# The Hurlstone Partnership

PROPOSAL TO INCREASE THE RANGE AND QUANTITY OF ALTERNATIVE FUELS AND ALTERNATIVE RAW MATERIALS AT THE BALLYCONNEL CEMENT PLANT

Transport Statement



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Transportation Planning, Highway Design and Environmental Assessment

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# 1 INTRODUCTION

1.1 Quinn Cement Ltd currently operates a cement production plant at its New Cement Works to the north of Ballyconnell, in the northwest of County Cavan on the lower south-eastern slopes of Slieve Rushen.

1.2 The site was opened in 2000 following the granting of planning permission in 1997. The planning permission at the site included a limit on the output from the site to 1.0 million tonnes per annum. Planning permission was subsequently granted to raise the output to 1.4 million tonnes per annum, at which the site currently operates.

1.3 In order to reduce consumption of finite fuel reserves and following recent advancements in technology, Quinn Cement Ltd obtained planning permission in 2009 to install new elements of plant which would enable the introduction of Solid Recovered Fuel (SRF), to replace 55% of the coal used in the annual production of 1.4 million tonnes of cement.

1.4 In order to allow the local highway authority, Cavan County Council, to consider the impact of the proposed substitution of a proportion of the coal with Solid Recovered Fuel, The Hurlstone Partnership was commissioned to undertake an assessment of the road network and the implications associated with the additional traffic attracted to the site.



1.5 Due to management and economic factors at the time, the project was only partially completed to facilitate combustion of SRF at the plant

1.6 It is now proposed to improve the sustainability of the cement plant, through the use of an increased range of waste derived alternative raw materials and fuels with the long term aim of displacing almost all fossil fuels at the plant (a limited proportion of fossil fuels will be required during process start up and for process optimisation/stabilisation). The use of these alternatives will equate to 300,000 tonnes per annum at maximum substitution.

1.7 A range of suitable materials are proposed for acceptance at the plant which can be summarised as follows:

1.8 Solid Fuels – including Solid Recovered Fuel (SRF) which is currently authorised for use at the plant, as well as a range of suitable fuels derived from other sources including:

- Meat and Bone Meal (MBM);
- Tyre Derived Fuel (TDF);
- Biomass Fuels;
- Sludges and Filter Cakes.
- Liquid Fuels – including Secondary Liquid Fuel (SLF) which is a blend of organic and solvent wastes blended to a defined specification as well as liquid fuels derived from other sources (e.g. waste oils).

1.9 Alternative Raw Materials (e.g. muds, minerals, sludges) have the potential to replace imported primary raw materials (e.g. Shale, Bauxite, Iron Ore) as well as gypsum and PFA. However, in order to represent a worst case scenario, it has been assumed that all of the Alternative Raw Materials would result in new traffic to the road network, as most, but not all of the existing primary raw materials are transported from local quarries via internal haul roads; thereby avoiding the local road network.

1.10 It is also proposed to include natural gas and petcoke as additional fuels in the licence. This is to provide flexibility for any future fossil fuel requirement.

1.11 The Hurlstone Partnership Limited was instructed to consider the impact of the proposed development on the local highway network, taking into account the construction and opening of the Ballyconnell Inner Relief Road, which provides a more direct link to the south and east and bypasses the centre of the town.

## 2 PLANNING HISTORY

2.1 When the original application for the New Cement Works was made, a Traffic Impact Assessment (TIA) was undertaken to consider the implications of the development on the local highway network.



2.2 At the time the original TIA for the New Cement Works was prepared, there was a specific constraint on the local road network that had a significant impact on the distribution of traffic through the area; namely the Aghalane bridge had been damaged, which precluded the use of the A509/N3 corridor for vehicles wishing to travel south towards Belturbet and beyond.

2.3 The bridge has since been replaced and the carriageway upgraded. The new crossing named "*The Senator George Mitchell Peace Bridge*" provides the main link between Northern Ireland and the Republic of Ireland for people travelling between Enniskillen and Dublin, and it is the point at which the A509 becomes the N3 at the border crossing.

2.4 The original development of the New Cement Works predicted an output of approximately 1 million tonnes per annum, which resulted in a total of 203 HGVs per day travelling along the public road network (406 movements) in addition to staff and visitor movements, which would comprise light traffic. Although the site is operational for 24 hours per day, the distribution of cement in HGVs only takes place between 07:00 – 19:00 under normal circumstances.

2.5 The impact of the proposed development was assessed on the network and found to be acceptable, as was the new access provided to serve the site.

2.6 A Highway Assessment report was also prepared in December 2005 to assess the impact of the previous proposal to increase the original output limit, which was subsequently

deemed acceptable. It was established that with the increased output of 1.4 million tonnes per annum, the daily HGV flows were 260 loads (520 movements).

2.7 When considering the distribution of traffic on the local road network at that time, it was established that the directional split at the site access was 57.5% northbound/42.5% southbound. Based on the total number of HGVs and the above distribution, it is established that 150 vehicles travelled to/from the north or south (300 movements) via Derrylin and Teemore Cross Roads respectively, and 110 vehicles travel to/from the south (220 movements) via Ballyconnell.

2.8 Based on the 55% substitution of coal with SRF approved in 2009 and the same 1.4 million tonnes per annum output, it was established that the daily HGV flows would increase by 11 loads (22 movements) per day to 271 loads (542 movements).

2.9 Planning permission was also obtained for a Mixed Bottle Recycling Plant within the site complex. This development was predicted to attract 38 additional HGV movements per day (19 in / 19 out), but was never implemented.

