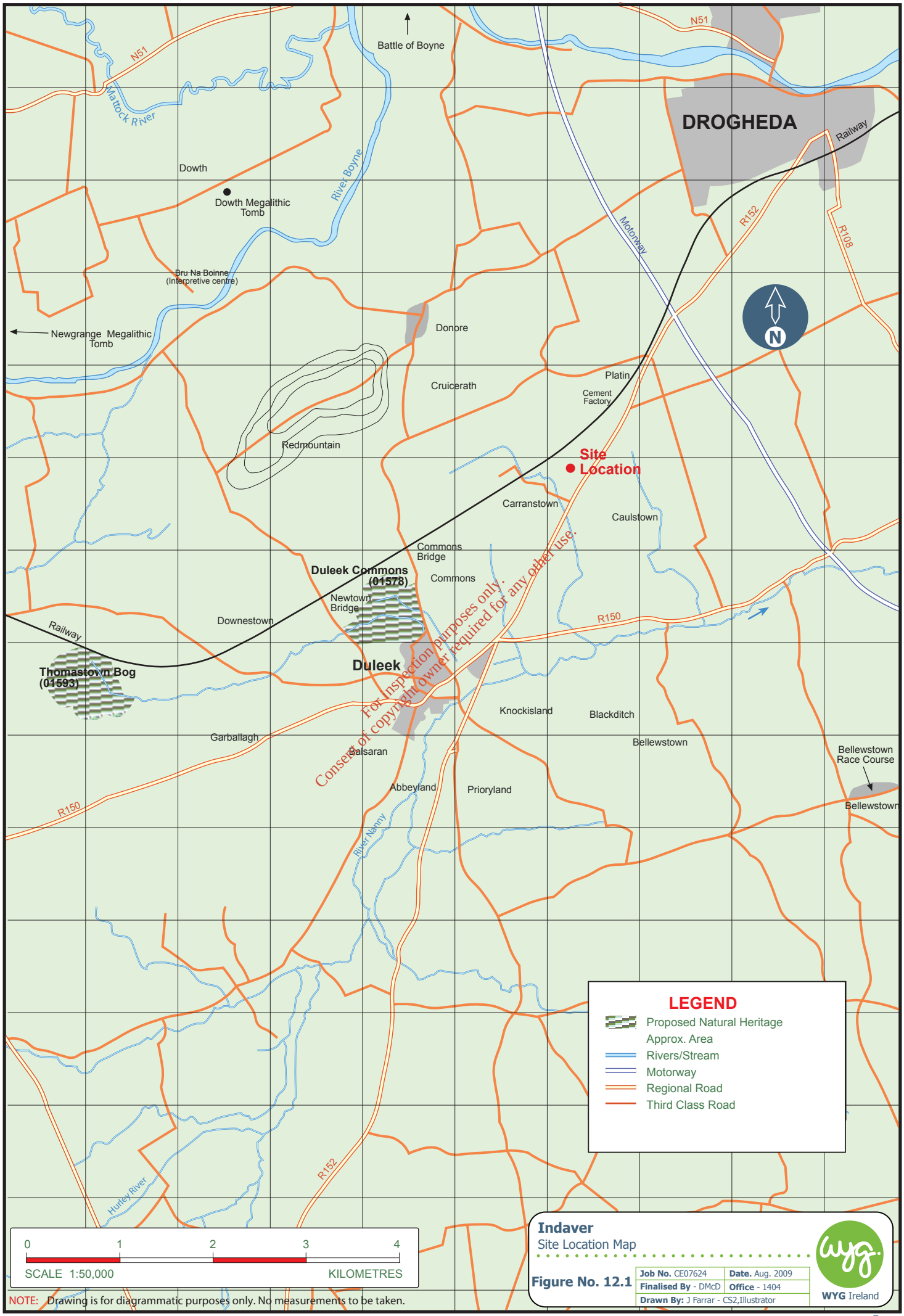


LEGEND

- Site Boundary
- Improved agricultural grassland
- Arable crops
- Spoil & bare ground
- Hedgerow (intact)
- Hedgerow (gappy)
- Treeline
- Drainage ditch

0 50 100 150
METRES

NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

Indaver
Habitat Map

Figure No. 12.2

Job No. CE07624	**Date.** Aug. 2009
Finalised By - DMcD	**Office** - 1404
Drawn By: J Farrar - CS2,Illustrator	

WYG Ireland

13. TRAFFIC IMPACT ASSESSMENT

13.1 Introduction

This Traffic Impact Assessment (TIA) has been prepared to assess the traffic and transportation impacts of the proposed expansion of the waste-to-energy facility located off the R152 at Carranstown, Co. Meath. It generally follows the '*Guidelines for Traffic Impact Assessment*' published by the Institution of Highways and Transportation (IHT).

13.2 Existing Transport Environment

13.2.1 Site Location & Road Network

The site of the existing development, see Figure 13.1: Location Plan in Appendix 13.1, is located on the R152 Regional Road linking Drogheda and Duleek. The existing plant includes a 70MW waste-to-energy facility with a capacity of 200,000 tonnes per annum.

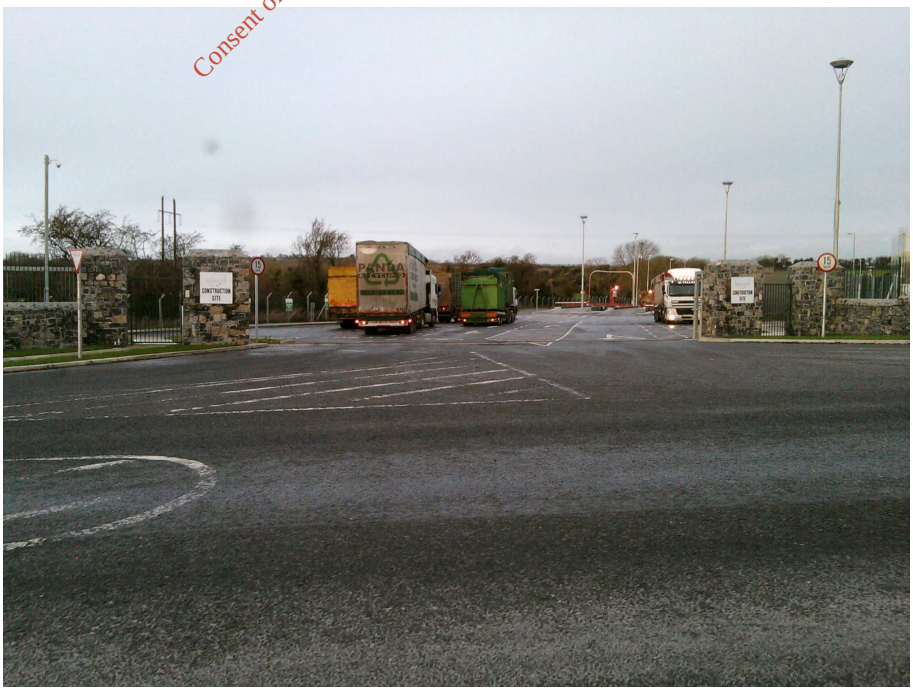
The R152 in the vicinity of the site is a single carriageway road with a typical road width of 7.0m and at the site entrance includes a right turning lane and a deceleration lane for traffic turning left into the site (see Photograph 13.1 and 13.2). A speed limit of 80Kph applies on the R152 in the vicinity of the site.

Photograph 13.1: R152 Layout South of the Indaver Facility

To the north of the site, the R152 connects to the M1 Motorway via the Drogheda South Interchange approximately 2.5km from the site. To the south of the site, the R152 forms a priority-controlled junction with the R150 to the east of Duleek approximately 2km from the site.

Photograph 13.2: R152 Layout North of the Indaver Facility

There is stacking space for up to 10 Heavy Goods Vehicles (HGV's) inside the site off the R152 in advance of the weighbridge and first barrier when entering the site, which ensures delivery trucks don't have to queue on the R152 when a number arrive simultaneously (see photograph 13.3).



Photograph 13.3: Indaver Site Entrance

13.2.2 Existing Traffic Conditions

The main access routes to the facility are shown on Figure 13.2 in Appendix 13.1. The main routes that carry traffic to and from the development are the R152, the N2 and the M1 motorway. There are 5 main haul routes as follows:

(i) From Drogheda via the R152;

(ii) From Louth and Monaghan via the M1 Motorway and R152;

(iii) From Navan and surrounds via the R153 through Kentstown, across the N2 and then via the R150 through Duleek to join the R152;

(iv) From Ashbourne via the N2 and R152 from Kilmoon Cross;

(v) From east Meath via the R150 through Julianstown.

The traffic data used in this assessment is based on two separate traffic counts, one carried out on a Wednesday in May 2009, when the plant was under construction, at 8 locations on the haul routes, and the second being three 7 day Automatic Traffic Count (ATC) surveys in December 2011 at different locations on the haul routes and one Manual Classified Count (MCC) survey at the site entrance. The results are included in Appendix 13.2 to this report.

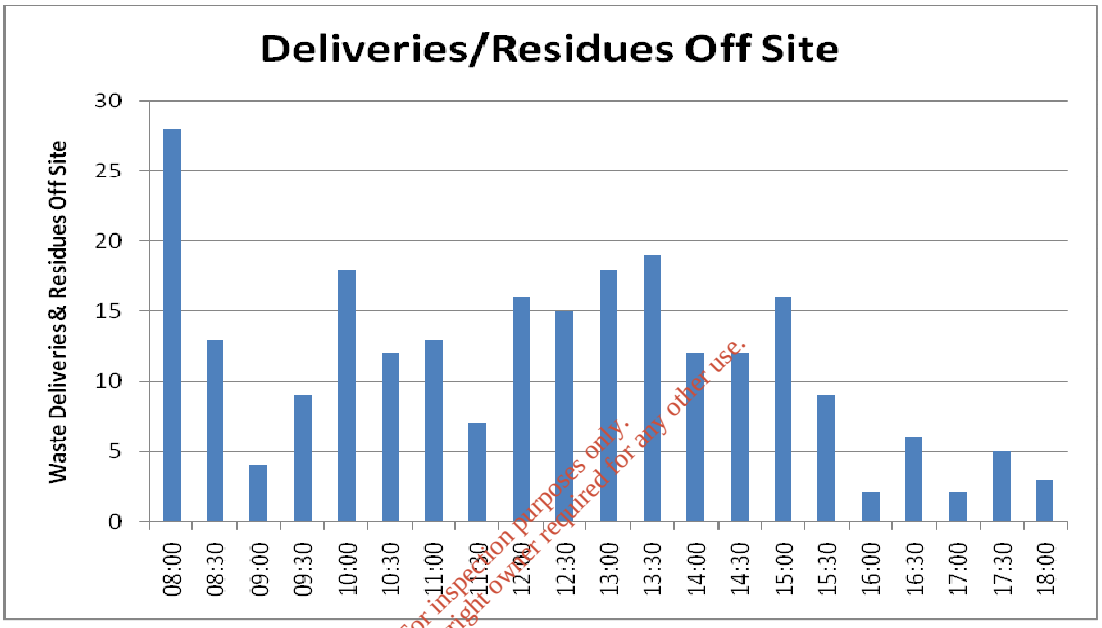
The average two-way flow on the R152 during the construction of the original scheme in 2009 was 1,111 vehicles/hr during the weekday AM peak hour 08:00-09:00. The traffic counts show that the weekday PM peak hour traffic period in 2009 was 17:00-18:00 with an average two-way traffic flow of 1,213veh/hr.

The survey from 2011 recorded a weekday AM peak at 08:00-09:00 with the two-way flow on the R152 is 1,035 vehicles/hr, which is a 7.3% decrease in traffic since 2009. The PM peak hour during 2011 was during the time period 17:00-18:00 with a two-way traffic flow of 1,110 vehicles/hr, which shows a decrease of 9.3% in traffic along the R152 since 2009.

Existing plant operations have been analysed based on data provided by Indaver as recorded at the weighbridge for HGV's entering or leaving the site. During the week dating from 19th December to the 24th December 2011 there were a total of 286 truck movements in and out of the facility site. The breakdown in these truck movements demonstrates that the highest proportion, at 28%, travel along the Kilmoon Cross haul route via (Figure 13.2 in Appendix 13.1) the N2 and the R152, 22.4% of these movements travel along the R153 haul route through Kentstown, while 21.7% of movements were calculated along the M1 and R152 haul route. 18.2% of the movements from the Dundalk direction, travelling along the R152, while 4.9% travel through Duleek. The final 4.9% of the truck movements were stated as originating from Meath.

It is an objective of Meath County Council to construct a bypass of Duleek Town, which will provide a direct alternative route for traffic travelling to or from the site via the R150 west of Duleek Town.

Graph 13.1 summarises the weekly deliveries to the site and the residues removed off site during the operational hours of the plant for the week of 21-11-2011 to 26-11-2011. The graph shows that the busiest period in the plant is in the first half hour of opening. Trucks are reported to queue at the weighbridge before the plant is operational, which corresponds with the high number of trucks reported at 08:00 in the graph below.



Graph 13.1: Indaver Carranstown Weekly Profile of HGV Deliveries and Export of Residues

13.3 Proposed Development and Site Access

13.3.1 Description of the Proposal

The existing Waste to Energy Facility at Carranstown, Co Meath consists of a 70 MW Waste to Energy Plant which has a capacity of 200,000 tonnes per annum for the treatment of Non Hazardous Waste. This proposal includes for a 10% increase in the capacity of the existing facility to 220,000 tonnes per annum and extending the opening hours on Monday to Fridays from between 08:00-18:30 (10.5 hours) to 06:00-20:00 (14 hours) and on Saturdays from between 08:00-14:00 (6 hours) to 06:00-14:00 (8 hours).

13.3.2 Vehicular Access

Access to the subject site is via the existing R152 Drogheda to Duleek Road. As part of the original development of the site the R152 was widened to allow for a right turning lane, and a deceleration lane or traffic turning left into the site. This widening minimises the impact on through traffic on the R152 and provides a safe access to and from the site.

The junction at the site is a four arm priority junction which includes an access to a small warehouse opposite the entrance to the Indaver site. There are no dedicated turning facilities into this site, however the level of traffic accessing this warehouse are relatively minor.

Photograph 13.3 above and Photograph 13.5 below shows the queuing area for the trucks within the site before being weighed at the weigh in facility. The queuing area consists of three straight ahead lanes with a combined capacity for approximately nine HGV's. There is space for two trucks to use the weighbridge facility at one time, amounting to a total of eleven HGV's within the site entrance.

Photograph 13.5: Truck Queuing Area within Site

The overall alignment and layout of the R152 is of reasonably high quality over most of the 15km length between the N2 junction at Kilmoon Cross and the M1/R152 motorway interchange. The presence of solid lines and the high volume of traffic along the R152 in sections provide limited opportunities to overtake, in particular in the vicinity of the access junction to the site. The standard of the R152 exceeds that of many regional roads, and indeed it would compare favourably with most of the national secondary routes.

Local concerns have been raised over the use of the R150 between Kentstown and the N2, particularly as the route takes traffic past the Kentstown School. Traffic has been prohibited from using this section of the R150 (between Kentstown and the N2) as a condition in the original planning application and by stipulating this restriction with hauliers delivering to the site. Instead, trucks serving the facility are required to stay on the R153 to the N2/R153 junction then up the N2 to the N2/R150 junction. This method of enforcement has been successfully used to prevent vehicles serving the nearby Greenstar facility from travelling past the school.

The haul routes to the site, based on the centres of waste generation are shown on Figure 13.2 in Appendix 13.1.

13.3.3 Traffic Generation and Capacity Impact Assessment

Trip Generation

An assessment of the catchment area of the facility was carried out based on deliveries recorded at the facility weighbridge and based on the traffic surveys carried out in 2011. The ATC traffic surveys present the total number of vehicle movements from the northern and southern directions on the R152. This assessment determined the total number of truck movements and the percentage of these truck movements associated with the Indaver site. A summary of this analysis has been provided below.

Data made available by Indaver for the weighbridge records, for the week 19-12-2011 to 24-12-2011, shows that the delivery of waste material generated on average there were 51 HGV movements per day. In addition to the truck movements delivering waste to the facility, truck movements associated with the delivery of consumables and the removal of residual waste are generated, resulting in an additional 12 HGV's movements on average per day.

There are a small number of car trips generated, but these movements are mostly outside peak traffic times of the surrounding road network and do not adversely affect the operation of the R152. Currently the majority of facility staff arrive before 08:00. The earlier opening times will change the arrival time of the security staff at the weighbridge (1 person) to before 06:00, which will not affect peak morning traffic. The facility staff work in a combination of shifts and fixed hours which will not change as a result of the proposed extension in hours of waste acceptance The facility currently receives waste between 08:00 and 18:30 (Mon-Fri) & 08:00 to 14:00 (Sat) and it is proposed to extend the operational hours to 06:00-20:00 (Mon-Fri) & 06:00 to 14:00 (Sat).

Based on the 7 day ATC traffic surveys carried out in December 2011, the R152 north of the development access during weekdays had on average 511 truck movements in a 12 hour period (07:00-19:00). The MCC traffic survey carried out at the development access shows that approximately 3% of these movements are associated with the Indaver site entering from the R152 Southbound direction.

Two other 7 day traffic counts were carried out at Duleek Town on the R150 and at Kilmoon Cross at the N2/R152 junction. The exact locations of all traffic counts are shown in Appendix 13.2. There were on average 262 truck movements at Duleek Town and 266 truck movements at Kilmoon Cross during the same 12 hour period (07:00-19:00) on weekdays. It is estimated that HGV movements associated with the Indaver facility accounts for 2.5% at each location.

Increase in Traffic on the R152

The maximum number of truck movements recorded by the MCC traffic survey undertaken in December 2011 accessing and leaving the facility in one hour amounted to 17 HGV's between 09:30 and 10:30. However, the truck movements recorded that coincided with the peak traffic conditions along the R152 was 6 HGV's in the AM peak (08:00 – 09:00) and 2 HGV's in the PM peak (17:00 – 18:00).

Based on the information provided by Indaver, during the week of the MCC traffic surveys, the facility accepted 56% of the weekly equivalent of the current permitted annual capacity (200,000 tonnes per annum). When the facility is operating at full capacity as currently permitted it is estimated that the facility generates on average 110 HGV movements per day. The proposed expansion of the facility to a 220,000 tonnes per annum is expected to generate an additional 12 HGV movements on average per day or an increase of 10% HGV movements.

Extending the operational times of the facility would spread the site traffic over a longer period and avoid the current rush in the morning and evening when the facility opening and closing times coincide with the peak road network conditions.

Analysis of the information provided by Indaver suggests that any additional staff movements will occur at the beginning / end of each shift which are outside the peak traffic conditions on the surrounding road network. A pro-rata increase in car traffic as a result of the proposed expansion is 15 vehicles per day.

Using the results from the 2011 ATC traffic survey conducted on the R152 in proximity to the site, the Average Annual Daily Traffic (AADT) was calculated as 6,300.

The increase in AADT flows as a result of the proposed expansion is less than 1%. This estimated increase in traffic associated with the plant expansion will have no discernable impact on traffic conditions. The *IHT Guidelines for Traffic Impact Assessment* recommend traffic capacity analysis is required where an increase in traffic of more than 5% is anticipated as a result of a development, and therefore no further analysis beyond the access junction is considered necessary for the proposed development.

Facility Access (Entrance Junction)

In order to assess the impact of the traffic generated by the proposed expansion to the facility on the surrounding road network, the capacities of the facility access junction with R152 and other key junctions are assessed. The junction was analysed using the Transport Research Laboratory (TRL) software Priority Intersection CApacity DelaY (Picady).

Picady is a computer software programme used to analyse priority junction capacity, which presents output in the form of Ratio of Flow to Capacity and anticipated queue lengths. The Ratio of Flow to Capacity (RFC) is a measure of the proportion of the capacity of a junction approach being availed of by traffic. Generally speaking, it is considered good practice to ensure that the RFC on any arm of a priority junction should not exceed 0.85 (that is to say that the junction should not operate above 85% of its theoretical capacity) as turbulent factors above that threshold may inhibit the optimal performance of the junction.

The junction capacity assessments were carried out using the results of the traffic counts carried out in December 2011.

Existing Conditions

The junction was analysed based on two scenarios, the first during the hour when the most movement in and out of the junction occurred, and the second during the Peak hour traffic flow at the junction.

The first analysis was carried out at 08:00-09:00, the Peak AM traffic flow along the R152 during the operational hours of the site. The results show that there is no queuing at this junction, with a maximum delay of 0.25 vehicles/min at the site access arm and a maximum delay of 0.14 vehicle/min for vehicles travelling from the R152 Southbound. The maximum RFC for the site access arm is 0.028 and 0.025 for the R152 Southbound.

The second analysis was carried out at 17:00-18:00 which was found to be the Peak PM traffic flow along the R152. There were a total of 17 movements in and out of the junction in this hour. The results show that there was no queuing at the junction, and the maximum delay was found to be 0.20 vehicles/min at the site access arm and 0.12 vehicles/min for vehicles travelling from the R152 Southbound. The maximum RFC for the site access arm is 0.007 while the RFC for the R152 Southbound right turning lane is 0.015. The lower RFC value for the site access arm in comparison with the R152 right turning lane is influenced by the low number of vehicles leaving the site during this hour.

These figures indicate that the junction works well within capacity in comparison with the desirable maximum RFC of 0.85 at both the peak site vehicle movement hour and the Peak Hour traffic flow. The results are presented in Table 13.2.

Table 13.2: Existing Conditions PICADY Junction Analysis Results

	Movement	Existing Traffic Conditions		
		RFC	Max Queue Length	Queuing Delay
08:00-09:00	From R152	0.025	0	0.14
	From Site	0.028	0	0.25
17:00-18:00	From R152	0.014	0	0.11
	From Site	0.007	0	0.20

Predicted Conditions Post Expansion

In order to assess the worst case scenario of the expansion of the plant capacity, the likely benefits of the spread of traffic associated with the proposed extended operating times has been ignored. It is estimated that a maximum average of 8 additional truck movements would be anticipated in during the above peak hours as a result of the proposed increase in facility capacity.

The junction capacity analysis was undertaken for the anticipated traffic conditions following the increase in facility capacity. During the Peak AM hour when the Indaver site was operational (between 08:00-09:00) the RFC increased to 0.069. This RFC is still well below the desirable maximum RFC of 0.85. No queuing is expected as a result of the increase in truck movements. The capacity demand increased on the R152 to an RFC 0.043 and is still well below the desirable maximum RFC of 0.85. The junction is predicted to operate well within capacity with the proposed expansion of the plant.

Table 13.3 Post Development PICADY Junction Analysis Results

	Movement	Existing Traffic Conditions		
		RFC	Max Queue Length	Queuing Delay
08:00-09:00	From R152	0.043	0	0.18
	From Site	0.069	0	031
17:00-18:00	From R152	0.031	0	0.11
	From Site	0.038	0	0.24

Construction Traffic

Only very minor construction works are proposed and its maximum expected construction period for the proposed facility is 1 month. During this period, there will be a maximum of 10 people employed in the construction activities.

The construction works will comprise the conversion of two temporary structures;

- An existing Maintenance Warehouse and associated Electrical Switchgear Building with hard core area
- An existing Single Storey Modular office block with associated infrastructure

The conversion of the temporary structures entails little construction as the structures are already present. The infrastructure associated with the office block includes an effluent treatment plant, paved roadway leading to the building and 22 additional car parking spaces added to the existing car park.

It is expected that construction traffic will not be generated during the peak morning and evening hours. As a result, the traffic impact of the proposed development will be negligible during peak morning and evening hours. As demonstrated previously, the surrounding road network is has sufficient

spare capacity to cater for the operational phase traffic. There is therefore sufficient capacity to cater for the predicted construction traffic.

13.4 Predicted Impacts and Conclusions

A summary of the traffic impacts of the proposed expansion of the plant is as follows:

- The proposed development will result in additional turning movements on the R152 at the entrance to the Waste to Energy Facility.
- The AM peak two way traffic flows on the R152 will increase from 1,035 vehicles to 1,048 vehicles during the peak hour. This equates to an increase of 1% based on predicated AADT increases.
- The PM peak two way traffic flows on the R152 will increase from 1,110 vehicles to 1,124 vehicles during the peak hour. This equates to an increase of 1% based on predicated AADT increases.
- The additional traffic generated by the facility will increase the number of vehicles travelling along the R150/R152 junction by a negligible amount.
- The additional traffic generated by the facility will increase the flows at the M1/R150 by a negligible amount. The roundabouts currently operate well without any queuing.
- The additional traffic generated by the facility will increase the flows at the N2/R150, N2/R153 and N2/R152 junctions by a negligible amount.

The conclusions of this EIS are as follows:

- The development will be accessed from the existing junction on the R152.
- The existing priority controlled access junction will continue to operate well within capacity under the expected traffic conditions.
- The R152/R150 junction will continue operate well within capacity under the expected traffic conditions with no significant loss in spare capacity as a result of the traffic generated by the development.
- The M1/R152 junction will continue to operate well within capacity under the expected traffic conditions with no significant loss in spare capacity as a result of the traffic generated by the expansion.
- The traffic flow at the R150/R152 junction will reach capacity in the year 2013. The construction of the planned Duleek by-pass will improve the traffic flows in and around the village of Duleek, particularly the R150/ R152 junction.
- The construction activities will be relatively minor with construction traffic similar to the operational traffic during the Peak Hour. The R152 has sufficient capacity to cater for the anticipated construction traffic.

