



Northern
Territory
Government

WASTE DISCHARGE LICENCE

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

Licensee Power and Water Corporation

Licence Number: **WDL148-08**

Registered Business Address: Level 2, Mitchell Centre
55-59 Mitchell Street
DARWIN NT 0800

ABN: 15 947 352 360

Premises: 80 Catalina Road, Marlow Lagoon, Northern Territory Lot 1111,
Location Code 590

Anniversary Date: 31 October

Commencement Date: 1 November 2021

Expiry Date: 31 October 2031

Licensed Activity: Controlled discharge of wastewater from the Palmerston Waste Stabilisation Ponds (WSPs) to Myrmidion Creek and thereafter Darwin Harbour subject to the conditions of this licence.

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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 *Water Act 1992*, the Controller of Water Resources may, by notice:
 - amend or modify the terms and conditions of a licence;
 - revoke a licence; or
 - suspend a licence.

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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, SOC 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 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. waste discharge licence number issued under the *Water Act 1992*; 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 cause a copy of this licence to be available at all times on the licensee's Australian website.
7. 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.
8. All notices, reports, documents or other correspondence required to be provided as a condition of this licence, unless otherwise specified as a condition of this licence, must be provided in electronic form by emailing waste@nt.gov.au.
9. The licensee must maintain and implement the documents listed in Table 1.

Table 1 Documents Relevant to Licenced Activity

Document ID	Document Title
D2015/500627	Wastewater Discharge Licence — Communications Strategy
D2015/199966	Power and Water Corporation Emergency Management Plan
D2021/148679	Palmerston Waste Stabilisation Ponds Improvement Plan 2021

10. Within 10 business days of any amendment (other than typographical changes or revisions of formatting or referencing) being made to a document listed in Table 1, the licensee must provide the amended document to the Administering Agency, along with:
 - 10.1. A tabulated summary of the amendment(s) with document references;
 - 10.2. Reasons for the amendments(s); and
 - 10.3. An assessment of environmental risk associated with the amendment(s)
11. The Administering Agency may require the licensee to revise or amend and resubmit any document provided as a condition of this licence. 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.
12. The licensee must operate and maintain a community feedback number.
13. The licensee must display the community feedback number:
 - 13.1. in a prominent location on the licensee's Australian website;
 - 13.2. in the Communications Strategy referred to in Table 1; and
 - 13.3. in other publicly available documents relating to the activity.

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14. The licensee must maintain a Complaint Log for all complaints received by the licensee in relation to the activity.
15. The licensee must ensure that the Complaint Log includes, for each complaint received by the licensee, the following information:
 - 15.1. the person to whom the complaint was made;
 - 15.2. the person responsible for managing the complaint;
 - 15.3. the date and time the complaint was reported;
 - 15.4. the date and time of the event(s) that led to the complaint;
 - 15.5. the contact details of the complainant if known, or where no details are provided a note to that effect;
 - 15.6. the nature of the complaint;
 - 15.7. the nature of event(s) giving rise to the complaint;
 - 15.8. prevailing weather conditions at the time (where relevant to the complaint);
 - 15.9. the action taken in relation to the complaint, including any follow-up contact with the complainant; and
 - 15.10. if no action was taken, why no action was taken.
16. The licensee must implement, maintain and follow an Emergency Response Plan that addresses procedures for responding to emergencies associated with the activity that may cause environmental harm.

EARLY SURRENDER OF LICENCE

17. 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

18. 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:
- The Darwin Harbour Region (Northern Territory Government Gazette No. G27, 7 July 2010).
19. The licensee must ensure any plant and equipment used by the licensee in conducting the activity:
 - 19.1. is reasonably fit for the purpose and use to which it is put;
 - 19.2. is maintained; and
 - 19.3. is operated by a person trained to use the plant and equipment.
20. No change, replacement or alteration of plant and equipment is permitted if the change, replacement or alteration increases the risk of environmental harm for the licenced activity, unless approved by the Administering Agency.

