

Reporting of Emission to Groundwater for the period of March 2024

Operator: CCR Energy Ltd

Form: Groundwater1

Location: Aberthaw Ash Disposal Site

Permit/Variation Number: DP3432SW

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH3B	Aluminium, Dissolved		18.6 µg/L		27/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		10.2 µg/L				
	Arsenic, Dissolved		163 µg/L				
	Boron, Dissolved		18500 µg/L				
	Cadmium, Dissolved		0.349 µg/L				
	Calcium, Dissolved		369000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		175000 µg/L				
	Manganese, Dissolved		268 µg/L				
	Molybdenum, Dissolved		1750 µg/L				
	Nickel, Dissolved		0.9 µg/L				
	Selenium Dissolved		5.34 µg/L				
	Vanadium, Dissolved		61.1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		357000 µg/L				
	Iron, Dissolved		86.6 µg/L				
	Potassium, Dissolved		85500 µg/L				
	Sodium, Dissolved		386000 µg/L				
	Sulphate, Dissolved as SO ₄		1210000 µg/L				
Nitrogen: Total Oxidised as N		<100 µg/L					
Chloride		705000 µg/L					
Fluoride		<500 µg/L					
Ammoniacal Nitrogen as N		661 µg/L					
Carbon, Organic: Total as C		<3000 µg/L					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Electrical conductivity		4368 µS/cm	Field measurements			
	Temperature		9.7 °C				
	Dissolved oxygen		1.76 mg/L				
	pH		7.58				
	Oxidation reduction potential		-44 mV				
	Groundwater level		6.62 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH5	Aluminium, Dissolved		<10 µg/L		27/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		0.938 µg/L				
	Boron, Dissolved		119 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		130000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.536 µg/L				
	Magnesium, Dissolved		10800 µg/L				
	Manganese, Dissolved		112 µg/L				
	Molybdenum, Dissolved		<3 µg/L				
	Nickel, Dissolved		3.11 µg/L				
	Selenium, Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		315000 µg/L				
	Iron, Dissolved		440 µg/L				
	Potassium, Dissolved		3670 µg/L				
	Sodium, Dissolved		21200 µg/L				
	Sulphate, Dissolved as SO ₄		87000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		22800 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		<200 µg/L				
Carbon, Organic: Total as C		4370 µg/L					
Electrical conductivity		843 µS/cm	Field measurements				
Temperature		8.4 °C					
Dissolved oxygen		0.51 mg/L					
pH		7.04					
Oxidation reduction potential		-95 mV					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Groundwater level		10.61 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH6	Aluminium, Dissolved		<10 µg/L		27/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		18.8 µg/L				
	Arsenic, Dissolved		97.9 µg/L				
	Boron, Dissolved		7580 µg/L				
	Cadmium, Dissolved		0.461 µg/L				
	Calcium, Dissolved		318000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.559 µg/L				
	Magnesium, Dissolved		111000 µg/L				
	Manganese, Dissolved		24.4 µg/L				
	Molybdenum, Dissolved		2100 µg/L				
	Nickel, Dissolved		2.28 µg/L				
	Selenium Dissolved		146 µg/L				
	Vanadium, Dissolved		286 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		697000 µg/L				
	Iron, Dissolved		<19 µg/L				
	Potassium, Dissolved		31600 µg/L				
	Sodium, Dissolved		27700 µg/L				
	Sulphate, Dissolved as SO ₄		531000 µg/L				
Nitrogen: Total Oxidised as N		725 µg/L					
Chloride		56300 µg/L					
Fluoride		<500 µg/L					
Ammoniacal Nitrogen as N		<200 µg/L					
Carbon, Organic: Total as C		<3000 µg/L					
Electrical conductivity		2104 µS/cm					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Temperature		13.0 °C	Field measurements			
	Dissolved oxygen		4.46 mg/L				
	pH		7.12				
	Oxidation reduction potential		72 mV				
	Groundwater level		9.44 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH7A	Aluminium, Dissolved		<10 µg/L		26/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		20.7 µg/L				
	Boron, Dissolved		23500 µg/L				
	Cadmium, Dissolved		0.251 µg/L				
	Calcium, Dissolved		537000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		87600 µg/L				
	Manganese, Dissolved		652 µg/L				
	Molybdenum, Dissolved		2430 µg/L				
	Nickel, Dissolved		0.525 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		379000 µg/L				
	Iron, Dissolved		3300 µg/L				
	Potassium, Dissolved		170000 µg/L				
	Sodium, Dissolved		1020000 µg/L				
	Sulphate, Dissolved as SO ₄		1300000 µg/L				
	Nitrogen: Total Oxidised as N		326 µg/L				
	Chloride		1960000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		2040 µg/L				
	Carbon, Organic: Total as C		<3000 µg/L				
Electrical conductivity		8425 µS/cm	Field measurements				
Temperature		12.6 °C					
Dissolved oxygen		0.64 mg/L					
pH		7.13					
Oxidation reduction potential		-79 mV					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Groundwater level		3.24 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH7B	Aluminium, Dissolved		<10 µg/L		26/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		31.8 µg/L				
	Boron, Dissolved		19500 µg/L				
	Cadmium, Dissolved		0.259 µg/L				
	Calcium, Dissolved		493000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		116000 µg/L				
	Manganese, Dissolved		1110 µg/L				
	Molybdenum, Dissolved		2330 µg/L				
	Nickel, Dissolved		<0.4 µg/L				
	Selenium Dissolved		4.16 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		500000 µg/L				
	Iron, Dissolved		8230 µg/L				
	Potassium, Dissolved		147000 µg/L				
	Sodium, Dissolved		836000 µg/L				
	Sulphate, Dissolved as SO ₄		1280000 µg/L				
	Nitrogen: Total Oxidised as N		298 µg/L				
	Chloride		1680000 µg/L				
Fluoride		<500 µg/L					
Ammoniacal Nitrogen as N		2170 µg/L					
Carbon, Organic: Total as C		<3000 µg/L					
Electrical conductivity		6995 µS/cm					
Temperature		12.2 °C					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Dissolved oxygen		0.5 mg/L	Field measurements			
	pH		7.12				
	Oxidation reduction potential		-94 mV				
