

TRANSPORT ASSESSMENT/  
TRAFFIC IMPACT ASSESSMENT

PROPOSED BIOMASS FUELLED POWER PLANT

BALLYVANNON ROAD, NR GLENAVY

ROSE ENERGY

MAY 2008

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## PREAMBLE

This report has been prepared by Mr Stephen Lockwood, Managing Director of Doran Consulting, a Chartered Civil Engineer, Member of the Institution of Civil Engineers, Member of the Institution of Structural Engineers, Member of the Institution of Highways and Transportation.

Mr Lockwood has in excess of 25 years of civil engineering experience including the preparation of traffic and transportation studies, for both public and private sector clients, in support of a wide variety of developments types.

Mr Lockwood was assisted by Jonathan Skelton, Associate and Alistair Toner, Project Engineer.

TRANSPORT ASSESSMENT/TRAFFIC IMPACT ASSESSMENT  
ROSE ENERGY GLENAVY

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## 1 INTRODUCTION

1.1 Doran Consulting have been commissioned by Rose Energy to carry out a Transport Assessment (TA)/Traffic Impact Assessment (TIA) that addresses traffic issues for a planning application to construct a new bio-mass fuelled Power Station near Glenavy. The proposed Power Plant is to be constructed and operated by Rose Energy Ltd, a joint venture Company of Moy Park Ltd, O'Kane Poultry Ltd and Glenfarm Holdings Limited,. Moy Park and O'Kane both produce and process poultry and Glenfarm Holdings Ltd is the owner of the adjoining plant of Ulster Farm By Products . The power plant would be fuelled with poultry bedding and meat and bone meal, a product of Ulster Farm By Products.

1.2 The TATIA has been undertaken in accordance with the DRD *Transport Assessment Guidelines for Development Proposals in Northern Ireland October 2006* and the Institution of Highways & Transportation's '*Guidelines for Traffic Impact Assessment*'.

## 2 EXISTING CONDITIONS

2.1 The site of the proposed Power Station is located on the Ballyvannon Road, Glenavy, refer to Figure 1. It adjoins the plant of Ulster Farm By-Products Ltd which operates a rendering plant. Ulster Farm By-Products is a wholly owned subsidiary of Glenfarm Holdings Ltd.

2.2 Turning count surveys were carried out on Thursday 6 March 2008 between 0700-1900 at the following locations, refer to Appendix A:

- Ulster Farm access
- Lurgan Road/Ballyvannon Road/Edenturchar Road

2.3 Automatic Traffic Count (ATC) surveys were carried out between Tuesday 4 March and Monday 10 March 2008 at the following locations, refer to Flow Diagrams in Appendix B. Station Road was closed for resurfacing when the above ATC surveys were being carried out and was therefore resurveyed between Tuesday 1 to Monday 7 April 2008:

:

- Lurgan Road (50m south of Ballyvannon Road)
- Edenturchar Road
- Lurgan Road (50m north of Ballyvannon Road)
- Ballyvanon Road (75m west of Ulster Farm Access)
- Ballyvannon Road (200m west of junction with Lurgan Road)
- Aughnadarragh Road
- Station Road

2.4 ATC traffic surveys were previously carried out between Tuesday 20 March and Wednesday 28 March 2007 at the following junctions, refer to Flow Diagram C in a Appendix C. The flows at the Lurgan crossroads in March 2007 are very similar to those recorded in March 2008 so it is robust to conclude the closure of Station Road did not influence the March 2008 ATC surveys.

- Lurgan Road (50m south of Ballyvannon Road)
- Edenturchar Road
- Lurgan Road (50m north of Ballyvannon Road)
- Ballyvanon Road (50m west of Lurgan Road)

2.5 The turning count survey indicates that there is negligible traffic in/out of the Ulster Farm By-Products access coming to/from Ballyvannon Road west. Therefore traffic generated by Ulster Farm By-Products can be calculated from the difference between the two Ballyvannon Road ATC sites either side of the Ulster Farm access, refer to Table 1.

Vehicle Type	Daily 2-way 5 day weekday average
Cars/Motorbikes/Passenger Service Vehicles	168
LGV	50
HGV	81
Total	299

Table 1 – Existing Ulster Farm Traffic March 2008

- 2.6 The ATC survey indicated the existing roads surrounding the site are very lightly trafficked. The results are summarised in Table 2, refer to Flow Diagram B3, Appendix B. *Design Manual for Roads and Bridges, Chapter 2, Volume 5, Section 1, Part 3 TA 46/97* gives an indication of the capacity of roads based on their geometry and context. With reference to this the roads in Table 2 would be at capacity if they carried 13,000 vehicles daily. The traffic surveys indicate the existing traffic flows are significantly below these indicative volumes and it is therefore robust to conclude the existing road network has spare capacity.