DISCHARGES

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

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Table 2 Authorised Discharge Points

Authorised Discharge Point	Description	Location
Myrmidon Creek Outfall SPAEOP	End of pipe for outlet from Pond 5 (Maturation Pond 4) comprising treated sewage effluent	Latitude:-12.50370 Longitude: 130.94861

22. 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.
23. The licensee must, for each authorised discharge point, install, operate and maintain a device to measure and record, for each discharge event:
 - 23.1. the time the discharge commenced and the duration of the discharge;
 - 23.2. the discharge rate of flow; and
 - 23.3. the discharge volume.
24. The licensee must ensure that the discharge from all discharge events at each authorised discharge point does not:
 - 24.1. contain any floating debris, oil, grease, petroleum hydrocarbon sheen, scum, litter or other objectionable matter;
 - 24.2. cause or generate odours which would adversely affect the use of surrounding environment;
 - 24.3. cause algal blooms in the receiving environment;
 - 24.4. cause visible change in the typical behaviour of fish or other aquatic organisms in the receiving environment;
 - 24.5. cause mortality of fish or other aquatic organisms; or
 - 24.6. cause adverse impacts on plants or animals in receiving waters.

MONITORING

25. The licensee must conduct surface water monitoring in accordance with Appendix 1, Table 1-1.
26. The licensee must conduct sediment monitoring in accordance with Appendix 2, Table 2-1.
27. The licensee must ensure that all samples and field environmental data are representative of the conditions at the time of sampling.
28. 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, ANZG 2018)
29. 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.
30. The licensee must for all land based monitoring points specified in this licence:
 - 30.1. install and maintain appropriate identification signage so that they are reasonably identifiable at all times; and
 - 30.2. maintain safe access and egress, as is reasonable and practicable.
31. The licensee must ensure any samples collected in accordance with this licence or in connection with the activity, are obtained by, or under the supervision of, a qualified sampler.
32. The licensee must ensure that, for each sample collected in accordance with this or in connection with the activity or this licence, the following information must be recorded and retained:
 - 32.1. the date on which the sample was collected;
 - 32.2. the time at which the sample was collected;
 - 32.3. the location at which the sample was collected;

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- 32.4. the name of the person who collected the sample;
- 32.5. the chain of custody forms relating to the sample;
- 32.6. the field measurements (if any) and analytical results (if any) relating to the sample; and
- 32.7. laboratory quality assurance and quality control documentation.

RECORDING AND REPORTING

33. 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.
34. 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.
35. The licensee must include in the notification of non-compliance the following information:
 - 35.1. when the non-compliance was detected and by whom;
 - 35.2. the date and time of the non-compliance;
 - 35.3. the actual and potential causes and contributing factors to the non-compliance;
 - 35.4. the risk of environmental harm arising from the non-compliance;
 - 35.5. the action(s) that have or will be undertaken to mitigate any environmental harm arising from the non-compliance;
 - 35.6. corrective actions that have or will be undertaken to ensure the non-compliance does not reoccur;
 - 35.7. if no action was taken, why no action was taken; and
 - 35.8. a date when an incident investigation report will be submitted to the Administering Agency.
36. The licensee must ensure there are no exceedances:
 - 36.1. of a site specific trigger value, as specified in Appendix 1 Table 1-2, on three consecutive sampling occasions; or
 - 36.2. of three times or more a site specific trigger value, specified in Appendix 1 Table 1-2
37. The licensee must keep records of all exceedances of trigger values specified in this licence. These records must be adequate to enable the licensee to comply with the non-compliance notification conditions of this licence.
38. The licensee must submit a completed Annual Return, by emailing waste@nt.gov.au, within 30 business days prior to each anniversary date of this licence, which relates to the preceding 12 month period.
39. The licensee must complete and provide to the Administering Agency 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.
40. The licensee must ensure that each Monitoring Report:
 - 40.1. is prepared in accordance with the requirements of the NT EPA 'Guideline for Reporting on Environmental Monitoring';
 - 40.2. includes a tabulation of all monitoring data required as a condition of this licence and any additional data used as part of the analysis and interpretation undertaken in the report, to be submitted in electronic Microsoft® Excel® format;
 - 40.3. includes long term trend analysis of monitoring data to demonstrate any environmental impact associated with the activity over a minimum period of six years (where the data is available);

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- 40.4. includes an assessment of surface water quality in accordance with Appendix 1, Table 1-3 and sediment quality in accordance with Appendix 2, Table 2-1;
- 40.5. reports on the progress of the Palmerston Waste Stabilisation Pond Improvement Plan 2021;
- 40.6. includes an assessment of environmental impact from the activity; and
- 40.7. reports on the following parameters associated with wastewater discharge:
 - total discharge (ML/year)
 - total biochemical oxygen demand (tonnes/year)
 - total phosphorous (tonnes/year)
 - total nitrogen (tonnes/year)

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END NOTES

This licence is a renewal and supersedes WDL148-07 which expired on 31 October 2021. This the first licence granted for 10 years.

