Reporting of Emission to Groundwater for the period of January 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		19.4 µg/L		10/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		9.8 µg/L				
	Arsenic, Dissolved		172 µg/L				
	Boron, Dissolved		23300 µg/L				
	Cadmium, Dissolved		0.182 µg/L				
	Calcium, Dissolved		418000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		195000 µg/L				
	Manganese. Dissolved		260 µg/L				
	Molybdenum, Dissolved		1800 µg/L				
	Nickel, Dissolved		0.761 µg/L				
	Selenium Dissolved		7.49 µg/L				
	Vanadium, Dissolved		49.2 µg/L				
	Mercury, Dissolved		0.0157 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		324000 µg/L				
	Iron, Dissolved		42.2 µg/L				
	Potassium, Dissolved		85800 µg/L				
	Sodium, Dissolved		352000 µg/L				
	Sulphate, Dissolved as SO_4		1360000 µg/L				
	Nitrogen: Total Oxidised as N		110 µg/L				
	Chloride		672000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		575 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		4603 µS/cm	Field measurements			
	Temperature		10.9 °C				
	Dissolved oxygen		1.6 mg/L				
	pH		7.46				
	Oxidation reduction potential		-16 mV				
	Groundwater level		7.66 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		11/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		<0.5 µg/L				
	Boron, Dissolved		308 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		226000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.506 µg/L				
	Magnesium, Dissolved		16000 µg/L				
	Manganese. Dissolved		70.9 µg/L				
	Molybdenum, Dissolved		15.2 µg/L				
	Nickel, Dissolved		1.58 µg/L				
	Selenium, Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		417000 µg/L				
	Iron, Dissolved		60.8 µg/L				
	Potassium, Dissolved		2340 µg/L				
	Sodium, Dissolved		28600 µg/L				
	Sulphate, Dissolved as SO_4		221000 µg/L				
	Nitrogen: Total Oxidised as N		896 µg/L				
	Chloride		40400 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		<200 µg/L				
	Carbon, Organic: Total as C		10100 µg/L				
	Electrical conductivity		1217 µS/cm	Field measurements			
	Temperature		10.5 °C				
	Dissolved oxygen		0.83 mg/L				
	pH		6.68				
	Oxidation reduction potential		-94 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		10.27 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		12/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		4.03 µg/L				
	Arsenic, Dissolved		22.2 µg/L				
	Boron, Dissolved		16800 µg/L				
	Cadmium, Dissolved		0.557 µg/L				
	Calcium, Dissolved		716000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		156000 µg/L				
	Manganese. Dissolved		804 µg/L				
	Molybdenum, Dissolved		3040 µg/L				
	Nickel, Dissolved		5.25 µg/L				
	Selenium Dissolved		13.9 µg/L				
	Vanadium, Dissolved		12.6 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		385000 µg/L				
	Iron, Dissolved		95.1 µg/L				
	Potassium, Dissolved		101000 µg/L				
	Sodium, Dissolved		1360000 µg/L				
	Sulphate, Dissolved as SO_4		1400000 µg/L				
	Nitrogen: Total Oxidised as N		1290 µg/L				
	Chloride		2670000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		998 µg/L				
	Carbon, Organic: Total as C		3310 µg/L				
	Electrical conductivity						

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Temperature		Field measurements not taken – well dried up	Field measurements			
	Dissolved oxygen						
	pH						
	Oxidation reduction potential						
	Groundwater level		9.65 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		11/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		19.3 µg/L				
	Boron, Dissolved		17700 µg/L				
	Cadmium, Dissolved		0.0931 µg/L				
	Calcium, Dissolved		634000 µg/L				
	Chromium, Dissolved		3.07 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		99500 µg/L				
	Manganese. Dissolved		841 µg/L				
	Molybdenum, Dissolved		3200 µg/L				
	Nickel, Dissolved		2.09 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		318000 µg/L				
	Iron, Dissolved		4100 µg/L				
	Potassium, Dissolved		222000 µg/L				
	Sodium, Dissolved		1450000 µg/L				
	Sulphate, Dissolved as SO_4		1700000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		2780000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		2360 µg/L				