## 3 THE LOCAL HIGHWAY NETWORK



3.1 Following consultation with Quinn Cement Ltd, it was established that there are two main haul routes on the public highway network used by the company for distribution of cement and importing of materials from/to the New Cement Works.

3.2 The route to the north follows the R205, which becomes the B127 at the County boundary. Vehicles continuing north remain on the B127 and travel to Derrylin and the double mini-roundabout with the A509. Historically, approximately 50% of the vehicles heading to/from the north of the site access turned right off the B127 to travel east to Teemore and the crossroads junction with the A509. At this point, vehicles turn right to travel south towards Belturbet and the south or southeast. However, since the Ballyconnell Inner Relief Road has been constructed, these vehicles have now diverted to/from the south of the site access where they travel to/from the N3 near Belturbet via the N87.

3.3 The alternative southern route directs traffic towards the south and/or southwest. This route follows the R205 south to Ballyconnell where vehicles stop at the crossroads before continuing straight on along the R205 to the R199 T junction.

3.4 The site access was constructed in accordance with the relevant design standards to provide a safe junction layout. The access provides a through traffic lane in each direction plus a central lane for vehicles turning right into the site from the southbound carriageway of the R205. There is a short area of hatching beyond which a right turn lane is introduced to serve an industrial development on the opposite side of the R205.

3.5 In the vicinity of the access the R205 is a 10m wide single carriageway with a 3.0m right turn lane.

3.6 The access also provides a diverge lane for vehicles turning left into the site from the northbound carriageway of the R205. An overrun area is also provided for vehicles turning left onto the R205 to travel northbound, which ensures HGVs do not encroach upon the opposing right turn traffic lane when leaving the site.

3.7 The site access road itself is approximately 8m wide with signed speed limit of 15kph. On the approach to the R205, drivers joining the R205 benefit from excellent visibility in both directions.

3.8 To the north of the New Cement Works access, the R205 continues to the County Boundary. Between the boundary and Derrylin the B127 has a nominal width of between 6.5 – 7.3m along its length with localised widening to provide right turn lanes at some accesses/junctions.

3.9 Continuing to the north, the route meanders its way in a generally northern direction to Derrylin. Along the route there are several minor priority junctions and direct accesses to various dwellings, farms and businesses, including Quinn Glass and a further Quinn Quarry.



## 4 BASELINE TRAFFIC FLOWS

4.1 In order to establish baseline traffic flows on the local highway network when the previous Highway Assessment was undertaken, new traffic surveys were undertaken at strategic points.

4.2 The ATCs were installed to record traffic flows over a one week period from 15th – 23rd October 2005 inclusive. The ATCs recorded directional flows and vehicle classifications along the following links:-

- A509 800m South of Teemore Crossroads
- Teemore Road West of the A509 Junction
- Teemore Road east of the B127 Junction
- B127 North of Teemore Road junction (800m North of Quinn Glass access)
- B127 North of New Cement Works access at Gortineddan
- R205 South of New Cement Works access
- R205 1000m South of Ballyconnell

4.3 The ATCs recorded all vehicle movements in hourly time intervals 24 hours per day over the nine day survey period.

4.4 Since the 2005 surveys were undertaken, additional surveys were carried out on behalf of Cavan County Council in order to assist in the assessment of the approved Ballyconnell

Inner Relief Road scheme. Cavan County Council kindly provided a copy of traffic survey data from February 2007 and June 2007, which were considered in the earlier highway reports.

4.5 Cavan County Council has confirmed that these are the most recent traffic counts available in the area.

4.6 These more recent flows have been compared with those of 2005 in the following paragraphs.

4.7 Taking each count site in turn, the survey results reveal:-

A509 South of Teemore Crossroads

4.8 During the 2005 surveys, the busiest day of the week was found to be Friday 21 October, when a total of 2932 vehicles were recorded at the count site over the 12 hour period 07:00 – 19:00, of which 499 (17.02%) were classified as HGVs. As would be expected, the flows during the weekend were lower than the working week (Monday to Friday). The daily variation in the total flow between Monday to Friday inclusive was found to be 448 vehicles.



4.9 When considering HGV flows in isolation, the busiest day was Wednesday 19 October, when 536 HGV movements were recorded at the count site. The daily variation in HGV flows between Monday – Friday was found to be 65 movements over the 12 hour period.

4.10 The peak hour of traffic flow at this count site was found to be 17:00 – 18:00 on Friday 21 October, when a total of 360 vehicles, including 44 HGVs (12.22%) were recorded.

4.11 By way of comparison, the traffic surveys on Friday 22nd June 2007 revealed a 12 hour flow of 3207 movements including 459 (14.3%) HGVs. In terms of the peak hour, this remained between 17:00 – 18:00 when 409 movements were recorded including 30 HGVs (7.33%).

4.12 It is therefore apparent that the total vehicle flows along the A509 have increased over the 12 hour and peak hour periods but the number of HGV movements has reduced during the same period on the comparable Fridays between 2005 and 2007.

Teemore Road West of A509 Junction

4.13 During the 2005 surveys the busiest day of the week was found to be Monday 17 October, when a total of 1194 vehicles were recorded at the count site over the 12 hour period, of which 331 (27.72%) were classified as HGVs. As would be expected, the flows during the weekend were lower than the working week (Monday to Friday). The daily

variation in the total flow between Monday to Friday inclusive was found to be 97 vehicles.