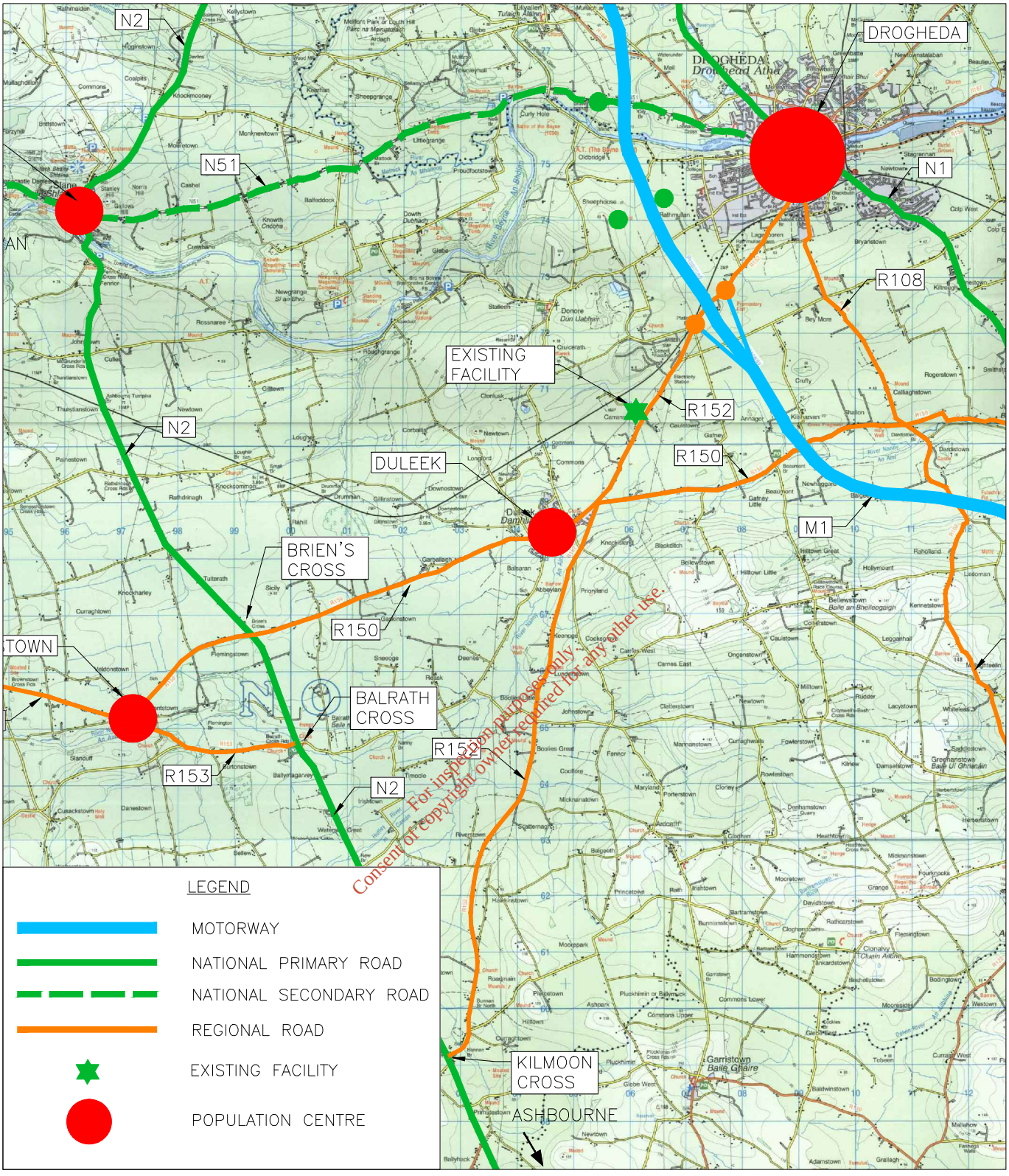
13.5 Proposed Mitigation

The increase in traffic flows will not adversely affect the operation of the road. The existing road layout has adequate capacity to cater for any additional traffic generated and the presence of turning lanes will mitigate any impacts on the flow due to turning traffic.

The increase in traffic flows on the surrounding junction is negligible. No mitigation measures are proposed at this junction.

The client has held discussions with Meath County Council to improve the signage on approach to the site on the R152/M1 haul route from Drogheda over the crest of the hill to give advanced warning of the access junction.

Appendix 13.1



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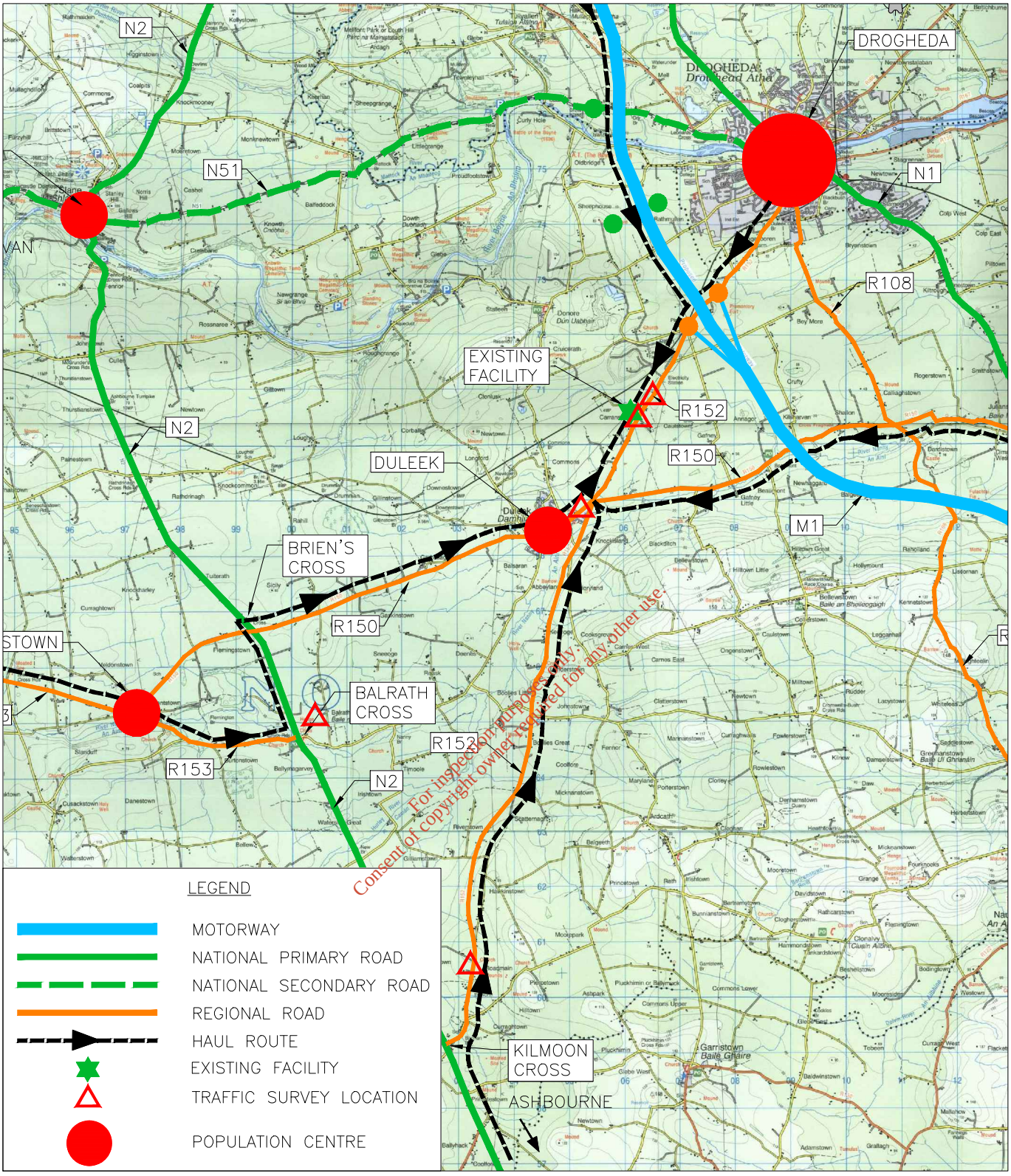
Roughan & O'Donovan
Consulting Engineers
Arena House, Arena Road,
Sandyford, Dublin 18.
Tel:+353 1 2940800, Fax :+353 1 2940820
e-mail : info@rod.ie
Website : www.rod.ie

Project Title	WASTE TO ENERGY FACILTY AT CARRANSTOWN, CO MEATH			
Drawing Title	LOCATION MAP			
Date: FEB '12	Scale: NTS	CAD File: 11226-Fig 13.1	Project No.: 11.226	
Drawn: DN	Checked: JB	Approved: SMG	Drawing No.: Figure 13.1	Rev.: -



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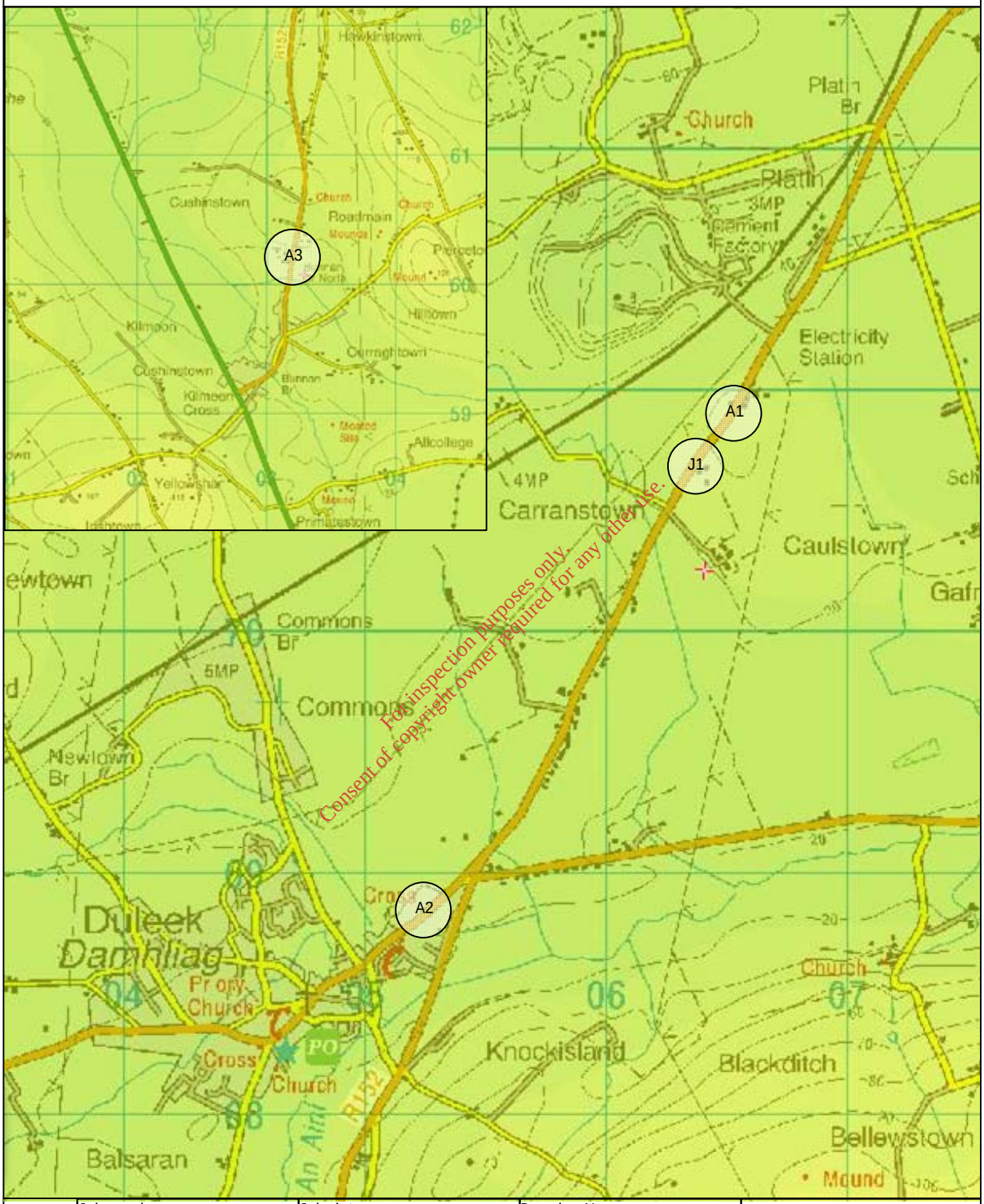
Roughan & O'Donovan
Consulting Engineers
Arena House, Arena Road,
Sandyford, Dublin 18.
Tel:+353 1 2940800, Fax :+353 1 2940820
e-mail : info@rod.ie
Website : www.rod.ie

Project Title	WASTE TO ENERGY FACILTY AT CARRANSTOWN, CO MEATH			
Drawing Title	HAUL ROUTES			
Date: FEB '12	Scale: NTS	CAD File: 11226-Fig 13.2	Project No.: 11.226	
Drawn: DN	Checked: JB	Approved: SMG	Drawing No.: Figure 13.2	Rev.: -

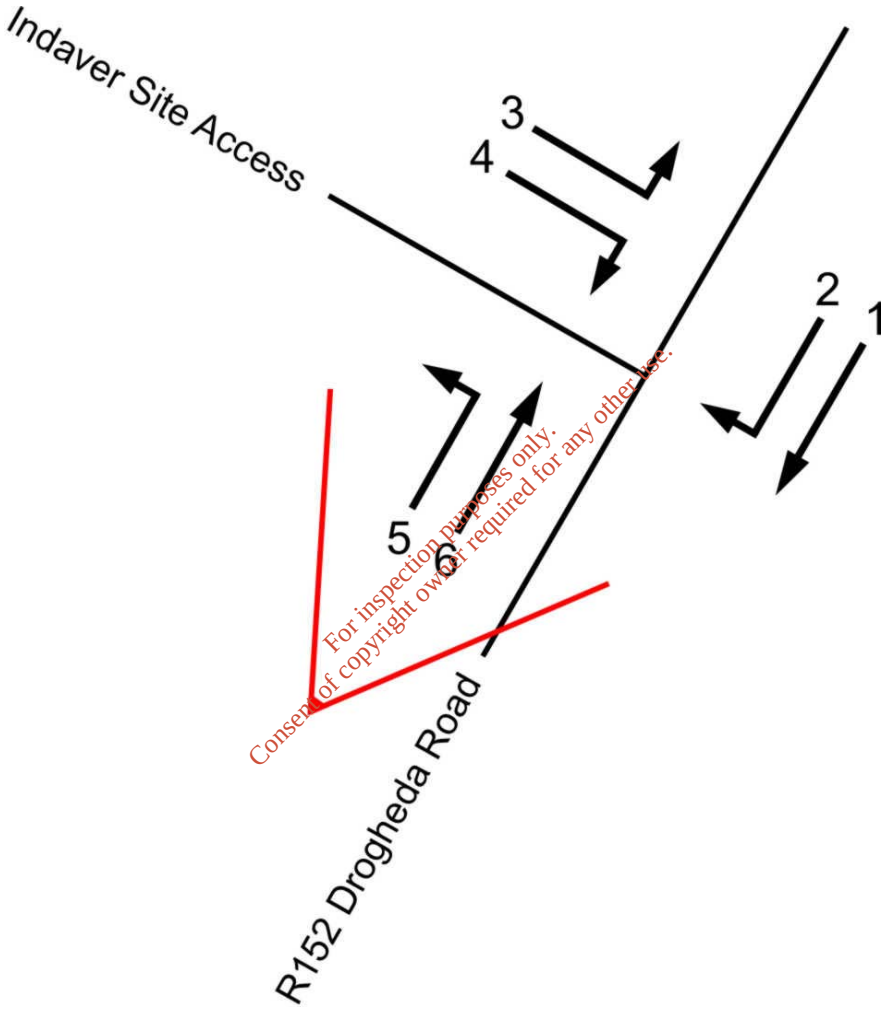
Appendix 13.2

Site Locations



Job number: ATH/11/071	Job date: W/C 16th December 2011	Drawing No: ATH/11/071-1	abacus Transportation Surveys
Client: ROD	Job day: Friday to Thursday	Author: SPW	

Site Locations



	Job number: ATH/11/071	Job date: W/C 16th December 2011	Drawing No: ATH/11/071-2	abacus Transportation Surveys
	Client: ROD	Job day: Friday to Thursday	Author: SPW	

ABACUS TRANSPORTATION SURVEYS

INDAVER SITE TRAFFIC COUNT **DECEMBER 2011**

MANUAL CLASSIFIED JUNCTION COUNT **ATH/11/071**

SITE: Indaver Site Access DATE: 20th December 2011

LOCATION: R152 Drogheda Road, Carranstown DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	65	13	2	4	2	86	94	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	91	11	3	2	0	107	111	2	0	0	0	0	2	2	1	0	0	0	0	1	1
07:30	103	15	5	2	1	126	132	5	1	0	0	0	6	6	0	0	0	0	0	0	0
07:45	104	13	2	5	0	124	132	9	1	0	0	0	10	10	1	0	0	0	0	1	1
H/TOT	363	52	12	13	3	443	469	16	2	0	0	0	18	18	2	0	0	0	0	2	2
08:00	131	18	4	2	0	155	160	3	1	0	0	0	4	4	2	1	0	1	0	4	5
08:15	94	11	4	4	1	114	122	3	0	0	0	0	3	3	0	0	0	0	0	0	0
08:30	88	20	5	5	1	119	129	2	0	1	0	0	3	4	0	1	0	0	0	1	1
08:45	110	21	2	3	1	137	143	1	0	0	1	0	2	3	0	1	1	1	0	3	5
H/TOT	423	70	15	14	3	525	554	9	1	1	1	0	12	14	2	3	1	2	0	8	11
09:00	92	27	7	4	1	131	141	2	0	0	1	0	3	4	1	1	0	0	0	2	2
09:15	80	18	3	6	1	108	118	0	0	1	0	0	1	2	0	0	0	0	0	0	0
09:30	56	15	3	4	1	79	87	1	0	0	1	0	2	3	0	0	0	1	0	1	2
09:45	49	13	10	3	0	75	84	0	0	1	1	0	2	4	1	0	0	2	0	3	6
H/TOT	277	73	23	17	3	393	430	3	0	2	3	0	8	13	2	1	0	3	0	6	10
10:00	53	15	7	4	0	79	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	65	14	3	6	0	88	97	2	0	1	1	0	4	6	0	0	0	0	0	0	0
10:30	53	9	3	3	1	69	75	0	0	1	0	0	1	2	0	0	0	0	0	0	0
10:45	70	14	8	8	0	100	114	0	1	0	0	0	1	1	1	0	0	1	0	2	3
H/TOT	241	52	21	21	1	336	375	2	1	2	1	0	6	8	1	0	0	1	0	2	3
11:00	58	15	3	3	0	79	84	0	1	0	0	0	1	1	1	0	1	1	0	3	5
11:15	53	14	4	4	0	75	82	1	0	0	0	0	1	1	1	0	0	0	0	1	1
11:30	74	15	8	10	0	107	124	0	0	0	0	0	0	0	0	0	1	1	0	2	4
11:45	61	11	5	4	2	83	93	0	0	0	1	0	1	2	0	1	0	0	0	1	1
H/TOT	246	55	20	21	2	344	383	1	1	0	1	0	3	4	2	1	2	2	0	7	11
12:00	69	14	6	2	0	91	97	2	0	1	0	0	3	4	0	0	0	0	0	0	0
12:15	56	9	4	6	0	75	85	1	0	0	0	0	1	1	0	0	1	2	0	3	6
12:30	56	14	3	10	0	83	98	1	1	1	1	0	4	6	0	0	0	0	0	0	0
12:45	80	8	3	2	0	93	97	0	0	0	1	0	1	2	1	0	1	0	0	2	3
H/TOT	261	45	16	20	0	342	376	4	1	2	2	0	9	13	1	0	2	2	0	5	9

ABACUS TRANSPORTATION SURVEYS

INDAVER SITE TRAFFIC COUNT **DECEMBER 2011**

MANUAL CLASSIFIED JUNCTION COUNT **ATH/11/071**

SITE: Indaver Site Access DATE: 20th December 2011

LOCATION: R152 Drogheda Road, Carranstown DAY: Tuesday

	MOVEMENT 1							MOVEMENT 2							MOVEMENT 3						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	83	12	7	3	0	105	112	1	0	0	0	0	1	1	0	1	0	1	0	2	3
13:15	75	10	4	7	0	96	107	0	0	1	0	0	1	2	0	0	0	1	0	1	2
13:30	66	8	2	8	0	84	95	0	0	0	0	0	0	0	0	1	1	0	0	2	3
13:45	71	14	1	2	1	89	93	0	1	2	0	0	3	4	2	1	0	0	0	3	3
H/TOT	295	44	14	20	1	374	408	1	1	3	0	0	5	7	2	3	1	2	0	8	11
14:00	72	15	4	2	0	93	98	0	1	0	1	0	2	3	0	1	1	1	0	3	5
14:15	82	8	5	7	0	102	114	1	0	0	0	0	1	1	0	1	0	0	0	1	1
14:30	72	16	8	6	1	103	116	0	0	0	0	0	0	0	1	0	1	1	0	3	5
14:45	64	10	1	5	0	80	87	2	0	1	0	0	3	4	0	0	0	0	0	0	0
H/TOT	290	49	18	20	1	378	414	3	1	1	1	0	6	8	1	2	2	2	0	7	11
15:00	61	11	1	3	0	76	80	0	1	0	0	0	1	1	0	0	0	0	0	0	0
15:15	73	9	6	3	0	91	98	0	0	1	0	0	1	2	1	0	0	0	0	1	1
15:30	93	16	4	6	0	119	129	0	1	1	1	0	3	5	1	1	1	0	0	3	4
15:45	86	14	2	7	0	109	119	0	0	1	0	0	1	2	3	1	0	0	0	4	4
H/TOT	313	50	13	19	0	395	426	0	2	3	1	0	6	9	5	2	1	0	0	8	9
16:00	84	13	6	6	1	110	122	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	102	23	4	3	3	135	144	0	0	0	1	0	1	2	2	2	1	1	0	6	8
16:30	134	17	2	3	4	160	169	0	0	0	0	0	0	0	3	1	0	0	0	4	4
16:45	91	13	6	2	1	113	120	1	0	0	0	0	1	1	1	0	0	0	0	1	1
H/TOT	411	66	18	14	9	518	554	1	0	0	1	0	2	3	6	3	1	1	0	11	13
17:00	98	15	1	4	0	118	124	0	0	0	0	0	0	0	7	0	0	0	0	7	7
17:15	109	9	1	3	0	122	126	0	0	0	1	0	1	2	2	1	0	0	0	3	3
17:30	97	16	2	4	0	119	125	1	0	0	0	0	1	1	0	0	0	0	0	0	0
17:45	103	13	2	0	0	118	119	0	0	0	0	0	0	0	2	0	0	0	0	2	2
H/TOT	407	53	6	11	0	477	494	1	0	0	1	0	2	3	11	1	0	0	0	12	12
18:00	89	14	4	3	0	110	116	0	0	0	0	0	0	0	4	0	0	0	0	4	4
18:15	99	13	1	5	0	118	125	0	0	0	0	0	0	0	2	0	0	0	0	2	2
18:30	104	8	1	1	1	115	118	0	0	0	0	0	0	0	3	1	0	0	0	4	4
18:45	63	7	1	1	0	72	74	0	0	0	0	0	0	0	1	0	0	0	0	1	1
H/TOT	355	42	7	10	1	415	433	0	0	0	0	0	0	0	10	1	0	0	0	11	11
P/TOT	3882	651	183	200	24	4940	5316	41	10	14	12	0	77	100	45	17	10	15	0	87	112

ABACUS TRANSPORTATION SURVEYS

INDAVER SITE TRAFFIC COUNT **DECEMBER 2011**

MANUAL CLASSIFIED JUNCTION COUNT **ATH/11/071**

SITE: Indaver Site Access DATE: 20th December 2011

LOCATION: R152 Drogheda Road, Carranstown DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	1	0	0	0	0	1	1	2	0	0	0	0	2	2	28	4	5	3	0	40	46
07:15	1	0	0	0	0	1	1	4	1	0	1	0	6	7	39	6	2	0	0	47	48
07:30	0	0	0	0	0	0	0	6	1	0	0	0	7	7	55	5	4	6	1	71	82
07:45	1	0	0	0	0	1	1	4	0	0	1	0	5	6	67	8	10	4	4	93	107
H/TOT	3	0	0	0	0	3	3	16	2	0	2	0	20	23	189	23	21	13	5	251	283
08:00	0	0	0	0	0	0	0	4	0	0	0	0	4	4	63	10	9	3	1	86	95
08:15	0	1	0	0	0	1	1	2	1	0	0	0	3	3	90	18	6	6	1	121	133
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	111	15	2	3	1	132	138
08:45	0	0	0	1	0	1	2	0	1	0	0	0	1	1	115	15	6	5	0	141	151
H/TOT	0	1	0	1	0	2	3	6	2	0	0	0	8	8	379	58	23	17	3	480	517
09:00	0	0	0	0	0	0	0	0	0	1	0	0	1	2	90	16	4	3	0	113	119
09:15	0	0	0	0	0	0	0	0	0	0	1	0	1	2	77	11	5	3	0	96	102
09:30	0	0	0	0	0	0	0	1	0	0	1	0	2	3	97	18	3	3	1	122	128
09:45	1	0	1	0	0	2	3	0	0	0	1	0	1	2	91	17	3	3	0	114	119
H/TOT	1	0	1	0	0	2	3	1	0	1	3	0	5	9	355	62	15	12	1	445	469
10:00	0	0	0	2	0	2	5	1	0	0	1	0	2	3	63	17	6	6	1	93	105
10:15	1	1	0	1	0	3	4	0	2	2	0	0	4	5	59	11	2	6	0	78	87
10:30	1	0	1	1	0	3	5	2	1	0	0	0	3	3	109	19	5	5	0	138	147
10:45	2	0	1	0	0	3	4	2	0	0	1	0	3	4	57	17	3	7	0	84	95
H/TOT	4	1	2	4	0	11	17	5	3	2	2	0	12	16	288	64	16	24	1	393	433
11:00	1	1	0	0	0	2	2	2	0	0	1	0	3	4	91	13	4	7	0	115	126
11:15	3	1	0	0	0	4	4	2	0	0	0	0	2	2	70	12	5	1	0	88	92
11:30	0	0	1	0	0	1	2	0	0	1	0	0	1	2	67	13	7	8	0	95	109
11:45	0	0	0	0	0	0	0	0	1	0	0	0	1	1	78	21	0	7	0	106	115
H/TOT	4	2	1	0	0	7	8	4	1	1	1	0	7	9	306	59	16	23	0	404	442
12:00	1	1	0	0	0	2	2	0	2	0	0	0	2	2	82	17	5	2	1	107	113
12:15	2	2	0	0	0	4	4	0	0	1	1	0	2	4	61	10	2	3	0	76	81
12:30	0	0	0	1	0	1	2	2	0	0	1	0	3	4	72	15	2	2	0	91	95
12:45	1	0	0	0	0	1	1	1	1	0	1	0	3	4	62	16	4	7	0	89	100
H/TOT	4	3	0	1	0	8	9	3	3	1	3	0	10	14	277	58	13	14	1	363	389

