wind turbine areas and hence all wind turbines areas were deemed a 'PASS'. One turbine at SBWF in 2017 produced a result of 4.3% cover of nettle-leafed goose foot, which was immediately removed by hand. Given the threshold of 20% was not exceeded, this turbine was still deemed a pass. On the basis of the wind turbine area results, the sites were also deemed a 'PASS' in each and every year.

During the surveys there were no significant areas of OBP weed species found in open pastures indicating the surveys and any control undertaken by VDL Farms was effective. Roads and hardstands were assessed by WNH personnel and during this PER period some herbicide and mechanical control was undertaken to reduce or prevent the presence and proliferation of any OBP weeds.

The verification surveys undertaken each January have therefore demonstrated the sites to be effectively free of the key OBP attracting weed species.

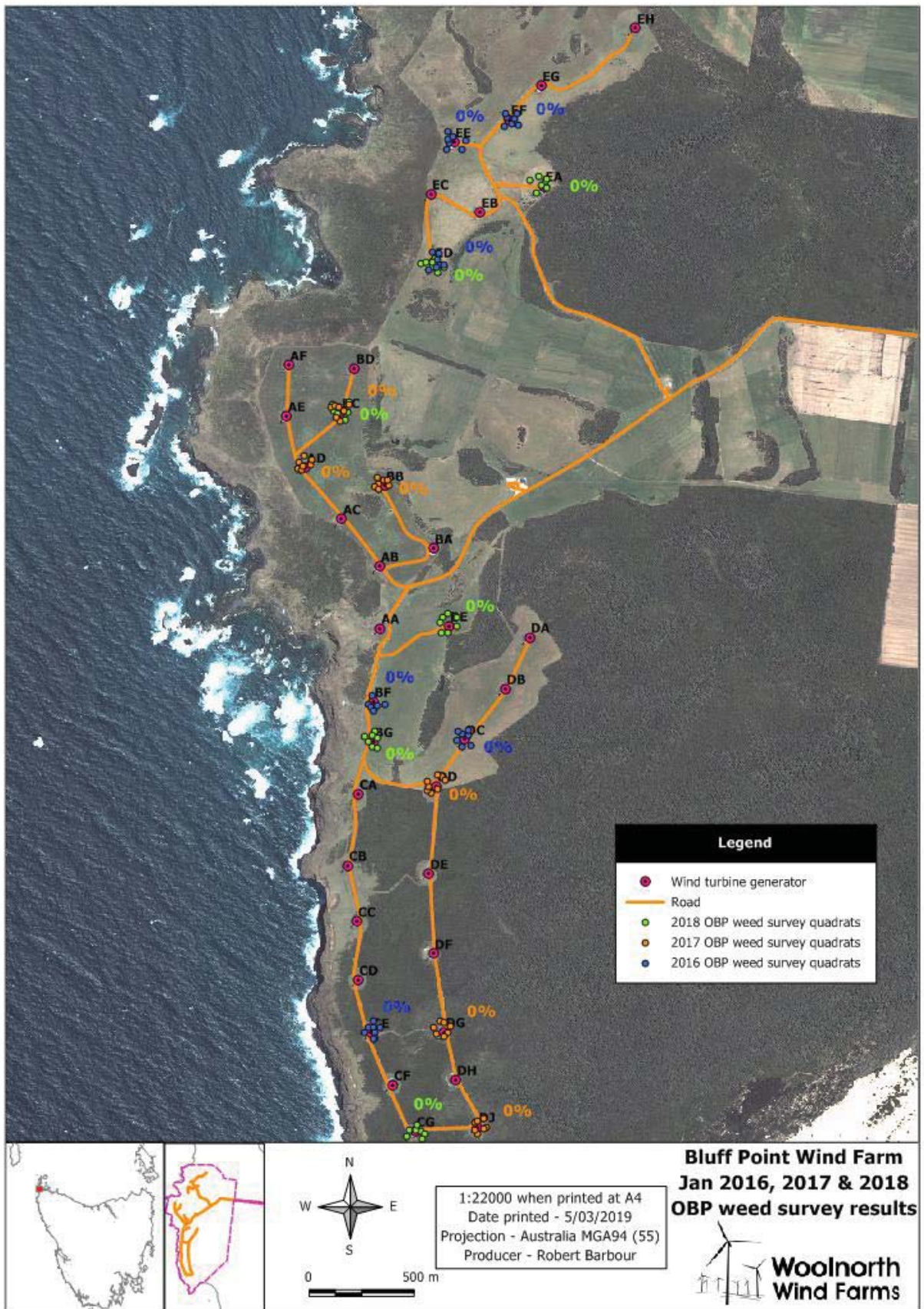


Figure 5. Results (turbine averages) from the OBP weed surveys conducted at BPWF in January of 2016, 2017 and 2018.



