



Northern
Territory
Government

WASTE DISCHARGE LICENCE

(Pursuant to section 74 of the *Water Act 1992*)

Licensee	Power and Water Corporation
Licence Number:	WDL 146-09
Registered Business Address:	Level 2, Mitchell Centre 55-59 Mitchell Street Darwin, NT, 0800
ABN:	15 947 352 360
Premises:	Berrimah Wastewater Treatment Plant Lot 4126, Hundred of Bagot
Anniversary Date:	12 October
Commencement Date:	13 October 2020
Expiry Date:	12 October 2022
Licensed Activity:	The discharge of wastewater from Berrimah Wastewater Treatment Plant to Blesers Creek, and thereafter Darwin Harbour subject to the Licence Conditions.

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INFORMATION ABOUT THIS LICENCE

Definitions of Terms

- A section including the definition of terms used in this Licence can be found at the end of it.
- Terms used in the waste discharge licence which are defined in the *Water Act 1992* (the Act) have the meaning given in that Act unless specifically indicated otherwise.

Responsibilities of Licensee

- It is an offence under the *Water Act 1992*, if the holder of a waste discharge licence contravenes or fails to comply with the conditions of a waste discharge licence.
- Licensees must comply at all times with the requirements of the *Water Act 1992* and all applicable laws.
- Except as expressly provided for in this Licence, the Licensee must not:
 - cause environmental harm either directly or indirectly;
 - allow waste to come into contact with water; or
 - allow water to be polluted.
- Without limiting the conditions of this licence, in conducting the activity, the licensee must do all things reasonable and practicable to:
 - prevent or minimise the likelihood of pollution occurring as a result of, or in connection with, the activity;
 - prevent or minimise the likelihood of environmental harm occurring as a result, or in connection with, the activity;
 - effectively respond to pollution and the risk of pollution occurring as a result of, or in connection with, the activity;
 - effectively respond to environmental harm and the risk of environmental harm occurring as a result of or in connection with the activity; and
 - apply the principles of ecologically sustainable development.

Duration of Licence

- This licence will remain in force until its expiry date, it is surrendered by the licensee, or until it is suspended or revoked by the Controller of Water Resources.
- As set out in section 94 of the *Water Act 1992*, the holder of a licence may, at any time, surrender the licence.

Amendment, Modification or Revocation of Licence (section 93 of the *Water Act 1992*)

- As set out in section 93 of the Act, the Controller of Water Resources may, by notice to the Licensee:
 - amend or modify the terms and conditions of a licence;
 - revoke a licence; or

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- suspend a licence.

Public Register

- A copy of this Licence will be placed on a register in accordance with section 95 of the Act.
- A copy of waste discharge licences and any plans for environmental management, reports, submissions or documents required as a condition of a waste discharge licence, will be placed on a register.
- The Administering Agency makes this register freely available from the Northern Territory Environment Protection Authority (NT EPA) website.

Beneficial Use Declaration (section 73 of the *Water Act 1992*)

- Beneficial Use Declaration (BUD) is a legislated process that reduces the effects of water pollution and assists in the protection and management of water. The community decides how a particular water body should be used by choosing on one or more Beneficial Use categories.

Environmental Interests

- This section highlights the beneficial uses as declared under the *Water Act 1992* and the sensitivity of the surrounding land use and environment associated with the location of the approved activity.
 - Declared beneficial uses and or water quality objectives are:
Declaration of Beneficial Uses and Objectives, Darwin Harbour Region, Northern Territory Government Gazette No. G27, 7 July 2010.
 - Sites of Conservation Significance: SOCS Number 6, Darwin Harbour.

Cultural Interests

- It is the licensee's responsibility to contact the Aboriginal Areas Protection Authority, appropriate land council or other governing body and ensure that any Authority Certificates required as a result of conducting the licenced activity are obtained and complied with.