	Groundwater level		2.75 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH8A	Aluminium, Dissolved		279 µg/L		27/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		10.5 µg/L				
	Arsenic, Dissolved		48.6 µg/L				
	Boron, Dissolved		16300 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		552000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.306 µg/L				
	Magnesium, Dissolved		25700 µg/L				
	Manganese, Dissolved		59.9 µg/L				
	Molybdenum, Dissolved		3280 µg/L				
	Nickel, Dissolved		<0.4 µg/L				
	Selenium Dissolved		30 µg/L				
	Vanadium, Dissolved		134 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		81100 µg/L				
	Iron, Dissolved		41.4 µg/L				
	Potassium, Dissolved		71700 µg/L				
	Sodium, Dissolved		564000 µg/L				
Sulphate, Dissolved as SO ₄		1130000 µg/L					
Nitrogen: Total Oxidised as N		8790 µg/L					
Chloride		920000 µg/L					
Fluoride		<500 µg/L					
Ammoniacal Nitrogen as N		1360 µg/L					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Carbon, Organic: Total as C		<3000 µg/L				
	Electrical conductivity		5279 µS/cm	Field measurements			
	Temperature		10.9 °C				
	Dissolved oxygen		0.3 mg/L				
	pH		7.87				
	Oxidation reduction potential		-65 mV				
	Groundwater level		8.17 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH8B	Aluminium, Dissolved		<10 µg/L		27/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		1.8 µg/L				
	Boron, Dissolved		2390 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		905000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.569 µg/L				
	Magnesium, Dissolved		423000 µg/L				
	Manganese, Dissolved		392 µg/L				
	Molybdenum, Dissolved		52.5 µg/L				
	Nickel, Dissolved		1.13 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		391000 µg/L				
	Iron, Dissolved		1720 µg/L				
	Potassium, Dissolved		128000 µg/L				
	Sodium, Dissolved		3530000 µg/L				
	Sulphate, Dissolved as SO ₄		979000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		8820000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		7770 µg/L				
Carbon, Organic: Total as C		<3000 µg/L					
Electrical conductivity		25966 µS/cm	Field measurements				
Temperature		11.2 °C					
Dissolved oxygen		0.31 mg/L					
pH		6.85					
Oxidation reduction potential		-21 mV					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Groundwater level		8.54 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH9B	Aluminium, Dissolved		<10 µg/L		26/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		<0.5 µg/L				
	Boron, Dissolved		163 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		120000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.394 µg/L				
	Magnesium, Dissolved		19500 µg/L				
	Manganese, Dissolved		<3 µg/L				
	Molybdenum, Dissolved		4.84 µg/L				
	Nickel, Dissolved		0.442 µg/L				
	Selenium Dissolved		1.09 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		339000 µg/L				
	Iron, Dissolved		<19 µg/L				
	Potassium, Dissolved		2400 µg/L				
	Sodium, Dissolved		36500 µg/L				
	Sulphate, Dissolved as SO ₄		44200 µg/L				
	Nitrogen: Total Oxidised as N		2690 µg/L				
	Chloride		67800 µg/L				
Fluoride		<500 µg/L					
Ammoniacal Nitrogen as N		<200 µg/L					
Carbon, Organic: Total as C		<3000 µg/L					
Electrical conductivity		926 µS/cm					
Temperature		9.9 °C					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Dissolved oxygen		2.99 mg/L	Field measurements			
	pH		7.09				
	Oxidation reduction potential		92 mV				
	Groundwater level		4.61 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH10B	Aluminium, Dissolved		<10 µg/L		26/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		11.3 µg/L				
	Arsenic, Dissolved		37.9 µg/L				
	Boron, Dissolved		3200 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		223000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		78300 µg/L				
	Manganese, Dissolved		67.8 µg/L				
	Molybdenum, Dissolved		245 µg/L				
	Nickel, Dissolved		5.39 µg/L				
	Selenium Dissolved		133 µg/L				
	Vanadium, Dissolved		44.7 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		645000 µg/L				
	Iron, Dissolved		<19 µg/L				
	Potassium, Dissolved		22600 µg/L				
	Sodium, Dissolved		127000 µg/L				
	Sulphate, Dissolved as SO ₄		173000 µg/L				
	Nitrogen: Total Oxidised as N		3000 µg/L				
	Chloride		309000 µg/L				
	Fluoride		<500 µg/L				
Ammoniacal Nitrogen as N		<200 µg/L					
Carbon, Organic: Total as C		<3000 µg/L					
Electrical conductivity		2302 µS/cm	Field measurements				
Temperature		12.5 °C					
Dissolved oxygen		5.04 mg/L					
pH		6.95					
Oxidation reduction potential		85 mV					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Groundwater level		4.33 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH11A	Aluminium, Dissolved		<10 µg/L		26/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		15.6 µg/L				
	Arsenic, Dissolved		52.5 µg/L				
	Boron, Dissolved		5120 µg/L				
	Cadmium, Dissolved		0.0999 µg/L				
	Calcium, Dissolved		213000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		87.9 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		57800 µg/L				
	Manganese, Dissolved		139 µg/L				
	Molybdenum, Dissolved		444 µg/L				
	Nickel, Dissolved		1.44 µg/L				
	Selenium Dissolved		317 µg/L				
	Vanadium, Dissolved		84.3 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		515000 µg/L				
	Iron, Dissolved		96 µg/L				
	Potassium, Dissolved		17200 µg/L				
	Sodium, Dissolved		65100 µg/L				
	Sulphate, Dissolved as SO ₄		384000 µg/L				
	Nitrogen: Total Oxidised as N		2420 µg/L				
	Chloride		160000 µg/L				
Fluoride		<500 µg/L					
Ammoniacal Nitrogen as N		466 µg/L					
Carbon, Organic: Total as C		<3000 µg/L					
Electrical conductivity		1816 µS/cm					
Temperature		11.0 °C					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Dissolved oxygen		2.5 mg/L	Field measurements			
	pH		6.97				
	Oxidation reduction potential		42 mV				
	Groundwater level		11.24 mAOD				

