

EPL230-03: Attachment B

Table 1 – Authorised wastewater discharge points and monitoring locations of EPL230-03.

Location Code	Description	Authorised Discharge Point (A) or Monitoring Location (M)	Location	Discharge Source
PW-01	Authorised Discharge Point (ADP) for production Formation Water discharged via diffuser to ocean.	A	14.241506 S 129.385128 E	Produced formation water separated from whole of well stream fluid, treated to meet discharge specification.
PW-02	Monitoring location for ADP PW-01 Production Formation Water.	M	14.243388 S 129.435190 E	
WW-01	Authorised Discharge Point (ADP) for treated wastewater effluent to irrigation field.	A	14.241548 S 129.438568 E	Treated wastewater from the wastewater treatment plant. Wastewater originates from showers, wash basins, toilet facilities, laundries and kitchens.
WW-02	Monitoring location for ADP WW-01 irrigation Water.	M	14.240915 S 129.437845 E	Treated wastewater effluent.
SW-03	Authorised Discharge Point (ADP) and monitoring location for stormwater overflow from process skids into open drains sump to land.	A, M	14.243559 S 129.435987 E	Stormwater runoff from incorporated drainage controls throughout the process area, directed to the corrugated plate interceptor separator for treatment.

Table 2 – Authorised wastewater discharge monitoring program.

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03		Treated Wastewater Effluent WW-02		Produced Formation Water PW-02		
	Unit	Limit	Frequency	Limit	Frequency	Trigger Value	Limit	Frequency
Environmental Parameters (In-situ)								
pH	pH	NA	S	6.5-8.5 ¹	Q	NA	6.5 - 8.5	U
Electrical conductivity (EC)	µs/cm	NA	S	2000	Q	NA	NA	U
Dissolved oxygen (DO)	% saturation	NA	S	NA	Q	NA	NA	U
Temperature	°C	NA	S	NA	Q	NA	NA	U
Turbidity	NTU	NA	S	NA	NR	NA	20	U
Oil in Water (OIW)	mg/L	6	S	NA	NR	15	25	U
Environmental Indicators								
Biological Oxygen Demand (BOD)	mg/L	NA	NR	NA	Q	NA	25	Q
Chemical Oxygen Demand (COD)	mg/L	NA	NR	NA	Q	NA	125	Q
Total Suspended Solids (TSS)	mg/L	NA	T	NA	Q	10	50	Q
Total Dissolved Solids (TDS)	mg/L	NA	T	NA	Q	NA	NA	Q
Total Organic Carbon (TOC)	mg/L	NA	T	NA	Q	NA	NA	Q
Nutrient Indicators								
Total Phosphorus (TP)	mg/L	NA	T	10	Q	NA	0.015	Q
Total Nitrogen (TN)	mg/L	NA	T	40	Q	NA	0.1	Q
Oxidised Nitrogen (NO _x)	mg/L	NA	T	NA	Q	NA	0.008	Q
Ammoniacal Nitrogen (NH ₃ -N)	mg/L	NA	T	NA	Q	NA	0.01	Q
Bacteriological								
Faecal Coliforms / E. coli	cfu/100mL	NA	NR	10000	Q	NA	NA	NR

¹ 90% of measured values must be within this range (consistent with reclaimed water being used for non-food crops according to: ANZECC/ANZOG, 2000. Guidelines for Sewerage Systems Use of Reclaimed Water, <https://www.waterquality.gov.au/sites/default/files/documents/use-reclaimed-water.pdf>)

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03		Treated Wastewater Effluent WW-02		Produced Formation Water PW-02		
	Unit	Limit	Frequency	Limit	Frequency	Trigger Value	Limit	Frequency
Per-and poly-fluoroalkyl substances (PFAS)								
28 PFAS compounds – low level	µg/L	NA	A	NA	A	NA	NA	Q
PFOS	µg/L	2	A	NA	A	NA	NA	Q
PFOA	µg/L	632	A	NA	A	NA	NA	Q
Metals^{2, #}								
Aluminium	µg/L	NA	A	5000	A	NA	NA	Q
Arsenic	µg/L	NA	A	NA	A	NA	NA	Q
Barium	µg/L	NA	A	NA	A	NA	NA	Q
Boron	µg/L	NA	A	500	A	NA	NA	Q
Cadmium	µg/L	NA	A	10	A	5.5	14	Q
Cobalt	µg/L	NA	A	50	A	14	150	Q
Copper	µg/L	NA	A	200	A	3	8	Q
Chromium	µg/L	NA	A	NA	A	20	85	Q
Iron	µg/L	NA	A	200	A	NA	NA	Q
Mercury	µg/L	NA	A	2	A	0.7	1.4	Q
Manganese	µg/L	NA	A	200	A	NA	80	Q
Lead	µg/L	NA	A	200	A	6.6	12	Q
Nickel	µg/L	NA	A	20	A	200	560	Q
Selenium	µg/L	NA	A	20	A	NA	NA	Q
Zinc	µg/L	NA	A	2000	A	23	43	Q