RULES FOR INTERPRETING THE CONDITIONS OF THIS LICENCE

- Where there is a discrepancy between the conditions of this licence and any plan, standard, guideline or other document referred to in this licence, the conditions of this licence prevail to the extent of the inconsistency.
- Any reference to any standard (Australian or international) in this licence means the relevant parts of the current version of that standard.
- A reference to any guideline or code of practice (or to the relevant parts of any guideline or code of practice) in this licence means the current version of the guideline or code of practice.
- Under section 76 of the *Water Act 1992*, any contravention of or failure to comply with this licence by the licensee may be an offence.
- In this licence, unless the contrary intention appears, words that are defined in the *Water Act 1992* are intended to have the meaning given to them in that Act.

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LICENCE CONDITIONS

GENERAL

1. The licensee must ensure the contact details recorded with the Administering Agency for this licence are correct at all times.
2. The licensee must at all times have a 24-hour emergency contact.
3. The licensee must notify the Administering Agency prior to making any operational change that will cause, or is likely to cause, an increase in the potential for environmental harm.
4. The licensee must cause clear and legible signage, in English, to be displayed in a prominent location at each public entrance to the premises that includes the following details:
 - 4.1. The number of this waste discharge Licence number issued under the *Water Act 1992* (as identified on the first page of this Licence); and
 - 4.2. 24 hour emergency contact details.
5. The licensee must cause a copy of this licence to be available for inspection by any person, in hard copy form, at the registered business address.
6. The licensee must provide to the Administering Agency, within 10 business days of a request, a copy of any document, monitoring data or other information in relation to the activity, in the format requested by the Administering Agency.
7. All notices, reports, documents, data, information or correspondence required to be provided by the Licensee in accordance with this Licence must be provided in electronic form by emailing the document to waste@nt.gov.au.
8. The licensee must maintain and implement the documents listed in Table 1.

Table 1 Documents Relevant to Licenced Activity

Document ID	Document Title
D2020/264914	Environmental Risk Assessment for the discharge of treated effluent from the Berrimah Waste Stabilisation Ponds to Blesers Creek, June 2020
D2015/589440	Communication Strategy Action Plan – Berrimah, October 2019
D2018/444944	Berrimah Waste Stabilisation Ponds Environmental Management Plan, April 2019
D2019/131237	Berrimah Waste Stabilisation Ponds Emergency Response Plan, April 2019

9. Within 10 business days of any amendment being made to a document listed in Table 1, the licensee must provide the amended document to the Administering Agency, along with:
 - 9.1. A tabulated summary of the amendment(s) with document references;
 - 9.2. Reasons for the amendments(s); and
 - 9.3. An assessment of environmental risk associated with the amendment(s)
10. The Administering Agency may require the licensee to revise or amend and resubmit any amended document. Where the Administering Agency requires a document to be resubmitted, the licensee must submit it to the Administering Agency by the date specified by the Administering Agency.
11. The licensee must operate and maintain a community feedback number.
12. The licensee must display the community feedback number:
 - 12.1. where the licensee has a website, in a prominent location on the licensee's website;
 - 12.2. in the Communication Strategy Action Plan referred to in Table 1; and

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- 12.3. in other publicly available documents relating to the activity.
13. The licensee must maintain a Complaint Log for all complaints received by the licensee in relation to the activity.
14. The licensee must ensure that the Complaint Log includes, for each complaint received by the licensee, the following information:
- 14.1. the person to whom the complaint was made;
 - 14.2. the person responsible for managing the complaint;
 - 14.3. the date and time the complaint was reported;
 - 14.4. the date and time of the event(s) that led to the complaint;
 - 14.5. the contact details of the complainant if known, or where no details are provided a note to that effect;
 - 14.6. the nature of the complaint;
 - 14.7. the nature of event(s) giving rise to the complaint;
 - 14.8. prevailing weather conditions at the time (where relevant to the complaint)
 - 14.9. the action taken in relation to the complaint, including any follow-up contact with the complainant; and
 - 14.10. if no action was taken, why no action was taken.