4.14 When considering HGV flows in isolation, the busiest day was Tuesday 18 October, when 346 HGV movements were recorded at the count site. The daily variation in HGV flows between Monday – Friday was found to be 25 movements over the 12 hour period.

4.15 The peak hour of traffic flow at this count site was found to be 17:00 – 18:00 on Friday 21 October, when a total of 162 vehicles, including 24 HGVs (14.81%) were recorded.

4.16 By way of comparison, the traffic surveys on Friday 22nd June 2007 revealed a 12 hour flow of 1432 movements including 324 (22.63%) HGVs. In terms of the peak hour, this remained between 17:00 – 18:00 when 160 movements were recorded including 8 HGVs (5.00%).

4.17 It is therefore apparent that the total vehicle flow along Teemore Road has increased over the 12 hour periods but the number of HGV movements has reduced during the same period on the comparable Fridays between 2005 and 2007. Both the total flow and number of HGVs within the total reduced during the peak between 2005 and 2007.

Teemore Road East of B127 Junction

4.18 The busiest day of the week was found to be Monday 17 October, when a total of 1061 vehicles were recorded at the count site over the 12 hour period, of which 407 (38.36%) were classified as HGVs. Once again, the flows during the weekend periods were lower than the working week (Monday to Friday). The daily variation in the total flow between Monday to Friday inclusive was found to be 102 vehicles.



4.19 When considering HGV flows in isolation, the busiest day was Tuesday 18 October, when 414 HGV movements were recorded at the count site. The daily variation in HGV flows between Monday – Friday was found to be 57 movements over the 12 hour period.

4.20 The peak hour of traffic flow at this count site was found to be 17:00 – 18:00 on Monday 17 October, when a total of 134 vehicles, including 35 HGVs (26.12%) were recorded.

4.21 There was no available count data for 2007 at this site.

B127 North of Teemore Road Junction

4.22 The busiest day of the week was found to be Friday 21 October, when a total of 3250 vehicles were recorded at the count site over the 12 hour period, of which 572 (17.60%) were classified as HGVs. The flows during the weekend periods were lower than the working week (Monday to Friday). The daily variation in the total flow between Monday to Friday inclusive was found to be 263 vehicles.

4.23 When considering HGV flows in isolation, the busiest day was Thursday 20 October, when 618 HGV movements were recorded at the count site. The daily variation in HGV flows between Monday – Friday was found to be 73 movements over the 12 hour period.

4.24 The peak hour of traffic flow at this count site was found to be 17:00 – 18:00 on Friday 21 October, when a total of 464 vehicles, including 37 HGVs (7.97%) were recorded.

4.25 There was no available count data for 2007 at this site.

B127 North of New Cement Works at Gortineddan

4.26 The busiest day of the week was found to be Friday 21 October, when a total of 4148 vehicles were recorded at the count site over the 12 hour period, of which 1040 (25.07%) were classified as HGVs. As with the preceding sites, the flows during the weekend were lower than the working week (Monday to Friday). The daily variation in the total flow between Monday to Friday inclusive was found to be 420 vehicles.

4.27 When considering HGV flows in isolation, the busiest day was Tuesday 18 October, when 1084 HGV movements were recorded at the count site. The daily range in HGV flows between Monday – Friday was found to be 112 movements over the 12 hour period.

4.28 The peak hour of traffic flow at this count site was found to be 17:00 – 18:00 on Friday 21 October, when a total of 478 vehicles, including 67 HGVs (14.02%) were recorded.

4.29 There was no available count data for 2007 at this site.

R205 South of New Cement Works

4.30 The busiest day of the week was found to be Friday 21 October, when a total of 3697 vehicles were recorded at the count site over the 12 hour period, of which 711 (19.23%) were classified as HGVs. The flows during the weekend were once again lower than the working week (Monday to Friday). The daily variation in the total flow between Monday to Friday inclusive was found to be 501 vehicles.

4.31 When considering HGV flows in isolation, the busiest day was Friday 21 October, when 711 HGV movements were recorded at the count site. The daily range in HGV flows between Monday – Friday was found to be 152 movements over the 12 hour period.

4.32 The peak hour of traffic flow at this count site was found to be 17:00 – 18:00 on Friday 21 October, when a total of 441 vehicles, including 41 HGVs (9.30%) were recorded.

4.33 By way of comparison, the traffic surveys on Friday 22nd June 2007 revealed a 12 hour flow of 3880 movements including 606 (15.62%) HGVs. In terms of the peak hour, this

remained between 17:00 – 18:00 when 464 movements were recorded including 32 HGVs (5.00%).

4.34 It is therefore apparent that the total vehicle flow along this section of the R205 has increased over both the 12 hour and peak hour periods. However, the number of HGV movements has reduced on the comparable Fridays between 2005 and 2007.

R205 South of Ballyconnell

4.35 The busiest day of the week was found to be Friday 21 October, when a total of 1405 vehicles were recorded at the count site over the 12 hour period, of which 290 (20.64%) were classified as HGVs. As with all of the other count sites, the flows during the weekend were lower than the working week (Monday to Friday). The daily variation in the total flow between Monday to Friday inclusive was found to be 232 vehicles.

4.36 When considering HGV flows in isolation, the busiest day was Tuesday 18 October, when 298 HGV movements were recorded at the count site. The daily range in HGV flows between Monday – Friday was found to be 40 movements over the 12 hour period.

4.37 The peak hour of traffic flow at this count site was found to be 16:00 – 17:00 on Friday 21 October, when a total of 182 vehicles, including 24 HGVs (13.19%) were recorded.