## 9.1 OBP Habitat Manipulation - off-site works

The OBP habitat plot, established in 2008/09, is visited at least twice yearly and photographs taken to document its progress (Figure 7). Re-fencing works were undertaken in 2018 to remove the area previously used for the annual forage crop and also to generally improve the fence condition.



**Figure 7.**  
The OBP habitat plot photographed  
December 2016, 2017 & 2018 (top to  
bottom)



## **9.2 Orange-bellied Parrot Rehabilitation and Offsets**

No OBPs were found injured after colliding with a turbine on either site during the period 2016-2018 (or in fact since operations commenced at either site). Therefore, no rehabilitation was required. No OBPs were killed or incapacitated at either BPWF or SBWF during the 2016 to 2018 period (or in fact since operations commenced at either site). Therefore, no offsets were required.

## **9.3 Turbine Shutdown Contingency Plan**

### **Turbine shutdown triggers**

No OBPs were observed on either site within 50m of any turbine, nor flocks of more than 20 blue-winged parrots (BWPs) during 2016-2018. Therefore, no management actions (as specified in the plan) were triggered. The triggers that are in place are designed to prevent collisions.

## **10. Eagle Management**

### **10.1 2016 EMP review**

The review of the Bird and Bat Monitoring Plan and the Wedge-tailed eagle and White-bellied Sea-eagle Management Plan in 2016 resulted in the consolidation of the majority of its commitments into either of two sections of the current plan; the General Management or the Eagle Management sections. Consequently, the commitments relating to the monitoring of eagle collisions, reporting of eagle collisions, minimising food resources, rehabilitation of injured eagles, and understanding the factors involved in wedge-tailed eagle (WTE) collision risk, are described below.

### **10.2 Monitoring eagle collisions with Wind Turbines**

The surveillance strategy approved and implemented during the previous plan continues. The strategy is based on site evidence and is underpinned by a series of benchmarks developed on the calculated long-term collision rate (for each site). All the benchmarks have triggered responses aimed at investigating any detected eagle mortalities (to understand or determine the root cause/s) and to determine if there has been a change (increase) in the average annual collision rate.

#### **Methods**

Monitoring is conducted by all personnel that are working on the sites, which includes WNH staff, external contractors, and other farm staff. The requirement to report any dead or injured eagles (or other birds and bats) to WNH, or their representative, is managed and reinforced through the general and site induction processes.

#### **Results**

There were no dead or injured eagles detected during the reporting period at either BPWF or SBWF and therefore no management actions were required.

### **10.3 Minimising food resources on-site**

WNH continued to minimise potential eagle food resources on site by preventing any calving on the land and by removing any dead cattle from turbine areas. This has been achieved by daily monitoring of stocked areas by farm staff. No sheep have been grazed on the wind farm sites for ten-years (approximately). In addition, a prey control program is implemented when there is a significant or unusual density of WTE or WBSE prey species (wallabies and pademelon) observed/identified on site. A prey control program was not deemed necessary during the reporting period, and therefore not implemented.

### **10.4 Rehabilitation of injured eagles**

There were no eagle collisions or injured eagles observed at either site during the 2016 to 2018 reporting period.

### **10.5 Understanding the factors involved in eagle collision risk**

The assessment of new technologies for understanding eagle collision risk, collision factors and potential mitigation options continued throughout the 2016 to 2018 period. This included the review

of technical reports and papers, summaries of conference proceedings and workshops, review of technology provider's websites and discussions or meetings with technology suppliers. In addition, an eagle collision mitigation workshop (MRWF focus) was conducted by WNH in conjunction with DPIPWE staff in 2017. The workshop explored the technological options available but also other novel ideas. The workshop output provided some guidance on areas where continued development or monitoring of strategies remains valid whilst also provided direction on those approaches that have little to no merit (for one or many reasons).