ABACUS TRANSPORTATION SURVEYS

INDAVER SITE TRAFFIC COUNT **DECEMBER 2011**

MANUAL CLASSIFIED JUNCTION COUNT **ATH/11/071**

SITE: Indaver Site Access DATE: 20th December 2011

LOCATION: R152 Drogheda Road, Carranstown DAY: Tuesday

	MOVEMENT 4							MOVEMENT 5							MOVEMENT 6						
TIME	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	2	1	1	0	0	4	5	2	0	0	1	0	3	4	74	13	3	4	0	94	101
13:15	1	0	0	0	0	1	1	0	1	0	0	0	1	1	50	16	4	2	0	72	77
13:30	0	0	0	1	0	1	2	0	0	0	0	0	0	0	74	5	7	7	1	94	108
13:45	0	0	0	1	0	1	2	2	0	0	0	0	2	2	61	15	5	3	0	84	90
H/TOT	3	1	1	2	0	7	10	4	1	0	1	0	6	7	259	49	19	16	1	344	375
14:00	0	2	1	0	0	3	4	0	0	0	0	0	0	0	71	12	3	8	1	95	108
14:15	2	0	0	0	0	2	2	2	0	0	0	0	2	2	71	16	5	3	1	96	103
14:30	1	0	0	0	0	1	1	1	3	0	0	0	4	4	79	15	3	2	1	100	105
14:45	0	0	0	0	0	0	0	1	0	0	0	0	1	1	69	12	3	8	0	92	104
H/TOT	3	2	1	0	0	6	7	4	3	0	0	0	7	7	290	55	14	21	3	383	420
15:00	2	0	0	0	0	2	2	2	1	0	0	0	3	3	91	20	3	3	0	117	122
15:15	3	0	0	0	0	3	3	0	0	1	0	0	1	2	102	19	4	3	0	128	134
15:30	1	0	0	1	0	2	3	0	1	2	0	0	3	4	87	18	7	4	2	118	129
15:45	2	1	2	0	0	5	6	1	0	1	0	0	2	3	89	17	7	1	0	114	119
H/TOT	8	1	2	1	0	12	14	3	2	4	0	0	9	11	369	74	21	11	2	477	504
16:00	0	0	0	1	0	1	2	0	0	0	0	0	0	0	83	21	5	6	1	116	127
16:15	3	2	1	0	0	6	7	0	0	0	0	0	0	0	84	21	3	4	0	112	119
16:30	2	1	0	0	0	3	3	0	0	0	0	0	0	0	101	19	7	3	0	130	137
16:45	1	0	0	0	0	1	1	2	0	0	0	0	2	2	103	20	5	5	0	133	142
H/TOT	6	3	1	1	0	11	13	2	0	0	0	0	2	2	371	81	20	18	1	491	525
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98	21	4	4	3	130	140
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	127	18	4	0	0	149	151
17:30	0	0	1	0	0	1	2	0	0	0	0	0	0	0	153	24	2	2	0	181	185
17:45	2	0	0	0	0	2	2	0	0	0	0	0	0	0	135	18	1	2	0	156	159
H/TOT	2	0	1	0	0	3	4	0	0	0	0	0	0	0	513	81	11	8	3	616	635
18:00	2	0	0	0	0	2	2	0	0	0	0	0	0	0	105	23	2	3	0	133	138
18:15	0	0	0	0	0	0	0	1	0	0	0	0	1	1	106	10	1	6	0	123	131
18:30	1	0	0	0	0	1	1	0	1	0	0	0	1	1	106	12	1	2	0	121	124
18:45	1	2	0	0	0	3	3	1	0	0	0	0	1	1	75	4	1	2	0	82	85
H/TOT	4	2	0	0	0	6	6	2	1	0	0	0	3	3	392	49	5	13	0	459	478
P/TOT	42	16	10	10	0	78	96	50	18	9	12	0	89	109	3988	713	194	190	21	5106	5471

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Northbound** | **16 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	32	0	27	3	0	0	0	0	0	0	1	1	0	0
0100	25	0	22	1	1	0	0	0	0	0	0	1	0	0
0200	12	0	10	0	0	0	0	0	0	0	0	2	0	0
0300	17	0	11	4	0	0	0	0	1	0	0	1	0	0
0400	16	0	12	1	0	0	1	0	1	0	0	1	0	0
0500	35	0	21	5	1	1	1	0	3	0	0	3	0	0
0600	74	0	59	9	1	0	1	0	3	0	0	1	0	0
0700	214	1	171	23	3	6	0	0	6	0	2	2	0	0
0800	468	1	404	40	0	5	1	0	6	0	1	10	0	0
0900	433	1	365	41	2	3	2	0	8	1	3	6	0	1
1000	375	0	296	43	2	9	0	0	14	0	3	8	0	0
1100	369	1	307	33	3	4	4	0	9	0	3	5	0	0
1200	398	0	322	43	2	3	2	0	10	0	3	10	0	3
1300	350	0	307	29	0	2	1	0	4	0	1	6	0	0
1400	444	1	368	42	6	5	4	0	6	0	3	9	0	0
1500	592	0	499	63	2	2	3	0	8	0	4	9	0	2
1600	579	1	496	57	0	6	1	0	7	0	3	7	0	1
1700	598	0	517	57	4	4	5	0	4	1	2	4	0	0
1800	414	0	366	36	2	2	1	1	2	0	1	2	0	1
1900	322	1	293	22	2	0	1	0	1	0	1	1	0	0
2000	230	0	217	11	1	0	0	0	0	0	0	1	0	0
2100	139	0	127	10	0	0	0	0	1	0	0	1	0	0
2200	91	0	81	3	2	0	0	0	2	0	0	3	0	0
2300	60	0	51	7	0	1	0	0	0	0	1	0	0	0
07-19	5234	6	4418	507	26	51	24	1	84	2	29	78	0	8
06-22	5999	7	5114	559	30	51	26	1	89	2	30	82	0	8
06-00	6150	7	5246	569	32	52	26	1	91	2	31	85	0	8
00-00	6287	7	5349	583	34	53	28	1	96	2	32	94	0	8

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Northbound** | **17 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	53	0	48	4	0	0	0	0	0	0	1	0	0	0
0100	42	0	37	3	0	0	0	0	0	0	0	2	0	0
0200	42	0	35	3	0	0	0	0	0	0	1	3	0	0
0300	27	0	25	2	0	0	0	0	0	0	0	0	0	0
0400	24	0	19	2	0	0	1	0	0	0	1	1	0	0
0500	28	0	23	3	0	0	0	1	1	0	0	0	0	0
0600	40	0	34	5	0	0	0	0	0	0	0	1	0	0
0700	104	0	83	16	1	3	1	0	0	0	0	0	0	0
0800	146	0	123	18	1	1	0	0	1	0	0	2	0	0
0900	259	0	225	27	1	1	1	0	1	0	0	3	0	0
1000	300	0	253	36	1	2	1	0	1	0	2	4	0	0
1100	421	0	383	28	1	1	1	0	4	0	2	1	0	0
1200	487	0	441	35	1	2	2	0	3	0	1	1	0	1
1300	439	1	396	33	1	3	0	0	1	0	1	3	0	0
1400	443	2	407	26	2	1	2	0	1	0	0	2	0	0
1500	409	0	381	20	1	0	2	0	0	0	0	4	0	1
1600	361	0	330	24	1	2	2	0	1	0	0	1	0	0
1700	290	0	269	16	0	1	1	0	1	0	0	2	0	0
1800	269	0	244	21	0	0	0	0	1	0	0	3	0	0
1900	208	0	197	8	1	1	0	0	0	0	1	0	0	0
2000	162	1	151	7	0	2	1	0	0	0	0	0	0	0
2100	97	0	88	7	0	1	0	0	0	0	0	1	0	0
2200	83	0	78	4	0	0	0	0	0	0	0	1	0	0
2300	63	0	58	5	0	0	0	0	0	0	0	0	0	0
07-19	3928	3	3535	300	11	17	13	0	15	0	6	26	0	2
06-22	4435	4	4005	327	12	21	14	0	15	0	7	28	0	2
06-00	4581	4	4141	336	12	21	14	0	15	0	7	29	0	2
00-00	4797	4	4328	353	12	21	15	1	16	0	10	35	0	2

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Northbound** | **18 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	51	0	45	5	1	0	0	0	0	0	0	0	0	0
0100	40	0	37	3	0	0	0	0	0	0	0	0	0	0
0200	43	0	40	3	0	0	0	0	0	0	0	0	0	0
0300	42	0	36	5	0	0	0	0	0	0	0	1	0	0
0400	35	0	31	1	0	1	0	0	1	0	1	0	0	0
0500	18	0	15	3	0	0	0	0	0	0	0	0	0	0
0600	23	0	20	1	0	0	0	0	0	0	0	2	0	0
0700	49	0	49	0	0	0	0	0	0	0	0	0	0	0
0800	38	0	34	3	0	0	0	0	0	0	0	1	0	0
0900	68	0	63	2	1	0	0	0	0	0	0	2	0	0
1000	167	0	151	13	1	0	0	0	0	0	0	2	0	0
1100	258	0	240	14	0	0	1	0	2	0	0	1	0	0
1200	337	0	322	12	1	0	0	0	1	0	0	1	0	0
1300	406	0	389	12	0	0	1	0	3	0	0	1	0	0
1400	404	0	384	17	1	0	1	0	1	0	0	0	0	0
1500	394	0	377	14	0	1	0	0	1	0	0	1	0	0
1600	334	1	317	14	0	0	1	0	0	0	0	1	0	0
1700	258	0	238	17	0	0	1	0	0	0	0	2	0	0
1800	231	0	218	10	0	0	1	0	1	0	0	1	0	0
1900	187	0	174	11	0	0	1	0	1	0	0	0	0	0
2000	155	1	147	5	0	0	1	0	1	0	0	0	0	0
2100	109	0	105	4	0	0	0	0	0	0	0	0	0	0
2200	63	0	60	2	0	1	0	0	0	0	0	0	0	0
2300	40	0	35	2	0	0	0	0	1	0	0	2	0	0
07-19	2944	1	2782	128	4	1	6	0	9	0	0	13	0	0
06-22	3418	2	3228	149	4	1	8	0	11	0	0	15	0	0
06-00	3521	2	3323	153	4	2	8	0	12	0	0	17	0	0
00-00	3750	2	3527	173	5	3	8	0	13	0	1	18	0	0

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Northbound** | **19 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	27	0	25	1	0	0	0	0	0	0	1	0	0	0
0100	15	0	14	0	0	0	0	0	0	0	0	1	0	0
0200	15	0	13	1	0	0	0	0	0	0	0	1	0	0
0300	17	0	14	1	0	0	0	0	0	0	0	2	0	0
0400	23	0	18	2	0	0	1	0	1	0	0	1	0	0
0500	37	0	25	2	0	1	4	0	2	0	0	3	0	0
0600	79	0	59	7	0	0	1	0	5	1	1	4	0	1
0700	220	1	184	20	2	5	1	0	4	0	0	3	0	0
0800	494	1	438	32	3	2	1	0	10	1	1	4	0	1
0900	390	1	321	47	0	5	0	0	6	0	3	6	0	1
1000	361	1	299	38	2	5	2	0	6	0	2	6	0	0
1100	365	0	290	47	2	2	2	0	6	1	5	8	0	2
1200	398	1	337	37	5	1	1	0	7	0	4	5	0	0
1300	343	1	280	39	1	1	4	0	9	0	1	6	0	1
1400	412	1	351	37	3	5	0	0	4	0	4	7	0	0
1500	495	0	422	45	2	2	4	0	10	2	2	6	0	0
1600	488	1	424	44	2	3	1	0	5	0	1	6	0	1
1700	590	0	517	56	2	3	1	0	3	0	2	6	0	0
1800	502	1	445	42	0	0	1	0	3	0	1	7	0	2
1900	286	0	259	23	1	0	0	0	1	0	1	1	0	0
2000	164	0	152	7	1	0	0	0	0	0	1	3	0	0
2100	91	0	84	4	0	0	1	0	0	0	0	2	0	0
2200	71	0	60	6	0	0	1	0	1	0	0	2	0	1
2300	62	0	60	1	0	0	0	0	0	0	1	0	0	0
07-19	5058	9	4308	484	24	34	18	0	73	4	26	70	0	8
06-22	5678	9	4862	525	26	34	20	0	79	5	29	80	0	9
06-00	5811	9	4982	532	26	34	21	0	80	5	30	82	0	10
00-00	5945	9	5091	539	26	35	26	0	83	5	31	90	0	10

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Northbound** | **20 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	38	0	35	2	0	0	0	0	0	0	0	1	0	0
0100	18	0	16	0	0	0	0	0	1	0	1	0	0	0
0200	8	0	6	1	0	0	0	0	0	0	0	1	0	0
0300	13	1	8	1	0	0	0	0	0	0	1	2	0	0
0400	9	0	5	1	0	0	0	0	0	0	1	2	0	0
0500	39	0	28	4	1	0	2	0	2	0	0	2	0	0
0600	73	0	54	9	1	0	1	0	2	1	2	3	0	0
0700	249	1	206	24	3	4	2	0	5	0	1	2	0	1
0800	482	0	401	49	4	2	4	0	13	0	3	5	0	1
0900	455	0	388	44	3	2	0	0	8	1	3	5	0	1
1000	365	2	293	47	1	1	2	0	7	1	3	7	1	0
1100	412	0	343	38	1	3	3	0	6	1	6	9	0	2
1200	374	0	321	29	1	2	4	0	8	1	3	5	0	0
1300	359	0	300	29	0	8	3	0	9	0	4	6	0	0
1400	389	1	317	42	2	6	3	0	5	0	2	9	0	2
1500	503	1	437	45	5	3	1	1	1	1	1	7	0	0
1600	504	1	413	59	4	2	3	1	12	0	0	8	0	1
1700	619	0	561	46	3	1	0	0	2	0	1	4	0	1
1800	480	0	435	32	0	0	1	0	4	1	1	5	0	1
1900	316	0	287	23	2	0	0	0	1	0	0	3	0	0
2000	201	0	187	8	2	0	0	0	3	0	0	1	0	0
2100	139	0	135	2	0	0	0	0	2	0	0	0	0	0
2200	83	0	75	4	0	0	0	0	1	0	1	1	0	1
2300	63	0	56	4	0	0	0	0	1	0	1	1	0	0
07-19	5191	6	4415	484	27	34	26	2	80	6	28	72	1	10
06-22	5920	6	5078	526	32	34	27	2	88	7	30	79	1	10
06-00	6066	6	5209	534	32	34	27	2	90	7	32	81	1	11
00-00	6191	7	5307	543	33	34	29	2	93	7	35	89	1	11

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Northbound** | **21 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	32	0	25	3	0	1	0	0	0	0	1	1	0	1
0100	20	0	18	0	0	0	0	0	0	0	0	2	0	0
0200	15	0	14	1	0	0	0	0	0	0	0	0	0	0
0300	9	0	4	1	0	0	0	0	2	0	1	0	0	1
0400	16	0	6	1	0	0	3	0	1	0	2	3	0	0
0500	28	0	19	3	0	0	2	0	2	0	0	2	0	0
0600	74	0	52	10	0	2	0	0	4	0	3	3	0	0
0700	239	0	189	27	3	2	1	0	9	1	0	6	0	1
0800	486	1	418	42	4	4	2	0	5	0	3	7	0	0
0900	439	0	369	37	2	5	5	0	7	1	3	9	0	1
1000	395	0	347	30	2	3	1	0	2	0	2	8	0	0
1100	403	1	331	48	2	3	0	0	7	0	3	6	0	2
1200	381	1	300	53	1	4	1	0	9	0	3	8	0	1
1300	406	0	344	37	1	4	2	0	5	0	2	10	0	1
1400	433	1	357	43	2	3	5	0	12	0	2	6	0	3
1500	524	1	447	47	1	3	5	0	8	1	2	7	0	2
1600	516	0	435	54	2	4	4	0	6	0	2	8	1	0
1700	676	0	606	52	5	1	1	0	6	0	1	1	1	2
1800	477	0	427	40	0	0	0	0	2	0	2	6	0	0
1900	353	0	326	23	1	0	0	0	0	0	0	3	0	0
2000	222	0	206	12	2	0	0	0	0	0	0	2	0	0
2100	164	0	155	7	0	1	0	0	0	0	0	1	0	0
2200	108	1	104	3	0	0	0	0	0	0	0	0	0	0
2300	72	0	63	8	0	0	0	0	0	0	0	1	0	0
07-19	5375	5	4570	510	25	35	27	0	78	3	25	82	2	13
06-22	6188	5	5309	562	28	38	27	0	82	3	28	91	2	13
06-00	6368	6	5476	573	28	38	27	0	82	3	28	92	2	13
00-00	6488	6	5562	582	28	39	32	0	87	3	32	100	2	15

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Northbound** | **22 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	39	0	32	4	0	0	0	0	0	0	0	3	0	0
0100	21	0	16	3	0	0	0	0	0	0	0	2	0	0
0200	15	0	13	0	0	0	0	0	0	0	1	1	0	0
0300	11	0	10	0	0	0	0	0	0	0	0	1	0	0
0400	15	0	5	4	0	0	1	0	1	0	2	2	0	0
0500	33	0	20	4	0	1	4	0	1	0	1	1	0	1
0600	78	0	62	4	0	2	2	0	3	1	0	4	0	0
0700	246	1	199	31	3	2	0	0	4	0	3	3	0	0
0800	453	1	376	41	6	2	1	0	13	1	2	9	0	1
0900	486	0	423	41	1	4	1	0	7	1	1	7	0	0
1000	363	0	289	49	2	3	4	0	5	0	2	8	0	1
1100	423	0	350	44	3	5	1	0	10	0	2	6	0	2
1200	507	0	426	57	0	4	5	0	3	1	4	7	0	0
1300	497	0	423	49	2	4	2	0	8	1	2	6	0	0
1400	487	0	412	48	0	6	3	0	4	0	2	10	0	2
1500	553	1	487	50	0	3	1	0	7	0	1	2	0	1
1600	486	1	425	43	3	3	1	0	4	0	1	5	0	0
1700	599	0	536	44	2	1	3	0	7	1	2	2	0	1
1800	471	1	427	31	1	1	0	0	1	0	2	7	0	0
1900	378	0	351	24	1	0	0	0	1	0	0	1	0	0
2000	242	0	223	12	2	0	0	0	0	0	1	4	0	0
2100	128	0	118	7	1	0	0	1	0	0	0	1	0	0
2200	108	0	99	7	0	0	0	0	1	0	0	1	0	0
2300	79	1	67	9	0	0	0	0	1	0	0	1	0	0
07-19	5571	5	4773	528	23	38	22	0	73	5	24	72	0	8
06-22	6397	5	5527	575	27	40	24	1	77	6	25	82	0	8
06-00	6584	6	5693	591	27	40	24	1	79	6	25	84	0	8
00-00	6718	6	5789	606	27	41	29	1	81	6	29	94	0	9

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Southbound** | **16 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	34	0	31	3	0	0	0	0	0	0	0	0	0	0
0100	13	0	12	1	0	0	0	0	0	0	0	0	0	0
0200	9	0	7	2	0	0	0	0	0	0	0	0	0	0
0300	18	0	16	1	0	0	0	0	0	0	0	1	0	0
0400	20	0	15	3	0	0	0	0	0	0	1	1	0	0
0500	63	0	44	9	2	1	0	0	2	0	2	3	0	0
0600	205	0	175	21	1	2	1	0	1	0	1	3	0	0
0700	387	0	329	43	2	5	0	0	3	0	2	3	0	0
0800	528	0	457	49	0	7	0	0	2	1	5	7	0	0
0900	387	0	323	38	2	5	1	0	7	0	3	6	0	2
1000	300	1	226	45	0	6	4	0	8	0	2	7	0	1
1100	322	0	248	40	2	10	3	0	8	1	2	9	0	0
1200	358	1	288	38	2	3	5	0	9	0	6	5	0	1
1300	400	0	345	29	2	4	2	0	6	0	3	9	0	0
1400	412	0	349	30	3	6	4	0	9	0	3	8	0	0
1500	414	0	351	42	2	2	1	0	5	0	6	5	0	0
1600	513	0	453	34	4	4	1	0	6	0	2	8	0	1
1700	450	0	405	29	0	2	1	0	4	0	2	5	0	2
1800	401	0	369	21	1	1	0	1	2	0	0	6	0	0
1900	252	0	235	12	0	0	1	0	1	0	2	1	0	0
2000	239	0	217	14	1	1	0	0	0	0	3	3	0	0
2100	191	1	179	8	0	0	0	0	0	0	2	1	0	0
2200	117	0	112	1	0	0	0	0	0	0	1	3	0	0
2300	76	0	70	5	0	1	0	0	0	0	0	0	0	0
07-19	4872	2	4143	438	20	55	21	1	69	2	36	78	0	7
06-22	5759	3	4949	493	22	58	23	1	71	2	44	86	0	7
06-00	5952	3	5131	499	22	59	23	1	71	2	45	89	0	7
00-00	6109	3	5256	518	24	60	23	1	73	2	48	94	0	7

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Southbound** | **17 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	57	0	51	3	0	0	0	0	0	0	1	2	0	0
0100	63	0	54	6	1	1	0	0	0	0	0	1	0	0
0200	42	0	38	3	0	0	0	0	0	0	0	1	0	0
0300	31	0	27	3	0	0	0	0	1	0	0	0	0	0
0400	28	0	26	1	0	1	0	0	0	0	0	0	0	0
0500	32	0	25	4	0	0	0	0	0	0	0	2	0	1
0600	64	0	57	5	1	0	0	0	0	0	0	1	0	0
0700	94	0	72	15	1	0	1	0	1	0	1	2	0	1
0800	152	0	129	15	0	0	2	0	1	0	0	4	0	1
0900	183	0	155	18	0	4	2	0	2	0	0	2	0	0
1000	230	0	191	26	0	2	3	0	2	0	2	3	0	1
1100	321	0	277	36	2	2	2	0	1	0	0	1	0	0
1200	358	3	320	24	1	2	1	0	2	0	1	3	1	0
1300	379	1	344	28	0	2	0	0	0	0	1	2	0	1
1400	398	1	370	21	0	1	0	0	3	0	0	2	0	0
1500	443	1	413	26	0	2	1	0	0	0	1	0	0	0
1600	432	1	409	17	0	3	0	0	1	0	0	0	0	1
1700	405	0	381	19	0	0	1	0	3	0	0	1	0	0
1800	316	0	301	12	0	1	0	0	1	0	0	1	0	0
1900	218	0	204	13	0	0	0	0	0	0	0	1	0	0
2000	192	0	182	10	0	0	0	0	0	0	0	0	0	0
2100	113	0	104	8	0	1	0	0	0	0	0	0	0	0
2200	80	0	74	6	0	0	0	0	0	0	0	0	0	0
2300	60	0	54	5	0	0	1	0	0	0	0	0	0	0
07-19	3711	7	3362	257	4	18	13	0	17	0	6	21	1	5
06-22	4298	7	3909	293	5	19	13	0	17	0	6	23	1	5
06-00	4438	7	4037	304	5	19	14	0	17	0	6	23	1	5
00-00	4691	7	4258	324	6	21	14	0	18	0	7	29	1	6