Location	Existing Daily 2-Way Flow (5 day weekday average)
Ballyvannon Road	1395
Lurgan Road	2083
Edenturcher Road	1371
Aughnadarragh Road	615
Station Road	978

Table 2 – Existing ATC Traffic Flows March 2008

- 2.7 The ATC data has been plotted on graphs presented in Appendix D. These graphs indicate the peak periods and split of traffic between HGVs, LGVs and cars. The peaks on the main local road network are the usual AM and PM peak periods of 0700-0900 and 1600-1800 respectively. The appropriate peak hours from the surveys are deemed to be 0800-0900 and 1700-1800.
- 2.8 From inspection of the 5 day weekday average graphs the HGV movements are generally consistent between 0700-1700 hours on all the roads surveyed. The maximum volumes of existing HGV movements is summarised in Table 3.

Location	HGV Peak Hours	Maximum 2-way hourly volume of HGVs based on 5 day average weekday survey
Ballyvannon Road 75m west of Ulster Farm Access	1400-1700	8
Ballyvannon Road 200m west of Lurgan Rd junction	1100-1200	17
Lurgan Road (south of crossroads)	1600-1700	17
Lurgan Road (north of crossroads)	1600-1700	14
Aughnadarragh Road	1500-1600	8
Edenturcher Road	1500-1600	9
Station Road	1500-1600	14
Ulster Farm Access	1100-1200	10

Table 3 – Exsiting Peak HGV Movements

- 2.9 The turning count survey indicated the HGV peak hour at the Lurgan Road cross roads and Ulster Farm access on Thursday 6 March 2008 was 1200-1300, refer to Flow Diagram A2, Appendix A. The turning count survey indicates that there are negligible HGV movements to/from Ballyvannon Road to/from Lurgan Road south. The HGV movements to/from Ballyvannon Road are distributed evenly between Lurgan Road (north) and Edenturcher Road.
- 2.10 From inspection of the turning count and ATC surveys it can be seen that although Ballyvannon Road is lightly trafficked it carries as much HGV movements as Lurgan Road. This is because of HGV movements predominantly generated by Whitemountain Quarry, Stoneyford Cement and Ulster Farm. Ulster Farm accounts for half the HGV movements on Ballyvannon Road at the Lurgan Road junction and other businesses such as Whitemount Quarry and Stoneyford Cement account for the other half.

### 3 PROPOSED DEVELOPMENT

- 3.1 There is a need in Northern Ireland, as elsewhere in the United Kingdom, to reduce dependence upon fossil fuels for generating energy and, combined with a switch to renewable fuel sources, thus also reduce carbon emissions. Use of poultry bedding as a fuel is a tried and tested process even though it is not of the highest calorific value. This need also coincides with the requirement under the Nitrates Directive to reduce spreading material, such as poultry bedding, as a means of disposal or use as fertiliser in areas which are nitrates vulnerable. Consequently, there is the potential to achieve both objectives in a new bio-mass fuelled power plant provided it is cost effective.
- 3.2 The proposal is to construct a 30 MWe Bio-Mass Fuelled Power Plant which will consume approximately 220,000 tonnes of poultry bedding and 40,000 tonnes of meat and bone meal (MBM) per year, refer to site layout Appendix H.
- 3.3 The access into the Power Plant will be via a new access off Ballyvannon Road at the location of the existing access to number 23. This will be an in only and traffic exiting the Power Plant will do so via the existing Ulster Farm access.
- 3.4 The location of the proposed Power Plant is well suited from a transport point of view as it can make use of the MBM which is produced by the existing rendering plant on the adjoining site run by Ulster Farm By-Products Ltd. MBM not only provides a high calorific value fuel but its use in the Power Station would also remove the need for export of MBM from this location.
- 3.5 The poultry bedding will be imported to the site on 27.5 tonne capacity tipper trucks from across Northern Ireland 5.5 days a week. The location of the poultry farms is indicated on a map in Appendix E.
- 3.6 Ash is produced as a by product of the Power Plant process at approximately 15% of the input material. A maximum of 40,000 tonnes of ash will be removed off the site per year. Ash will be taken off the site in 20 tonne loads between the hours of 7am to 7pm.
- 3.7 The Power Plant will operate 24 hours a day, 7 days a week and will have around 25-30 full time employees, some of whom will operate on a 4 shift work pattern. There will be general deliveries including fuel to the Power Plant day to day between the hours 7am to 7pm.