4.38 By way of comparison, the traffic surveys on Friday 22nd June 2007 revealed a 12 hour flow of 2158 movements including 259 (12.00%) HGVs. In terms of the peak hour, this shifted to between 16:30 – 17:30 when 273 movements were recorded including 21 HGVs (7.69%). However, it was noted that there was only one less movement between 16:00 and 17:00, which was the peak hour observed in 2005.



4.39 It is therefore apparent that the total vehicle flow along the R205 has increased significantly over the 12 hour period, although there has been a reduction in HGV traffic. Despite the increase over the 12 hour day, the peak hour total and HGV flows are lower than the peak observed in 2005.

N87 To / From the Southeast of Ballyconnell

4.40 Flows recorded on behalf of the Cavan County Council on 1st February 2007 revealed peak hour traffic flows on the N87 in the vicinity of the proposed connection to the Ballyconnell Inner Relief Road of 450 vehicles including 17 HGVs in the AM peak hour and 585 including 40 HGVs during the PM peak hour. Surveys in a similar location on 22nd June 2007 recorded flows of 6373 movements including 327 HGVs over the 24 hour day, with AM and PM peak hour flows of 348 including 24 HGVs and 590 including 22 HGVs respectively.

## Comment on Traffic Survey Results

4.41 The survey results demonstrated that there is a wide variation in traffic volumes on the local road network. It is interesting to note that the flows on the B127 and R205 north of Ballyconnell are higher than those on the A509 during the working week (Monday to Friday). This is likely to be a result of the numerous industrial developments along the B127/R205 corridor, which attract relatively high volumes of traffic, and particularly HGVs.

4.42 Notwithstanding the wide variation in traffic flows, it is apparent that all of the routes were relatively lightly trafficked when compared to their respective design capacities. The highest hourly flow recorded on any of the routes considered was 590 movements on the N87 to/from the southeast of Ballyconnell.

4.43 As described in section 3 of this report, the carriageway width of the B127 varies between 6.5 to 7.3m along its length. TA 79/99 "*Traffic Capacity of Urban Roads*" details hourly capacities for carriageways of similar width as varying between 1250 vehicles for a 6.1m wide busy high street with unrestricted access, parking pedestrian crossings etc. to 2450 vehicles on a 7.3m wide single carriageway route with frontage access, access to properties and more than two side roads per km.

4.44 Although much of the network considered would not normally be classified as urban, the capacities quoted within the advice note provide a useful benchmark against which the observed flows may be assessed. TA 46/97 "*Traffic Flow Ranges for use in the Assessment of New Rural Roads*" identifies a capacity in the year of opening for a 7.3m wide carriageway as 13,000 vehicles per day Annual Average Weekday Traffic (AADT), which is the average daily flow over the whole year, including weekends. It is apparent that traffic flows on all of the routes considered fall below this 'opening year' design capacity.



4.45 When considering the capacity of the local highway network and the level of traffic observed to be travelling on it, it is apparent that a significant level of reserve capacity exists, even when allowing for any reasonable levels of traffic growth during the intervening period.

## New Cement Works Traffic

4.46 The New Cement Works Traffic was described in Section 2 above, and confirmed that based upon the 1.4 million tonnes output the daily HGV flows were 260 loads (520 movements). These were distributed 57.5% to/from the north and 42.5% to/from the south of the site access.

4.47 In 2007, when Cavan County Council undertook the most recent traffic surveys between February and June, the New Cement Works was operating close to its maximum capacity and sold 1,331,796 tonnes of cement, whilst clinker production was 1,214,148 tonnes. The busiest month of production within the year was May 2007.

4.48 Weighbridge data has been analysed from May 2007 and it was found that over the full working weekdays (Monday to Friday), the total number of loads associated with imports and exports ranged from 196 on Monday 14th May to 279 on Tuesday 8th and Tuesday 29th May, giving a day to day variation of 83 loads/166 movements at the site. When including Saturdays, the range increased to 212 loads/424 movements due to the lowest number of loads (67) recorded on Saturday 5th May 2007.

4.49 As described in Section 3, of the traffic to/from the north, approximately 50% of it (28.75% of the overall total) travelled to/from the east then south via Teemore Cross). This traffic has now diverted to/from the south of the access as it uses the more direct route to/from the N3 via the N87 and the Ballyconnell Inner Relief Road which has subsequently been constructed and opened to traffic.

4.50 This revised distribution now equates to 28.75% to/from the north and 71.25% to from the south, resulting in 75 loads/150 movements to/from the north and 185 loads/370 movements to/from the south.

4.51 The effect of substituting 55% of coal imports with SRF was identified to be an increase of 11 loads/22 movements to/from the north of the site, due to the sources of both the coal and SRF supplies. However, this was based on SRF being sourced from Northern Ireland and Dublin, with the latter travelling south via Teemore Cross. Based on the 50/50 distribution identified above, half of this traffic would divert to the southern route to the N3 via the Ballyconnell Inner Relief Road and N87.



4.52 Based on the average HGV movements associated with the 1.4 million tonnes of cement production and taking into account the substitution of coal with SRF, this results in 80 loads / 160 movements to/from the north and 191 loads/382 movements to/from the south.

## 5 PROPOSED DEVELOPMENT

5.1 As described in the introduction, it is now proposed to improve the sustainability of the cement plant, through the use of an increased range of waste derived alternative raw materials and fuels with the long term aim of displacing almost all fossil fuels at the plant (a limited proportion of fossil fuels will be required during process start up and for process optimisation/stabilisation). The use of these alternatives will equate to 300,000 tonnes per annum at maximum substitution.