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Southbound** | **18 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	60	0	51	8	0	1	0	0	0	0	0	0	0	0
0100	63	0	59	3	0	0	0	0	0	0	0	1	0	0
0200	46	0	42	3	0	0	1	0	0	0	0	0	0	0
0300	48	0	46	0	0	1	0	0	0	0	0	1	0	0
0400	43	0	40	3	0	0	0	0	0	0	0	0	0	0
0500	19	0	16	3	0	0	0	0	0	0	0	0	0	0
0600	43	0	36	5	0	0	1	0	0	0	0	1	0	0
0700	33	0	29	4	0	0	0	0	0	0	0	0	0	0
0800	53	0	37	14	0	1	0	0	0	0	0	1	0	0
0900	63	0	55	6	0	1	0	0	0	0	0	1	0	0
1000	114	0	113	1	0	0	0	0	0	0	0	0	0	0
1100	206	0	196	8	1	0	0	0	0	0	0	1	0	0
1200	228	0	208	15	0	1	0	0	2	0	1	1	0	0
1300	293	0	275	13	0	1	1	0	3	0	0	0	0	0
1400	346	0	337	9	0	0	0	0	0	0	0	0	0	0
1500	337	0	324	9	1	0	0	0	2	0	0	1	0	0
1600	364	0	346	17	0	1	0	0	0	0	0	0	0	0
1700	366	0	355	9	0	0	0	0	1	0	1	0	0	0
1800	338	0	320	11	0	0	0	0	3	0	0	4	0	0
1900	215	0	207	8	0	0	0	0	0	0	0	0	0	0
2000	171	0	167	3	1	0	0	0	0	0	0	0	0	0
2100	122	0	117	3	0	0	0	0	0	0	0	2	0	0
2200	72	0	69	3	0	0	0	0	0	0	0	0	0	0
2300	48	0	44	1	0	0	0	0	0	0	0	3	0	0
07-19	2741	0	2595	116	2	5	1	0	11	0	2	9	0	0
06-22	3292	0	3122	135	3	5	2	0	11	0	2	12	0	0
06-00	3412	0	3235	139	3	5	2	0	11	0	2	15	0	0
00-00	3691	0	3489	159	3	7	3	0	11	0	2	17	0	0

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Southbound** | **19 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	47	0	44	3	0	0	0	0	0	0	0	0	0	0
0100	20	0	18	1	0	0	0	0	0	0	0	1	0	0
0200	19	0	18	0	0	0	0	0	0	0	0	1	0	0
0300	38	0	34	3	0	0	0	0	0	0	0	1	0	0
0400	21	0	15	3	0	0	0	0	0	0	2	1	0	0
0500	66	0	51	8	0	0	0	0	1	0	0	5	0	1
0600	200	0	164	21	1	1	2	0	2	0	6	2	0	1
0700	451	1	400	36	4	2	0	0	1	1	1	5	0	0
0800	538	1	466	44	1	6	0	0	11	1	2	5	0	1
0900	386	0	321	43	2	5	0	0	8	0	2	5	0	0
1000	309	0	239	41	0	4	2	0	6	1	7	9	0	0
1100	319	0	258	38	2	3	1	0	7	1	4	4	0	1
1200	370	1	292	48	0	5	2	0	11	1	1	7	0	2
1300	377	0	317	36	3	1	3	0	7	1	5	4	0	0
1400	382	0	328	31	3	1	3	0	8	0	1	6	0	1
1500	408	0	356	30	0	4	3	0	3	0	2	9	0	1
1600	506	0	436	40	4	3	3	0	10	1	2	5	0	2
1700	482	1	433	32	3	1	1	0	3	1	1	3	0	3
1800	349	0	324	14	2	1	0	0	2	0	1	4	0	1
1900	249	0	226	18	0	0	0	0	0	0	1	2	0	2
2000	196	0	172	14	0	1	0	0	3	0	0	6	0	0
2100	136	0	122	7	1	0	1	0	0	0	1	4	0	0
2200	84	0	78	4	0	0	0	0	0	0	0	2	0	0
2300	52	0	51	0	0	0	0	0	0	0	0	1	0	0
07-19	4877	4	4170	433	24	36	18	0	77	8	29	66	0	12
06-22	5658	4	4854	493	26	38	21	0	82	8	37	80	0	15
06-00	5794	4	4983	497	26	38	21	0	82	8	37	83	0	15
00-00	6005	4	5163	515	26	38	21	0	83	8	39	92	0	16

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Southbound** | **20 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	36	0	32	1	1	0	0	0	1	0	1	0	0	0
0100	23	0	20	0	0	0	0	0	0	0	0	3	0	0
0200	9	0	8	0	0	0	0	0	0	0	0	1	0	0
0300	12	0	11	0	0	0	0	0	0	0	0	1	0	0
0400	26	0	17	5	0	0	0	0	0	0	2	2	0	0
0500	61	0	45	6	0	1	0	0	0	0	3	5	0	1
0600	215	1	185	20	1	2	0	0	0	0	1	4	0	1
0700	469	0	407	43	4	3	0	0	2	0	2	8	0	0
0800	540	0	473	44	0	4	4	0	6	0	1	8	0	0
0900	407	0	326	50	3	7	0	0	13	1	2	5	0	0
1000	340	1	270	38	1	2	4	1	6	1	6	8	0	2
1100	350	0	280	31	1	6	5	0	12	1	7	6	0	1
1200	360	3	298	34	0	0	5	0	8	1	4	6	0	1
1300	379	1	315	40	2	3	3	0	7	0	4	4	0	0
1400	384	1	320	33	4	4	0	1	9	1	5	3	0	3
1500	404	1	340	38	2	3	2	0	9	0	5	4	0	0
1600	472	1	395	50	3	5	4	0	5	0	2	6	0	1
1700	475	0	445	20	0	3	0	0	3	0	0	4	0	0
1800	372	0	339	20	1	2	1	0	0	0	3	6	0	0
1900	271	0	245	10	0	0	0	0	3	0	1	11	0	1
2000	215	0	199	11	0	1	0	0	0	0	1	3	0	0
2100	167	0	147	11	2	0	0	0	1	0	2	3	0	1
2200	127	0	121	1	0	0	0	0	0	0	1	4	0	0
2300	64	0	57	1	0	0	0	0	0	0	0	5	0	1
07-19	4952	8	4208	441	21	42	28	2	80	5	41	68	0	8
06-22	5820	9	4984	493	24	45	28	2	84	5	46	89	0	11
06-00	6011	9	5162	495	24	45	28	2	84	5	47	98	0	12
00-00	6178	9	5295	507	25	46	28	2	85	5	53	110	0	13

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Southbound** | **21 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	38	0	34	1	0	1	0	1	0	0	0	1	0	0
0100	26	0	22	1	0	0	0	0	0	0	1	2	0	0
0200	14	0	11	1	0	0	0	0	0	0	1	1	0	0
0300	9	0	8	1	0	0	0	0	0	0	0	0	0	0
0400	24	0	13	5	0	0	0	0	0	0	4	2	0	0
0500	56	0	42	6	0	0	0	0	0	0	3	5	0	0
0600	222	0	189	23	3	2	0	0	2	0	0	3	0	0
0700	454	1	389	47	4	2	1	0	1	0	4	5	0	0
0800	554	0	493	45	0	2	0	1	5	0	3	5	0	0
0900	405	0	333	44	5	3	2	0	7	1	2	7	0	1
1000	339	0	273	37	1	5	4	0	6	2	5	6	0	0
1100	358	0	297	38	1	3	4	1	5	2	3	4	0	0
1200	399	2	343	34	0	2	3	0	7	1	3	2	0	2
1300	407	0	346	37	0	1	2	0	6	0	4	11	0	0
1400	409	1	340	30	1	5	3	0	14	1	6	7	0	1
1500	416	0	356	38	3	3	1	0	7	1	2	5	0	0
1600	496	3	431	34	2	4	5	0	9	1	2	4	0	1
1700	509	2	462	31	0	2	1	0	4	0	3	4	0	0
1800	342	0	312	20	2	2	1	0	2	0	0	3	0	0
1900	303	0	284	13	0	0	0	0	1	0	0	5	0	0
2000	270	0	249	12	1	0	0	0	0	0	0	8	0	0
2100	200	0	187	13	0	0	0	0	0	0	0	0	0	0
2200	110	0	102	4	0	0	0	0	0	0	2	2	0	0
2300	79	1	71	4	0	0	0	0	0	0	2	1	0	0
07-19	5088	9	4375	435	19	34	27	2	73	9	37	63	0	5
06-22	6083	9	5284	496	23	36	27	2	76	9	37	79	0	5
06-00	6272	10	5457	504	23	36	27	2	76	9	41	82	0	5
00-00	6439	10	5587	519	23	37	27	3	76	9	50	93	0	5

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 01 Southbound** | **22 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	46	0	41	4	0	0	0	0	0	0	1	0	0	0
0100	27	0	25	2	0	0	0	0	0	0	0	0	0	0
0200	17	0	15	1	0	0	0	0	0	0	0	1	0	0
0300	18	0	16	0	0	0	0	0	0	0	1	1	0	0
0400	24	0	17	5	0	0	0	0	1	0	0	1	0	0
0500	53	0	42	6	0	0	0	1	2	0	0	2	0	0
0600	175	0	149	15	1	0	0	0	2	0	4	3	0	1
0700	377	0	329	33	4	1	0	0	4	0	0	4	0	2
0800	547	0	481	42	0	5	2	0	4	1	3	5	0	4
0900	427	1	342	52	1	7	0	0	9	1	5	6	0	3
1000	312	0	253	39	2	1	4	0	5	1	3	4	0	0
1100	415	2	334	48	0	8	3	0	8	1	3	6	0	3
1200	440	2	365	46	1	4	4	0	7	0	2	8	0	1
1300	394	1	325	40	2	5	2	0	11	1	4	3	0	0
1400	471	1	403	43	2	4	3	1	7	1	3	3	0	0
1500	436	2	380	37	1	0	4	1	2	2	2	3	0	2
1600	538	3	466	45	1	2	2	0	9	0	3	6	0	1
1700	477	1	439	27	2	1	1	0	2	0	2	2	0	0
1800	393	0	371	16	0	1	0	0	1	0	1	3	0	0
1900	283	0	266	9	0	1	0	0	2	0	1	4	0	0
2000	288	0	261	21	0	0	0	0	0	0	1	5	0	0
2100	226	0	215	10	0	0	0	0	0	0	1	0	0	0
2200	155	0	142	9	0	0	1	0	0	0	0	3	0	0
2300	98	0	91	5	0	0	0	0	0	0	1	1	0	0
07-19	5227	13	4488	468	16	39	24	2	69	8	31	53	0	16
06-22	6199	13	5379	523	17	40	24	2	73	8	38	65	0	17
06-00	6452	13	5612	537	17	40	25	2	73	8	39	69	0	17
00-00	6637	13	5768	555	17	40	25	3	76	8	41	74	0	17

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Northbound** | **16 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	16	0	15	1	0	0	0	0	0	0	0	0	0	0
0100	10	0	9	1	0	0	0	0	0	0	0	0	0	0
0200	8	0	6	0	0	1	0	0	0	0	0	1	0	0
0300	11	0	7	3	0	0	0	0	1	0	0	0	0	0
0400	13	0	11	2	0	0	0	0	0	0	0	0	0	0
0500	36	0	22	6	1	0	1	0	4	0	0	2	0	0
0600	78	0	65	10	1	0	1	0	0	0	0	1	0	0
0700	211	0	169	27	4	7	1	0	3	0	0	0	0	0
0800	374	1	326	34	2	6	1	0	0	0	0	4	0	0
0900	352	1	309	35	0	3	0	0	1	1	0	2	0	0
1000	272	0	227	28	1	1	3	0	6	0	3	3	0	0
1100	305	1	257	33	1	1	1	0	6	0	1	4	0	0
1200	271	0	240	23	1	2	0	0	2	0	0	3	0	0
1300	275	0	243	24	0	2	2	0	2	0	1	1	0	0
1400	290	0	244	27	0	5	5	0	5	0	2	2	0	0
1500	389	0	341	32	0	5	3	0	2	0	1	4	0	1
1600	329	0	298	24	0	4	0	0	1	0	2	0	0	0
1700	317	0	288	23	2	1	0	0	3	0	0	0	0	0
1800	241	0	222	16	0	0	2	0	0	1	0	0	0	0
1900	221	0	206	12	1	0	1	0	1	0	0	0	0	0
2000	167	0	162	4	0	0	0	0	1	0	0	0	0	0
2100	107	0	99	8	0	0	0	0	0	0	0	0	0	0
2200	71	0	63	4	2	0	0	0	1	0	0	1	0	0
2300	45	0	41	4	0	0	0	0	0	0	0	0	0	0
07-19	3626	3	3164	326	11	37	18	0	31	2	10	23	0	1
06-22	4199	3	3696	360	13	37	20	0	33	2	10	24	0	1
06-00	4315	3	3800	368	15	37	20	0	34	2	10	25	0	1
00-00	4409	3	3870	381	16	38	21	0	39	2	10	28	0	1

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Northbound** | **17 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	42	0	39	3	0	0	0	0	0	0	0	0	0	0
0100	26	0	23	3	0	0	0	0	0	0	0	0	0	0
0200	27	0	24	2	1	0	0	0	0	0	0	0	0	0
0300	17	0	16	1	0	0	0	0	0	0	0	0	0	0
0400	15	0	14	1	0	0	0	0	0	0	0	0	0	0
0500	23	0	22	1	0	0	0	0	0	0	0	0	0	0
0600	36	0	31	5	0	0	0	0	0	0	0	0	0	0
0700	61	0	52	8	0	1	0	0	0	0	0	0	0	0
0800	125	0	109	13	1	0	1	0	1	0	0	0	0	0
0900	206	0	188	16	0	1	0	0	1	0	0	0	0	0
1000	252	0	226	24	1	0	0	0	0	0	1	0	0	0
1100	345	2	316	20	2	0	1	0	0	0	1	2	1	0
1200	374	0	342	24	1	1	1	0	3	0	1	1	0	0
1300	328	0	297	26	0	0	2	0	2	0	0	0	0	1
1400	289	0	270	19	0	0	0	0	0	0	0	0	0	0
1500	308	0	298	9	0	1	0	0	0	0	0	0	0	0
1600	271	0	248	19	1	0	1	0	1	0	0	0	0	1
1700	219	0	209	9	0	0	0	0	1	0	0	0	0	0
1800	225	0	212	10	0	1	1	0	0	0	0	1	0	0
1900	184	0	174	8	1	0	0	0	1	0	0	0	0	0
2000	150	0	146	4	0	0	0	0	0	0	0	0	0	0
2100	96	0	90	5	0	1	0	0	0	0	0	0	0	0
2200	52	0	50	2	0	0	0	0	0	0	0	0	0	0
2300	44	0	40	3	0	0	0	0	0	0	0	1	0	0
07-19	3003	2	2767	197	6	5	7	0	9	0	3	4	1	2
06-22	3469	2	3208	219	7	6	7	0	10	0	3	4	1	2
06-00	3565	2	3298	224	7	6	7	0	10	0	3	5	1	2
00-00	3715	2	3436	235	8	6	7	0	10	0	3	5	1	2

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Northbound** | **18 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	30	0	27	3	0	0	0	0	0	0	0	0	0	0
0100	35	0	31	4	0	0	0	0	0	0	0	0	0	0
0200	26	0	22	3	0	0	0	0	1	0	0	0	0	0
0300	34	0	29	5	0	0	0	0	0	0	0	0	0	0
0400	28	0	27	1	0	0	0	0	0	0	0	0	0	0
0500	17	0	14	3	0	0	0	0	0	0	0	0	0	0
0600	29	0	28	1	0	0	0	0	0	0	0	0	0	0
0700	29	0	26	3	0	0	0	0	0	0	0	0	0	0
0800	33	0	32	1	0	0	0	0	0	0	0	0	0	0
0900	83	0	79	4	0	0	0	0	0	0	0	0	0	0
1000	160	0	147	10	1	0	1	0	0	0	0	1	0	0
1100	221	0	216	5	0	0	0	0	0	0	0	0	0	0
1200	281	0	271	9	0	0	1	0	0	0	0	0	0	0
1300	286	1	276	7	0	0	1	0	0	0	0	0	1	0
1400	287	0	279	7	1	0	0	0	0	0	0	0	0	0
1500	261	0	250	11	0	0	0	0	0	0	0	0	0	0
1600	257	0	248	8	0	0	1	0	0	0	0	0	0	0
1700	182	0	173	8	0	0	0	0	1	0	0	0	0	0
1800	164	0	162	1	1	0	0	0	0	0	0	0	0	0
1900	152	0	148	3	0	0	1	0	0	0	0	0	0	0
2000	147	0	141	6	0	0	0	0	0	0	0	0	0	0
2100	85	0	82	2	1	0	0	0	0	0	0	0	0	0
2200	46	0	45	1	0	0	0	0	0	0	0	0	0	0
2300	29	0	29	0	0	0	0	0	0	0	0	0	0	0
07-19	2244	1	2159	74	3	0	4	0	1	0	0	1	1	0
06-22	2657	1	2558	86	4	0	5	0	1	0	0	1	1	0
06-00	2732	1	2632	87	4	0	5	0	1	0	0	1	1	0
00-00	2902	1	2782	106	4	0	5	0	2	0	0	1	1	0

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Northbound** | **19 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	27	0	26	1	0	0	0	0	0	0	0	0	0	0
0100	9	0	8	1	0	0	0	0	0	0	0	0	0	0
0200	13	0	12	1	0	0	0	0	0	0	0	0	0	0
0300	14	0	14	0	0	0	0	0	0	0	0	0	0	0
0400	17	0	13	3	0	0	0	0	0	0	0	1	0	0
0500	33	0	25	5	0	0	0	0	2	0	0	1	0	0
0600	76	0	65	5	0	1	1	0	2	0	1	1	0	0
0700	209	0	174	22	2	3	3	0	4	0	1	0	0	0
0800	387	1	349	25	0	2	3	0	4	0	1	2	0	0
0900	330	1	273	41	0	1	1	0	6	1	3	3	0	0
1000	285	0	237	33	1	2	1	0	2	0	1	8	0	0
1100	294	0	248	33	0	0	1	0	7	1	1	3	0	0
1200	284	1	248	25	1	0	1	0	4	0	1	3	0	0
1300	259	0	219	26	0	3	1	0	6	0	0	2	0	2
1400	288	1	247	26	1	5	1	0	4	0	1	2	0	0
1500	342	0	300	25	1	2	2	0	7	1	2	2	0	0
1600	256	0	232	19	0	0	0	0	2	0	1	2	0	0
1700	249	0	229	16	0	0	2	0	1	0	0	1	0	0
1800	243	1	217	17	0	0	4	0	1	0	0	3	0	0
1900	192	0	176	11	2	0	0	0	0	0	0	3	0	0
2000	129	0	121	6	1	0	1	0	0	0	0	0	0	0
2100	69	0	64	3	0	0	0	0	0	0	0	2	0	0
2200	52	0	46	4	0	1	1	0	0	0	0	0	0	0
2300	36	0	35	1	0	0	0	0	0	0	0	0	0	0
07-19	3426	5	2973	308	6	18	20	0	48	3	12	31	0	2
06-22	3892	5	3399	333	9	19	22	0	50	3	13	37	0	2
06-00	3980	5	3480	338	9	20	23	0	50	3	13	37	0	2
00-00	4093	5	3578	349	9	20	23	0	52	3	13	39	0	2

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Northbound** | **20 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	31	0	30	1	0	0	0	0	0	0	0	0	0	0
0100	9	0	8	0	0	0	0	0	1	0	0	0	0	0
0200	4	0	3	0	0	1	0	0	0	0	0	0	0	0
0300	4	0	4	0	0	0	0	0	0	0	0	0	0	0
0400	7	0	6	1	0	0	0	0	0	0	0	0	0	0
0500	31	0	21	6	0	0	3	0	1	0	0	0	0	0
0600	73	0	61	7	0	0	3	0	1	0	0	1	0	0
0700	238	0	197	21	3	5	4	0	4	0	0	3	0	1
0800	355	0	301	40	1	3	3	0	3	0	1	2	0	1
0900	371	1	328	27	1	0	3	0	4	1	2	4	0	0
1000	309	0	256	35	1	2	2	0	6	1	1	4	0	1
1100	307	1	264	26	0	2	5	0	4	0	1	4	0	0
1200	285	0	250	24	1	2	0	0	1	1	3	3	0	0
1300	276	0	241	18	0	4	3	0	4	1	1	2	0	2
1400	306	0	264	27	2	3	4	0	2	1	2	1	0	0
1500	343	0	299	28	1	3	3	0	5	0	1	3	0	0
1600	266	0	230	27	0	1	1	0	3	0	0	4	0	0
1700	262	0	236	25	0	0	1	0	0	0	0	0	0	0
1800	225	0	215	8	0	0	1	0	0	0	0	1	0	0
1900	196	0	186	6	1	0	0	0	2	0	0	1	0	0
2000	176	0	165	5	1	0	3	0	1	0	1	0	0	0
2100	95	0	89	4	0	0	0	0	1	0	0	1	0	0
2200	75	0	70	2	1	0	0	0	0	0	0	2	0	0
2300	35	0	33	2	0	0	0	0	0	0	0	0	0	0
07-19	3543	2	3081	306	10	25	30	0	36	5	12	31	0	5
06-22	4083	2	3582	328	12	25	36	0	41	5	13	34	0	5
06-00	4193	2	3685	332	13	25	36	0	41	5	13	36	0	5
00-00	4279	2	3757	340	13	26	39	0	43	5	13	36	0	5

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Northbound** | **21 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	23	0	23	0	0	0	0	0	0	0	0	0	0	0
0100	8	0	7	1	0	0	0	0	0	0	0	0	0	0
0200	9	0	7	1	1	0	0	0	0	0	0	0	0	0
0300	4	0	3	1	0	0	0	0	0	0	0	0	0	0
0400	6	0	3	1	0	0	1	0	0	0	0	1	0	0
0500	27	0	20	3	0	0	2	0	2	0	0	0	0	0
0600	71	0	57	9	0	2	0	0	2	0	0	1	0	0
0700	234	0	190	31	2	4	2	0	2	0	0	3	0	0
0800	358	1	316	31	1	3	2	0	1	0	1	2	0	0
0900	342	0	298	32	1	3	0	0	4	0	3	1	0	0
1000	331	0	293	25	2	2	1	0	3	0	0	3	0	2
1100	305	1	273	21	0	1	1	0	2	0	1	5	0	0
1200	298	1	254	32	1	0	4	0	3	0	0	3	0	0
1300	264	0	233	17	0	1	2	0	5	0	3	3	0	0
1400	328	0	279	32	2	2	4	0	4	0	1	2	0	2
1500	335	1	298	26	1	3	0	0	3	1	1	1	0	0
1600	290	0	262	15	2	1	3	0	1	0	2	4	0	0
1700	270	1	244	23	2	0	0	0	0	0	0	0	0	0
1800	264	0	247	14	0	0	0	0	0	0	2	1	0	0
1900	209	0	194	13	1	0	0	0	1	0	0	0	0	0
2000	157	0	142	11	1	0	2	0	0	0	0	1	0	0
2100	128	0	121	7	0	0	0	0	0	0	0	0	0	0
2200	77	1	69	5	1	0	1	0	0	0	0	0	0	0
2300	48	0	41	6	0	0	1	0	0	0	0	0	0	0
07-19	3619	5	3187	299	14	20	19	0	28	1	14	28	0	4
06-22	4184	5	3701	339	16	22	21	0	31	1	14	30	0	4
06-00	4309	6	3811	350	17	22	23	0	31	1	14	30	0	4
00-00	4386	6	3874	357	18	22	26	0	33	1	14	31	0	4

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Northbound** | **22 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	21	0	19	1	0	0	0	0	0	0	0	1	0	0
0100	8	0	6	1	0	0	1	0	0	0	0	0	0	0
0200	11	0	10	1	0	0	0	0	0	0	0	0	0	0
0300	7	0	6	1	0	0	0	0	0	0	0	0	0	0
0400	5	0	4	1	0	0	0	0	0	0	0	0	0	0
0500	27	0	20	3	0	0	2	0	2	0	0	0	0	0
0600	71	0	61	5	1	2	0	1	1	0	0	0	0	0
0700	240	1	197	32	0	3	2	0	3	0	1	1	0	0
0800	363	1	309	32	4	3	3	0	8	0	1	1	0	1
0900	366	0	332	25	0	4	0	0	2	1	0	2	0	0
1000	286	0	253	22	1	2	1	0	2	0	1	3	0	1
1100	329	3	277	38	1	2	1	0	5	0	0	2	0	0
1200	388	0	334	39	2	2	2	0	3	1	2	2	0	1
1300	352	0	306	32	0	3	4	0	4	0	3	0	0	0
1400	338	1	286	38	2	1	1	0	3	1	2	3	0	0
1500	318	1	279	28	0	0	3	0	4	1	0	2	0	0
1600	256	0	226	25	1	2	0	0	1	0	0	1	0	0
1700	272	0	252	15	0	0	0	0	2	0	1	2	0	0
1800	291	0	268	21	0	0	0	0	0	0	0	2	0	0
1900	284	0	269	13	1	0	0	0	0	0	0	1	0	0
2000	161	0	156	2	2	0	0	0	0	0	0	1	0	0
2100	86	0	80	5	1	0	0	0	0	0	0	0	0	0
2200	83	1	75	7	0	0	0	0	0	0	0	0	0	0
2300	40	0	32	5	0	0	1	0	1	0	0	1	0	0
07-19	3799	7	3319	347	11	22	17	0	37	4	11	21	0	3
06-22	4401	7	3885	372	16	24	17	1	38	4	11	23	0	3
06-00	4524	8	3992	384	16	24	18	1	39	4	11	24	0	3
00-00	4603	8	4057	392	16	24	21	1	41	4	11	25	0	3