	Carbon, Organic: Total as C		4180 µg/L				
	Electrical conductivity		11067 µS/cm	Field measurements			
	Temperature		11.8 °C				
	Dissolved oxygen		0.27 mg/L				
	pH		7.11				
	Oxidation reduction potential		-118 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		3.35 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		11/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		33.3 µg/L				
	Boron, Dissolved		11800 µg/L				
	Cadmium, Dissolved		0.151 µg/L				
	Calcium, Dissolved		470000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		110000 µg/L				
	Manganese. Dissolved		1290 µg/L				
	Molybdenum, Dissolved		2420 µg/L				
	Nickel, Dissolved		0.428 µg/L				
	Selenium Dissolved		3.14 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		483000 µg/L				
	Iron, Dissolved		8380 µg/L				
	Potassium, Dissolved		168000 µg/L				
	Sodium, Dissolved		1030000 µg/L				
	Sulphate, Dissolved as SO_4		1350000 µg/L				
	Nitrogen: Total Oxidised as N		318 µg/L				
	Chloride		1950000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		2290 µg/L				
	Carbon, Organic: Total as C		9180 µg/L				
	Electrical conductivity		8280 µS/cm				
	Temperature		11.8 °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		1.55 mg/L	Field measurements			
	pH		7.01				
	Oxidation reduction potential		-79 mV				
	Groundwater level		2.84 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		458 µg/L		10/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		9.71 µg/L				
	Arsenic, Dissolved		52.7 µg/L				
	Boron, Dissolved		11100 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		383000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		30300 µg/L				
	Manganese. Dissolved		4.22 µg/L				
	Molybdenum, Dissolved		2250 µg/L				
	Nickel, Dissolved		<0.4 µg/L				
	Selenium Dissolved		19.3 µg/L				
	Vanadium, Dissolved		149 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		56600 µg/L				
	Iron, Dissolved		<19 µg/L				
	Potassium, Dissolved		42700 µg/L				
	Sodium, Dissolved		183000 µg/L				
	Sulphate, Dissolved as SO_4		963000 µg/L				
	Nitrogen: Total Oxidised as N		7040 µg/L				
	Chloride		330000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		325 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		2903 µS/cm	Field measurements			
	Temperature		9.6 °C				
	Dissolved oxygen		0.33 mg/L				
	pH		8.73				
	Oxidation reduction potential		12 mV				
	Groundwater level		8.16 AOD				

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		10/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		1.59 µg/L				
	Boron, Dissolved		2790 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		1040000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		470000 µg/L				
	Manganese. Dissolved		475 µg/L				
	Molybdenum, Dissolved		52.6 µg/L				
	Nickel, Dissolved		0.672 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		399000 µg/L				
	Iron, Dissolved		9190 µg/L				
	Potassium, Dissolved		123000 µg/L				
	Sodium, Dissolved		3990000 µg/L				
	Sulphate, Dissolved as SO_4		1030000 µg/L				
	Nitrogen: Total Oxidised as N		<500 µg/L				
	Chloride		8880000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		8430 µg/L				
	Carbon, Organic: Total as C		<3000 µg/L				
	Electrical conductivity		25426 µS/cm	Field measurements			
	Temperature		10.1 °C				
	Dissolved oxygen		0.42 mg/L				
	pH		6.77				
	Oxidation reduction potential		-129 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		8.47 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		11/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		<0.5 µg/L				
	Boron, Dissolved		226 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		108000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		0.654 µg/L				
	Magnesium, Dissolved		23700 µg/L				
	Manganese. Dissolved		5.02 µg/L				
	Molybdenum, Dissolved		4.62 µg/L				
	Nickel, Dissolved		0.459 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		345000 µg/L				
	Iron, Dissolved		<19 µg/L				
	Potassium, Dissolved		4140 µg/L				
	Sodium, Dissolved		33800 µg/L				