EARLY SURRENDER OF LICENCE

15. Any reports, records or other information required or able to be provided by the licensee under this licence must be submitted to the Administering Agency prior to the licensee surrendering the licence. If the date on which a report, record or other information is required falls after the date the licensee requests to surrender this licence, the licensee must provide the report, record or information as far as possible using data available to the licensee up to and including the date the request to surrender the licence is made.

OPERATIONAL

16. The licensee must, without limiting any other condition of this licence, in conducting the activity do all things reasonable and practicable to ensure the activity does not adversely affect the Declared Beneficial Uses and Objectives as declared from time to time, including those applying to:
- Darwin Harbour Region, Northern Territory Government Gazette No. G27, 7 July 2010
17. The licensee must ensure any plant or equipment used by the Licensee in conducting the activity:
- 17.1. is reasonably fit for the purpose and use to which it is put;
 - 17.2. is maintained; and
 - 17.3. is operated by a person trained to use the plant and equipment.

DISCHARGES

18. This licence authorises wastewater to be discharged from the authorised discharge point(s) identified in Table 2, and as otherwise allowed in accordance with the conditions of this licence.

Table 2 Authorised Discharge Point

Authorised Discharge Point	Description / Source	Location
Bleesers Creek Outfall (SBEEOP)	Maturation Pond 2 (P3) - Appendix 4	Latitude: -12.45392° Longitude: 130.91006°

19. The licensee must ensure that all discharge events at each authorised discharge point consist only of waste from the source(s) as specified in Table 2.

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20. The licensee must ensure that the discharge from all discharge events at the authorised discharge point does not:
 - 20.1. contain any floating debris, oil, grease, petroleum hydrocarbon sheen, scum, litter or other objectionable matter;
 - 20.2. cause or generate odours which would adversely affect the use of surrounding waters;
 - 20.3. cause algal blooms in the receiving water;
 - 20.4. cause visible change in the behaviour of fish or other aquatic organisms in the receiving water;
 - 20.5. cause mortality of fish or other aquatic organisms; or
 - 20.6. cause adverse impacts on plants.

MONITORING

21. The licensee must conduct surface water monitoring in accordance with Appendix 1, Table 1.1 of this licence.
22. The licensee must conduct sediment monitoring in accordance with Appendix 2, Table 2.1 of this licence.
23. The licensee must ensure that all samples and field environmental data are representative of the conditions at the time of sampling.
24. The licensee must ensure that all samples and field environmental data are collected in accordance with recognised Australian Standards and guidelines (such as AS/NZS 5667, Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000.
25. The licensee must ensure that all monitoring samples are analysed at a laboratory with current NATA accreditation or equivalent, for the parameters to be measured.
26. The licensee must for all land based monitoring points specified in the licence:
 - 26.1. install, maintain and provide appropriate identification signage so that they are easily identifiable at all times; and
 - 26.2. maintain safe access and egress, as is reasonably practicable.
27. The licensee must ensure any samples collected in accordance with the Licenced activity or this licence, are obtained by, or under the supervision of a qualified sampler.
28. The licensee must ensure that, for each sample collected in accordance with the Licenced activity the following information must be recorded and retained:
 - 28.1. the date on which the sample was collected;
 - 28.2. the time at which the sample was collected;
 - 28.3. the location at which the sample was collected;
 - 28.4. the name of the person who collected the sample;
 - 28.5. the chain of custody forms relating to the sample;
 - 28.6. the field measurements (if any) and analytical results (if any) relating to the sample; and
 - 28.7. laboratory quality assurance and quality control documentation.