#### 4 TRIP GENERATION

- 4.1 The proposed Power Plant will generate car trips from employees, and heavy vehicular traffic associated with deliveries and removal of ash.
- 4.2 The expected daily vehicle movements are summarised in Table 4. The trips in Table 4 are based on delivery of 220,000 tonnes of poultry litter a year. The daily flow assumes a 5.5 day week, over a 48 week year and that deliveries arrive in 25 tonne loads (in 27.5 tonne capacity tipper trucks). For example 220,000 tonnes/48 weeks/5.5 days/25 tonne lorry equals 33 lorries therefore 33 multiplied by 2 gives 66 two-way daily lorry movements. As the density of Ash is low it has been assumed it is taken off site in 20 tonne loads.

Material	Two way vehicles/day	Two-way vehicles peak hour (10% of daily)
Chicken Litter 220,000 tonnes	66	7
MBM 25,000 tonnes (net reduction as provided by Ulster Farm)	-8	-1
MBM 15,000 tonnes imported	4	0
Ash 40,000 tonnes	16	2
General Deliveries	14	1
Employees and Visitors (Assumed 2 trips/employee – 25 employees)	50	5
Total	142	14

Table 4 – Proposed Net Power Plant Movements on Road Network

- 4.3 The figures in Table 4 are robust as they are based on the design thermal output of the power plant. The loads are also directly related to the fairly standard size of poultry shed, the known number of birds, their feed regime and drop out of chicken litter. For example a 20,000 bird shed produces around 25 tonne of litter. The litter is taken out of the sheds once the chickens have reached maturity which is approximately 56 days. It is proposed that all the litter will come from farms owned by or contracted to the two poultry producing partners within the client Company and therefore constancy of operation and control is assured.
- 4.4 The MBM used in the Power Station will come from Ulster Farm By-Products. Consequently there will be no need for the Ulster Farm MBM to continue to be transported off site via the main road network. These MBM movements are counted as a reduction in Table 4. The MBM will be transported from Ulster Farms to the Power Station via lorry on the short stretch of Ballyvannon Road to the new 'in' access point. This is reflected on the proposed Flow Diagrams in Appendix A for robustness.
- 4.5 The peak hour of the proposed power plant is assumed to be 10% of the proposed daily traffic. This is based on the peak hour of Ulster Farm By-Products which is 10% of its daily flow.
- 5 TRIP DISTRIBUTION AND ASSIGNMENT
- 5.1 The incoming chicken litter will arrive from farms across Northern Ireland as indicated on the plan in Appendix E. The farms are concentrated fairly evenly between the north east and south west of the province. By inspection of the location of the site,(refer to Figure 1) the main routes to the site will be via the A26 Nutts Corner roundabout to the north and Moira roundabout to the south.
- 5.2 Ingress to the Power Station will be via the new access and egress will be via the existing Ulster Farm access. All the Power Station traffic will enter and exit the site via Ballyvannon Road – Lurgan Road crossroads. This is robust from inspection of the site's location in the road network and surveys of the existing Ulster Farm access which indicate this is what currently happens.

5.3 Proposed Power Station traffic has been distributed at the Lurgan crossroads as per the existing distribution:

- 45% Lurgan Road (north)
- 45% Edenturcher Road
- 10% Lurgan Road (south)

## 6 ASSESSMENT YEARS

6.1 The assessment years are as follows:

- 2008 - existing year
- 2011 - base year, i.e. year of opening
- 2021 - future year, i.e. base year plus 10 years

## 7 HIGHWAY IMPACT

7.1 As demonstrated already in Section 2 the existing road network is lightly trafficked and has spare capacity. The proposed increase in traffic generated by the Power Station is also low with a total net increase of 14 two-way vehicle movements in the peak hour of which 8 are HGVs.

7.2 The IHT Guidelines recommend that the threshold approach should be used to establish the area of influence of the proposed development and that the study area should include all links and associated junctions where traffic to and from the development will exceed 10% of the existing two-way traffic (or 5% in congested or other sensitive locations).

7.3 It is considered that the use of the 10% threshold is appropriate at all locations on the surrounding road network as the traffic surveys indicated there was no significant congestion or sensitivity.