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Southbound** | **16 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	22	0	19	2	0	1	0	0	0	0	0	0	0	0
0100	18	0	15	3	0	0	0	0	0	0	0	0	0	0
0200	8	0	8	0	0	0	0	0	0	0	0	0	0	0
0300	15	0	14	1	0	0	0	0	0	0	0	0	0	0
0400	12	0	8	3	0	0	0	0	0	0	0	1	0	0
0500	18	0	12	3	0	0	0	0	2	0	1	0	0	0
0600	59	0	43	12	0	1	1	0	1	0	0	1	0	0
0700	100	2	76	18	1	1	0	0	2	0	0	0	0	0
0800	182	0	155	22	1	2	2	0	0	0	0	0	0	0
0900	288	0	241	35	1	4	1	0	4	0	0	2	0	0
1000	197	0	161	24	0	1	1	0	8	1	0	1	0	0
1100	260	1	218	27	4	0	0	0	8	1	1	0	0	0
1200	266	1	234	18	2	0	4	0	4	0	0	2	0	1
1300	340	0	303	29	0	1	0	0	4	0	2	1	0	0
1400	316	0	269	28	2	3	2	1	5	0	1	4	0	1
1500	368	0	314	30	2	4	2	0	10	0	4	2	0	0
1600	448	3	381	37	2	5	5	0	8	0	1	6	0	0
1700	403	0	357	36	0	0	1	0	3	1	2	3	0	0
1800	355	0	325	25	1	1	1	0	0	0	0	2	0	0
1900	237	0	223	13	0	0	0	0	1	0	0	0	0	0
2000	207	0	191	14	0	1	0	0	0	0	1	0	0	0
2100	173	0	167	6	0	0	0	0	0	0	0	0	0	0
2200	100	0	96	3	0	0	1	0	0	0	0	0	0	0
2300	60	0	55	5	0	0	0	0	0	0	0	0	0	0
07-19	3523	7	3034	329	16	22	19	1	56	3	11	23	0	2
06-22	4199	7	3658	374	16	24	20	1	58	3	12	24	0	2
06-00	4359	7	3809	382	16	24	21	1	58	3	12	24	0	2
00-00	4452	7	3885	394	16	25	21	1	60	3	13	25	0	2

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Southbound** | **17 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	52	0	50	2	0	0	0	0	0	0	0	0	0	0
0100	42	0	34	6	1	1	0	0	0	0	0	0	0	0
0200	38	0	38	0	0	0	0	0	0	0	0	0	0	0
0300	20	0	17	3	0	0	0	0	0	0	0	0	0	0
0400	16	0	14	1	1	0	0	0	0	0	0	0	0	0
0500	17	0	16	1	0	0	0	0	0	0	0	0	0	0
0600	27	0	24	2	1	0	0	0	0	0	0	0	0	0
0700	49	0	44	4	1	0	0	0	0	0	0	0	0	0
0800	87	0	67	16	0	1	1	0	1	0	1	0	0	0
0900	127	0	106	15	1	1	2	0	2	0	0	0	0	0
1000	182	0	159	19	0	0	4	0	0	0	1	2	0	0
1100	266	1	229	28	2	0	3	0	2	0	1	1	0	0
1200	298	2	271	18	1	0	5	0	1	0	0	0	0	0
1300	333	2	300	27	1	1	1	0	0	0	0	1	0	0
1400	308	1	284	19	0	1	0	0	1	0	1	1	0	0
1500	351	2	327	18	1	1	0	0	0	0	1	1	0	0
1600	345	0	327	16	1	1	0	0	0	0	0	0	0	0
1700	333	0	309	22	0	1	0	0	1	0	0	0	0	0
1800	284	0	265	15	0	2	0	0	1	0	0	1	0	0
1900	215	0	193	20	0	0	0	0	1	0	0	1	0	0
2000	159	0	152	7	0	0	0	0	0	0	0	0	0	0
2100	109	0	102	7	0	0	0	0	0	0	0	0	0	0
2200	82	0	78	4	0	0	0	0	0	0	0	0	0	0
2300	57	0	54	3	0	0	0	0	0	0	0	0	0	0
07-19	2963	8	2688	217	8	9	12	0	9	0	5	7	0	0
06-22	3473	8	3159	253	9	9	12	0	10	0	5	8	0	0
06-00	3612	8	3291	260	9	9	12	0	10	0	5	8	0	0
00-00	3797	8	3460	273	11	10	12	0	10	0	5	8	0	0

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Southbound** | **18 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	50	0	46	4	0	0	0	0	0	0	0	0	0	0
0100	47	0	44	3	0	0	0	0	0	0	0	0	0	0
0200	32	0	28	3	0	0	1	0	0	0	0	0	0	0
0300	39	0	38	1	0	0	0	0	0	0	0	0	0	0
0400	35	0	32	3	0	0	0	0	0	0	0	0	0	0
0500	15	0	14	1	0	0	0	0	0	0	0	0	0	0
0600	18	0	16	2	0	0	0	0	0	0	0	0	0	0
0700	23	0	19	4	0	0	0	0	0	0	0	0	0	0
0800	30	0	28	1	1	0	0	0	0	0	0	0	0	0
0900	41	0	40	1	0	0	0	0	0	0	0	0	0	0
1000	104	0	100	4	0	0	0	0	0	0	0	0	0	0
1100	162	0	153	8	1	0	0	0	0	0	0	0	0	0
1200	207	1	195	10	0	1	0	0	0	0	0	0	0	0
1300	250	0	234	14	0	1	0	1	0	0	0	0	0	0
1400	256	0	247	8	0	0	0	0	1	0	0	0	0	0
1500	263	0	252	6	1	0	0	0	4	0	0	0	0	0
1600	268	0	259	9	0	0	0	0	0	0	0	0	0	0
1700	292	0	282	10	0	0	0	0	0	0	0	0	0	0
1800	265	0	252	10	0	0	1	0	2	0	0	0	0	0
1900	199	0	192	6	0	1	0	0	0	0	0	0	0	0
2000	156	0	150	5	1	0	0	0	0	0	0	0	0	0
2100	102	0	99	2	0	0	0	0	1	0	0	0	0	0
2200	68	0	65	3	0	0	0	0	0	0	0	0	0	0
2300	44	0	43	1	0	0	0	0	0	0	0	0	0	0
07-19	2161	1	2061	85	3	2	1	1	7	0	0	0	0	0
06-22	2636	1	2518	100	4	3	1	1	8	0	0	0	0	0
06-00	2748	1	2626	104	4	3	1	1	8	0	0	0	0	0
00-00	2966	1	2828	119	4	3	2	1	8	0	0	0	0	0

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Southbound** | **19 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	35	0	35	0	0	0	0	0	0	0	0	0	0	0
0100	22	0	19	3	0	0	0	0	0	0	0	0	0	0
0200	13	0	13	0	0	0	0	0	0	0	0	0	0	0
0300	18	0	16	2	0	0	0	0	0	0	0	0	0	0
0400	11	0	9	1	0	0	0	0	0	0	1	0	0	0
0500	20	0	16	3	0	0	0	0	0	0	0	1	0	0
0600	50	0	37	11	1	0	1	0	0	0	0	0	0	0
0700	103	0	90	7	2	0	1	0	1	0	1	1	0	0
0800	189	2	154	19	1	2	0	0	7	0	1	3	0	0
0900	258	1	211	28	1	5	0	0	6	1	0	4	0	1
1000	203	0	166	29	0	0	2	0	4	0	0	1	0	1
1100	238	0	202	27	2	0	0	0	3	1	2	1	0	0
1200	275	0	229	31	0	0	1	0	9	1	3	1	0	0
1300	302	1	253	29	2	0	4	1	7	1	1	3	0	0
1400	297	1	258	23	1	1	4	0	6	1	0	2	0	0
1500	324	0	280	29	0	1	5	0	3	1	0	5	0	0
1600	417	1	352	41	3	4	5	0	9	1	1	0	0	0
1700	376	0	329	38	1	0	1	0	3	0	0	3	0	1
1800	332	0	307	19	1	0	0	0	2	0	1	1	0	1
1900	232	0	213	16	0	0	1	0	1	0	0	1	0	0
2000	180	0	166	10	0	0	0	0	2	0	0	2	0	0
2100	135	0	123	11	0	0	1	0	0	0	0	0	0	0
2200	76	0	72	4	0	0	0	0	0	0	0	0	0	0
2300	56	0	53	2	0	1	0	0	0	0	0	0	0	0
07-19	3314	6	2831	320	14	13	23	1	60	7	10	25	0	4
06-22	3911	6	3370	368	15	13	26	1	63	7	10	28	0	4
06-00	4043	6	3495	374	15	14	26	1	63	7	10	28	0	4
00-00	4162	6	3603	383	15	14	26	1	63	7	11	29	0	4

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Southbound** | **20 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	30	0	26	2	1	0	0	0	1	0	0	0	0	0
0100	14	0	14	0	0	0	0	0	0	0	0	0	0	0
0200	7	0	7	0	0	0	0	0	0	0	0	0	0	0
0300	4	0	4	0	0	0	0	0	0	0	0	0	0	0
0400	11	0	8	0	0	0	1	0	0	0	0	2	0	0
0500	12	0	9	1	1	0	0	0	0	0	1	0	0	0
0600	50	1	33	11	1	1	0	0	0	0	1	1	0	1
0700	113	0	93	13	1	1	0	1	1	0	0	1	0	2
0800	197	0	165	24	1	0	2	0	4	0	0	1	0	0
0900	290	0	246	30	2	5	0	0	5	1	1	0	0	0
1000	243	0	202	27	0	0	2	0	6	1	1	3	0	0
1100	264	2	217	28	1	2	2	0	6	1	3	2	0	0
1200	278	0	243	24	0	0	2	0	3	1	2	2	0	1
1300	320	1	279	26	1	2	3	1	6	0	0	1	0	0
1400	322	3	268	36	3	3	0	0	3	3	2	1	0	0
1500	331	0	282	30	0	0	4	0	7	1	2	2	0	0
1600	387	0	321	41	4	8	2	0	5	1	2	3	0	0
1700	402	0	355	37	0	0	2	0	3	0	1	4	0	0
1800	357	0	331	19	0	0	1	0	2	0	2	2	0	0
1900	237	1	216	14	0	0	0	0	1	0	0	3	0	2
2000	193	0	183	9	0	0	0	0	0	0	0	1	0	0
2100	131	0	124	5	1	0	0	0	1	0	0	0	0	0
2200	109	0	107	2	0	0	0	0	0	0	0	0	0	0
2300	56	0	53	2	0	0	0	0	0	0	0	1	0	0
07-19	3504	6	3002	335	13	24	21	2	51	9	16	22	0	3
06-22	4115	8	3558	374	15	25	21	2	53	9	17	27	0	6
06-00	4280	8	3718	378	15	25	21	2	53	9	17	28	0	6
00-00	4358	8	3786	381	17	25	22	2	54	9	18	30	0	6

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Southbound** | **21 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	25	0	24	1	0	0	0	0	0	0	0	0	0	0
0100	13	0	13	0	0	0	0	0	0	0	0	0	0	0
0200	12	0	10	2	0	0	0	0	0	0	0	0	0	0
0300	3	0	1	2	0	0	0	0	0	0	0	0	0	0
0400	7	0	4	2	0	0	0	0	0	0	0	1	0	0
0500	14	0	12	2	0	0	0	0	0	0	0	0	0	0
0600	42	0	35	5	2	0	0	0	0	0	0	0	0	0
0700	114	0	96	14	1	0	1	0	1	0	0	1	0	0
0800	204	0	175	20	1	3	0	0	4	0	0	1	0	0
0900	284	0	235	32	1	6	2	0	4	1	1	1	0	1
1000	214	2	176	24	0	2	3	0	2	0	1	3	0	1
1100	276	1	231	30	3	1	3	1	1	1	0	3	0	1
1200	285	2	255	21	0	0	2	0	2	1	0	2	0	0
1300	324	0	282	30	1	1	3	0	4	0	1	2	0	0
1400	309	1	261	28	3	3	0	0	9	1	1	1	0	1
1500	339	0	293	30	1	0	3	0	5	2	1	1	0	0
1600	392	0	333	38	4	4	4	1	4	1	2	1	0	0
1700	429	0	374	41	1	0	4	1	5	0	2	1	0	0
1800	311	0	279	27	0	0	0	0	4	0	0	1	0	0
1900	264	0	252	10	0	0	0	0	1	0	0	1	0	0
2000	220	0	199	19	1	0	0	0	0	0	0	1	0	0
2100	189	0	172	14	0	1	1	0	1	0	0	0	0	0
2200	92	0	86	6	0	0	0	0	0	0	0	0	0	0
2300	62	1	57	4	0	0	0	0	0	0	0	0	0	0
07-19	3481	6	2990	335	16	23	25	3	45	7	9	18	0	4
06-22	4196	6	3648	383	19	24	26	3	47	7	9	20	0	4
06-00	4350	7	3791	393	19	24	26	3	47	7	9	20	0	4
00-00	4424	7	3855	402	19	24	26	3	47	7	9	21	0	4

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 02 Southbound** | **22 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	45	0	41	4	0	0	0	0	0	0	0	0	0	0
0100	19	0	17	2	0	0	0	0	0	0	0	0	0	0
0200	10	0	9	1	0	0	0	0	0	0	0	0	0	0
0300	11	0	9	2	0	0	0	0	0	0	0	0	0	0
0400	12	0	9	1	0	0	1	0	0	0	0	1	0	0
0500	15	0	10	3	0	0	0	0	2	0	0	0	0	0
0600	45	0	39	4	1	0	0	0	0	0	1	0	0	0
0700	109	0	90	13	2	0	0	0	2	0	0	2	0	0
0800	215	1	179	24	2	1	1	1	4	1	0	1	0	0
0900	301	1	255	31	1	5	0	0	5	2	1	0	0	0
1000	226	0	194	20	2	0	3	0	5	1	0	1	0	0
1100	330	0	274	41	1	2	4	0	7	1	0	3	0	0
1200	334	2	280	40	0	3	0	0	5	1	1	2	0	0
1300	348	0	290	43	4	3	2	0	2	2	1	1	0	0
1400	356	3	301	39	2	1	1	1	7	0	1	0	0	0
1500	358	3	307	36	1	2	2	0	3	1	2	2	0	0
1600	434	0	373	44	1	0	3	0	9	0	1	3	0	0
1700	407	3	370	30	0	0	0	1	1	0	0	1	0	1
1800	310	0	289	16	1	0	2	0	0	0	0	2	0	0
1900	254	0	236	15	0	0	0	0	1	0	0	2	0	0
2000	247	0	225	21	1	0	0	0	0	0	0	0	0	0
2100	191	0	182	8	0	0	0	0	0	0	0	1	0	0
2200	127	0	118	8	0	0	0	0	1	0	0	0	0	0
2300	77	0	71	5	0	0	0	0	0	0	1	0	0	0
07-19	3728	13	3202	377	17	16	15	3	50	9	7	18	0	1
06-22	4465	13	3884	425	19	16	15	3	51	9	8	21	0	1
06-00	4669	13	4073	438	19	16	15	3	52	9	9	21	0	1
00-00	4781	13	4168	451	19	16	16	3	54	9	9	22	0	1

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Northbound** | **16 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	28	0	23	3	0	0	0	0	0	0	1	1	0	0
0100	22	0	19	1	1	0	0	0	0	0	0	1	0	0
0200	14	0	12	0	0	0	0	0	0	0	0	2	0	0
0300	11	0	7	2	0	0	0	0	1	0	0	1	0	0
0400	11	0	7	1	0	0	1	0	1	0	0	1	0	0
0500	23	0	13	3	1	1	1	0	2	0	0	2	0	0
0600	67	0	53	8	1	0	1	0	3	0	0	1	0	0
0700	189	1	151	20	3	5	0	0	5	0	2	2	0	0
0800	296	1	255	25	0	3	1	0	4	0	1	6	0	0
0900	205	0	174	20	1	1	1	0	4	0	1	3	0	0
1000	166	0	131	19	1	4	0	0	6	0	1	4	0	0
1100	169	0	142	15	1	2	2	0	4	0	1	2	0	0
1200	186	0	151	20	1	1	1	0	5	0	1	5	0	1
1300	187	0	164	15	0	1	1	0	2	0	1	3	0	0
1400	218	0	182	21	3	2	2	0	3	0	1	4	0	0
1500	283	0	239	30	1	2	1	0	4	0	2	4	0	1
1600	321	1	274	31	0	3	1	0	4	0	2	4	0	1
1700	323	0	279	31	2	2	3	0	2	1	1	2	0	0
1800	227	0	199	20	1	1	1	1	1	0	1	1	0	1
1900	192	1	173	13	1	0	1	0	1	0	1	1	0	0
2000	124	0	116	6	1	0	0	0	0	0	0	1	0	0
2100	82	0	74	6	0	0	0	0	1	0	0	1	0	0
2200	41	0	37	1	1	0	0	0	1	0	0	1	0	0
2300	37	0	30	4	0	1	0	0	0	0	1	0	0	1
07-19	2770	3	2341	267	14	26	14	1	44	1	15	40	0	4
06-22	3235	4	2757	300	17	26	16	1	49	1	16	44	0	4
06-00	3313	4	2824	305	18	27	16	1	50	1	17	45	0	5
00-00	3422	4	2905	315	20	28	18	1	54	1	18	53	0	5

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Northbound** | **17 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	30	0	27	2	0	0	0	0	0	0	1	0	0	0
0100	23	0	20	2	0	0	0	0	0	0	0	1	0	0
0200	27	0	22	2	0	0	0	0	0	0	1	2	0	0
0300	9	0	8	1	0	0	0	0	0	0	0	0	0	0
0400	14	0	10	1	0	0	1	0	0	0	1	1	0	0
0500	19	0	15	2	0	0	0	1	1	0	0	0	0	0
0600	37	0	31	5	0	0	0	0	0	0	0	1	0	0
0700	72	0	57	11	1	2	1	0	0	0	0	0	0	0
0800	81	0	67	10	1	1	0	0	1	0	0	1	0	0
0900	136	0	116	14	1	1	1	0	1	0	0	2	0	0
1000	148	0	126	18	0	1	0	0	0	0	1	2	0	0
1100	184	0	169	12	0	0	0	0	2	0	1	0	0	0
1200	205	0	187	15	0	1	1	0	1	0	0	0	0	0
1300	188	0	172	14	0	1	0	0	0	0	0	1	0	0
1400	214	1	197	13	1	0	1	0	0	0	0	1	0	0
1500	198	0	185	10	0	0	1	0	0	0	0	2	0	0
1600	190	0	172	13	1	1	1	0	1	0	0	1	0	0
1700	137	0	128	8	0	0	0	0	0	0	0	1	0	0
1800	132	0	121	10	0	0	0	0	0	0	0	1	0	0
1900	127	0	119	5	1	1	0	0	0	0	1	0	0	0
2000	70	0	66	3	0	1	0	0	0	0	0	0	0	0
2100	55	0	49	4	0	1	0	0	0	0	0	1	0	0
2200	36	0	34	2	0	0	0	0	0	0	0	0	0	0
2300	30	0	28	2	0	0	0	0	0	0	0	0	0	0
07-19	1885	1	1697	148	5	8	6	0	6	0	2	12	0	0
06-22	2174	1	1962	165	6	11	6	0	6	0	3	14	0	0
06-00	2240	1	2024	169	6	11	6	0	6	0	3	14	0	0
00-00	2362	1	2126	179	6	11	7	1	7	0	6	18	0	0

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Northbound** | **18 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	30	0	26	3	1	0	0	0	0	0	0	0	0	0
0100	16	0	15	1	0	0	0	0	0	0	0	0	0	0
0200	18	0	17	1	0	0	0	0	0	0	0	0	0	0
0300	15	0	13	2	0	0	0	0	0	0	0	0	0	0
0400	9	0	9	0	0	0	0	0	0	0	0	0	0	0
0500	19	0	16	3	0	0	0	0	0	0	0	0	0	0
0600	16	0	14	1	0	0	0	0	0	0	0	1	0	0
0700	34	0	34	0	0	0	0	0	0	0	0	0	0	0
0800	39	0	35	3	0	0	0	0	0	0	0	1	0	0
0900	48	0	45	1	1	0	0	0	0	0	0	1	0	0
1000	96	0	87	7	1	0	0	0	0	0	0	1	0	0
1100	153	0	142	8	0	0	1	0	1	0	0	1	0	0
1200	188	0	178	7	1	0	0	0	1	0	0	1	0	0
1300	205	0	195	6	0	0	1	0	2	0	0	1	0	0
1400	198	0	190	8	0	0	0	0	0	0	0	0	0	0
1500	213	0	202	8	0	0	0	0	1	0	0	1	0	0
1600	157	0	150	7	0	0	0	0	0	0	0	0	0	0
1700	123	0	114	8	0	0	0	0	0	0	0	1	0	0
1800	118	0	110	5	0	0	1	0	1	0	0	1	0	0
1900	102	0	94	6	0	0	1	0	1	0	0	0	0	0
2000	75	0	73	2	0	0	0	0	0	0	0	0	0	0
2100	54	0	52	2	0	0	0	0	0	0	0	0	0	0
2200	33	0	31	1	0	1	0	0	0	0	0	0	0	0
2300	19	0	17	1	0	0	0	0	0	0	0	1	0	0
07-19	1572	0	1482	68	3	1	3	0	6	0	0	9	0	0
06-22	1819	0	1715	79	3	1	4	0	7	0	0	10	0	0
06-00	1871	0	1763	81	3	2	4	0	7	0	0	11	0	0
00-00	1978	0	1859	91	4	2	4	0	7	0	0	11	0	0

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Northbound** | **19 December 2011**
Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	11	0	11	0	0	0	0	0	0	0	0	0	0	0
0100	5	0	5	0	0	0	0	0	0	0	0	0	0	0
0200	5	0	5	0	0	0	0	0	0	0	0	0	0	0
0300	5	0	4	0	0	0	0	0	0	0	0	1	0	0
0400	16	0	12	1	0	0	1	0	1	0	0	1	0	0
0500	25	0	17	1	0	1	3	0	1	0	0	2	0	0
0600	78	0	58	7	0	0	1	0	5	1	1	4	0	1
0700	202	1	168	18	2	5	1	0	4	0	0	3	0	0
0800	306	1	270	20	2	1	1	0	6	1	1	2	0	1
0900	204	1	167	24	0	3	0	0	3	0	2	3	0	1
1000	159	0	131	17	1	2	1	0	3	0	1	3	0	0
1100	172	0	137	22	1	1	1	0	3	0	2	4	0	1
1200	161	0	137	15	2	0	0	0	3	0	2	2	0	0
1300	151	0	125	17	0	0	2	0	4	0	0	3	0	0
1400	210	1	177	19	2	3	0	0	2	0	2	4	0	0
1500	232	0	197	21	1	1	2	0	5	1	1	3	0	0
1600	272	1	235	24	1	2	1	0	3	0	1	3	0	1
1700	360	0	315	34	1	2	1	0	2	0	1	4	0	0
1800	282	1	249	23	0	0	1	0	2	0	1	4	0	1
1900	176	0	158	14	1	0	0	0	1	0	1	1	0	0
2000	87	0	79	4	1	0	0	0	0	0	1	2	0	0
2100	51	0	47	2	0	0	1	0	0	0	0	1	0	0
2200	50	0	42	4	0	0	1	0	1	0	0	1	0	1
2300	41	0	39	1	0	0	0	0	0	0	1	0	0	0
07-19	2711	6	2308	254	13	20	11	0	40	2	14	38	0	5
06-22	3103	6	2650	281	15	20	13	0	46	3	17	46	0	6
06-00	3194	6	2731	286	15	20	14	0	47	3	18	47	0	7
00-00	3261	6	2785	288	15	21	18	0	49	3	18	51	0	7

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Northbound** | **20 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	20	0	18	1	0	0	0	0	0	0	0	1	0	0
0100	6	0	6	0	0	0	0	0	0	0	0	0	0	0
0200	5	0	3	1	0	0	0	0	0	0	0	1	0	0
0300	5	0	4	0	0	0	0	0	0	0	0	1	0	0
0400	8	0	4	1	0	0	0	0	0	0	1	2	0	0
0500	34	0	24	3	1	0	2	0	2	0	0	2	0	0
0600	68	0	50	8	1	0	1	0	2	1	2	3	0	0
0700	198	1	163	19	2	3	2	0	4	0	1	2	0	1
0800	295	0	246	30	2	1	2	0	8	0	2	3	0	1
0900	233	0	197	22	2	1	0	0	4	1	2	3	0	1
1000	161	1	131	21	0	0	1	0	3	0	1	3	0	0
1100	185	0	155	17	0	1	1	0	3	0	3	4	0	1
1200	168	0	145	13	0	1	2	0	4	0	1	2	0	0
1300	178	0	150	14	0	4	1	0	4	0	2	3	0	0
1400	205	1	166	22	1	3	2	0	3	0	1	5	0	1
1500	227	0	200	21	2	2	0	0	0	0	0	3	0	0
1600	260	1	212	30	2	1	2	1	6	0	0	4	0	1
1700	367	0	332	27	2	1	0	0	1	0	1	2	0	1
1800	290	0	262	19	0	0	1	0	2	1	1	3	0	1
1900	180	0	163	13	1	0	0	0	1	0	0	2	0	0
2000	103	0	95	4	1	0	0	0	2	0	0	1	0	0
2100	74	0	72	1	0	0	0	0	1	0	0	0	0	0
2200	48	0	42	2	0	0	0	0	1	0	1	1	0	1
2300	43	0	37	3	0	0	0	0	1	0	1	1	0	0
07-19	2767	4	2359	255	13	17	14	1	42	2	15	37	0	8
06-22	3192	4	2739	281	16	17	15	1	48	3	17	43	0	8
06-00	3283	4	2818	286	16	17	15	1	50	3	19	45	0	9
00-00	3361	4	2877	292	17	17	17	1	52	3	20	52	0	9