Of the literature reviewed throughout the reporting period the most useful summary of current research and relevant information has been published by the National Wind Coordinating Collaborative (NWCC) and the American Wind Wildlife Institute (AWWI). These groups have published the proceedings of both the XI and XII Wind and Wildlife Research Meeting held in November 2016 and 2018. Meeting information is available at [www.awwi.org/news-events](http://www.awwi.org/news-events). The Proceedings summarise several developing technologies to minimising impacts however the two that were relevant to minimising eagle impacts were papers on IdentiFlight and DT Bird. Websites for these technologies are included below and the website content contains considerably more information than what is contained in the proceedings. There were a number of papers on innovative approaches to obtaining supportive information about eagle impacts such as innovative survey methods and methods of determining the size of local eagle populations and identifying individuals. Another general publication of interest published in 2017 (also published by NCC/AWWI) was 'Wind Turbine Interactions with Wildlife and Their Habitats'. The publication is not specific to technologies or eagles. It is available at the following link [Wind turbine interactions with wildlife and their habitats June 2017](#).

During the reporting period these existing and developing technologies were reviewed including:

- Robin Radar - [www.robinradar.com](http://www.robinradar.com)
- DeTect Inc radar systems - [www.detect-inc.com](http://www.detect-inc.com)
- LRAD Corporation (long range acoustic device deterrents) - [www.lradx.com](http://www.lradx.com)
- Hyper-spike (noise deterrent technology) – [www.hyper-spike.com](http://www.hyper-spike.com)
- IdentiFlight camera systems - [www.res-group.com/en/services-products/identiflight](http://www.res-group.com/en/services-products/identiflight)
- DT Bird - [www.dtbird.com](http://www.dtbird.com)

In summary, none of these technologies reviewed can be easily and practically implemented at BPWF or SBWF. WNH will continue to monitor the progression of technologies, research projects and relevant literature and will continue to monitor organisations such as the NREL, AWWI and NWCC for new information.

Note that during the reporting period, field trials of two new high-powered acoustic deterrent devices were undertaken at MRWF despite previous unsuccessful trials at Woolnorth in 2010. These trials were of the Hyper-Spike manufactured units rather than LRAD (tested in previous years). These devices produce a highly focussed beam of sound, potentially utilised for hazing away eagles at risk of collision with wind turbines. At 1m the Hyper-Spike HS-18 produces 160dB and at 4km is still reaching volumes of 88dB. The tests of the device on wedge-tailed eagles in flight at MRWF, however, demonstrated little hazing effect on the birds with some initial avoidance response on first experiencing the noise then little response in proceeding flights on the same day. Similarly, trials of the HyperSpike HS-10, which is a hand held unit producing 144 dB of sound, produced little response when tested on wedge-tailed eagles at MRWF. See following Figure 8.



Hyper-Spike HS-10



Hyper-Spike HS-18



**Figure 8**      **Hyperspike HS-10 & HS-18, lower image testing of HS-18 at MRWF**

# Commonwealth Environmental Management Plans

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Actions that have been developed in response to the Commonwealth permit conditions are contained within the following EMPs:

- Bird and Bat Monitoring Plan (specifically bird utilisation surveys and monitoring of bird mortalities);
- Vegetation Management Plan (specifically habitat management for OBPs);
- OBP Management Plan;
- Wedge-tailed Eagle and White-bellied Sea-eagle Nesting Habitat Management Plan (actions relating to wedge-tailed eagles); and the
- Transmission line EMPs.

As indicated in discussions in relation to the State EMPs above, actions in the OBP Management Plan are completed (with the exception of ongoing management requirements). The remaining EMPs are discussed below.

## **11. Bird and Bat Monitoring Plan**

Approval was obtained from the Commonwealth to cease the generic bird utilisation surveys and to modify the bird mortality surveys. See General Management (section 8) for further details.

## **12. Vegetation Management Plan**

The actions in this plan that are relevant to the Commonwealth are those relating to habitat management of OBPs. The results of these actions are reported Section 9, Orange-Bellied Parrot Management.