² For treated wastewater effluent, the limits are the Default Guideline Values in ANZG (2024) Water Quality for Irrigation and General Water Uses: Background Information (Table 10, p. 16, <https://www.waterquality.gov.au/sites/default/files/documents/irrigation-guidelines-draft-4.2.pdf>). For produced formation water, the trigger values/limits are: the toxicant default guideline values, table 3.4.1 ANZECC/ARMCANZ Water Quality (2000) Guidelines, at a species protection values of 80% for limits and 90% for trigger values. Available at <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants> . For Chromium, DGVs for Chromium VI were selected.

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03		Treated Wastewater Effluent WW-02		Produced Formation Water PW-02		
	Unit	Limit	Frequency	Limit	Frequency	Trigger Value	Limit	Frequency
Radiological analysis								
Radium Isotopes Ra-226	Bq/L	NA	NR	NA	NR	NA	NA	A
Radium Isotopes Ra-228	Bq/L	NA	NR	NA	NR	NA	NA	A
Total phenols³								
Phenol	µg/L	NA	NR	NA	NR	520	720	Q
TRH⁴								
Total Recoverable Hydrocarbons TRH C6-C10 less BTEX (F1)	µg/L	NA	T	NA	NR	NA	NA	M
TRH >C10-C16 (F2) less Naphthalene	µg/L	NA	T	NA	NR	NA	NA	M
TRH >C16-C34 (F3)	µg/L	NA	T	NA	NR	NA	NA	M
PAH⁵								
Total PAH	µg/L	NA	NR	NA	NR	NA	NA	Q
BTEX								
Benzene	µg/L	1300	A	NA	NR	900	1300	M
Toluene	µg/L	230	A	NA	NR	230	330	M
Ethyl benzene	µg/L	110	A	NA	NR	110	160	M
m+p-xylene	µg/L	100	A	NA	NR	100	150	M
Xylene	µg/L	NA	NR	NA	NR	NA	NA	M
Aliphatic/ Aromatic Speciation	µg/L	NA	NR	NA	NR	NA	NA	M

³ ANZG 2018 default guideline values for phenols and xylenols in marine water (PW-02) and freshwater (SW-03) at a species protection level of 80% for limits and 90% for trigger values. Available at <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants>

⁴ C6-C10 (note F1='C6-C10' less BTEX), >C10-C16 (note F2= '>C10-C16' less Naphthalene), F3 =>C16-C34)

⁵ ANZG 2018 default guideline values for Polycyclic Aromatic Hydrocarbons in marine water (PW-02) at a species protection level of 80% for limits and 90% for trigger values. Available at <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants>

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03		Treated Wastewater Effluent WW-02		Produced Formation Water PW-02		
	Unit	Limit	Frequency	Limit	Frequency	Trigger Value	Limit	Frequency
NOTES: NA = Not Applicable; >0 = Reportable if greater than the laboratory established practical quantitation limits (PQL); # = Both dissolved and total metals sampling is required, and the trigger values and limits are only applicable to dissolved metal samples.								
KEY: A = Annually; M = Monthly; Q = Quarterly; U = Upon Discharge; S = Seasonal (monthly over a typical Wet Season [November to May]); T = two times over the course of a wet season with one sample to be timed to capture first flush effects at the commencement of the wet season and the second sample in the middle of the wet season. NR = Not Reportable. NA = Not applied.								

Table 3 – Authorised air emission points and monitoring program.