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Northbound** | **21 December 2011**
Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	12	0	11	1	0	0	0	0	0	0	0	0	0	0
0100	9	0	8	0	0	0	0	0	0	0	0	1	0	0
0200	15	0	14	1	0	0	0	0	0	0	0	0	0	0
0300	8	0	3	1	0	0	0	0	2	0	1	0	0	1
0400	11	0	4	1	0	0	2	0	1	0	1	2	0	0
0500	28	0	19	3	0	0	2	0	2	0	0	2	0	0
0600	67	0	46	9	0	2	0	0	4	0	3	3	0	0
0700	216	0	171	24	3	2	1	0	8	1	0	5	0	1
0800	301	1	260	26	2	2	1	0	3	0	2	4	0	0
0900	228	0	189	19	1	3	3	0	4	1	2	5	0	1
1000	188	0	166	14	1	1	0	0	1	0	1	4	0	0
1100	183	0	151	22	1	1	0	0	3	0	1	3	0	1
1200	176	0	140	25	0	2	0	0	4	0	1	4	0	0
1300	200	0	171	18	0	2	1	0	2	0	1	5	0	0
1400	205	0	170	20	1	1	2	0	6	0	1	3	0	1
1500	249	0	214	23	0	1	2	0	4	0	1	3	0	1
1600	245	0	206	26	1	2	2	0	3	0	1	4	0	0
1700	397	0	354	30	3	1	1	0	4	0	1	1	1	1
1800	274	0	246	23	0	0	0	0	1	0	1	3	0	0
1900	182	0	167	12	1	0	0	0	0	0	0	2	0	0
2000	112	0	104	6	1	0	0	0	0	0	0	1	0	0
2100	72	0	69	3	0	0	0	0	0	0	0	0	0	0
2200	57	1	54	2	0	0	0	0	0	0	0	0	0	0
2300	40	0	35	4	0	0	0	0	0	0	0	1	0	0
07-19	2862	1	2438	270	13	18	13	0	43	2	13	44	1	6
06-22	3295	1	2824	300	15	20	13	0	47	2	16	50	1	6
06-00	3392	2	2913	306	15	20	13	0	47	2	16	51	1	6
00-00	3475	2	2972	313	15	20	17	0	52	2	18	56	1	7

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Northbound** | **22 December 2011**
Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	20	0	16	2	0	0	0	0	0	0	0	2	0	0
0100	9	0	7	1	0	0	0	0	0	0	0	1	0	0
0200	9	0	7	0	0	0	0	0	0	0	1	1	0	0
0300	6	0	5	0	0	0	0	0	0	0	0	1	0	0
0400	11	0	4	3	0	0	1	0	1	0	1	1	0	0
0500	32	0	19	4	0	1	4	0	1	0	1	1	0	1
0600	76	0	60	4	0	2	2	0	3	1	0	4	0	0
0700	199	1	162	25	2	2	0	0	3	0	2	2	0	0
0800	277	1	229	25	4	1	1	0	8	1	1	5	0	1
0900	238	0	210	20	0	2	0	0	3	0	0	3	0	0
1000	179	0	144	24	1	1	2	0	2	0	1	4	0	0
1100	181	0	150	19	1	2	0	0	4	0	1	3	0	1
1200	234	0	198	26	0	2	2	0	1	0	2	3	0	0
1300	247	0	211	24	1	2	1	0	4	0	1	3	0	0
1400	236	0	200	23	0	3	1	0	2	0	1	5	0	1
1500	256	0	228	23	0	2	0	0	3	0	0	1	0	0
1600	248	1	214	22	2	2	1	0	2	0	1	3	0	0
1700	344	0	307	25	1	1	2	0	4	1	1	1	0	1
1800	248	1	223	16	1	1	0	0	1	0	1	4	0	0
1900	186	0	174	12	0	0	0	0	0	0	0	0	0	0
2000	98	0	90	5	1	0	0	0	0	0	0	2	0	0
2100	69	0	62	4	1	0	0	1	0	0	0	1	0	0
2200	59	0	53	4	0	0	0	0	1	0	0	1	0	0
2300	52	1	43	6	0	0	0	0	1	0	0	1	0	0
07-19	2887	4	2476	272	13	20	10	0	37	2	12	37	0	4
06-22	3316	4	2862	297	15	22	12	1	40	3	12	44	0	4
06-00	3427	5	2958	307	15	22	12	1	42	3	12	46	0	4
00-00	3514	5	3016	317	15	23	17	1	44	3	15	53	0	5

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Southbound** | **16 December 2011**
Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	29	0	26	3	0	0	0	0	0	0	0	0	0	0
0100	12	0	11	1	0	0	0	0	0	0	0	0	0	0
0200	11	0	9	2	0	0	0	0	0	0	0	0	0	0
0300	12	0	10	1	0	0	0	0	0	0	0	1	0	0
0400	13	0	9	2	0	0	0	0	0	0	1	1	0	0
0500	37	0	26	5	1	1	0	0	1	0	1	2	0	0
0600	186	0	158	19	1	2	1	0	1	0	1	3	0	0
0700	342	0	290	38	2	4	0	0	3	0	2	3	0	0
0800	332	0	288	31	0	4	0	0	1	1	3	4	0	0
0900	183	0	154	18	1	2	0	0	3	0	1	3	0	1
1000	133	0	100	20	0	3	2	0	4	0	1	3	0	0
1100	150	0	115	19	1	5	1	0	4	0	1	4	0	0
1200	166	0	135	18	1	1	2	0	4	0	3	2	0	0
1300	213	0	184	15	1	2	1	0	3	0	2	5	0	0
1400	202	0	172	15	1	3	2	0	4	0	1	4	0	0
1500	197	0	168	20	1	2	0	0	2	0	3	2	0	0
1600	283	0	250	19	2	2	1	0	3	0	1	4	0	1
1700	244	0	219	16	0	1	1	0	2	0	1	3	0	1
1800	218	0	200	11	1	1	0	1	1	0	0	3	0	0
1900	150	0	139	7	0	0	1	0	1	0	1	1	0	0
2000	129	0	116	7	1	1	0	0	0	0	2	2	0	0
2100	112	1	104	5	0	0	0	0	0	0	1	1	0	0
2200	53	0	52	0	0	0	0	0	0	0	0	1	0	0
2300	45	0	41	3	0	1	0	0	0	0	0	0	0	0
07-19	2663	0	2275	240	11	29	10	1	34	1	19	40	0	3
06-22	3240	1	2792	278	13	32	12	1	36	1	24	47	0	3
06-00	3338	1	2885	281	13	33	12	1	36	1	24	48	0	3
00-00	3452	1	2976	295	14	34	12	1	37	1	26	52	0	3

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Southbound** | **17 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	33	0	29	2	0	0	0	0	0	0	1	1	0	0
0100	35	0	29	3	1	1	0	0	0	0	0	1	0	0
0200	26	0	23	2	0	0	0	0	0	0	0	1	0	0
0300	9	0	8	1	0	0	0	0	0	0	0	0	0	0
0400	16	0	14	1	0	1	0	0	0	0	0	0	0	0
0500	22	0	17	3	0	0	0	0	0	0	0	1	0	1
0600	60	0	53	5	1	0	0	0	0	0	0	1	0	0
0700	66	0	50	10	1	0	1	0	1	0	1	1	0	1
0800	83	0	70	8	0	0	1	0	1	0	0	2	0	1
0900	94	0	80	9	0	2	1	0	1	0	0	1	0	0
1000	113	0	95	13	0	1	1	0	1	0	1	1	0	0
1100	141	0	122	16	1	1	1	0	0	0	0	0	0	0
1200	150	1	136	10	0	1	0	0	1	0	0	1	0	0
1300	163	0	149	12	0	1	0	0	0	0	0	1	0	0
1400	191	0	179	10	0	0	0	0	1	0	0	1	0	0
1500	213	0	200	13	0	0	0	0	0	0	0	0	0	0
1600	227	1	213	9	0	2	0	0	1	0	0	0	0	1
1700	192	0	182	9	0	0	0	0	1	0	0	0	0	0
1800	155	0	149	6	0	0	0	0	0	0	0	0	0	0
1900	132	0	123	8	0	0	0	0	0	0	0	1	0	0
2000	84	0	80	4	0	0	0	0	0	0	0	0	0	0
2100	63	0	58	4	0	1	0	0	0	0	0	0	0	0
2200	35	0	32	3	0	0	0	0	0	0	0	0	0	0
2300	28	0	26	2	0	0	0	0	0	0	0	0	0	0
07-19	1788	2	1625	125	2	8	5	0	8	0	2	8	0	3
06-22	2127	2	1939	146	3	9	5	0	8	0	2	10	0	3
06-00	2190	2	1997	151	3	9	5	0	8	0	2	10	0	3
00-00	2331	2	2117	163	4	11	5	0	8	0	3	14	0	4

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Southbound** | **18 December 2011**
Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	36	0	30	5	0	1	0	0	0	0	0	0	0	0
0100	25	0	24	1	0	0	0	0	0	0	0	0	0	0
0200	19	0	18	1	0	0	0	0	0	0	0	0	0	0
0300	16	0	16	0	0	0	0	0	0	0	0	0	0	0
0400	13	0	12	1	0	0	0	0	0	0	0	0	0	0
0500	20	0	17	3	0	0	0	0	0	0	0	0	0	0
0600	31	0	25	4	0	0	1	0	0	0	0	1	0	0
0700	23	0	20	3	0	0	0	0	0	0	0	0	0	0
0800	54	0	38	14	0	1	0	0	0	0	0	1	0	0
0900	46	0	40	4	0	1	0	0	0	0	0	1	0	0
1000	66	0	65	1	0	0	0	0	0	0	0	0	0	0
1100	123	0	116	5	1	0	0	0	0	0	0	1	0	0
1200	127	0	115	8	0	1	0	0	1	0	1	1	0	0
1300	149	0	138	7	0	1	1	0	2	0	0	0	0	0
1400	171	0	167	4	0	0	0	0	0	0	0	0	0	0
1500	182	0	174	5	1	0	0	0	1	0	0	1	0	0
1600	171	0	163	8	0	0	0	0	0	0	0	0	0	0
1700	174	0	170	4	0	0	0	0	0	0	0	0	0	0
1800	172	0	162	6	0	0	0	0	2	0	0	2	0	0
1900	116	0	112	4	0	0	0	0	0	0	0	0	0	0
2000	84	0	83	1	0	0	0	0	0	0	0	0	0	0
2100	60	0	58	1	0	0	0	0	0	0	0	1	0	0
2200	38	0	36	2	0	0	0	0	0	0	0	0	0	0
2300	23	0	22	0	0	0	0	0	0	0	0	1	0	0
07-19	1458	0	1368	69	2	4	1	0	6	0	1	7	0	0
06-22	1749	0	1646	79	2	4	2	0	6	0	1	9	0	0
06-00	1810	0	1704	81	2	4	2	0	6	0	1	10	0	0
00-00	1939	0	1821	92	2	5	2	0	6	0	1	10	0	0

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Southbound** | **19 December 2011**
Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	20	0	19	1	0	0	0	0	0	0	0	0	0	0
0100	7	0	7	0	0	0	0	0	0	0	0	0	0	0
0200	7	0	7	0	0	0	0	0	0	0	0	0	0	0
0300	11	0	10	1	0	0	0	0	0	0	0	0	0	0
0400	14	0	10	2	0	0	0	0	0	0	1	1	0	0
0500	46	0	35	6	0	0	0	0	1	0	0	3	0	1
0600	197	0	161	21	1	1	2	0	2	0	6	2	0	1
0700	414	1	366	33	4	2	0	0	1	1	1	5	0	0
0800	333	1	287	27	1	4	0	0	7	1	1	3	0	1
0900	201	0	167	22	1	3	0	0	4	0	1	3	0	0
1000	135	0	104	18	0	2	1	0	3	0	3	4	0	0
1100	149	0	122	18	1	1	0	0	3	0	2	2	0	0
1200	150	0	119	20	0	2	1	0	4	0	0	3	0	1
1300	167	0	142	16	1	0	1	0	3	0	2	2	0	0
1400	195	0	165	16	2	1	2	0	4	0	1	3	0	1
1500	189	0	166	14	0	2	1	0	1	0	1	4	0	0
1600	281	0	241	22	2	2	2	0	6	1	1	3	0	1
1700	297	1	264	20	2	1	1	0	2	1	1	2	0	2
1800	196	0	181	8	1	1	0	0	1	0	1	2	0	1
1900	152	0	138	11	0	0	0	0	0	0	1	1	0	1
2000	102	0	89	7	0	1	0	0	2	0	0	3	0	0
2100	77	0	68	4	1	0	1	0	0	0	1	2	0	0
2200	58	0	54	3	0	0	0	0	0	0	0	1	0	0
2300	34	0	33	0	0	0	0	0	0	0	0	1	0	0
07-19	2707	3	2324	234	15	21	9	0	39	4	15	36	0	7
06-22	3235	3	2780	277	17	23	12	0	43	4	23	44	0	9
06-00	3327	3	2867	280	17	23	12	0	43	4	23	46	0	9
00-00	3432	3	2955	290	17	23	12	0	44	4	24	50	0	10

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Southbound** | **20 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	21	0	17	1	1	0	0	0	1	0	1	0	0	0
0100	9	0	8	0	0	0	0	0	0	0	0	1	0	0
0200	6	0	5	0	0	0	0	0	0	0	0	1	0	0
0300	5	0	5	0	0	0	0	0	0	0	0	0	0	0
0400	22	0	14	4	0	0	0	0	0	0	2	2	0	0
0500	53	0	39	5	0	1	0	0	0	0	3	4	0	1
0600	200	1	171	19	1	2	0	0	0	0	1	4	0	1
0700	370	0	321	34	3	2	0	0	2	0	2	6	0	0
0800	331	0	290	27	0	2	2	0	4	0	1	5	0	0
0900	209	0	166	25	2	4	0	0	7	1	1	3	0	0
1000	151	0	120	17	0	1	1	0	3	0	3	4	0	1
1100	156	0	126	14	0	3	3	0	5	0	3	3	0	0
1200	162	1	135	15	0	0	2	0	4	0	2	3	0	0
1300	187	0	157	20	1	1	1	0	3	0	2	2	0	0
1400	204	1	168	17	2	2	0	1	5	1	3	2	0	2
1500	183	0	155	17	1	2	1	0	4	0	2	2	0	0
1600	245	1	203	26	2	3	2	0	3	0	1	3	0	1
1700	281	0	263	12	0	2	0	0	2	0	0	2	0	0
1800	225	0	204	12	1	1	1	0	0	0	2	4	0	0
1900	155	0	139	6	0	0	0	0	2	0	1	6	0	1
2000	111	0	101	6	0	1	0	0	0	0	1	2	0	0
2100	90	0	78	6	1	0	0	0	1	0	1	2	0	1
2200	72	0	68	1	0	0	0	0	0	0	1	2	0	0
2300	42	0	37	1	0	0	0	0	0	0	0	3	0	1
07-19	2704	3	2308	236	12	22	13	1	42	2	22	39	0	4
06-22	3260	4	2797	273	14	25	13	1	45	2	26	53	0	7
06-00	3374	4	2902	275	14	25	13	1	45	2	27	58	0	8
00-00	3490	4	2990	285	15	26	13	1	46	2	33	66	0	9

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Southbound** | **21 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	15	0	15	0	0	0	0	0	0	0	0	0	0	0
0100	11	0	10	0	0	0	0	0	0	0	0	1	0	0
0200	14	0	11	1	0	0	0	0	0	0	1	1	0	0
0300	7	0	6	1	0	0	0	0	0	0	0	0	0	0
0400	15	0	8	3	0	0	0	0	0	0	3	1	0	0
0500	55	0	41	6	0	0	0	0	0	0	3	5	0	0
0600	198	0	168	20	3	2	0	0	2	0	0	3	0	0
0700	411	1	353	43	1	2	1	0	1	0	4	5	0	0
0800	345	0	307	28	0	1	0	1	3	0	2	3	0	0
0900	211	0	171	23	3	2	1	0	4	1	1	4	0	1
1000	161	0	130	18	0	2	2	0	3	1	2	3	0	0
1100	162	0	136	17	0	1	2	0	2	1	1	2	0	0
1200	185	1	160	16	0	1	1	0	3	0	1	1	0	1
1300	201	0	172	18	0	0	1	0	3	0	2	5	0	0
1400	192	0	162	14	0	2	1	0	7	0	3	3	0	0
1500	197	0	171	18	1	2	0	0	3	0	1	2	0	0
1600	233	1	204	16	1	2	2	0	4	0	1	2	0	0
1700	297	1	270	18	0	1	1	0	2	0	2	2	0	0
1800	198	0	180	12	1	1	1	0	1	0	0	2	0	0
1900	157	0	146	7	0	0	0	0	1	0	0	3	0	0
2000	136	0	125	6	1	0	0	0	0	0	0	4	0	0
2100	89	0	83	6	0	0	0	0	0	0	0	0	0	0
2200	57	0	53	2	0	0	0	0	0	0	1	1	0	0
2300	44	1	39	2	0	0	0	0	0	0	1	1	0	0
07-19	2793	4	2416	241	7	16	13	1	36	3	20	34	0	2
06-22	3373	4	2938	280	11	18	13	1	39	3	20	44	0	2
06-00	3474	5	3030	284	11	18	13	1	39	3	22	46	0	2
00-00	3591	5	3121	295	11	18	13	1	39	3	29	54	0	2

ABACUS TRANSPORTATION SURVEYS

Indaver Traffic Counts | **Site 03 Southbound** | **22 December 2011**

Automatic Traffic Counts | **Ath/11/071**

TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
0000	24	0	21	2	0	0	0	0	0	0	1	0	0	0
0100	13	0	12	1	0	0	0	0	0	0	0	0	0	0
0200	10	0	8	1	0	0	0	0	0	0	0	1	0	0
0300	10	0	8	0	0	0	0	0	0	0	1	1	0	0
0400	18	0	12	4	0	0	0	0	1	0	0	1	0	0
0500	51	0	40	6	0	0	0	1	2	0	0	2	0	0
0600	171	0	145	15	1	0	0	0	2	0	4	3	0	1
0700	306	0	267	27	3	1	0	0	3	0	0	3	0	2
0800	333	0	293	26	0	3	1	0	2	1	2	3	0	2
0900	209	0	170	26	0	3	0	0	4	0	2	3	0	1
1000	153	0	126	19	1	0	2	0	2	0	1	2	0	0
1100	177	1	143	21	0	3	1	0	3	0	1	3	0	1
1200	204	1	170	21	0	2	2	0	3	0	1	4	0	0
1300	194	0	162	20	1	2	1	0	5	0	2	1	0	0
1400	226	0	196	21	1	2	1	0	3	0	1	1	0	0
1500	203	1	178	17	0	0	2	0	1	1	1	1	0	1
1600	274	2	235	23	1	1	1	0	5	0	2	3	0	1
1700	274	1	252	15	1	1	1	0	1	0	1	1	0	0
1800	207	0	194	8	0	1	0	0	1	0	1	2	0	0
1900	139	0	132	4	0	0	0	0	1	0	0	2	0	0
2000	115	0	105	8	0	0	0	0	0	0	0	2	0	0
2100	119	0	113	5	0	0	0	0	0	0	1	0	0	0
2200	84	0	76	5	0	0	1	0	0	0	0	2	0	0
2300	64	0	59	3	0	0	0	0	0	0	1	1	0	0
07-19	2760	6	2386	244	8	19	12	0	33	2	15	27	0	8
06-22	3304	6	2881	276	9	19	12	0	36	2	20	34	0	9
06-00	3452	6	3016	284	9	19	13	0	36	2	21	37	0	9
00-00	3578	6	3117	298	9	19	13	1	39	2	23	42	0	9

Pl.GI date	Waste Origin	Qty (stckpg unit)	BUn	Time Arriva	Time Depart	Ref. Doc.
19/12/2011	Dublin	20,420	KG	08:00:40	08:17:47	20022297
19/12/2011	Cavan	21,420	KG	08:02:55	08:25:35	20021673
19/12/2011	Dublin	19,940	KG	08:13:11	08:38:45	20022297
19/12/2011	Dublin	23,860	KG	08:36:24	08:58:44	20021683
19/12/2011	Dublin	23,760	KG	08:54:24	09:13:42	20021683
19/12/2011	Dundalk	8,060	KG	08:56:03	09:10:33	20021667
19/12/2011	Navan	23,040	KG	09:22:45	09:35:32	20022295
19/12/2011	Dublin	20,880	KG	09:51:25	10:09:56	20022297
19/12/2011	Limerick	19,960	KG	09:55:48	10:21:44	20021634
19/12/2011	Dublin	21,000	KG	10:12:55	10:47:03	20022297
19/12/2011	Limerick	19,140	KG	10:25:26	11:10:03	20021634
19/12/2011	Navan	21,580	KG	10:29:32	11:20:13	20022294
19/12/2011	Dundalk	9,400	KG	11:13:13	11:26:14	20021667
19/12/2011	Monaghan	20,840	KG	11:19:34	12:07:18	20021621
19/12/2011	Meath	12,020	KG	11:53:46	12:06:35	20022424
19/12/2011	Dublin	22,360	KG	11:55:11	12:28:34	20022409
19/12/2011	Drogheda	8,320	KG	12:08:26	12:33:35	20022292
19/12/2011	Navan	25,200	KG	12:26:19	12:42:53	20022295
19/12/2011	Dublin	26,360	KG	12:34:08	13:07:11	20021683
19/12/2011	Cavan	18,540	KG	12:52:17	13:15:24	20021673
19/12/2011	Drogheda	12,180	KG	13:02:56	13:21:55	20022292
19/12/2011	Dublin	24,340	KG	13:11:49	13:38:23	20021683
19/12/2011	Carlow	21,200	KG	13:16:01	13:59:27	20021678
19/12/2011	Dublin	16,900	KG	13:35:34	14:09:23	20021636
19/12/2011	Meath	8,860	KG	13:48:17	14:14:20	20022424
19/12/2011	Meath	12,200	KG	13:56:40	14:20:22	20022424
19/12/2011	Dundalk	19,760	KG	14:36:06	14:52:41	20021674
19/12/2011	Duleek	7,060	KG	14:44:04	14:59:31	20021841
19/12/2011	Navan	24,180	KG	14:47:47	15:30:19	20022294
19/12/2011	Dublin	20,100	KG	15:07:47	15:43:17	20021636
19/12/2011	Dundalk	21,760	KG	15:11:53	15:54:05	20021674
19/12/2011	Drogheda	4,340	KG	15:16:16	16:00:07	20022292
19/12/2011	Dublin	18,360	KG	15:23:28	16:19:50	20021636
19/12/2011	Drogheda	13,040	KG	15:39:43	16:26:39	20022292
19/12/2011	Navan	11,920	KG	15:41:08	16:33:47	20022295
19/12/2011	Clonmel	20,040	KG	15:43:49	16:53:48	20021879
19/12/2011	Navan	11,780	KG	15:49:39	16:49:56	20022295
19/12/2011	Navan	16,240	KG	16:04:14	16:59:01	20022295
19/12/2011	Dublin	20,600	KG	16:20:25	17:10:55	20021636
19/12/2011	Galway	22,800	KG	16:29:12	17:23:05	20021677
19/12/2011	Dublin	26,440	KG	17:26:56	17:50:45	20021683
19/12/2011	Dundalk	19,920	KG	18:08:41	18:20:35	20021674
19/12/2011	Dundalk	18,600	KG	18:11:16	18:27:19	20021674
19/12/2011	Limerick	24,960	KG	18:20:46	19:03:58	20021634
20/12/2011	Dublin	25,020	KG	08:13:46	08:49:28	20021636
20/12/2011	Dundalk	7,720	KG	08:44:18	08:56:10	20021667
20/12/2011	Donegal	25,180	KG	09:04:18	09:45:40	20021672
20/12/2011	Dublin	18,500	KG	09:22:39	10:01:37	20021940
20/12/2011	Navan	6,760	KG	09:33:32	10:00:42	20021843
20/12/2011	Limerick	19,920	KG	09:47:17	10:11:59	20021634
20/12/2011	Navan	20,980	KG	10:27:03	10:39:25	20022294
20/12/2011	Newtowncunningham	22,260	KG	10:28:47	10:50:46	20021671
20/12/2011	Drogheda	11,400	KG	10:29:45	11:00:00	20022292
20/12/2011	Drogheda	13,500	KG	10:37:17	11:34:30	20022292
20/12/2011	Limerick	19,300	KG	11:11:37	12:03:26	20021634