5.2 A range of suitable materials are proposed for acceptance at the plant which can be summarised as follows:

5.3 Solid Fuels – including Solid Recovered Fuel (SRF) which is currently authorised for use at the plant, as well as a range of suitable fuels derived from other sources including:

- Meat and Bone Meal (MBM);
- Tyre Derived Fuel (TDF);
- Biomass Fuels;

- Sludges and Filter Cakes.
- Liquid Fuels – including Secondary Liquid Fuel (SLF) which is a blend of organic and solvent wastes blended to a defined specification as well as liquid fuels derived from other sources (e.g. waste oils).

5.4 Alternative Raw Materials (e.g. muds, minerals, sludges) have the potential to replace imported primary raw materials (e.g. Shale, Bauxite, Iron Ore), as well as gypsum and PFA. However, in order to represent a worst case scenario, it has been assumed that all of the Alternative Raw Materials would result in new traffic to the road network, as most, but not all of the existing primary raw materials are transported from local quarries via internal haul roads; thereby avoiding the local road network.

5.5 It is also proposed to include natural gas and petcoke as additional fuels in the licence. This is to provide flexibility for any future fossil fuel requirement.

5.6 It is predicted that the distribution of traffic entering and leaving the site in terms of supplies and sales of products other than coal and the alternative fuels would not alter as a result of the proposed development, as there is a consistent additional demand across the existing customer base.

5.7 It is not proposed to revise the existing access arrangement or transportation methods in order to accommodate the proposed development, as the existing arrangement is considered to be acceptable.



5.8 Up to 95% of the existing coal consumed in the production process could be replaced by alternative, sustainable fuels. It is necessary to maintain some coal imports for certain processes, such as starting up the plant and optimisation/stabilisation.

5.9 The substitution of up to 95% of coal by alternative fuels and the use of alternative raw materials would result in a variation in traffic flow at the site access due to the different characteristics and sources of the material. As a result of the different characteristics, the alternative fuels would typically be transported in 24 tonne payloads, as its density is lower than coal, which is transported in 30 tonne loads; hence for the same volume of product within a load there is less mass. The same 24 tonne payload is also applicable to the alternative raw materials that would be used within the plant.

5.10 The calorific value of the alternative fuels is also lower than coal. In order to obtain the same calorific output as a tonne of coal, 1.5 tonnes of the alternative fuels is required.

5.11 Quinn Cement Ltd has identified the main sources of the alternative fuels and raw materials to be split between the north (40%) and south (60%). Based on the sources to the south, vehicles would travel via the Ballyconnell Inner Relief Road and N87, rather than pass through the town.

5.12 As the coal is currently sourced via the north, this will result in a redistribution of traffic on the local road network.

5.13 The alternative fuels and raw materials are sourced more locally than the existing coal. As a result, their imports would be distributed over more days of the year than the existing coal imports. It has been established that the alternative products would be imported over 330 days per annum.

5.14 The proposed development will result in an additional 7 staff working at the site, including 1 administrative person working 08:00 – 17:30 Monday to Friday; 3 day shift operatives working 07:00 – 19:00; and 3 night shift operatives working 19:00 – 07:00.

Development Traffic

5.15 In terms of coal imports, the annual consumption at the site associated with the production of 1.4 million tonnes of cement is 155,000 tonnes. This is currently imported in 30 tonne payloads giving a total of 5167 loads per annum or an average of 19 loads per day based on the deliveries taking place 5.5 days per week for 51 weeks per annum.

5.16 In terms of the alternative fuels, taking the worst case scenario in terms of traffic increases, whereby 95% of the coal consumption is replaced, it is calculated that the equivalent of 147,250 tonnes of coal would be replaced by the sustainable alternatives.



5.17 Based on an alternative fuel with the lowest calorific value acceptable to the plant, an additional 50% of alternative fuels would be required to generate the equivalent energy as coal i.e. for every 1 tonne of coal 1.5 tonnes of alternative fuel is required. Some of the alternative fuels will have a higher calorific value resulting in improved coal displacement ratios, resulting in less alternative fuel being required and therefore less haulage traffic. Therefore, the following calculations represent the worst case scenario in terms of predicted increases in vehicle movements.

5.18 The displaced 147,250 tonnes of coal therefore equates to 220,875 tonnes of alternative fuel. When taking into account the 24 tonne payload, a total of 9203 loads would be imported annually. This equates to 28 loads per working day and 56 movements when taking into account the 330 days over which the alternative fuels are imported.

5.19 The balance of the 300,000 tonnes of imported alternative materials (79,125 tonnes) would comprise alternative raw materials. When taking into account the 24 tonne payload and 330 days per annum over which it would be imported, this equates to 3,297 loads per annum and 10 loads/20 movements per day.

5.20 In addition, the residual coal requirement of 7,750 tonnes would be transported over 280.5 days in 30 tonne loads, resulting in 259 loads annually and 1 load/2 movements per day.

5.21 Based on the foregoing, it is calculated that in terms of fuel/coal and raw material imports, the proposed development would result in 39 loads/78 movements per day compared with 19 loads/38 movements, giving an uplift of 20 loads/40 movements per day when compared with the situation when the plant was fuelled entirely with coal and assuming the majority of primary raw materials are all imported via internal haul routes.

5.22 However, the substitution of up to 55% of the coal by SRF has already been approved, which would account for 11 loads / 22 movements per day. Therefore, the net increase in movements at the site access is calculated to be 9 loads / 18 movements per day.