	Sulphate, Dissolved as SO_4		35500 µg/L				
	Nitrogen: Total Oxidised as N		2280 µg/L				
	Chloride		49700 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		<200 µg/L				
	Carbon, Organic: Total as C		3640 µg/L				
	Electrical conductivity		842 µS/cm				
	Temperature		9.6 °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		2.13 mg/L	Field measurements			
	pH		7.06				
	Oxidation reduction potential		56 mV				
	Groundwater level		4.64 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		10/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		1.25 µg/L				
	Arsenic, Dissolved		11.1 µg/L				
	Boron, Dissolved		17700 µg/L				
	Cadmium, Dissolved		0.109 µg/L				
	Calcium, Dissolved		442000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		205000 µg/L				
	Manganese. Dissolved		998 µg/L				
	Molybdenum, Dissolved		1820 µg/L				
	Nickel, Dissolved		1.37 µg/L				
	Selenium Dissolved		10.3 µg/L				
	Vanadium, Dissolved		<1 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		593000 µg/L				
	Iron, Dissolved		<19 µg/L				
	Potassium, Dissolved		85700 µg/L				
	Sodium, Dissolved		934000 µg/L				
	Sulphate, Dissolved as SO_4		1280000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		1630000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		2910 µg/L				
	Carbon, Organic: Total as C		<3000 µg/L				
	Electrical conductivity		7565 µS/cm	Field measurements			
	Temperature		12.1 °C				
	Dissolved oxygen		0.75 mg/L				
	pH		7.13				
	Oxidation reduction potential		-86 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		1.53 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		10/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		7.54 µg/L				
	Arsenic, Dissolved		7.31 µg/L				
	Boron, Dissolved		17400 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		485000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		132000 µg/L				
	Manganese. Dissolved		790 µg/L				
	Molybdenum, Dissolved		1350 µg/L				
	Nickel, Dissolved		3.86 µg/L				
	Selenium Dissolved		120 µg/L				
	Vanadium, Dissolved		9.35 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		495000 µg/L				
	Iron, Dissolved		32.3 µg/L				
	Potassium, Dissolved		42800 µg/L				
	Sodium, Dissolved		122000 µg/L				
	Sulphate, Dissolved as SO_4		1280000 µg/L				
	Nitrogen: Total Oxidised as N		128 µg/L				
	Chloride		170000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		1010 µg/L				
	Carbon, Organic: Total as C		<3000 µg/L				
	Electrical conductivity		3236 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		0.9 mg/L	Field measurements			
	pH		6.92				
	Oxidation reduction potential		-59 mV				
	Groundwater level		10.73 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		12/01/2024	Sampling WSP / Testing ALS	
	Antimony, Dissolved		<1 µg/L				
	Arsenic, Dissolved		28.6 µg/L				
	Boron, Dissolved		4170 µg/L				
	Cadmium, Dissolved		<0.08 µg/L				
	Calcium, Dissolved		263000 µg/L				
	Chromium, Dissolved		<1 µg/L				
	Hexavalent Chromium		<30 µg/L				
	Copper, Dissolved		<0.3 µg/L				
	Magnesium, Dissolved		63000 µg/L				
	Manganese. Dissolved		1150 µg/L				
	Molybdenum, Dissolved		313 µg/L				
	Nickel, Dissolved		0.741 µg/L				
	Selenium Dissolved		<1 µg/L				
	Vanadium, Dissolved		3.43 µg/L				
	Mercury, Dissolved		<0.01 µg/L				
	Alkalinity to pH 4.5 as $CaCO_3$		591000 µg/L				
	Iron, Dissolved		4740 µg/L				
	Potassium, Dissolved		21700 µg/L				
	Sodium, Dissolved		55400 µg/L				
	Sulphate, Dissolved as SO_4		351000 µg/L				
	Nitrogen: Total Oxidised as N		<100 µg/L				
	Chloride		120000 µg/L				
	Fluoride		<500 µg/L				
	Ammoniacal Nitrogen as N		1180 µg/L				
	Carbon, Organic: Total as C		9870 µg/L				
	Electrical conductivity		Field measurements not taken – well volume not	Field measurements			
	Temperature						
	Dissolved oxygen						
	pH						
	Oxidation reduction potential						

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
	Groundwater level		sufficient for in-situ monitoring				

[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 ……. Date……16/02/2024……..
(authorised to sign as representative of the Operator)