20/12/2011	Dundalk	9,380	KG	11:31:03	12:12:15	20021667
20/12/2011	Drogheda	12,420	KG	12:14:25	12:22:31	20022292
20/12/2011	Dublin	19,960	KG	12:20:32	12:41:27	20021940
20/12/2011	Drogheda	3,300	KG	12:37:29	12:47:17	20022292
20/12/2011	Westport	3,980	KG	12:45:57	12:58:02	20022737
20/12/2011	Clonmel	20,040	KG	12:58:39	13:33:55	20021879
20/12/2011	Monaghan	20,920	KG	13:01:16	14:03:54	20021621
20/12/2011	Meath	18,740	KG	13:16:18	13:48:06	20022424
20/12/2011	Meath	14,880	KG	15:18:23	15:29:45	20022424
20/12/2011	Drogheda	11,840	KG	15:36:57	15:46:04	20022292
20/12/2011	Navan	14,000	KG	15:41:50	15:52:16	20022295
20/12/2011	Navan	12,920	KG	15:48:33	15:59:32	20022295
20/12/2011	Drogheda	2,200	KG	16:04:23	16:13:06	20022292
20/12/2011	Duleek	12,440	KG	17:21:01	17:32:44	20021841
21/12/2011	Meath	16,400	KG	08:00:24	08:25:56	20022424
21/12/2011	Navan	27,260	KG	09:44:00	10:13:09	20022294
21/12/2011	Dundalk	14,760	KG	10:22:48	10:34:29	20021667
21/12/2011	Dundalk	19,240	KG	13:18:32	13:45:40	20021674
21/12/2011	Dundalk	19,000	KG	13:22:39	13:34:58	20021674
21/12/2011	Duleek	7,300	KG	13:52:05	14:02:27	20021841
21/12/2011	Navan	16,780	KG	14:09:25	14:18:20	20022295
21/12/2011	Dundalk	12,640	KG	14:56:56	15:07:55	20021667
21/12/2011	Dublin	21,560	KG	15:31:15	16:05:16	20021636
21/12/2011	Drogheda	12,940	KG	15:52:35	16:09:28	20022292
21/12/2011	Limerick	26,560	KG	16:00:41	16:44:43	20021634
21/12/2011	Drogheda	11,980	KG	16:19:35	16:54:16	20022292
21/12/2011	Navan	9,020	KG	16:29:02	17:06:55	20022295
21/12/2011	Drogheda	4,420	KG	16:31:37	17:11:48	20022292
21/12/2011	Navan	18,080	KG	16:34:56	17:19:24	20022295
21/12/2011	Drogheda	9,540	KG	16:43:08	17:22:46	20022292
21/12/2011	Monaghan	22,980	KG	16:51:23	18:00:05	20021621
21/12/2011	Navan	3,380	KG	16:58:14	17:54:35	20021843
22/12/2011	Navan	10,220	KG	09:07:00	09:18:56	20021843
22/12/2011	Donegal	26,280	KG	09:39:31	10:10:31	20021672
22/12/2011	Navan	21,640	KG	10:39:00	10:52:15	20022294
22/12/2011	Drogheda	13,300	KG	11:29:40	11:43:30	20022292
22/12/2011	Drogheda	13,120	KG	12:07:21	12:17:13	20022292
22/12/2011	Dundalk	17,320	KG	12:18:19	12:34:01	20021674
22/12/2011	Dundalk	18,580	KG	12:47:39	13:17:44	20021674
22/12/2011	Drogheda	13,400	KG	12:51:35	13:27:47	20022292
22/12/2011	Monaghan	4,460	KG	13:32:38	14:15:29	20021621
22/12/2011	Dundalk	12,080	KG	13:41:41	14:21:49	20021667
22/12/2011	Cavan	20,340	KG	13:51:53	14:36:43	20021673
22/12/2011	Drogheda	2,160	KG	14:18:07	14:46:40	20022292
22/12/2011	Dundalk	12,660	KG	14:21:44	14:53:25	20021667
22/12/2011	Dublin	20,920	KG	15:07:00	15:39:13	20021636
22/12/2011	Drogheda	2,480	KG	15:31:24	15:43:57	20022292
22/12/2011	Clonmel	20,960	KG	15:56:14	16:13:17	20021879
22/12/2011	Monaghan	21,060	KG	16:16:21	17:04:26	20021621
22/12/2011	Duleek	2,100	KG	16:18:04	16:30:18	20021841
22/12/2011	Navan	15,580	KG	17:05:41	17:15:27	20022295
22/12/2011	Duleek	11,480	KG	17:13:43	17:21:25	20021841
23/12/2011	Navan	22,300	KG	08:00:51	08:21:48	20022294
23/12/2011	Cavan	20,700	KG	08:02:03	08:41:04	20021673
23/12/2011	Dundalk	17,500	KG	09:06:29	09:20:33	20021674
23/12/2011	Meath	13,700	KG	09:12:00	09:28:13	20022424

23/12/2011	Limerick	19,180	KG	09:30:53	10:06:55	20021634
23/12/2011	Dundalk	14,840	KG	10:51:38	11:07:36	20021674
23/12/2011	Cavan	19,720	KG	10:59:32	11:22:11	20021673
23/12/2011	Monaghan	20,940	KG	12:19:25	13:09:04	20021621
23/12/2011	Drogheda	7,960	KG	13:24:47	13:36:16	20022292
23/12/2011	Dundalk	9,220	KG	14:10:33	14:26:06	20021667
23/12/2011	Duleek	8,840	KG	14:52:49	15:03:44	20021841
23/12/2011	Navan	12,900	KG	15:07:16	15:17:40	20021843
23/12/2011	Navan	10,120	KG	15:13:56	15:24:27	20022295
23/12/2011	Drogheda	13,080	KG	15:27:50	15:41:07	20022292
23/12/2011	Limerick	25,380	KG	15:55:14	16:25:04	20021634
23/12/2011	Drogheda	12,900	KG	15:56:42	16:32:05	20022292
23/12/2011	Dublin	20,180	KG	16:01:45	18:18:56	20021636
23/12/2011	Drogheda	2,080	KG	17:11:23	17:20:34	20022292
23/12/2011	Dundalk	10,540	KG	17:22:39	17:32:56	20021667
23/12/2011	Duleek	6,880	KG	18:07:57	18:27:32	20021841
24/12/2011	Dublin	27,200	KG	08:00:32	08:28:34	20021636
24/12/2011	Cavan	20,200	KG	08:02:32	08:40:30	20021673
24/12/2011	Cavan	23,020	KG	08:03:54	08:53:27	20021673
24/12/2011	Navan	7,620	KG	09:01:54	09:14:04	20022295
24/12/2011	Bray	21,040	KG	09:24:41	09:49:30	20022725
24/12/2011	Drogheda	6,460	KG	10:07:15	10:22:33	20022292
24/12/2011	Navan	24,220	KG	10:35:55	10:48:38	20022294
24/12/2011	Dublin	27,100	KG	10:37:22	10:56:52	20021636
24/12/2011	Drogheda	8,540	KG	11:28:39	11:40:54	20022292
24/12/2011	Dublin	18,940	KG	12:12:08	12:26:36	20021636
24/12/2011	Dublin	20,740	KG	12:24:48	12:37:59	20021636
24/12/2011	Dundalk	16,160	KG	12:40:26	12:52:18	20021674
24/12/2011	Dundalk	17,720	KG	12:43:56	13:03:00	20021674
24/12/2011	Drogheda	9,300	KG	12:53:04	13:07:34	20022292
24/12/2011	Dublin	22,360	KG	13:10:01	13:28:33	20021636
24/12/2011	Bray	21,980	KG	13:12:20	13:35:53	20022725
		2,307,380	**KG**			

Delivery	Description	Delivery quantity	Sales unit	Inbound date	Outbound date	Time Departure	Time Arrival	Destination	Origin Of transport Unit
80180695	BOTTM ASH	27620	KG	19/12/2011	19/12/2011	12:21:11	11:51:35	Collen, Co Louth	Collen, Co Louth
80180696	BOTTM ASH	26620	KG	19/12/2011	19/12/2011	10:28:35	09:50:59	Collen, Co Louth	Collen, Co Louth
80180697	BOTTM ASH	26220	KG	19/12/2011	19/12/2011	08:26:13	07:47:53	Collen, Co Louth	Bellewstown
80180746	BOTTM ASH	25960	KG	19/12/2011	19/12/2011	14:15:16	13:52:39	Collen, Co Louth	Collen, Co Louth
80180803	BOTTM ASH	27220	KG	20/12/2011	20/12/2011	08:00:17	07:26:33	Collen, Co Louth	Bellewstown
80180804	BOTTM ASH	29500	KG	20/12/2011	20/12/2011	09:45:04	09:12:32	Collen, Co Louth	Collen, Co Louth
80180807	BOTTM ASH	26620	KG	20/12/2011	20/12/2011	11:36:44	11:11:30	Collen, Co Louth	Collen, Co Louth
80180808	BOTTM ASH	25460	KG	20/12/2011	20/12/2011	13:03:10	12:40:13	Collen, Co Louth	Collen, Co Louth
80180904	BOTTM ASH	27160	KG	20/12/2011	20/12/2011	14:33:59	14:09:16	Collen, Co Louth	Collen, Co Louth
80180927	BOTTM ASH	29200	KG	21/12/2011	21/12/2011	12:44:38	12:24:38	Collen, Co Louth	Collen, Co Louth
80180928	BOTTM ASH	27460	KG	21/12/2011	21/12/2011	11:19:36	10:58:45	Collen, Co Louth	Collen, Co Louth
80180929	BOTTM ASH	28940	KG	21/12/2011	21/12/2011	09:54:06	09:22:12	Collen, Co Louth	Collen, Co Louth
80180930	BOTTM ASH	29400	KG	21/12/2011	21/12/2011	08:10:16	07:44:37	Collen, Co Louth	Indaver Site
80180931	BOTTM ASH	27060	KG	21/12/2011	21/12/2011	08:00:56	07:25:05	Collen, Co Louth	Bellewstown
80180932	BOTTM ASH	29900	KG	21/12/2011	21/12/2011	09:35:50	09:14:41	Collen, Co Louth	Collen, Co Louth
80180933	BOTTM ASH	29800	KG	21/12/2011	21/12/2011	11:19:01	10:53:49	Collen, Co Louth	Collen, Co Louth
80180934	BOTTM ASH	25940	KG	21/12/2011	21/12/2011	13:23:25	12:59:25	Collen, Co Louth	Collen, Co Louth
80181014	BOTTM ASH	25080	KG	21/12/2011	21/12/2011	14:53:29	14:34:46	Collen, Co Louth	Collen, Co Louth
80181050	BOTTM ASH	29140	KG	22/12/2011	22/12/2011	09:01:29	08:39:21	Collen, Co Louth	Collen, Co Louth
80181051	BOTTM ASH	27120	KG	22/12/2011	22/12/2011	08:00:46	07:36:43	Collen, Co Louth	Bellewstown
80181052	BOTTM ASH	26760	KG	22/12/2011	22/12/2011	09:49:53	09:28:06	Collen, Co Louth	Collen, Co Louth
80181053	BOTTM ASH	24640	KG	22/12/2011	22/12/2011	11:36:31	11:16:05	Collen, Co Louth	Collen, Co Louth
80181054	BOTTM ASH	24900	KG	22/12/2011	22/12/2011	13:08:11	12:50:57	Collen, Co Louth	Collen, Co Louth
80181183	BOTTM ASH	24980	KG	23/12/2011	23/12/2011	08:11:52	07:51:31	Collen, Co Louth	Bellewstown
80181184	BOTTM ASH	24960	KG	23/12/2011	23/12/2011	10:02:10	09:29:26	Collen, Co Louth	Collen, Co Louth
80181188	BOTTM ASH	26600	KG	23/12/2011	23/12/2011	11:33:15	11:05:21	Collen, Co Louth	Collen, Co Louth
80181189	BOTTM ASH	25360	KG	23/12/2011	23/12/2011	09:35:26	09:14:48	Collen, Co Louth	Collen, Co Louth
80181190	BOTTM ASH	28060	KG	23/12/2011	23/12/2011	08:01:09	07:26:48	Collen, Co Louth	Indaver Site

Existing & Estaimted Future HGV Traffic

Survey period 19/12/2011 - 24/12/2011

Average tonnage per vehicle	16
Average delivery tonnage per day	420
Equivalent tonnage per year	113,062
Two-way traffic movements	**vehicles / day**
Average daily delivery HGV movements (period 19 - 23/12/2012)	51
Average daily residues HGV movements	6
Average raw materials HGV movements	6
Average daily total vehicle movements	62
200,000 tonne equivalent	110
220,000 tonne equivalent	121
Average Increase on existing permitted	48
Average Increase on current permitted	11
Average increase on recorded traffic 19 - 23/12/2012	59

Appendix 13.3

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 4.0 (NOV 2003)

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Run with file:-
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(drive-on-the-left) at 10:41:17 on Wednesday, 15 February 2012

RUN TITLE
****
Indaver Carranstown Site

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

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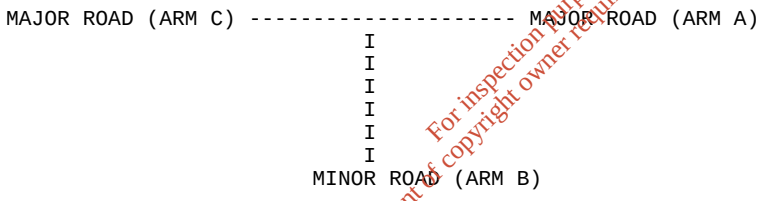

ARM A IS R152 South
ARM B IS Indaver Site Access
ARM C IS R152 North

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 10.50 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.30 M.
- VISIBILITY	(VC-B) 100.0 M.
- BLOCKS TRAFFIC	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 90.0 M.
- VISIBILITY TO RIGHT	(VB-A) 100.0 M.
- LANE 1 WIDTH	(WB-C) -
- LANE 2 WIDTH	(WB-A) -
- WIDTH AT 0 M FROM JUNC.	5.00 M.
- WIDTH AT 5 M FROM JUNC.	3.75 M.
- WIDTH AT 10 M FROM JUNC.	3.75 M.
- WIDTH AT 15 M FROM JUNC.	3.75 M.
- WIDTH AT 20 M FROM JUNC.	3.75 M.
- LENGTH OF FLARED SECTION	2 VEHS

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.00

LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN):

TIME INTERVAL	ARM A	ARM B	ARM C
08.00 - 08.15			
ENTRY	6.0	0.3	10.6
EXIT	10.3	0.5	6.0
08.15 - 08.30			
ENTRY	8.3	0.1	7.8
EXIT	7.7	0.4	8.1
08.30 - 08.45			
ENTRY	8.8	0.1	8.1
EXIT	7.9	0.2	8.9
08.45 - 09.00			
ENTRY	9.5	0.3	9.3
EXIT	9.2	0.2	9.6

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS (PERCENTAGE OF H.V.S)		
08.00 - 09.00	ARM A	0.000 (0.0)	0.016 (8.2)	0.984 (8.2)
	ARM B	0.383 (40.0)	0.000 (0.0)	0.617 (40.0)
	ARM C	0.977 (5.8)	0.023 (5.8)	0.000 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.17	7.21	0.023		0.0	0.0	0.3	
B-A	0.10	4.11	0.025		0.0	0.0	0.4	
C-A	10.36							
C-B	0.24	9.79	0.025		0.0	0.0	0.4	
A-B	0.09							
A-C	5.91							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.04	6.87	0.006		0.0	0.0	0.1	
B-A	0.03	4.05	0.007		0.0	0.0	0.1	
C-A	7.62							
C-B	0.18	9.28	0.019		0.0	0.0	0.3	
A-B	0.13							
A-C	8.14							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.04	6.78	0.006		0.0	0.0	0.1	
B-A	0.03	3.94	0.007		0.0	0.0	0.1	
C-A	7.94							
C-B	0.19	9.16	0.020		0.0	0.0	0.3	
A-B	0.14							
A-C	8.66							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.17	6.64	0.025		0.0	0.0	0.4	
B-A	0.10	3.75	0.028		0.0	0.0	0.4	
C-A	9.06							
C-B	0.21	9.01	0.024		0.0	0.0	0.4	
A-B	0.15							
A-C	9.32							

WARNING THE JUNCTION MODELLED CAN CARRY HIGH-SPEED MAJOR ROAD TRAFFIC. (AG23 REF. 8.4.2(v)).

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	6.3	6.3	0.9	0.14	0.9	0.14
B-A	3.9	3.9	1.0	0.25	1.0	0.25
C-A	524.7	524.7				
C-B	12.3	12.3	1.3	0.11	1.3	0.11
A-B	7.7	7.7				
A-C	480.4	480.4				
ALL	1035.3	1035.3	3.2	0.00	3.2	0.00

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

****** PICADY 4 run completed.

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[Printed at 10:41:30 on 15/02/2012]

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CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

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RUN TITLE
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Indaver Carranstown Site

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
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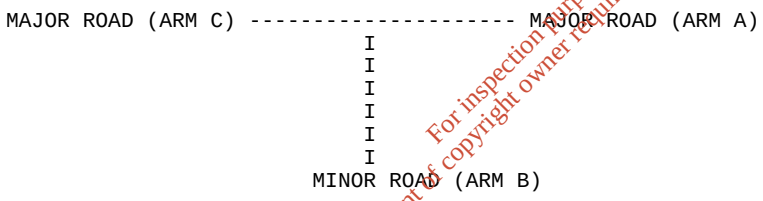

ARM A IS R152 South
ARM B IS Indaver Site Access
ARM C IS R152 North

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 10.50 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.30 M.
- VISIBILITY	(VC-B) 100.0 M.
- BLOCKS TRAFFIC	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 90.0 M.
- VISIBILITY TO RIGHT	(VB-A) 100.0 M.
- LANE 1 WIDTH	(WB-C) -
- LANE 2 WIDTH	(WB-A) -
- WIDTH AT 0 M FROM JUNC.	5.00 M.
- WIDTH AT 5 M FROM JUNC.	3.75 M.
- WIDTH AT 10 M FROM JUNC.	3.75 M.
- WIDTH AT 15 M FROM JUNC.	3.75 M.
- WIDTH AT 20 M FROM JUNC.	3.75 M.
- LENGTH OF FLARED SECTION	2 VEHS

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.00

LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN):

TIME INTERVAL	ARM A	ARM B	ARM C
08.00 - 08.15			
ENTRY	6.1	0.5	10.7
EXIT	10.4	0.8	6.1
08.15 - 08.30			
ENTRY	8.4	0.3	7.9
EXIT	7.8	0.7	8.2
08.30 - 08.45			
ENTRY	8.9	0.3	8.3
EXIT	8.1	0.4	9.0
08.45 - 09.00			
ENTRY	9.6	0.5	9.4
EXIT	9.3	0.5	9.7

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS (PERCENTAGE OF H.V.S)		
08.00 - 09.00	ARM A	0.000 (0.0)	0.029 (9.7)	0.971 (9.7)
	ARM B	0.408 (66.7)	0.000 (0.0)	0.592 (66.7)
	ARM C	0.961 (7.2)	0.039 (7.2)	0.000 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.31	5.90	0.053		0.0	0.1	0.8	
B-A	0.22	3.45	0.063		0.0	0.1	0.9	
C-A	10.29							
C-B	0.41	9.62	0.043		0.0	0.0	0.6	
A-B	0.18							
A-C	5.95							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-C	0.20	5.63	0.035		0.1	0.0	0.6	
B-A	0.13	3.39	0.040		0.1	0.0	0.7	
C-A	7.62							
C-B	0.31	9.10	0.034		0.0	0.0	0.5	
A-B	0.25							
A-C	8.15							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.45								
B-C	0.20	5.55	0.035		0.0	0.0	0.5	
B-A	0.13	3.30	0.041		0.0	0.0	0.6	
C-A	7.94							
C-B	0.32	8.99	0.036		0.0	0.0	0.5	
A-B	0.26							
A-C	8.67							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.45-09.00								
B-C	0.31	5.42	0.058		0.0	0.1	0.9	
B-A	0.22	3.13	0.069		0.0	0.1	1.0	
C-A	9.04							
C-B	0.36	8.83	0.041		0.0	0.0	0.6	
A-B	0.28							
A-C	9.32							

WARNING THE JUNCTION MODELLED CAN CARRY HIGH-SPEED MAJOR ROAD TRAFFIC. (AG23 REF. 8.4.2(v)).

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.0
08.45	0.0
09.00	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.0
08.45	0.0
09.00	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	15.3	15.3	2.8	0.18	2.8	0.18
B-A	10.5	10.5	3.2	0.31	3.2	0.31
C-A	523.3	523.3				
C-B	21.0	21.0	2.4	0.11	2.4	0.11
A-B	14.5	14.5				
A-C	481.4	481.4				
ALL	1066.1	1066.1	8.4	0.01	8.4	0.01

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

****** PICADY 4 run completed.

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[Printed at 10:40:58 on 15/02/2012]

14 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

14.1 INTRODUCTION

ARC Consultants have been commissioned by the Applicant to carry out a visual impact assessment of the development which is the subject of this planning application. The proposed development relates to the conversion of two temporary buildings (a modular office building and a spare parts building) to permanent use and three temporary areas of hard standing as part of the existing Waste-to-Energy Facility at Carranstown, Duleek, County Meath. The subject application also seeks to increase the through-put of the facility from 200,000 tonnes per annum to 220,000 tonnes per annum (a 10% increase).

14.2 METHODOLOGY FOR ASSESSMENT OF POTENTIAL VISUAL IMPACTS

In order to assess the likely visibility and consequent visual impact of the proposed development, staff from ARC visited the site on Friday the 27th of January 2012, to take photographs within the site and from the R152 where it passes the site. The conditions were clear and sunny with good long distance visibility. Photographs were taken with a high-resolution digital camera using a lens with a horizontal angle of coverage of some 73.5 degrees.

14.3 DEFINITION OF VISUAL IMPACTS

The assessment of visual impacts on landscape and on the built environment had regard to the *Guidelines on the Information to be Contained in Environmental Impact Statements* prepared by the Environmental Protection Agency (2002), and to the *European Communities (Environmental Impact Assessment) (Amendment) Regulations, 1999*.

The list of definitions given below is taken from *Section 5: Glossary of Impacts* contained in the *Guidelines on the Information to be Contained in Environmental Impact Statements* prepared by the Environmental Protection Agency. Some comment is also given below on what these definitions might imply in the case of visual impact or landscape and visual impact. The definitions from the EPA document are in italics.

Imperceptible Impact: *An impact capable of measurement but without noticeable consequences.* The definition implies that the development would be visible, capable of detection by the eye, but not noticeable. If the development were not visible, there could be no impact.

Slight Impact: *An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.* For this definition to apply, a development would be both visible and

noticeable, and would also bring about a change in the visual character of the environment. However, apart from the development itself, the visual sensitivity of the surrounding environment should remain unchanged.

Moderate Impact: *An impact that alters the character of the environment in a manner that is consistent with emerging trends.* In this case, a development must bring about a change in the visual character of the environment; and this change must be consistent with a pattern of change that is already taking place.

Significant Impact: *An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.* The wording of the definition is clear. Difficulty in assessing whether an impact might or might not be significant lies in the word 'sensitive'. In visual terms, particularly when related to the appearance of landscape or the built environment, what one person might be sensitive to another might not. A conservative approach, classifying impacts as significant even though many observers might not regard them as significant, is taken here.

Profound Impact: *An impact which obliterates sensitive characteristics.* In visual terms, profound impacts are only likely to occur on a development site, in that it is only on the site that all previous visually sensitive characteristics could be obliterated. Outside the site, some visual characteristic of the original environment is likely to remain.

The range of possible impacts listed above deal largely with the extent of impact; and the extent of the impact of a development is usually proportional to the extent to which that development is visible. The extent of impact will also, in part, depend on the sensitivity of the spaces from which the development is seen. This proportionality may be modified by the extent to which a development is regarded as culturally or socially acceptable.

The character of the impact: positive, negative or neutral, will depend on how well a development is received by the public, and on the general contribution of the development to the built environment. The character of a visual impact, and even the duration of a visual impact, is very dependent on the attitude of the viewer. If a viewer is opposed to a new building for reasons other than visual, that viewer is likely to see the building in a negative light, no matter beautiful the building might be. It is also the case that a building thought startling when first built, in time becomes part of the background, and what at first might have been regarded by the public a significant impact, fades to slight. Though buildings are intended to be permanent, and will be permanently visible, the extent of visual impact associated with a building often diminishes with time.

14.4 POTENTIAL VISUAL IMPACTS

From ARC's on-site assessment, it is clear that neither of the two buildings and none of the three areas of hard-standing are readily visible from outside the site. Glimpses of one of the buildings and one of the areas of hard-standing may be possible from just inside the gate. Since these features will not be visible from outside the site, they can have no visual impact on the surroundings.

The proposed increase in through-put at the facility will result in additional truck movements on the R152. However, as detailed in Chapter 13 Traffic, these additional truck movements are very minor when compared to peak traffic flow on the R152. Therefore this will not give rise to any additional visual impact. In addition, the traffic impact assessment points out that the existing operating hours are 10 hours per day, whereas the proposed operating hours with the additional through-put are to be 14 hours a day, an increase of 40%. It, therefore, appears that there will be a 10% increase in truck movements, but a 40% increase in the period of time over which truck movements may be spread. This would suggest that the number of truck movements per hour would actually reduce.

Two photomontages produced in August 2009 as part of a previous planning application are reproduced on the following pages. Photographs taken from the same locations as these photomontages are also reproduced. The photographs demonstrate that the two subject buildings and three subject areas of hard-standing are not visible from either location. It will be noted that the planting shown in the photomontages is indicated as more mature than that in the photographs. The photomontages were also produced in the summer and show summer foliage, whereas the photographs were taken in January of this year. The photographs also show that some small areas of planting are not yet complete. It is expected that, when planting matures, it will be similar to that represented in the photomontages.

14.5 MITIGATION

This assessment identified no potential visual impacts so no mitigation measures are proposed.

14.6 PREDICTED VISUAL IMPACTS

It is predicted that the development which is the subject of this application will not result in any visual impacts.

Landscape & Visual Impact Assessment

Proposed Amendments to Existing Planning Permission

Indaver Ireland, Carranstown, Co. Meath • 2012

Map Showing Location of Views

Photomontage view from the R152, prepared in August 2009

View 1 • Looking north towards the entrance to the plant

Note: the blue line indicates the outline of the plant as approved under a planning application prior to 2009

Photograph taken in January 2012

View 1 • Looking north towards the entrance to the plant

Photomontage view from the R152, prepared in August 2009

View 2 • Looking south west towards the entrance to the plant

Note: the blue line indicates the outline of the plant as approved under a planning application prior to 2009

Photograph taken in January 2012

View 2 • Looking south west towards the entrance to the plant

15 CLIMATE

15.1 INTRODUCTION

The climate assessment undertaken in 2009 comprehensively addressed the potential impacts of the emissions from the existing development on the climate of the site and its environs. The 2009 study has been updated to allow for an increase in waste accepted from 200,000 tonnes to 220,000 tonnes (including a possible maximum of between 10,000 – 15,000 tpa of suitable hazardous waste). A summary of the key findings of the updated climate assessment is presented below. The general principle of the assessment was to compare greenhouse gas emissions (GHG) from the proposed facility against GHG from an equivalent notional landfill facility.