5.23 This increase is directly comparable with the traffic identified to be attracted to the unimplemented Mixed Bottle Recycling Plant within the site complex. This development was predicted to attract 38 additional HGV movements per day (19 in / 19 out).

5.24 Having considered the foregoing, it is apparent that the overall quantum of traffic associated with the proposed development would be 10 loads / 20 movements less than the cumulative attractions to the site historically accepted on the local road network.

5.25 Notwithstanding this, setting aside the unimplemented Mixed Bottle Recycling Plant traffic, based on the sources of coal and alternative fuels/raw materials there would be a redistribution of traffic.



5.26 When assessed against the fuelling of the plant based on coal alone, to the north of the site access, based on the 39 loads / 78 movements per day associated with the development and the 40% / 60% north / south split there would be 16 loads / 32 movements per day to / from the north and 23 loads / 46 movements per day to / from the south.

5.27 The northern movements would be offset by a reduction of 19 loads / 38 movements associated with coal imports leading to a reduction of 3 loads / 6 movements per day on the northern route.

5.28 There would be no offset to the south so the remaining 23 loads / 46 movements per day would be an increase on the southern route, which equates to the net overall increase on the network overall of 20 loads / 40 movements.

5.29 When assessed against the fuelling of the plant based on 55% coal substitution with SRF, to the north of the site access there would already be 5 loads /10 movements of the additional 16 loads / 32 movements associated with the replacement fuels/materials per day on the northern route. The net increase to offset against the reduction of coal movements therefore becomes 11 loads / 22 movements, resulting in a net reduction of 8 loads / 16 movements per day on the northern route.

5.30 The same 55% coal substitution has also been established to result in 6 loads heading to / from the Ballyconnell Inner Relief Road since its construction (as diverted from the

historic northern route via Teemore Cross). This results in a net increase of 17 loads / 34 movements on the southern route as a result of the proposal when compared with the baseline of 55% of coal being replaced by SRF, as currently approved.

5.31 When compared with the permitted 55% substitution of coal with SRF, the proposed development represents an overall increase of 9 loads / 18 movements per day on the local road network.

5.32 Figure 1 at the back of this report illustrates these changes compared to the permitted use of SRF as a 55% replacement for coal, taking into account the impact the Ballyconnell Inner Relief Road has had on traffic distribution to / from the site.

5.33 Based on this distribution it is calculated that the hourly flows would be a reduction of around 0 - 1 load / 0 - 2 movements per hour between the site access and route to the north via the B127 and an increase of 1 – 2 loads / 2 – 4 movements per hour between the site access and N3 to the south via the Ballyconnell Inner Relief Road and N87.

5.34 In terms of staff movements, assuming the worst case scenario whereby all additional staff members travel independently by car, an additional 14 movements per day could be expected (7 in / 7 out).



Traffic Impact

5.35 A comparison between the 2005 and 2007 traffic flows indicate that when permission was granted to increase the output from the site from 1.0 to 1.4 million tonnes of cement per annum, whilst overall traffic movements were lower, the number of HGV movements within the total flow was higher.

5.36 On those routes for which data is available, over the typical 12 hour working day it is apparent that on the R205, B127 and A509 to the north of the site the proposed development would result in a reduction of up to 16 HGV movements per day.

5.37 On the R205 to the south of the site access the proposed development would result in an increase of 23 loads / 46 HGV movements per day when compared with the plant being fuelled by 100% coal and 17 loads / 34 HGV movements per day when compared with 55% of the coal being replaced by SRF, as currently permitted. When spread over a typical 12 hour working day, this equates to 1 – 2 loads / 2 – 4 HGV movements per hour.

5.38 This increase of 46 HGV movements falls above the daily range of 40 HGV movements observed within the 2005 surveys. However, when assessed against the baseline of 55% of coal being replaced by SRF, as approved, the 34 HGV movements falls within the observed range of day to day variations on the route. The hourly increases fall within the range of observed variations in both cases.

5.39 Flows recorded on behalf of Cavan County Council on 1st February 2007 revealed peak hour traffic flows on the N87 in the vicinity of the proposed connection to the Ballyconnell Inner Relief Road of 450 including 17 HGVs in the AM peak hour and 585 including 40 HGVs during the PM peak hour. Surveys in a similar location on 22nd June 2007 recorded flows of 6373 movements including 327 HGVs over the 24 hour day, with AM and PM peak hour flow of 348 including 24 HGVs and 590 including 22 HGVs.

5.40 It is therefore apparent that on the routes where an increase is predicted to occur, the level of change falls within the observed day to day variations on routes which retain significant levels of reserve capacity during the peak hour periods.

5.41 The addition of up to 20 loads / 40 movements overall when compared with the fuelling of the plant with 100% coal may also be assessed with reference to the weighbridge data from May 2007, which revealed a day to day variation of 83 loads/166 movements at the site from Monday to Friday and, 212 loads/424 movements when including Saturdays.

5.42 Having considered the relatively low volumes of traffic on the local road network in combination with the level of reserve capacity together with observed variations in traffic flow both on a daily basis it is considered that the impact of the proposed substitution of up to 95% of coal with alternative fuels together with the use of alternative raw materials would be insignificant. It should also be recognised that this conclusion is reached based on the worst case scenario in terms of potential increases in HGV activity associated with the proposed development.



5.43 It is also apparent that the total cumulative traffic volumes to/from the site fall below the level that has previously been approved when taking into account the proposed Mixed Bottle Recycling Plant, which was never implemented.