WDL148-06 was a renewal and was issued on 1 November 2017

WDL 148-05 was a renewal and was issued on 1 November 2015

WDL 148-04 was a renewal and was issued on 1 November 2013

WDL 148-03 was an amendment issued on 12 August 2016 and superseded WDL 148-02

WDL148-02 was an amendment issued on 22 March 2013 and superseded WDL 148-01

WDL148-01 was a renewal and was issued on 1 November 2011

WDL 148 was issued on 13 October 2006

The end notes are to assist with historical records

END OF LICENCE CONDITIONS

This licence is not valid unless signed below:



JOANNE TOWNSEND

Controller of Water Resources

Dated the 29 October 2021

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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(c) 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.
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

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Term	Definition
	occupy a place within the area or are otherwise lawfully in the area; or (b) an unsightly or offensive condition caused by contaminants or waste.
incident	includes: (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.
Land	includes water and air on, above or under land.
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: (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 (c) 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.
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, pipe work and hosing, vehicles (including vessels), tools, and measuring equipment.
Point source discharge	means any discernible, confined or discrete conveyance from which contaminants or waste are or may be discharged.
Pollute	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: (a) public health, safety or welfare; (b) animals, birds, fish or aquatic life or other organisms; or (c) plants.
Pollution	(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.

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Term	Definition
Public entrance	access to the premises that is utilised by the public.
Qualified person	a person registered under Section 68 of the WMPC Act.
Qualified sampler	a person who has training and experience in obtaining samples from the relevant environmental medium.
Serious environmental harm	environmental harm that is more serious than material environmental harm and includes environmental harm that: <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.
Stormwater	water flowing over ground surfaces, in natural streams and drains as a direct result of rainfall over a catchment and consists primarily of rainfall runoff.
Trigger values	assigned value for each indicator used to assess the risk to an environmental value, a value that initiates some type of pre-defined management action.
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 1998</i> .

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APPENDIX 1: Surface Water Monitoring Schedule and Water Quality Trigger Values

Table 1-1 Sampling locations, parameters and frequency

		Sample Locations ^a					
		Discharge	Surface Water - Myrmidon Creek				
Site Code	SPAMYDP (SPa100)	SPAMY01	SPAMY03	SPAMY05	SPAMY06	SPAMY07	
Coordinates	-12.50390	-12.50051	-12.50128	-12.50424	-12.50641	-12.49606	
Latitude:	130.94901	130.94761	130.94580	130.94321	130.94025	130.94636	
Longitude:							
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 Quality Trigger Values

Indicator	Units	Sampling Locations ^a					Annual Report Reporting Requirements
		Zone of influence (ZOI)		Slightly-Moderately Disturbed Zone (SMDZ)			
		SPAMY01	SPAMY03	SPAMY05	SPAMY06	SPAMY07	
Site Code							
Indicator	Units	Site Specific Tigger Values					Annual Report Reporting Requirements
Physio-chemical parameters							
pH	pH unit	<6 and >8.5 ^b		<6 and >8.5 ^b		Exceedance of SSTV	
Dissolved oxygen	% saturation	<30		<65 and >110 ^c		Exceedance of SSTV	
Total suspended solids	mg/L	-		>15 ^c	>20 ^c	Exceedance of SSTV	
Biological Parameters							
Chlorophyll-a	µg/L	-		>8 ^c		Exceedance of SSTV	
Nutrient Parameters							
NH ₃ -N	µg/L	1320 ^d	1320 ^e	1100 ^e	1100 ^e	1320 ^e	Exceedance of SSTV
		-		>20 ^b			Exceedance of SSTV for the median of the 6 most recent samples – only report when chlorophyll-a also exceeds SSTV
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 ^f		>1.3 ^g		Exceedance of SSTV	
Zinc (filtered)	µg/L	>15 ^g		>15 ^g		Exceedance of SSTV	
Pathogen Indicators							
Enterococci	cfu/100 mL or mpn/100 mL	-	>500 ^h	>200 ^h		Exceedance of SSTV	

^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 Acute trigger value estimated based on the pH adjusted trigger value with a default acute to chronic ratio of 10 subsequently applied (ANZECC and ARMCANZ 2000)

^e pH adjusted SMD trigger value based on long-term average pH at these sites 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)

^f 80% level of species protection trigger value 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).

