Summary of Air Quality Assessment for the Installation of a District Heating Scheme at Flatt Road, Largs

The air that we breath contains a number of pollutants which, in small doses, have no adverse effects on human health. The Scottish Government has guidelines that state the maximum acceptable level for each pollutant and the air is constantly monitored at various sites throughout the country to ensure that these levels are adhered to. The maximum acceptable levels for safe fresh air are as follows:

Pollutant	Acceptable level (ug/m^3)
NO_2 – Short Term	200
NO_2 – Long Term	40
PM_{10} – Short Term	50
PM_{10} – Long Term	18
$PM_{2.5}$ – Long Term	10

Table 1 – Acceptable Pollution Levels

NO_2 is Nitrogen Dioxide which is produced when burning any fuel in boilers, engines and fires. PM_{10} and $PM_{2.5}$ are very small particles (Particulate Matter) which are most commonly produced by diesel engines. The pollutant level will vary from day to day so the acceptable levels are considered to be an average over a whole year (long term) and an average over 24 hours (short term).

The data for the existing air quality in Largs is as follows:

Pollutant	Pollution Level (ug/m^3)	% of Acceptable Level
NO_2 – Short Term	16.0	8%
NO_2 – Long Term	8.1	20%
PM_{10} – Short Term	15.0	30%
PM_{10} – Long Term	7.5	42%
$PM_{2.5}$ – Long Term	4.9	49%

Table 2 – Existing Pollution Levels

The predicted data for air quality following completion of the development:

Pollutant	Pollution Level (ug/m^3)	% of Acceptable Level
NO_2 – Short Term	26.0	13%
NO_2 – Long Term	9.0	23%
PM_{10} – Short Term	16.0	32%
PM_{10} – Long Term	7.6	42%
$PM_{2.5}$ – Long Term	5.0	50%

Table 3 – Predicted Pollution Levels

From these tables it can be seen that the air quality in Largs is safe and the air quality will continue to be safe following the addition of the biomass boiler system.

Table 3 is based on the NO_2 and PM emissions from a biomass boiler. The NO_2 and PM emissions from a gas boiler would be approximately half that of a biomass boiler so the pollution level would be halfway between those shown in Tables 2 and 3 above. The chimney for a biomass boiler would need to be taller than the chimney for a gas boiler to permit safe dispersion of these emissions.

The main advantage of a biomass boiler in relation to air quality is much lower Carbon Dioxide (CO_2) emissions when compared to a gas boiler. It is estimated that operating the Flatt Road district heating scheme with a biomass boiler would reduce the annual CO_2 emissions by 320 Tonnes when compared to a gas boiler.