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
BH11B	Aluminium, Dissolved		<10 µg/L		26/03/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		49.2 µg/L				
	Boron, Dissolved		5580 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		228000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		60700 µg/L				
	Manganese, Dissolved		841 µg/L				
	Molybdenum, Dissolved		324 µg/L				
	Nickel, Dissolved		0.453 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		4.47 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as CaCO ₃		622000 µg/L				
	Iron, Dissolved		5980 µg/L				
	Potassium, Dissolved		20100 µg/L				
	Sodium, Dissolved		62900 µg/L				
	Sulphate, Dissolved as SO ₄		279000 µg/L				
	Nitrogen: Total Oxidised as N		132 µg/L				
	Chloride		116000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		729 µg/L				
	Carbon, Organic: Total as C		<3000 µg/L				
Electrical conductivity		1304 µS/cm	Field measurements				
Temperature		12.8 °C					
Dissolved oxygen		0.29 mg/L					
pH		7.18					
Oxidation reduction potential		-107 mV					

Emission Point	Substance / Parameter	Emission Limit Value	Result ^[1]	Test Method ^[2]	Sample Date and Times ^[3]	Accreditation/ Certification ^[4]	Uncertainty ^[5]
	Groundwater level		4.34 mAOD				

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. colorimetry.

[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements, or flow/time proportional samples, the percentage of the process operating time covered by the monitoring is given.

[4] The accreditation status of the equipment and/or the monitoring organisation, as appropriate, for the methods used for both sampling and analysis.

[5] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.



Signed
(authorised to sign as representative of the Operator)

Date...11/06/2024.....