RECORDING AND REPORTING

29. The licensee must keep records of all non-compliances with this licence. These records must be adequate to enable the licensee to comply with the non-compliance notification conditions of this licence

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30. The licensee must notify the Administering Agency of any non-compliance with this licence by emailing waste@nt.gov.au, as soon as practicable after (and in any case within 24 hours after) first becoming aware of the non-compliance.
31. The licensee must include in the notification of non-compliance the following information:
 - 31.1. when the non-compliance was detected and by whom;
 - 31.2. the date and time of the non-compliance;
 - 31.3. the actual and potential causes and contributing factors to the non-compliance;
 - 31.4. the risk of environmental harm arising from the non-compliance;
 - 31.5. the action(s) that have or will be undertaken to mitigate any environmental harm arising from the non-compliance;
 - 31.6. corrective actions that have or will be undertaken to ensure the non-compliance does not reoccur;
 - 31.7. if no action was taken, why no action was taken, and
 - 31.8. a date when an incident investigation report will be submitted to the Administering Agency.
32. A non-compliance with this licence includes:
 - 32.1. an exceedance of a site specific trigger value, as specified in Appendix 1 Table 1.2, on three consecutive sampling occasions;
 - 32.2. an exceedance of three times or more of a site specific trigger value specified in Appendix 1 Table 1.2
33. The licensee must submit a completed Annual Return, by emailing waste@nt.gov.au, within 30 business days after each anniversary date of this licence, which report relates to the preceding 12 month period.
34. The licensee must complete and provide to the Administering Authority a Monitoring Report, not less than 30 business days prior to the anniversary date of this licence, for each year of this licence by emailing waste@nt.gov.au.
35. The licensee must ensure that each Monitoring Report:
 - 35.1. is prepared in accordance with the requirements of the Administering Agency 'Guideline for Reporting on Environmental Monitoring';
 - 35.2. includes a tabulation of all monitoring data required as a condition of this licence;
 - 35.3. includes long term trend analysis of monitoring data to demonstrate any environmental impact associated with the Licenced activity over a minimum period of three years (where the data is available);
 - 35.4. includes an assessment of environmental impact from the activity;
 - 35.5. reports on progress of the Berrimah Wastewater Treatment Plant Improvement Plan dated September 2016;
 - 35.6. contain a summary of the reporting limit (trigger value) exceedances that have occurred during the reporting period; and
 - 35.7. report on the following parameters associated with wastewater discharge:
 - total discharge (ML/year);
 - total biochemical oxygen demand (tonnes/year);
 - total phosphorus (tonnes/year); and
 - total nitrogen (tonnes/year).

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PERFORMANCE IMPROVEMENT

36. The licensee must progress, implement and comply with the actions identified in the Berrimah Wastewater Treatment Plant Improvement Plan dated September 2016.

END NOTES

This licence is a renewal and supersedes WDL146-08 which was issued on 12 October 2018

WDL146-07 was issued on 12 July 2018, expiring 12 October 2018 (a renewal of WDL146-06 and change of reporting period)

WDL146-06 was issued on 1 November 2017, expiring 12 July 2018

WDL146-05 was issued on 1 November 2015, expiring 31 October 2017

WDL146-04 was issued on 1 November 2013, expiring 31 October 2015

WDL146-03 was issued on 12 August 2013, expiring 31 October 2013 (an amendment of WDL146-02)

WDL146-02 was issued on 22 March 2013, expiring 31 October 2013 (an amendment of WDL146-01)

WDL146-01 was issued on 1 November 2011, expiring 31 October 2013

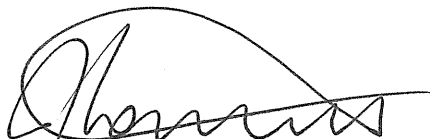
WDL146 was issued on 13 October 2006 and expired 31 October 2011

The end notes are to assist with historical records

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END OF LICENCE CONDITIONS

This licence is not valid unless signed below:



JOANNE TOWNSEND

Controller of Water Resources

Dated the 11 October 2020

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DEFINITIONS

In this licence, unless a contrary intention appears:

Term	Definition
24 hour emergency contact	the phone number of a person who can be contacted at any time and be capable of responding to and providing information about any incident associated with the activity.
Activity	the Licenced activity as described on the covering page of this licence.
Administering Agency	means the Department of Environment, Parks and Water Security, or if dissolved, another Government Department with responsibility for administering the <i>Water Act 1992</i> .
Annual Return	an Administering Agency prescribed format for demonstrating and reporting compliance with the conditions of this licence.
ANZECC/ARMCANZ	Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, 2000: National Water Quality Management Strategy: <i>Australian Guidelines for Water Quality Monitoring and Reporting</i> .
Business days	a day not Saturday, Sunday or a public holiday, in the Northern Territory.
Community feedback number	a telephone number enabling members of the public to contact, at any time, a person or voice mail system that can accept, on behalf of the licensee, enquiries or complaints about the activity, and to which the licensee must respond.
Complaint Log	a register of complaints to be maintained by the Licensee that records the details of each complaint received in relation to the activity.
Consultation and Communication Plan	a written plan documenting proposed consultation and communications for the activity before, during and after the activity which includes a strategy for communicating with members of the public who are likely to have a real interest in, or be affected by, the activity.
Contact details	includes the 24 hour emergency contact, and name, position title and phone number of a representative of the licensee who can be contacted about the licence and activity.
Contaminant	a solid, liquid or gas or any combination of such substances and includes: <ul style="list-style-type: none">(a) noise, odour, heat and electromagnetic radiation;(b) a prescribed substance or prescribed class of substances; and a substance having a prescribed property or prescribed class of properties.
Discharges	allow a liquid, gas or other substance to flow out from where it has been confined.

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Term	Definition
Emergency Response Plan	a written plan documenting the licensee's procedures for responding to emergencies caused by, resulting from or associated with the activity and that may cause environmental harm.
Environmental harm	any harm to or adverse effect on, or potential harm to or potential adverse effect on, the environment
Environmental nuisance	means: <ul style="list-style-type: none">(a) an adverse effect on the amenity of an area that:<ul style="list-style-type: none">(i) is caused by noise, smoke, dust, fumes or odour; and(ii) unreasonably interferes with or is likely to unreasonably interfere with the enjoyment of the area by persons who occupy a place within the area or are otherwise lawfully in the area; or an unsightly or offensive condition caused by contaminants or waste.
Incident	includes: <ul style="list-style-type: none">(a) an accident, emergency or malfunction; and(b) a deliberate action, whether or not that action was taken by the person conducting the activity in the course of which the incident occurred.
Litter	litter, garbage, rubbish, refuse or waste matter, and includes the body of a dead animal.
Maintain	kept in a manner that it does not present or cause a risk of environmental harm or a hazard to persons or property or, for the purposes of documents including plans, a process of reviewing and amending documentation to ensure it is relevant.
Material environmental harm	environmental harm that: <ul style="list-style-type: none">(a) is not trivial or negligible in nature;(b) results, or is likely to result, in not more than \$50,000 or prescribed amount (whichever is greater) being spent in taking appropriate action to prevent or minimise the harm or rehabilitate the environment; or results in actual or potential loss or damage to the value of not more than \$50,000.
NATA	National Association of Testing Authorities, Australia.
Non-compliance	failure or refusal to comply, whether by act or omission, with obligations or requirements and includes any exceedance of a reporting limit.
Non-compliance notification	an Administering Agency prescribed format for notifying the Administering Agency of a non-compliance.
Plant and equipment	all material items used in association with the activity, including (but not limited to) storage vessels and containers,