5.44 Consideration should also be given to the sustainable use of alternative fuels and raw materials when compared with coal and primary materials. Using the alternatives not only reduces consumption of finite mineral/coal reserves, but also diverts a significant volume of waste to a practical use, which would otherwise unnecessarily be deposited in landfill sites.

5.45 In terms of the additional 7 staff trips to/from work per day, 6 staff members would work shifts, which change over at 07:00 and 19:00. As a result, their movements would occur off-peak. The additional administrative person would work between 08:00 – 17:30 and would therefore arrive before the AM network peak hour. Whilst they would leave at the end of the normal network PM peak hour, a single additional trip, assuming the person travels by car, is not considered to represent a material increase on a network which retains significant reserve or spare capacity and which exhibits significantly greater levels of day to day and hour to hour variations under existing, baseline conditions.

## 6 SUMMARY AND CONCLUSION

### Summary

6.1 Quinn Cement Ltd currently operates a cement production plant at its New Cement Works to the north of Ballyconnell, in the northwest of County Cavan on the lower south-eastern slopes of Slieve Rushden.

6.2 As a result of increased demand in the marketplace, the output from the site has progressively increased from the original level of 1.0 million tonne per annum to its current level of 1.4 million tonnes per annum.

6.3 Following permission to install new plant and machinery at the existing New Cement Works to enable the site to be able to accept and accommodate the introduction of Solid Recovered Fuel as a replacement for up to 55% of coal used, it is now proposed to improve the sustainability of the cement plant, through the use of an increased range of waste derived alternative raw materials and fuels with the long term aim of displacing almost all fossil fuels at the plant (a limited proportion of fossil fuels will be required during process start up and for process optimisation/stabilisation). The use of these alternatives will equate to 300,000 tonnes per annum at maximum substitution.



6.4 A range of suitable materials are proposed for acceptance at the plant which can be summarised as follows:

6.5 Solid Fuels – including Solid Recovered Fuel (SRF) which is currently authorised for use at the plant, as well as a range of suitable fuels derived from other sources including:

- Meat and Bone Meal (MBM);
- Tyre Derived Fuel (TDF);
- Biomass Fuels;
- Sludges and Filter Cakes.
- Liquid Fuels – including Secondary Liquid Fuel (SLF) which is a blend of organic and solvent wastes blended to a defined specification as well as liquid fuels derived from other sources (e.g. waste oils).

6.6 Alternative Raw Materials (e.g. muds, minerals, sludges) have the potential to replace imported primary raw materials (e.g. Shale, Bauxite, Iron Ore) as well as gypsum and PFA. However, in order to represent a worst case scenario, it has been assumed that all of the Alternative Raw Materials would result in new traffic to the road network, as most, but not all of the existing primary raw materials are transported from local quarries via internal haul roads; thereby avoiding the local road network.

6.7 It is also proposed to include natural gas and petcoke as additional fuels in the licence. This is to provide flexibility for any future fossil fuel requirement.

6.8 In order to allow the local highway authority, Cavan County Council, to consider the impact of the proposed development, The Hurlstone Partnership was commissioned to undertake an assessment of the existing road network and the implications associated with the additional traffic attracted to the site.

6.9 The study considered the impact of the additional traffic on the local road network including the site access, the R205 to the south through and beyond Ballyconnell, the R205/B127 to the north up to Derrylin and the N87 to the southeast of Ballyconnell, which connects to the N3 near Belturbet.

6.10 The characteristics of the local road network were reviewed, together with highway capacity based on the most recent traffic survey data available provided by Cavan County Council, which were recorded as part of the Ballyconnell Inner Relief Road scheme, and those that prevailed when the previous planning permission for the increased cement production was granted at the site.

6.11 It was found that the traffic flows on all links of the network fluctuated significantly from day to day, both in terms of total flow and HGV content.

6.12 The proposed development would result in an additional 7 people being employed, resulting in additional trips. However, due to their working hours, the impact of these trips on the road network would be limited as they would primarily occur off-peak. However, the proposed development does result in increased HGV traffic delivering materials to the site.



6.13 To establish the number of additional HGVs travelling on the network, Quinn Cement Ltd reviewed its records of distribution, collections and deliveries of materials.

6.14 It was found that the substitution of 95% of coal with alternative fuels and the use of alternative raw materials would result in an additional 20 HGVs (40 movements) per day travelling on the local road network when compared to the scenario whereby the site is fuelled 100% by coal.

6.15 When compared with the permitted scenario of 55% of coal being replaced by SRF, the increase in HGV traffic reduces to 9 loads / 18 movements per day.

6.16 These increases represent the worst case scenario assuming all of the replacement fuel has the lowest calorific value of those proposed, which maximises the amount that would need to be imported as a replacement for coal, thereby maximising the associated traffic impact and may be compared with the additional 19 loads / 38 HGV movements approved at the site related to the Mixed Bottle Recycling Plant, which was never implemented.

6.17 When taking into account the directional distribution at the site access, it was established there would be a reduction of up to 8 loads / 16 movements per day on the R205 / B127 and A509 to the north of the site.

6.18 To the south of the site there would be an increase of between 17 loads / 34 HGV movements and 23 loads / 46 HGV movements per day when compared with the 55% replacement of coal with SRF (as approved) and 100% fuelling by coal respectively. This increase would occur along the R205 between the site access and Ballyconnell Inner Relief Road, along the Inner Relief Road itself and thereafter along the N87 en-route to the N3 at Belturbet.

6.19 This equates to between 1 – 3 loads / 2 – 6 HGV movements per hour when spread over a typical working day, or up to one HGV movement every 10 minutes.