## **13. Tasmanian Wedge-tailed Eagle and White-bellied Sea-eagle Nesting Habitat Management Plan**

The commitments outlined in this plan have all been completed and have been reported in the previous PERs. No further reporting against this plan is considered necessary.

## **14. Woolnorth to Smithton Transmission Line**

Various management plans apply to the Woolnorth to Smithton 110kV transmission line. These are:

- Transmission Line Bird Strike Mitigation Plan;
- Transmission Line Vegetation Management Plan;
- Transmission Line Vegetation Management to Deter the Orange-bellied Parrot; and
- Transmission Line Bird Strike Monitoring Plan.

The majority of actions contained in these plans were completed during the construction of the transmission line. The remaining actions including vegetation surveys to deter OBPs from the transmission line corridor and surveys of the easements for evidence of collisions were undertaken as required by the relevant plans.

## **15. Environmental management activities above and beyond regulated commitments**

### **15.1 Emergency response**

Throughout the PER period, a number of emergency response exercises were conducted according to annual plans. These exercises have involved operational staff in all cases but have been run as either desktop/toolbox type training, integrated sessions with external services such as the Tasmanian Police, Tas Fire, State Emergency Service, and practical response exercises. These sessions have found that the site emergency response, preparedness, on-site equipment and staff training was adequate to deal with the majority of emergency scenarios.

### **15.2 Bat study**

During 2016 a final report was prepared and submitted regarding a bat monitoring study undertaken at BPWF and SBWF. The study, results and conclusions were outlined in the previous PER (2013-15), Section 9.5.

In summary, with regard to the objectives, objective 1 being to assess the seasonal patterns in bat calls across the two wind farm sites, the monitoring found an increase in bat calls during the summer months and a reduction between July and September. Despite this pattern, there was bat activity recorded in all months of the year. A fairly broad range of species were identified throughout the study period with *Chalinolobus gouldii*, *C.morio-V.vulturnus* and *Nyctophilus* tending to appear on more nights than other species, regardless of time of year. The call counts for *C.gouldii* (Gould's wattled bat) peaked in May and December, while *C.morio-V.vulturnus*, on the other hand, dominated the summer call counts.

The second objective of the study was to investigate the effects of vegetation structure on bat activity by comparing the Anabat recordings from the fragmented (North BPWF, South SBWF) compared to continuous (South BPWF, North SBWF) native vegetation sites. No pattern was observed in the influence of vegetation structure. There was however a large difference between individual sites in the amount of bat activity, with the north SBWF monitoring site producing far less calls than other sites. A potential difference in bat activity between the wind farm sites was also noted, with SBWF having bat activity recorded across fewer months.

#### Conclusions

Although the study suffered significant technical difficulties, requiring a re-setting of objectives in 2013, a number of conclusions and findings are noteworthy:

- From an equipment and resource perspective, long term deployment presented a number of issues, most related to equipment malfunction and failures. Although units were attended to on (at least) a fortnightly basis, issues continued to be noted. Additional unit checking by a person with significant technical and Anabat knowledge may have reduced some of the equipment errors and subsequent data variability.

- Identifying bat calls to species level is difficult and 63% of calls recorded during this study were labelled unknown.
- Despite the data variability, the data confirms the overall pattern of bat activity at BPWF and SBWF, with bats present all year round.
- The data indicated potential differences between the two wind farm sites (e.g. fewer months of activity but high call counts during periods of activity), and a higher degree of variability between the two monitoring locations at SBWF.
- Gould's wattled bats were the most commonly recorded species. This mirrors the mortality records which confirmed at least 70% (possibly 96%) of bat mortalities were Gould's wattled bats (Hull and Cawthen, 2013).
- Interestingly however a range of bat species were recorded using the wind farms sites, however the mortality record indicates only one species<sup>1</sup> appears prone to collision with wind turbines (Hull and Cawthen, 2013).
- There was no distinct spatial pattern between monitoring sites with vegetation close by and sites in open areas. This echoes the bat mortality data which also shows no significant spatial pattern (Hull and Cawthen, 2013).
- An interesting finding is that bat mortalities at SBWF were recorded in the months February, March, May and November which were also high activity months in this study. However at BPWF, the majority of mortalities were detected in the Autumn months but the highest activity recorded during this study was in the Spring months.