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Term	Definition
	pipe work and hosing, vehicles (including vessels), tools, and measuring equipment.
Pollute	<p>in relation to water, means directly or indirectly to alter the physical, thermal, chemical, biological or radioactive properties of the water so as to render it less fit for a prescribed beneficial use for which it is or may reasonably be used, or to cause a condition which is hazardous or potentially hazardous to:</p> <ul style="list-style-type: none">(a) public health, safety or welfare;(b) animals, birds, fish or aquatic life or other organisms; or(c) plants.
Pollution	<ul style="list-style-type: none">(a) a contaminant or waste that is emitted, discharged, deposited or disturbed or that escapes; or(b) a contaminant or waste, effect or phenomenon, that is present in the environment as a consequence of an emission, discharge, deposition, escape or disturbance or a contaminant or waste.
Premises	the premises identified in this licence which includes equipment, plant and structures, whether stationary or portable, and the land on which premises are situated.
Public entrance	access to the premises that is utilised by the public.
Qualified sampler	a person who has training and experience in obtaining samples from the relevant environmental medium.
Serious environmental harm	<p>environmental harm that is more serious than material environmental harm and includes environmental harm that:</p> <ul style="list-style-type: none">(a) results or is likely to result in more than \$50,000 or prescribed amount (whichever is greater) being spent in taking appropriate action to prevent or minimise the harm or rehabilitate the environment;(b) results in actual or potential loss or damage to the value of more than \$50,000;(c) damages an aspect of the environment that is of a high conservation value or of special significance; and(d) is irreversible or otherwise of a high impact or on a wide scale.
Waste	Includes matter or a thing, whether wholly or partly in a solid, liquid or gaseous state, which, if added to water, may pollute the water.
Wastewater	water that contains a contaminant or waste.
Water	means water, whether or not it contains impurities.
WMPC Act	the Northern Territory <i>Waste Management and Pollution Control Act</i> .

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APPENDIX 1: Surface Water and Discharge Monitoring

Table 1.1: Surface Water and Discharge Monitoring Frequencies

Site Code	Sample Locations ^a				
	Discharge	Surface Water – Bleesers Creek			
	SBEBLDP (SBe100)	SBEBL02	SBEBL03	SBEBL04	SBEBL06
Indicator					
Physio-chemical parameters					
Flow	F	NR			
pH		M			
Electrical conductivity					
Dissolved oxygen					
Temperature					
Turbidity					
Total suspended solids	M				
Biological Parameters					
Biochemical oxygen demand	M				
Chlorophyll-a					
Nutrient Parameters					
Ammonia (Total as N)	M				
Total Nitrogen					
Oxidised Nitrogen (NO _x as N)					
Total Phosphorous					
Filterable Reactive Phosphorous					
Metal Parameters					
Copper (filtered)	M				
Zinc (filtered)					
Pathogen Indicators					
Escherichia coli	F	M			
Enterococci					

Key: F = fortnightly; NR = not required; M = monthly

Note: Samples to be collected from 0.2 – 0.5 m below surface

^a As identified in Appendix 3 (Location Map)

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Table 1.2: Surface Water and Discharge Reporting Limits (Trigger Values)

Indicator	Units	Sampling Locations ^a				Reporting Trigger
		Zone of influence (ZOI)		Slightly-Moderately Disturbed Zone (SMDZ)		
		Site Code	SBEBL02	SBEBL03	SBEBL04	
		Trigger values				
Physio-chemical parameters						
pH	pH unit	<6 and >8.5 ^b		<6 and >8.5 ^b		Exceedance of trigger value ^h
Dissolved oxygen	% satn.	<30		<65 ^c and >110 ^c		Exceedance of trigger value ^h
Total suspended solids	mg/L	-		>15 ^c		Exceedance of trigger value ^h
Biological Parameters						
Chlorophyll-a	µg/L	-		>6 ^c		Exceedance of trigger value ^h
Nutrient Parameters						
NH ₃ -N (Total Ammonia as N)	µg/L	1850 ^d	1320 ^d	1320 ^d	1100 ^d	Exceedance of trigger value ^h
				>20 ^b		Exceedance of trigger value for the median of the 6 most recent samples – only report when chlorophyll-a also exceeds reporting limit
Total Nitrogen	µg/L	-		>300 ^b		
NO _x as N	µg/L	-		>20 ^b		
Total Phosphorous (TP)	µg/L	-		>30 ^b		
Filterable Reactive Phosphorous (FRP)	µg/L	-		>10 ^b		
Metal Parameters						
Copper (filtered)	µg/L	>8 ^e		>1.3 ^f		Exceedance of trigger value ^h
Zinc (filtered)	µg/L	>15 ^f		>15 ^f		Exceedance of trigger value ^h
Pathogen Indicators						
Enterococci	cfu/100 mL or mpn/100 mL	-	>500 ^g	>200 ^g		Exceedance of trigger value ^h

^a As identified in Appendix 3 (Location Map)

^b *Water Quality Objectives for the Darwin Harbour Region* (NRETAS 2010)

^c Adjusted *Water Quality Objectives* to account for change in assessment statistic from 'median' to individual value

^d pH adjusted SMD trigger value based on long-term average pH at these sites (*Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, 2000 (ANZECC and ARMCANZ 2000) ANZECC and ARMCANZ 2000 – Volume 2 Table 8.3.7)

^e 80% level of species protection for marine water as per Table 3.4.1 of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, 2000 (ANZECC and ARMCANZ 2000 – Volume 1).