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- ^g 95% level of species protection SMD trigger value for marine water as per Table 3.4.1 of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, (ANZECC and ARMCANZ 2000).
- ^h 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)

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Table 1-3 Surface Water Assessment Protocol

	Classification	Sampling Locations ^a				
		Zone of influence (ZOI)		Slightly-Moderately Disturbed Zone (SMDZ)		
		Site Code	SPAMY01	SPAMY03	SPAMY07	SPAMY05
Indicator	Unit	Assessment Criteria				Assessment Statistic
Dissolved oxygen	% saturation	<75 and > 100 ^b				median
Total suspended solids	mg/L	10 ^b				median
Chlorophyll-a*	µg/L	4 ^b				median
Ammonia (Total as N)	µg/L	20 ^b				median
		1320 ^c		1100 ^c		95 th percentile
Total nitrogen	µg/L	300 ^b				median
Oxidised nitrogen (NOx as N)	µg/L	20 ^b				median
Total phosphorous	µg/L	30 ^b				median
Filterable reactive phosphorous	µg/L	10 ^b				median
Copper (filtered)	µg/L	1.3 ^d				95 th percentile
Zinc (filtered)	µg/L	15 ^d				95 th percentile
Enterococci	Enterococci/100 mL	50 ^b				maximum
		A, B,C,D ^e				Long term 95 th percentile (Hazen Method)

a As identified in Appendix 3 (Location Map)

b Water Quality Objectives for the Darwin Harbour Region – Background Document (Department of Natural Resources, Environment, The Arts and Sport, 2010)

c Table 8.3.7 Volume 2 of ANZECC and ARMCANZ (2000) - pH adjusted SMD Trigger Value based on long-term average pH for sites in these zones

d Table 3.4.1 ANZECC and ARMCANZ (2000) – SMD Trigger Value

e Determine the Microbial Water Quality Assessment Category for the assessment statistic (A, B,C,D), Table 5.7 in order to apply these categories within Table 5.17 Classification Matrix for Faecal Pollution of Recreational Water Environments of the Guidelines for Managing Risks in Recreational Waters (National Health and Medical Research Council 2008)

Where, 'Long term' means all monitoring data collected to date pooled. Hazen based assessments require more data points to be reasonably accurate in terms of the true 95th percentile (i.e. N > 21)

WASTE DISCHARGE LICENCE (WDL148-08)

APPENDIX 2: Sediment Monitoring Schedule

Table 2-1 Sediment Monitoring Program and Assessment and Reporting Schedule

				Sampling Locations ^a									
				Classification	Test Estuary Myrmidon Creek					Reference Estuary – Short Creek			
					Site Code	SPAMY01	SPAMY03	SPAMY05	SPAMY06	SPAMY07	SPASC01	SPASC02	SPASC03
Coordinates				Latitude:	-12.50390	-12.50051	-12.50128	-12.50424	-12.50641	-12.51908	-12.51968	-12.52122	-12.52525
Longitude:				130.94901	130.94761	130.94580	130.94321	130.94025	130.94627	130.94708	130.94530	130.94401	
Indicators	Matrix		Assessment Protocol	Monitoring Frequency									
	Sediment	Pore water											
Interpretive													
Total Organic Carbon	✓	×	Calculate C:N ratios	Annual - Dry season									
Aluminium	✓	×	Al normalisation of total metals in sediment										
pH		✓	pH adjustment of SMD TV (NH ₃ -N)										
Biological													
Chlorophyll a	✓	×	1. Compare to 2 x 80 th percentile of reference data 2. Calculate ratio to pheophytin-a	Annual - Dry season									
Nutrients													
Total N	✓	✓	1. 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)	×	✓	1. Compare to pH adjusted SMD TV ^b 2. Compare to 2 x 80 th percentile of reference data										
Filterable reactive phosphorous	×	✓	1. Compare to 80 th percentile of reference site data										
Metals													
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 80 th percentile of reference data	Annual – Dry season									
Zinc	✓ T,B	✓ F	4. Compare Al normalised 'T' in sediment to 2 x 80 th percentile of reference data in that season and assess for significant differences										

