Response to Compliance Assessment Report CAR_NRW0040982

B5: Kepak must model the impact of the planned reduced water at the effluent treatment plant. Kepak to report what is the current and predicted kgCOD/day once the reduced water is considered. Consider the impact of the reduced water on the whole effluent treatment process and report back to NRW the positive and negative impacts.

Using an average of the COD (mg/l) and flow rate (m3/hr) recorded throughout 2022 from PP8 and PP11 respectively (Table 1), a current figure for kg COD/day was generated. From this, a predicted figure was generated for a 10% and 20% reduction (Table 2).

2022	Limit	Minimum	Average	Percentile	Maximum
pH	**6.0-11.0**	6.2	7.5	9.5	10.3
D. O. Concentration	**-**	0.5	1.1	6.79	8.7
SS (mg/l)	**600**	8	44.2	86.7	115
Ammoniacal Nitrogen as N (mg/l)	**30**	0.41	13.13	25.3	57.5
Detergents as NaLS (mg/l)	**100**	0.0025	0.025	0.025	0.025
COD (mg/l)	**3600**	26	303.4	514.65	695
Oil and Grease (mg/l)	**100**	0.6	10.73	22.475	37.2
Flow Rate (daily) m3/d	**800**		552.24		
Flow rate (hourly) m3/h	**34**		23		

(Table 1 – 2022 water quality parameters)

	Current	10% reduced water	20% reduced water
Kg COD / Day	167.48	184.28	201
Concentration (mg/l)	303.4	333.84	364.13

(Table 2 – current and predicted kg COD per day)

As the table shows, if we were successful in reducing our site water usage by up to 20%, it would have a small impact on the amount of COD discharged to PP8 per day, and it would see us staying comfortably within our consent levels in terms of concentration. The projected COD concentration with a water reduction of 20% is 364.14 mg/l, and our consent level is 3,600 mg/l.

After discussing with the Effluent Treatment Plant (ETP) engineers, the positives of reducing water flow through the plant would far outweigh the negatives. The positives are:

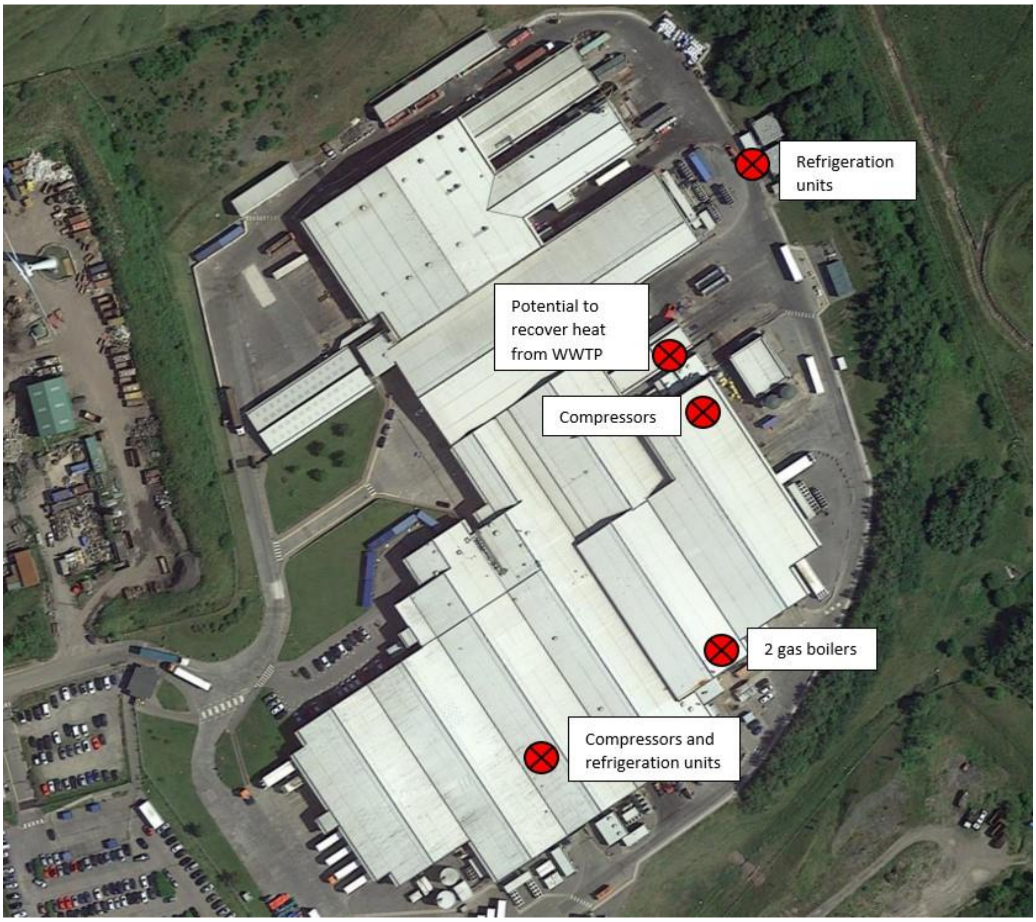
1. We very often get close to our effluent flow limit, so less water through the factory would mean we could stay comfortable within our limits at all times.
2. If there is less water to treat, less chemicals are needed which would have an economic benefit.

3. It would also help to offset times of heavy rainfall. When rainfall is very heavy, it fills up the 2 EQ tanks very quickly and tankers are called in to take the water away, incurring costs.
4. Electricity consumption at the plant would be reduced, as there would be less wate to heat, and less running of pressure pumps as they run to the demand of water.

On the flipside, the only negative brought to my attention was, however small, an increased concentration of pollutants and solids going to sewer, which will need to be closely monitored.

H2: Kepak to map heat loss and the potential for heat recovery.

There are multiple sources of heat loss and also potential for heat recovery on site (Figure 1).



(Figure 1 – Sources of heat loss)

There is a total of 7 compressors on site located in various plant rooms and are approximately 20 years old. Machines of this age are very unreliable and inefficient compared to modern equivalents. Air compressor replacement would not only allow for heat recovery but would reduce energy use at the site.

Similarly, our gas boilers are approximately 20 years old, and boilers of this age do not have the benefit of modern burner technology or efficient heat exchangers. Again, replacing these boilers would allow for heat recovery and reduced energy. However, the feasibility of gas boiler replacement would need to be explored.

Another potential for heat recovery is a Wastewater Heat Recovery System. This is specifically designed to use residual heat from wastewater by way of an instantaneous heat exchange to pre-heat mains water. This could be explored further once the results of ESOS Phase 3 has been released.