^f 95% level of species protection for marine water as per Table 3.4.1 of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, 2000 (ANZECC and ARMCANZ 2000 – Volume 1).

^g Microbial Water Quality Assessment Limits for Category B (200 enterococci/ 100 mL) and Category C (500 enterococci/ 100 mL) as per Table 5.7 of the *Guidelines for Managing Risks in Recreational Waters* (NHMRC 2008).

^h In accordance with Condition 32 reporting requirements.

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APPENDIX 2: Sediment Monitoring

Table 2.1: Sediment Monitoring Plan

				Sampling Locations ^a											
				Classification				Test Estuary Bleasers Creek				Reference Estuary – Short Creek			
				Site Code				SBEBL02	SBEBL03	SBEBL04	SBEBL06	SPASC01	SPASC02	SPASC03	SPASC04
Indicators	Matrix		Assessment Protocol	Monitoring Frequency											
	Sediment	Pore water													
Interpretive															
Total Organic Carbon	✓	x	Calculate C:N ratios	Annual - Dry season											
Aluminium	✓	x	Al normalisation of total metals in sediment												
pH		✓	pH adjustment of SMD TV (NH ₃ -N)												
Biological															
Chlorophyll a	✓	x	1. Compare to 2 x 80 th percentile of reference data 2. Calculate ratio to pheophytin-a	Annual - Dry season											
Nutrients															
Total N	✓	✓	Compare to 2 x 80 th percentile of reference data	Annual – Dry season											
Total P	✓	✓	1. Compare to 2 x 80 th percentile of reference data												
Ammonia (Total as N)	x	✓	1. Compare to pH adjusted SMD TV ^b 2. Compare to 2 x 80 th percentile of reference data												
Filterable reactive phosphorous	x	✓	Compare to 80 th percentile of reference site data												
Metals															

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			Sampling Locations ^a							
			Classification	Test Estuary Bleasers Creek				Reference Estuary – Short Creek		
			Site Code	SBEBL02	SBEBL03	SBEBL04	SBEBL06	SPASC01	SPASC02	SPASC03
Indicators	Matrix		Assessment Protocol	Monitoring Frequency						
	Sediment	Pore water								
Copper	✓ T,B	✓ F	1. Compare 'T' in sediment to ISQG Low ^c and then if exceeds compare 'B' in sediment to ISQG Low ^c 2. Compare 'F' in pore water to SMD TV ^d 3. Compare 'T' and 'B' in sediment and 'F' in porewater to 2 x 80th percentile of reference data 4. Compare AI normalised 'T' in sediment to 2 x 80th percentile of reference data in that season and assess for significant differences	Annual – Dry season						
Zinc	✓ T,B	✓ F								

Key: T = total metal fraction; B = bioavailable fraction in sediment, estimated by dilute 1 M HCl extraction; F = filtered porewater; SMD = slightly-moderately disturbed; TV = trigger value; ISQG = interim sediment quality guideline

^a Co-ordinates for all sampling locations/site codes are identified in Appendix 3, Location Map