7.4 Percentage Impact Diagrams have been calculated for the year of opening and are presented in Appendix A. The percentage impacts are greater than 10% at the following junctions:

- Site access
- Ballyvannon Road/Lurgan Road/Edenturcher Road

- 7.5 The main reason the percentage impacts are greater than 10% is because the traffic volumes on the existing road network are so low. For robustness the above two junctions have been analysed using the Transport Research Laboratory's computer software PICADY. The results are summarised in Appendix F and indicate a maximum RFC = 0.031 at the site access and a maximum RFC = 0.171 at the Lurgan Road crossroads in the future year 2021. A junction is approaching capacity when the RFC = 0.85 therefore the junctions are operating well within capacity under the proposals.
- 7.6 The total proposed Power Station traffic through the day has been plotted on the existing traffic graphs for Ballyvannon Road, Lurgan Road (north and south), Edenturchar Road and is presented in Appendix G. The trend of traffic generated through the day by the Power Station has been based on the same trend as Ulster Farm. It can be clearly seen the minimal impact the proposed traffic has on the road network.
- 7.7 A robust indicator of the acceptable increase of traffic volume generated by the proposed Power Station is given in the *Transport Assessment Guidelines for Development Proposals for Northern Ireland October 2006*. This as a guide indicates a threshold of 100 or more additional two way vehicle movements in the peak hour before a detailed Transport Assessment is required. At an increase of 14 two-way vehicle movements in the peak hour the proposed Power Station traffic is well within this threshold.
- 7.8 The construction period of the Power Station is estimated by the contractor to be 2.5 years. Up to 400 people in the peak will be working on the site with 200 people the norm. The contractor will need to submit a method statement to Roads Service for traffic management during the construction period. It would be recommended that the surrounding roads are inspected before during and after the construction period and repaired where necessary. Vehicle undercarriages should be washed before leaving the site.

## 8 ENVIRONMENTAL IMPACT

- 8.1 The IHT Guidelines recommend that environmental assessment of traffic links in the road network be undertaken where traffic flows will increase by more than 30% in the opening year as a result of development traffic. The proposed increase in traffic is below this threshold with a maximum percentage increase of 14% on the Ballyvannon Road during the AM Peak Hour therefore further assessment is not required.
- 8.2 It is noted that noise and air quality are being assessed as part of the Environmental Impact Assessment. The noise and air quality assessments consider the increase in vehicle movements at the site entrance where they are greatest as appropriate.

## 9 ROAD SAFETY

- 9.1 Accidents statistics for the last three years at Lurgan Road/Ballyvannon Road/Edenturchar Road have been received from the PSNI and are presented in Table 5. The frequency of accidents is evidently low and does not warrant further deliberation.

Location	Fatal	Serious	Slight
Ballyvannon Road/Lurgan Road/ Road/Edenturchar Road	0	0	1
	Killed	Seriously Injured	Slightly Injured
	0	0	1

Table 5 – PSNI Accident Statistics

## 10 INTERNAL LAYOUT AND PARKING

- 10.1 The site layout is presented in Appendix H. Twenty six car parking spaces (including 3 disabled spaces) are being provided for staff and visitors. The internal road layout allows for the safe circulation, parking and turning of HGVs.



11 PUBLIC TRANSPORT

11.1 Due to the nature of the development public transport provision is not applicable to the transport of materials. The small number of staff working at the site are likely to travel by car due to the site's location. Translink have been consulted and have yet to reply at the time of issuing this report.

12 PEDESTRIANS AND CYCLISTS

12.1 Existing pedestrian and cycle movements on the road network were recorded as negligible during the traffic surveys with 3 pedestrians and 8 two-way cyclists recorded on the Ballyvannon Road between 0700-1900 hours. As the development proposal is for a Bio-Mass Fuelled Power Station pedestrian and cycle movements will also be negligible. Showers, changing rooms and lockers along with cycle parking will be provided to encourage staff members to cycle.

13 CONCLUSIONS

13.1 The TA/TIA has demonstrated that the impact of the proposed Power Station traffic can be accommodated on the road network. This is robust for the following reasons:

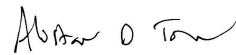
- Traffic surveys indicate the existing road network is lightly trafficked with spare capacity.
- The proposed increase in traffic is small at 14 vehicles two-way in the peak hour on Ballyvannon Road which is less than would normally generate a need for a TA/TIA.
- Junction analysis has demonstrated the junctions can accommodate the proposed traffic.



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Appendix A  
Traffic Flow Diagrams – Turning Counts

Appendix B  
Traffic Flow Diagrams – ATC March 2008

Appendix C  
Traffic Flow Diagrams – ATC March 2007

Appendix D  
Graphs - Existing Traffic

Appendix E  
Chicken Farm Locations

Appendix F  
Junction Analysis

Appendix G  
Graphs Proposed Traffic

Appendix H  
Site Layout