4. d. Assessment of whether you will meet the minimum LCP performance standards of Chapter III of the industrial emissions directive, or justification that these are not relevant. If you intend to meet them, briefly explain how you will demonstrate achievement of the standard, if integration of the LCP into the cement process complicates this (e.g. BAT-AEL).

The CHP proposed for the project is unique in that it will use kiln gas as part of the oxygen source for combustion and therefore the input streams already contain pollutants such as NOx, SO2 and CO2 that have BATAELs for the LCP. In normal operation the exhaust gas from the CHP is not released to atmosphere but passes through the carbon capture plant, thus 95% of the CO2 emitted from the LCP will be captured. The application of the BAT AELs and performance standards are not considered appropriate for assessing BAT of the CHP integrated with two other industrial processes. In the feasibility study a separate standalone CHP was considered but this generated larger gas volumes than the integrated solution which would have increased all the CCS equipment sizes and energy consumption.

It is noted that as per request relating to document CCS-C3-3a-2 "Technical description", in order to demonstrate BAT, you will also need to provide further technical information on the LCP-CHP unit you propose, e.g. Capacity (MWth), output (MWe and MWth), minimum stable load, etc.

This is covered in the response to question 4c.

Given the intention to use kiln gas as combustion air, but also to add ambient air, a breakdown of the expected gas volume flows is likely to be needed (from kiln, through LCP, bypassing LCP, added ambient air, total flow to CCP/bypass) for us to fully understand/assess the combined process

The gas flows around the CHP and illustrated in the diagram below for mode 1 operation (the most common mode raw mill and coal mill running) for the normal plant operation. The volume of kiln gases that can pass through the CHP burner is controlled to ensure complete combustion and avoid the production of soot which will lead to increased amine consumption and emission in the Capture plant. The operation of the CHP burners, boiler and SCR will be optimised through detailed design and in plant commissioning/operation to minimise the consumption of natural gas.

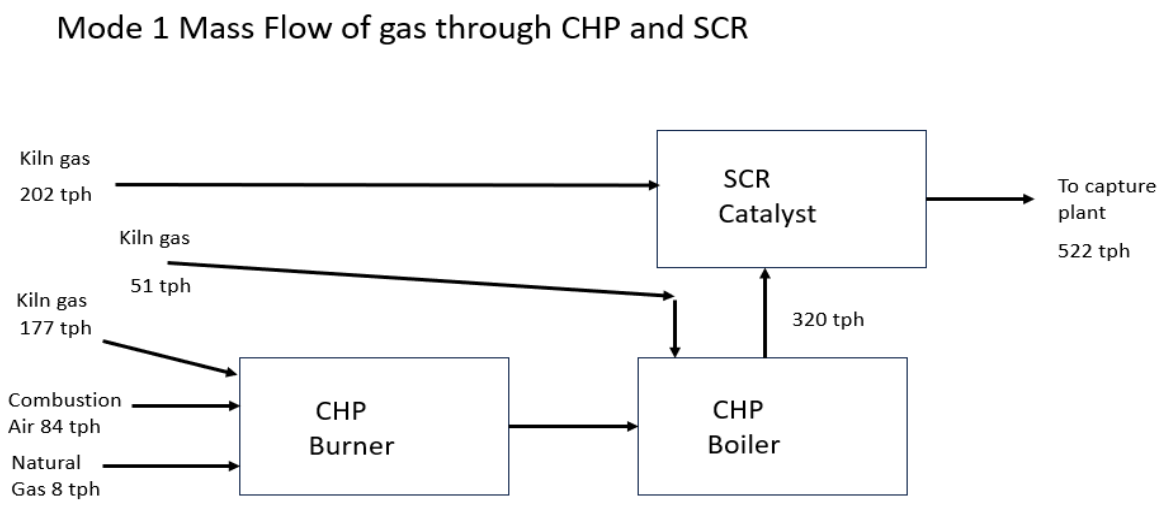

Diagram 1 – gas flow through CHP and SCR to the capture plant

NRW have discussed with the applicant one possible approach to demonstrating compliance with LCP requirements, by considering pollutant inlet and outlet concentration/loading (mass balance), and comparison with LCP requirement. This strategy would differ from, but be broadly in line with the principles of the "mixing rules" described in IED for combined process gas flows.

The table below has been created to explain how the proposed ELVs used in the air quality modelling demonstrate compliance with LCP requirements.

By applying IED chapter III and chapter IV ELVs to the flows and converting to mass emission, the combined mass emission can be determined. This mass is then converted back to mg/Nm3 for the combined flow and then to 10% O2 reference conditions.

The outcome of applying this method is that ELVs for the combined processes, with the same reference conditions, is determined. It can be seen in the table that the values in the last column that have been used for modelling are below that of the ELVs calculated and assuming these will be adopted in the permit, LCP requirement will be achieved.

	Ch III limit dry 3% O2	**Ch III kg/h at ELV**	**Ch IV limit dry 10% O2**	**Ch IV kg/h at ELV**	**combined flow kg/h at ELV**	**combined flow mg/Nm3 dry**	**calculated ELV mg/Nm3 dry 10% O2**	**Proposed ELV used in modelling dry 10%O2**
Flow rate Nm3/h	107,973		284,200			392,173		
NOx	100	13	450	107	120	307	261	200
SO2	35	5	200	48	52	133	113	50
CO	100	13	1200	286	299	763	648	400
O2	3%		10%			8%	10%	10%