### **15.3 Raptor Refuge support**

In 2018, WNH in collaboration with TasNetworks and UPC Renewables made a substantial financial contribution to the Raptor Refuge in Kettering south of Hobart ([www.raptorrefuge.com.au](http://www.raptorrefuge.com.au)). This facility has supported the rehabilitation and release of birds of prey for over 20 years as well as providing educational opportunities to school groups and the general public.

### **15.4 Roadkill mitigation for Save the Devil Program**

During 2017, WNH in collaboration with Save the Tasmanian Devil Program, VDL, Fonterra, Circular Head Council and other local Woolnorth based businesses progressed a roadkill mitigation program in the region. The objective of the program to reduce devil and general wildlife roadkill. In November 2017, Save the Tasmanian Devil Program, VDL and Council staff selected 66 locations to place 'virtual fence devices' (see Figure 9 below). WNH contributed enough funds for the procurement of almost all the required devices (63 out of 66). A roadkill study in Tasmania's Arthur River area conclude the devices were highly effective at reducing roadkill ([report](#)).



**Figure 9. Virtual fence device used to alert, repel and prevent animals from entering the road**

## **15.5 Technological investigations**

Monitoring of technological advances and strategies being used around the world to monitor the effects of wind farms on avian fauna and bats, and mitigation strategies to reduce impacts was undertaken throughout the PER period. This is beyond that explored for eagle impacts discussed above. There continues to be an increase in the amount of data published on quantifying and mitigating wind farm effects in the scientific literature, but little new, novel or commercially viable options or techniques that have been demonstrated as effective .

## **15.6 Publications and Presentations**

The following presentation was made during the period 2016-2018:

- Australian Ecology Society – Annual Conference 2018

## **15.7 Land management activities**

Various land management activities have been undertaken across the wind farm sites during the PER period. The principle activity has focussed on strategic gorse control at both BPWF and SBWF. This has been an ongoing program for a number of years, but has now reached the point where existing populations are being managed under annual maintenance regimes.

# Glossary

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WNH	Woolnorth Wind Farm Holding Pty Ltd, the controlling entity and owner/operator of BPWF and SBWF, person responsible for the activity
BPWF	Bluff Point Wind Farm
SBWF	Studland Bay Wind Farm
DPIPWE	Tasmanian Department of Primary Industry Parks Water and Environment
DoE	Department of Environment
EMP	Environmental Management Plan
EPA	Tasmanian Environment Protection Authority
TSPA	Tasmanian <i>Threatened Species Protection Act 1995</i>
EPBCA	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPN	Environmental Protection Notice
BWP	Blue-winged Parrot ( <i>Neophema chrysostoma</i> );
OBP	Orange-bellied Parrot ( <i>Neophema chrysogaster</i> )
WBSE	White-bellied Sea-Eagle ( <i>Haliaeetus leucogaster</i> )
WTE	Wedge-tailed Eagle ( <i>Aquila audax fleayi</i> )

## Species names referred to in text

### Plants

Common Name	Species
Chickweed	<i>Stellaria media</i>
Fat hen	<i>Chenopodium album</i>
Gorse	<i>Ulex europeaus</i>
Nettle-leaved goosefoot	<i>Chenopodium murale</i>
Water buttons	<i>Cotula coronopifolia</i>
Wire weed	<i>Polygonum aviculare</i>

### Birds

Common Name	Species
Wedge-tailed eagle	<i>Aquila audax fleayi</i>
White-bellied sea-eagle	<i>Haliaeetus leucogaster</i>

### Mammals

Common Name	Scientific name
Tasmanian Devil	<i>Sarcophilus harrisii</i>
Wallabies	<i>Notamacropus rufogriseus</i> or <i>Thylogale billardierii</i>
Bandicoots	<i>Perameles gunnii</i>
Quolls	<i>Dasyurus spp.</i>
Gould's wattle bat	<i>Chalinolobus gouldii</i>
Chocolate wattled bat	<i>Chalinolobus morio</i>
Vespa bat	<i>Nyctophilus</i>
Little forest bat	<i>Vespadelus vulturnus</i>

# **Appendix 1 - Bluff Point Wind Farm EPN 7421/2 (current version)**

## Appendix 2 – Studland Bay Wind Farm EPN 7423/3 (current version)