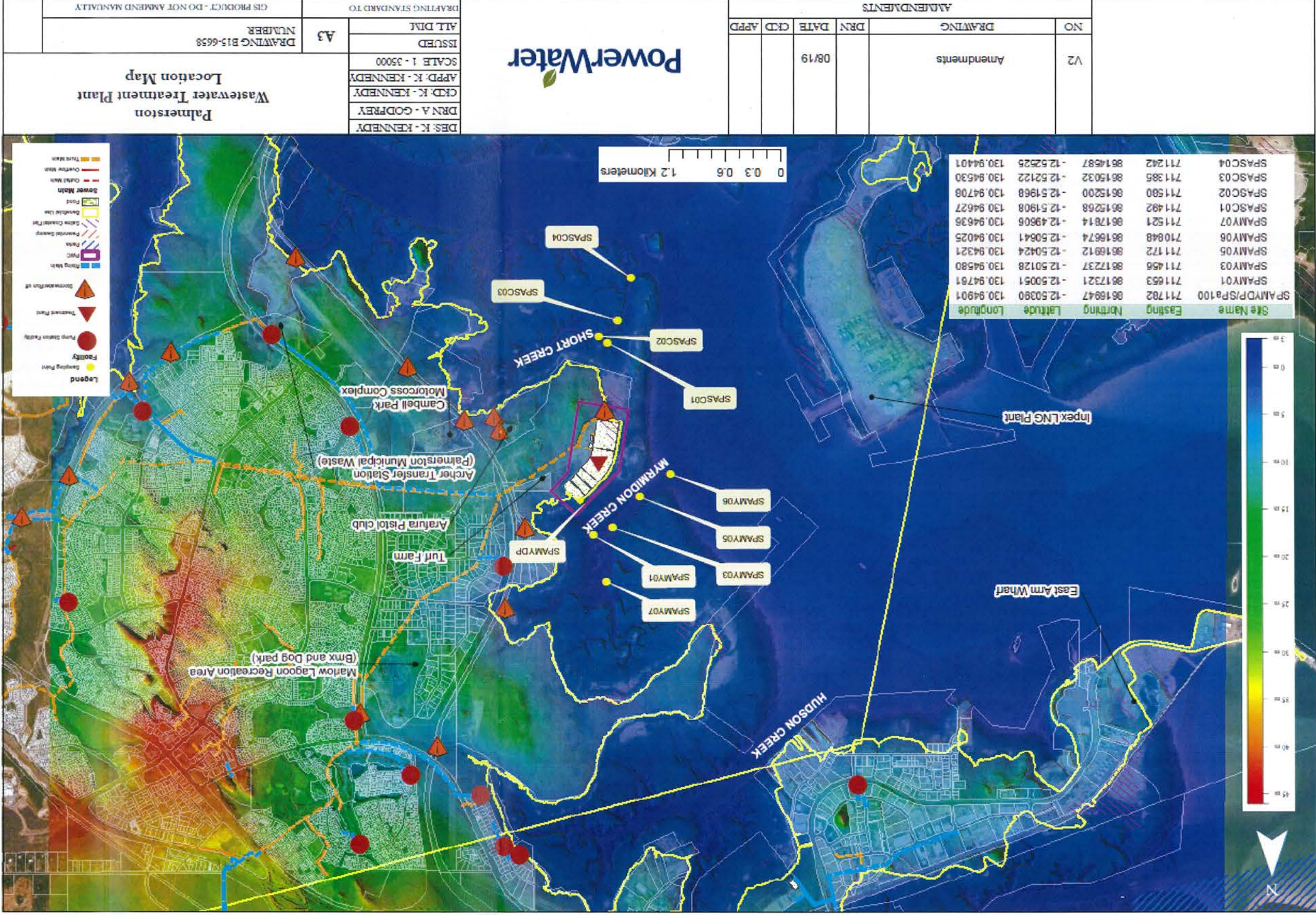
Key: T = total metal fraction; B = bioavailable fraction in sediment, estimated by dilute 1 M HCl extraction; F = filtered porewater; SMD = slightly-moderately disturbed; TV = trigger value; ISQG = interim sediment quality guideline

^a Co-ordinates for all sampling locations/site codes are additionally 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)



AMENDMENTS		DRAWING				DRN	DATE	CKD	APPD
NO	V2	Amendments					08/19		

DRAFTING STANDARD TO		DES: K. KENNEDY	
ISSUED	SCALE 1 - 35000	APPD: K. KENNEDY	DRN A - GODFREY
ALL DIM		CKD: K. KENNEDY	
A3			

GIS PRODUCT - DO NOT AMEND MANUALLY	
DRAWING NUMBER	DRAWING B15-6658



Palmerston Wastewater Treatment Plant Location Map

APPENDIX 4: Site Layout