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Release Point Number	Source (with nominal power output)	Gas Flow Meter (FIT)	Pollutant	Concentration Limit	Monitoring Frequency*	Annual Monitoring Parameters^	Concentration Target to be Achieved by 9 February 2030 ⁶
				mg/Nm ³			mg/Nm ³
A01, A02	Flaring	002, 008, 007	Smoke	No visible emission other than a total of no more than 5 minutes in any 2-hour period	All events	Smoke, mass of hydrocarbons flared, VOCs, fuel/gas flow	Column 5 limit to be retained
A03, A04, A05	Gas turbine compressor (6.5MW)	161, 261, 361	SO ₂	100 @ 15% O ₂ dry ⁷	Biannually	Temperature, efflux velocity, volumetric flow rate, fuel/gas flow, emissions of oxides of nitrogen as nitrogen dioxide, particulate matter (PM2.5 and PM10), carbon monoxide, carbon dioxide, sulfur dioxide, methane, nitrous oxide, mercury, hydrogen sulfide, total VOCs and VOCs speciated to provide individual emissions of benzene, toluene, ethylbenzene, xylenes and n-hexane	Column 5 limit to be retained
			NO _x as NO ₂	350 @ 15% O ₂ dry ⁷			70 @15% O ₂ dry
			CO	100 @ 15% O ₂ dry ⁸			Column 5 limit to be retained
			VOCs	40 @ 15% O ₂ dry ⁷			Column 5 limit to be retained
A06, A07, A08		004	SO ₂	100 @ 15% O ₂ dry ⁷	Biannually	Temperature, efflux velocity, volumetric flow rate, fuel/gas flow, emissions of oxides of nitrogen as	Column 5 limit to be retained

⁶ NSW EPA concentration limits for plants licenced on or after 1 September 2005 (Group 6). Available at [Protection of the Environment Operations \(Clean Air\) Regulation 2022](#)

⁷ Protection of the Environment Operations (Clean Air) Regulation 2010, New South Wales.

⁸ Integrated Pollution Prevention and Control Reference Document on Best Available Techniques for Large Combustion Plants, European Commission 2006

	Gas engine generator (1MW)		NO _x as NO ₂	2000 @ 15% O ₂ dry ⁷		nitrogen dioxide, particulate matter (PM2.5 and PM10), carbon monoxide, carbon dioxide, sulfur dioxide, methane, nitrous oxide, mercury, hydrogen sulfide, total VOCs and VOCs speciated to provide individual emissions of benzene, toluene, ethylbenzene, xylenes and n0hexane	70 @15% O ₂ dry
			CO	1600 @ 15% O ₂ dry ⁹			125 @15% O ₂ dry
			VOCs	40 @ 15% O ₂ dry ⁷			Column 5 limit to be retained
A09	Emergency diesel generator package (1 MW)	-	Smoke	20% opacity	Upon use -up to twice yearly	Smoke, fuel/gas flow	Column 5 limit to be retained
NOTES: * = Column 6 Monitoring Frequency describes monitoring (plant not each release point number) for Column 4 Pollutants. ^ = Column 7 Monitoring Parameters should be reported in the AEMR as measure of total annual emissions or estimate of total annual emissions.							

⁹ Based on Waukesha gas engines, VHP Series Four L7044GSI – technical data, GE Energy

Table 4 – Groundwater monitoring frequency and interim concentration limits.

Parameter	Monitori ng site code	BH1*	BH2	BH4	BH5	BH7	DHWQO	Historical data estimates
	Location	14.331296 S 129.261108 E	14.344688S 129.269416 E	14.344688 S 129.269416 E	14.37117 S 129.262446 E	14.41143 S 129.435572 E		
	Unit	Frequency	Frequency	Frequency	Frequency	Frequency	Interim concentration trigger value^	
Environmental Parameters (In-situ)								
Depth	mAHD	Q	Q	Q	Q	Q		-
pH	pH	Q	Q	Q	Q	Q	7.0-8.5	5.0-6.0^
Electrical conductivity (EC)	µs/cm	Q	Q	Q	Q	Q		<200
Dissolved oxygen (DO)	% saturatio n	Q	Q	Q	Q	Q	80-100	30-80^
Turbidity	NTU	Q	Q	Q	Q	Q		^
Reduction Oxidation Potential (REDOX)	mV	Q	Q	Q	Q	Q		^
Environmental Indicators								
BOD	mg/L	Q	Q	Q	Q	Q		<2.6^
COD	mg/L	Q	Q	Q	Q	Q		^
TSS	mg/L	Q	Q	Q	Q	Q		^
TDS	mg/L	Q	Q	Q	Q	Q		^
TOC	mg/L	Q	Q	Q	Q	Q		^
Nutrient Indicators NR								
Total Phosphorus (TP)	mg/L	Q	Q	Q	Q	Q		^
Total Nitrogen (TN)	mg/L	Q	Q	Q	Q	Q	<0.27	^
Oxidised Nitrogen (NOx)	mg/L	Q	Q	Q	Q	Q	<0.02	^
Ammoniacal Nitrogen (NH3-N)	mg/L	Q	Q	Q	Q	Q	<0.02	<9^