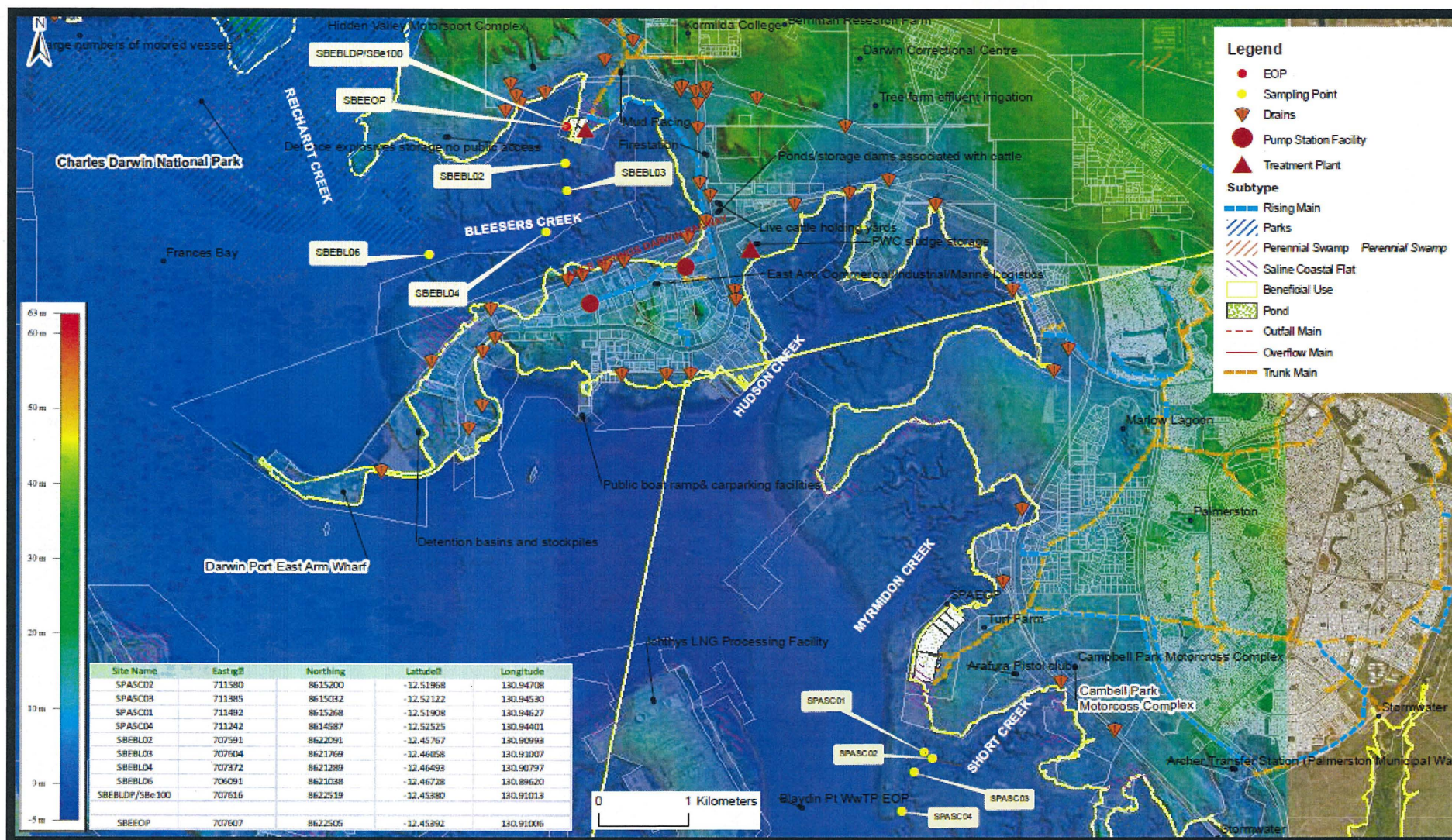
^b pH adjusted SMD trigger value based on in-situ pore water pH, as per Table 8.3.7 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000 – Volume 2)

^c Table 3.5.1 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000 – Volume 1)

^d Table 3.4.1 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000 – Volume 1)

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APPENDIX 3: Location Map for Sampling Sites and Authorised Discharge Point



WASTE DISCHARGE LICENCE (WDL 146-09)

APPENDIX 4: Berrimah Wastewater Treatment Plant Site Layout