6.20 When considering the permitted replacement of 55% of coal with SRF as the baseline scenario, on all links along which the development traffic would travel, the quantum of development traffic falls within the range of existing day-to-day and hour to hour variations in HGV activity. If assessed against the 100% fuelling by coal, the proposed development traffic represents 6 HGVs per 12 hour day more than the 40 HGV movements observed in 2005, but the variation remains within those observed on an hour to hour basis.



6.21 The increase in traffic associated with the proposed development would not have a significant detrimental impact on highway capacity on any links considered within the study area as a significant level of reserve capacity would be retained.

## Conclusion

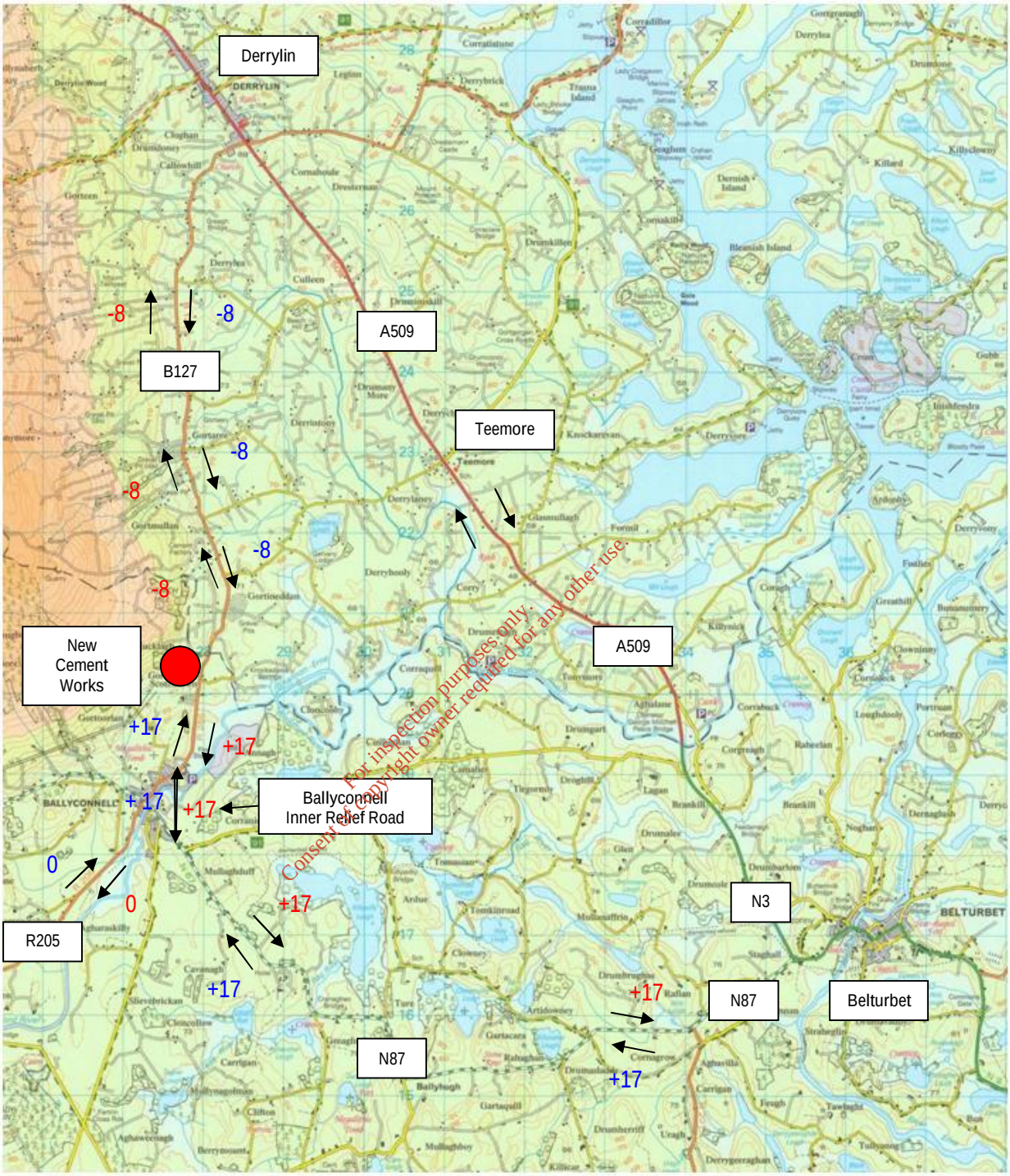
6.22 As a result of the proposed development at the New Cement Works, to enable the plant to be able to accept and accommodate a wider range of alternative fuels and raw materials, the plant will attract additional HGV deliveries.

6.23 The distribution of traffic is such that the highest average hourly increase on any given link is up to 6 movements (3 in/3 out) per hour, which equates to 1 movement every 10 minutes. However, this increase to the south of the site may be partially offset by a reduction in HGV traffic to the north.

6.24 Comparison of empirical traffic flow data revealed that the proposed quantum of HGV traffic falls within the range of observed day to day variations on the local highway network and the cumulative total remains below those previously approved on routes which retain significant levels of reserve capacity.

6.25 When assessed against the baseline flows on the network and the reserve capacity available on the local roads, it is concluded that the increased traffic would have an insignificant impact on the area.

# FIGURES




Development Traffic Impact on Local Highway Network:
Daily HGV Flows Relative to Current Coal Replacement Permission
Outbound / Inbound

FIGURE 1