Parameter	Monitoring site code	BH1*	BH2	BH4	BH5	BH7	DHWQO	Historical data estimates
	Location	14.331296 S 129.261108 E	14.344688S 129.269416 E	14.344688 S 129.269416 E	14.37117 S 129.262446 E	14.41143 S 129.435572 E		
	Unit	Frequency	Frequency	Frequency	Frequency	Frequency	Interim concentration trigger value^	
Major-ion chemistry								
major cations: sodium, potassium, calcium and magnesium	mg/L	Q	Q	Q	Q	Q		^
major anions: chloride, sulphate, bicarbonate and carbonate	mg/L	Q	Q	Q	Q	Q		^
Hardness	mg/L	Q	Q	Q	Q	Q		^
Metals ¹⁰								
Aluminium	mg/L	Q	Q	Q	Q	Q		^
Arsenic	mg/L	Q	Q	Q	Q	Q		<0.13^
Boron	mg/L	Q	Q	Q	Q	Q		^
Cadmium	mg/L	Q	Q	Q	Q	Q	<0.0055	^
Chromium (total)	mg/L	Q	Q	Q	Q	Q	<0.0013	^
Copper	mg/L	Q	Q	Q	Q	Q	<0.0013	<0.15^
Iron	mg/L	Q	Q	Q	Q	Q		^
Manganese	mg/L	Q	Q	Q	Q	Q		^
Lead	mg/L	Q	Q	Q	Q	Q	<0.0044	^
Nickel	mg/L	Q	Q	Q	Q	Q	<0.07	^
Strontium	mg/L	Q	Q	Q	Q	Q		^
Zinc	mg/L	Q	Q	Q	Q	Q	<0.015	^

¹⁰ Toxicant default guideline values, table 3.4.1 ANZECC/ARMCANZ Water Quality (2000) Guidelines

Parameter	Monitoring site code	BH1*	BH2	BH4	BH5	BH7	DHWQO	Historical data estimates
	Location	14.331296 S 129.261108 E	14.344688S 129.269416 E	14.344688 S 129.269416 E	14.37117 S 129.262446 E	14.41143 S 129.435572 E		
	Unit	Frequency	Frequency	Frequency	Frequency	Frequency	Interim concentration trigger value^	
Per-and Polyfluoroalkyl Substances								
28 PFAS compounds – low level	µg/L	Q	Q	Q	Q	Q	^Identify the source of PFAS, pathway and potential receptors (and risk to them) if concentrations above laboratory limit of reporting occur.	
Bacteriological								
Enterococci	cfu/100 mL	Q	Q	Q	Q	Q	<50	^
Escherichia coli	cfu/100 mL	Q	Q	Q	Q	Q		^
Volatiles and semi-volatiles								
Total Recoverable Hydrocarbons NEPM 11	µg/L	Q	Q	Q	Q	Q	^Identify the source of TRH or BTEX, pathway and potential receptors (and risk to them) if concentrations above laboratory limit of reporting occur. Include TPH, TRH and/or BTEX	
Benzene	µg/L	Q	Q	Q	Q	Q		
Toluene	µg/L	Q	Q	Q	Q	Q		
Ethyl benzene	µg/L	Q	Q	Q	Q	Q		
m/p-xylene	µg/L	Q	Q	Q	Q	Q		
o-xylene	µg/L	Q	Q	Q	Q	Q		
Aliphatic/ Aromatic Speciation	µg/L	Q	Q	Q	Q	Q	^	
NOTES:								
* = BH1 is screened at different intervals because the well intersects multiple hydrogeologic units. Sampling is to target the shallowest screened interval. Sampling at deeper								

¹¹ C6-C10 (note F1='C6-C10' less BTEX), >C10-C16 (note F2= '>C10-C16' less Naphthalene), >C16-C34, >C34-C40)

Parameter	Monitoring site code	BH1*	BH2	BH4	BH5	BH7	DHWQO	Historical data estimates
	Location	14.331296 S 129.261108 E	14.344688S 129.269416 E	14.344688 S 129.269416 E	14.37117 S 129.262446 E	14.41143 S 129.435572 E		
	Unit	Frequency	Frequency	Frequency	Frequency	Frequency	Interim concentration trigger value^	
screened intervals is recommended if TRH, BTEX or PFAS are detected above laboratory limits of reporting, to verify that contamination has not reached lower hydrogeologic units.								
^ = Interim concentration trigger values will not be applied to determine non-compliance. Interim concentration trigger values are to be updated with site specific limits as resolved with the NT EPA through the Groundwater Monitoring Plan.								
KEY:								
Q = Quarterly (covering 2 wet season and 2 dry season sampling events for the 12-month reporting period).								
DHWQO – Darwin Harbour Water Quality Objectives 2010								