15.2 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

15.2.1 Forecasting Methods

Predictions of greenhouse gas emissions from the waste management facility were prepared using the emission factors derived from the IPCC[1], UK[2,3] and EU[4] and from information supplied by Indaver Ireland. The prediction of GHG emissions from landfills was developed using the IPCC Landfill Model[5] and using emission factors derived from the IPCC[1].

15.2.2 Construction

There will be some minor construction activities associated with this application. Two existing buildings will be converted from temporary to permanent structures in addition to ancillary roads, additional parking spaces and the installation of a Puraflo effluent treatment system.

15.2.3 Incineration

Incineration would be expected to be the dominant source of greenhouse gas (CO_2, CH_4 and N_2O) emissions from the development. Detailed waste throughput information was obtained from Indaver Ireland and this information was used to estimate GHG emissions from the scheme. The annual waste throughput for the proposed Waste Management Facility will be a maximum of 220,000 tonnes consisting of all non-recyclable household, commercial and/or industrial waste. For the purpose of this study the maximum annual throughput of 220,000 tonnes was used including 20,000 tonnes of industrial hazardous and non-hazardous waste although in reality the maximum tonnage of industrial hazardous and non-hazardous waste will be 10,000 - 15,000 tonnes of suitable hazardous waste streams. The net greenhouse gas contribution from the waste was derived using the procedure recommended by the IPCC. The breakdown of waste for both the "Do Nothing" and "Do Something" scenario is shown in Appendix 15.1 which is based on the most recent national waste breakdown of residual waste[6]. For the

purposes of this assessment, the "Do Nothing" scenario is based on the facility in operation treating 200,000 tonnes of residual household and commercial waste whilst the "Do Something" scenario is based on the facility in operation treating 200,000 tonnes of residual household and commercial waste and 20,000 tonnes of industrial hazardous and non-hazardous waste as a worst-case (industrial hazardous and non-hazardous waste will have a greater GHG impact than MSW).

15.2.4 Road Traffic

Road traffic will be an additional source of greenhouse gas emissions as a result of the development. Waste will be transported from the source of the waste to the site for disposal whilst the ash will subsequently be removed from the facility to be landfilled. In the absence of a detailed breakdown of the sources of waste, a detailed comparison of GHG emissions between the current operation (Do Nothing) and the proposed operation (Do Something) is not possible. However, analysis by the USEPA has estimated that the traffic-derived GHG emissions from waste-to-energy is approximately equivalent at 0.01 MTCE (metric tonnes of carbon equivalent) of anthropogenic CO_2 emission per ton (US) of material incinerated with the resulting ash landfilled(7). In this context, the impact from the transport of the additional waste accounts for less than 2% of the impact from the incineration of waste (excluding energy recovery) and thus is a minor contributor to the overall GHG emission total.

15.2.5 Modelling Methodology – Waste-to-Energy Facility

In order to calculate the scheme's net contribution to greenhouse gas emissions and the effect of the scheme on Ireland's obligations under the Kyoto Protocol, the total forecasted anthropogenic emissions due to the proposed development have been calculated. The baseline year is assumed to be 2012. Given in Table 15.1 and Table 15.2 is the annual greenhouse gas emission from the site for both the "Do Nothing" and "Do Something" scenario. The emissions have been compared with the Kyoto Target for Ireland over the period 2008-2012(8). The contribution to the total greenhouse gas emissions, in the absence of power generation, is 0.11% of the Kyoto Target for the "Do Nothing" scenario and 0.16% of the Kyoto Target for the "Do Something" scenario. Thus, compared to the "Do Nothing" scenario, greenhouse gas emissions increase by no more than 0.05% of the Kyoto Target as a result of this proposal.

During the incineration of waste at the facility the thermal energy generated by the burning of waste will be recovered and when the plant is running at 100% load will give a maximum electrical output of about 18.2MW. The current data from the plant (prior to final optimisations etc) indicates 16.56 MW for both the "Do Nothing" scenario and the "Do Something" scenario. Although this figure will increase over time as the operation of the plant is optimised, the figure is conservative in the context of this assessment. As approximately 1.88 MW and 2.07 MW is required for electrical demand within the plant respectively, the net electrical output from the plant for export to the national grid will be 14.68 MW for the "Do Nothing" scenario and 14.49 MW for the "Do Something" scenario, which will be approximately equivalent to a net electrical output of 114,504 MWh and 113,022 MWh for the "Do Nothing" and "Do Something" scenarios

respectively. Thus, the export of 114,504 MWh / 113,022 MWh will give a direct benefit in terms of greenhouse gas emissions which would have been released in the production of 114,504 MWh / 113,022 MWh from power stations. In order to calculate the net benefit in terms of greenhouse gas emissions, the likely greenhouse gas emissions from a combined cylce gas turbine (CCGT) power station (the most GHG efficient power source) producing 114,504 MWh / 113,022 MWh of power have been calculated and subtracted from the site's greenhouse gas emissions (see Table 15.3 and Table 15.4). The dominant primary fuels, on which the generation system currently relies in terms of electricity generation output, are gas (62%), coal (14%), renewables (16%), peat (8%) and oil (2%)[9]. CO_2 emissions from coal are 77% higher per Joule, peat is 110% higher per joule whilst oil is 49% higher per Joule than natural gas[9]. Thus, the assumption that the displaced power generation is from a CCGT burning natural gas is a worst-case scenario and more pessimistic assumption than using the average fossil fuel profile.

The production of power for export to the national grid is equivalent to a net reduction of 65% in the amount of greenhouse gases emitted from the site for the "Do Nothing" scenario and a net reduction of 46% in the amount of greenhouse gases emitted from the site for the "Do Something" scenario. The actual contribution to the total greenhouse gas emissions is 0.04% of the Kyoto Target for Ireland in 2012 for the "Do Nothing" scenario and 0.09% of the Kyoto Target for Ireland in 2012 for the "Do Something" scenario. Thus, the overall impact of the "Do Something" scenario compared to the "Do Nothing" scenario is to increase Total Greenhouse Gas Emissions in Ireland by 0.05% of the Kyoto Target for Ireland in 2012 and thus the proposal has a negligible impact on Ireland's obligations under the Kyoto protocol.

15.3 PREDICTED IMPACT OF DEVELOPMENT ON CLIMATE

15.3.1 Construction

The effect of construction on climate will not be significant.

15.3.2 Incineration

The contribution of the Waste-to-Energy Facility to total greenhouse gas emissions in Ireland is equivalent to only 0.(of the Kyoto Target for Ireland in 2012, when energy recovery in taken into account. Moreover, compared to the Nothing" scenario, emissions will increase by only 0.05% of the Kyoto Target for Ireland in 2012, when energy reco in taken into account. Thus, the overall annual impact of the existing plant on climate is to increase greenhouse emissions by approximately 0.05% (See Table 15.5) of the total greenhouse gas emissions in Ireland in 2012 and will be imperceptible in terms of Ireland's obligations under the Kyoto Protocol.

15.4 DESCRIPTION OF MITIGATION MEASURES

15.4.1 Construction

As there will be no significant impact on climate, no mitigation measures are proposed.

15.4.2 Incineration

During the incineration of waste at the facility the thermal energy generated by the burning of waste will be recovered and will give an electrical output of about 16.56 MW with a net electrical output from the plant for export to the national grid will be 14.49 MW (equivalent to 113,022 MWh) (see Table 15.4). Thus, the export of 113,022 MWh will give a direct benefit in terms of greenhouse gas emissions which would have been released in the production of 113,022 MWh from power stations.

The Waste-to-Energy facility will also recover and recycle ferrous materials during the incineration process. The recycling of metals will require less energy than processes using virgin inputs and thus lead to a direct saving in energy and thus GHG emissions. A recent USEPA report has estimated that approximately 0.01 MTCE per ton (US) of mixed MSW is saved through recycling of metals[7].

15.5 REFERENCES

(1) IPCC 2006 IPCC Guidelines for National GHG Inventories (2006)
(2) UK DEFRA / ERM (2006) Impact of Energy from Waste and Recycling Policy on UK GHG Emissions
(3) UK DEFRA / ERM (2006) Carbon Balances & Energy Impacts of the Management of UK Wastes
(4) European Commission Waste Management Options and Climate Change (2001)
(5) IPCC (2006) IPCC Spreadsheet for Estimating Methane Emissions from Solid Waste Disposal Sites (IPCC Waste Model) 2006 Guidelines for National GHG Inventories
(6) EPA National Waste Database Report 2009 (2011)
(7) USEPA Greenhouse Gas Emissions From Management of Selected Materials in Municipal Solid Waste (2002)
(8) DEHLG National Climate Change Strategy 2007-2012
(9) SEAI Energy Forecast for Ireland to 2020 – 2011 Report

Table 15.1: Greenhouse Gas Emissions At Indaver Ireland's Waste Management Facility, Carranstown, Based On 200,000 Tonnes/Annum (Do Nothing Scenario)

	CO_2	N_2O[2]	CH_4[3]	% Of Ireland's Total Emissions
Total / Annum (tonnes)[1]	70,481	2.1	15.4	-
Total / Annum (tonnes CO_2 Equivalent)[4]	70,481	592	354	-
Total / Annum (tonnes CO_2 Equivalent)	71,443			0.11

(1) Based on average of the UK[2,3] and EU[4] default emission rates
(2) N_2O Emission Factor of 4 kg/TJ taken from Volume 2 Table 2.2 of IPCC Guidelines (2006)[1]
(3) CH_4 Emission Factor of 30 kg/TJ taken from Volume 2 Table 2.2 of IPCC Guidelines (2006)[1]
(4) Conversion of N_2O and CH_4 to carbon equivalents taken from Council Directive 2009/28/EC

Table 15.2: Greenhouse Gas Emissions At Indaver Ireland's Waste Management Facility, Carranstown, Based On 220,000 Tonnes/Annum (Do Something Scenario)

	CO_2	N_2O[2]	CH_4[3]	% Of Ireland's Total Emissions
Total / Annum (tonnes)[1]	98,641	2.9	21.7	-
Total / Annum (tonnes CO_2 Equivalent)[4]	98,641	899	456	-
Total / Annum (tonnes CO_2 Equivalent)	99,995			0.16

(1) Based on average of the UK[2,3] and EU[4] default emission rates
(2) N_2O Emission Factor of 4 kg/TJ taken from Volume 2 Table 2.2 of IPCC Guidelines (2006)[3]
(3) CH_4 Emission Factor of 30 kg/TJ taken from Volume 2 Table 2.2 of IPCC Guidelines (2006)[3]
(4) Conversion of N_2O and CH_4 to carbon equivalents taken from Council Directive 2009/28/EC

Table 15.3: Greenhouse Gas Emissions At Indaver Ireland's Waste Management Facility, Carranstown As A Result of Exporting 14.68 MW (Do Nothing Scenario)

	CO_2	N_2O[3]	CH_4[3]	% Of Irelands Total Emissions[1]
CCGT Producing 14.68 MW[2] (tonnes)	45,802	1.2	0.41	-
CCGT Producing 14.68 MW (tonnes CO_2 Equivalent)	46,194			-
Total / Annum (tonnes CO_2 Equivalent) After Subtraction Of Power (Do Nothing)	25,249			**0.04**

(1) Based on a Kyoto Target of 62.8 million tonnes CO_2 equivalent in 2008-2012

(2) Based on an energy saving of 0.40t CO_2 / MWh CCGT for electricity generation[9] and assuming 114,504 MWh

(3) Based on 2006 IPCC Guidelines[1]

Table 15.4: Greenhouse Gas Emissions At Indaver Ireland's Waste Management Facility, Carranstown As A Result of Exporting 14.49 MW (Do Something Scenario)

	CO_2	N_2O[3]	CH_4[3]	% Of Irelands Total Emissions[1]
CCGT Producing 14.49 MW[2] (tonnes)	45,209	1.2	0.41	-
CCGT Producing 14.49 MW (tonnes CO_2 Equivalent)	45,596			-
Total / Annum (tonnes CO_2 Equivalent) After Subtraction Of Power (Do Something)	54,400			**0.09**
Impact Of Proposal	**29,151 Tonnes CO_2 Equivalent**			**0.04**

(1) Based on a Kyoto Target of 62.8 million tonnes CO_2 equivalent in 2008-2012

(2) Based on an energy saving of 0.40t CO_2 / MWh CCGT for electricity generation[9] and assuming 113,022 MWh

(3) Based on 2006 IPCC Guidelines[1]

APPENDIX 15.1

In order to calculate the facility's net contribution to GHG emissions and the effect of the facility on Ireland's obligations under the Kyoto Protocol, the anthropogenic emissions have been calculated. Given in Tables A15.1 - 15.4 are the annual anthropogenic GHG emission from the facility based on UK and EU default emission factors for both the "Do Nothing" and "Do Something" scenarios. The average of the two default emission databases had been used in the calculations.

Type	Waste Totals	Waste Fraction	Total Carbon Content (wet)	Fossil Carbon Fraction	CO_2 Emissions (Tonnes/Annum)
Paper	42,319	21.2%	31.9%	0.0%	**0**
Glass	5,392	2.7%	0.3%	0.0%	**0**
Plastic	25,086	12.5%	**51.3%**	100.0%	**47,186**
Ferrous	5,445	2.7%	0.0%	100.0%	**0**
Aluminium	10,457	5.2%	24.0%	10.0%	**920**
Other Metals	12,788	6.4%	**39.9%**	50.0%	**9,354**
Textiles	69,986	35.0%	13.5%	0.2%	**69**
Organics	524	0.3%	0.0%	100.0%	**0**
WEEE	1,796	0.9%	42.5%	0.0%	**0**
Wood	26,208	13.1%	**21.8%**	50.0%	**10,474**
Others	42,319	21.2%	31.9%	0.0%	**0**
Total	200,000				**68,004**

Table A15.1 Anthropogenic CO_2 Emissions From The Incineration of 200,000 tonnes of MSW (tonnes CO_2 eq) Based On UK Guidance[2,3] (Do Nothing)

Type	Waste Totals	Waste Fraction	Total Carbon Content (wet)	Fossil Carbon Fraction	CO_2 Emissions (Tonnes/Annum)
Paper	42,319	21.2%	33.0%	0.0%	**0**
Glass	5,392	2.7%	0.0%	0.0%	**0**
Plastic	25,086	12.5%	**61.0%**	100.0%	**56,108**
Ferrous	5,445	2.7%	0.0%	100.0%	**0**
Aluminium	10,457	5.2%	24.0%	10.0%	**920**
Other Metals	12,788	6.4%	**39.0%**	50.0%	**9,143**
Textiles	69,986	35.0%	19.0%	0.2%	**98**
Organics	524	0.3%	0.0%	100.0%	**0**
WEEE	1,796	0.9%	42.5%	0.0%	**0**
Wood	26,208	13.1%	**24.0%**	29.0%	**6,688**
Others	42,319	21.2%	33.0%	0.0%	**0**
Total	200,000	100.0%			**72,957**

Table A15.2 Anthropogenic CO_2 Emissions From The Incineration of 200,000 tonnes of MSW (tonnes CO_2 eq) Based On EU Guidance[4] (Do Nothing)

Type	Waste Totals	Waste Fraction	Total Carbon Content (wet)	Fossil Carbon Fraction	CO_2 Emissions (Tonnes/Annum)
Paper	42,319	19.2%	31.9%	0.0%	**0**
Glass	5,392	2.5%	0.3%	0.0%	**0**
Plastic	25,086	11.4%	**51.3%**	100.0%	**47,186**
Haz Waste	20,000	9.1%	**38.4%**	100.0%	**28,160**
Metals	5,445	2.5%	0.0%	100.0%	**0**
Nappies	10,457	4.8%	24.0%	10.0%	**920**
Textiles	12,788	5.8%	**39.9%**	50.0%	**9,354**
Organics	69,986	31.8%	13.5%	0.2%	**69**
WEEE	524	0.2%	0.0%	100.0%	**0**
Wood	1,796	0.8%	42.5%	0.0%	**0**
Others	26,208	11.9%	**21.8%**	50.0%	**10,474**
Total	220,000				**96,164**

Table A15.3 Anthropogenic CO_2 Emissions From The Incineration of 220,000 tonnes of MSW (tonnes CO_2 eq) Based On UK Guidance[2,3] (Do Something)

Type	Waste Totals	Waste Fraction	Total Carbon Content (wet)	Fossil Carbon Fraction	CO_2 Emissions (Tonnes/Annum)
Paper	42,319	19.2%	33.0%	0.0%	**0**
Glass	5,392	2.5%	0.0%	0.0%	**0**
Plastic	25,086	11.4%	**61.0%**	100.0%	**56,108**
Haz / Non-Haz Waste	20,000	9.1%	**38.4%**	100.0%	**28,160**
Metals	5,445	2.5%	0.0%	100.0%	**0**
Nappies	10,457	4.8%	24.0%	10.0%	**920**
Textiles	12,788	5.8%	**39.0%**	50.0%	**9,143**
Organics	69,986	31.8%	19.0%	0.2%	**98**
WEEE	524	0.2%	0.0%	100.0%	**0**
Wood	1,796	0.8%	42.5%	0.0%	**0**
Others	26,208	11.9%	**24.0%**	29.0%	**6,688**
Total	220,000	100.0%			**101,117**

Table A15.4 Anthropogenic CO_2 Emissions From The Incineration of 220,000 tonnes of MSW (tonnes CO_2 eq) Based On EU Guidance[4] (Do Something)

16 CULTURAL HERITAGE

16.1 INTRODUCTION

This chapter of the EIS sets out the potential impacts (if any) of the proposed amendments to the facility, as described in Chapter 1 on the Cultural Heritage aspect. It is considered that the primary archaeological impact assessment undertaken at the site in 2005 coupled with the results of recent monitoring of site stripping (2008-2009) are sufficient to determine possible impacts of the proposed amendments to the facility on the archaeology of the site and its environs. It is anticipated with the primary facility now constructed that minimal further stripping of the site will be required for the proposed amendments. This chapter therefore represents an update of the 2009 assessment to include the results of mitigation measures as implemented and any further mitigation measures now required.

During the period between October 2008 and January 2009, the site was stripped of topsoil in preparation for construction of the facility (completed in 2011). Some archaeological activity was identified by archaeologists monitoring the topsoil stripping works as was required by the Condition 10 of the grant of planning permission for the existing facility. These works were completed in February 2009. A summary of the assessment in 2005 along with the findings from the more recent surveys are presented in this chapter.

16.2 FIELD INSPECTION

At the time of the site inspection in 2005, the site was composed of four fields bounded by hedgerows. No archaeological activity was recorded at the site. The site is located on the northern edge of a low-lying ridge, oriented N-S. It is overlooked by slightly higher ground in Cruicerath townland, immediately to the North; and by the Bellewstown ridge ca. 4km to the South.

The boundary of the facility encloses an area of 25 acres in extent, however the actual footprint of the buildings covers only approximately 10 acres of the site, with the remaining land utilised for landscaping to minimise the visual impacts of the facility. The proposed amendments to the facility are within the 10 acre footprint. The 2005 assessment considered the entire 25 acres.

16.3 DESK BASED RESEARCH

The following field walking and desk based research was undertaken as part of the 2006 EIS;

- An assessment of Journal and documentary research -Various published sources and artefact corpora were consulted. These did not reveal anything of archaeological significance relating to the proposed development site.

- An assessment of Cartographic Research – A number of historical Ordnance Survey and other relevant maps were inspected. The timing of the formation of the various field boundaries was observed from historical Ordnance Survey Maps. Limestone deposits were noted between the railway line and the road. No other significant features were noted in the area.
- An assessment of Aerial Photography- no features of archaeological interest were identified on the proposed development site or in the immediate area.
- An assessment of the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP)- -Department of Environment, Heritage and Local Government- The SMR and RMP are lists of known archaeological sites compiled by the Archaeological Survey of Ireland from their files and from site visits carried out by archaeologists. The 2006 EIS study reviewed the SMR and RMP for each site. Where an archaeological site occurred all details were noted. There were no known archaeological sites recorded on the proposed development site in the Sites and Monuments Records. Four monuments were recorded in the vicinity. These comprised an Inland Promontory Fort at Platin (ME030-014), an Earthwork site at Cruicerath (ME027-002), a Soutterain at Bellewstown (ME027-006) and a Castle/Church at Platin (ME027-03).
- An assessment of the Topographic Files, Irish Antiquities Division, National Museum of Ireland- The townlands of Carranstown, Caulstown, Cruicerath and Newtown were searched in the Topographic Files of the National Museum of Ireland. Nothing was recorded as having come from the townland of Carranstown; one find was noted for Cruicerath (bronze pin dating from the early Christian period) and one from Newtown (a stone battle axe and stone hammer).

16.4 INFORMATION FROM RECENT ARCHAEOLOGICAL MONITORING

Monitoring of topsoil stripping by ADS was completed at the site in 2009. Five features were identified during the course of the works. Two were isolated pits, while the remaining three occurred in a cluster at the southwest of the site. Three of the features were archaeological and charcoal from these features was submitted for dating. The results of dating indicated that the features were late Neolithic and Middle Bronze age. A copy of their report is presented in Appendix 16.1.

16.5 PREDICTED IMPACTS OF THE DEVELOPMENT

16.5.1 Direct Impacts

The 2005 study and the findings from the monitoring of topsoil stripping identified archaeological activity on the proposed development site. Three of a total of five features identified were found to be archaeological comprising possible burnt mounds and a possible refuse pit with fire have been assessed recorded and documented by ADS.

Topsoil stripping is now complete and limited if any stripping will be required for the amendments proposed. It is therefore unlikely that construction works required by the proposed amendments will

have any impact on any further archaeological features which may survive below ground at the development site.

The physical impact of the development due to its proximity to the World Heritage Site of Newgrange was considered in the 2006 EIS. The facility is a minimum of 3km from the river valley and approximately 5km from the boundary of the World Heritage Site, sufficiently distant so as to render any archaeological impacts not significant. The UNESCO-ICOMOS monitoring mission which reported on the site in 2004, also considered the direct impacts and found that *there were no grounds for believing that the construction of the proposed incinerator itself would have a direct impact on the outstanding universal value of the World heritage site. Any effect on possible archaeological sites of local interest within the application area would be mitigated by archaeological monitoring*[1]

16.5.2 Indirect Impacts

A report entitled *Assessment Of Air Quality Impact Of Carranstown Waste Management Facility At Bru Na Boinne* was completed by AWN in March 2004. A USEPA approved air dispersion model was used to predict ground level concentrations at Bru na Boinne resulting from compounds emitted at the proposed facility at Carranstown. It was concluded that the impact of air emissions from the facility at Bru na Boinne will be insignificant. As is demonstrated in Chapter 7 Air Quality there is no significant change in the emissions from the development as modelled in 2006 and the proposed amended development. It has therefore not been necessary to reassess the impact on Bru na Boinne. A summary of the findings of this report is presented in Appendix 16.2.

16.6 REMEDIAL & MITIGATION MEASURES[2]

Although nothing of archaeological interest was noted during the field visit in 2005, a small number of archaeological features have been encountered during subsequent soil stripping works. The facility is situated in a region that was important in Irish pre-historic and historic times. Results of dating on features recorded at the site indicated they are prehistoric in age.

The fertile nature of this part of Meath also means it has been subject to intensive farming practices over a long period of time which may have resulted in the destruction of above ground archaeological features, traces of which may still survive beneath the present ground surface. Therefore it is recommended that:

- It is expected that no further topsoil stripping works at the site will be required. In the unlikely event that soil stripping is required, works will be monitored by a suitably qualified archaeologist as required by Planning Condition 10 of the existing planning permission.

[1] UNESCO-ICOMOS reactive monitoring mission report on the Archaeological Ensemble on the Bend of the Boyne (Ireland) 17-21 February 2004. p 3
[2] All archaeological recommendations are subject to the approval of the relevant statutory authorities.

- Should any archaeological discoveries be made during construction it is the responsibility of the finder, under the terms of the National Monuments Act (1930 & amendments), to immediately report their discovery to the Duty Officer of the National Museum of Ireland. Any archaeological discoveries should also be reported to the heritage authorities in the Department of Environment Heritage and Local Government.

Appendix 16.1

Licence No: 08E0670

Planning Ref. No: SA/60050

Final Report

on Archaeological Monitoring & Excavation at Carranstown, Co. Meath.

Client: Indaver Ireland

Author: Dáire Leahy

Date of Field Work: September 2008–February 2009

Submission Date: November 2009

ADS | Archaeological Development Services

Final Report

on Archaeological

Monitoring & Excavation

at Carranstown, Co. Meath.

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ABSTRACT

Monitoring of topsoil removal was conducted prior to the construction of the Waste to Energy facility at Carranstown, Co. Meath. The monitoring was carried out between September 2008 and January 2009. A total of five features were uncovered during the course of the works and these were subsequently excavated between October and February 2009. Two of these were isolated, unrelated pits while the remaining three occurred in a cluster at the southwest of the site. Three of the features were archaeological and charcoal from these features was submitted for dating. The dates returned placed two of these features in the Late Neolithic and the third in the Middle Bronze Age. It is suggested that these features represent short term use of this portion of the landscape, related to more intensive use in the close vicinity.

1. INTRODUCTION

Planning permission for the construction of a waste to energy facility at Carranstown, Co. Meath (Fig. 1) was received by Indaver Ireland in 2008 (Planning Ref. SA/60050). The first phase of works associated with the construction of the facility, involving topsoil removal and site preparation, began in September 2008 and continued until the end of January 2009. The excavation of the archaeological features was completed in February 2009.

As per condition 10 of the planning permission the presence of an archaeologist during all development works was required. The archaeological presence was initially provided by Eoin Corcoran and subsequently by the author for Archaeological Development Services Ltd (ADS).

2. REASONS FOR ARCHAEOLOGICAL MONITORING

The requirements of condition 10 of the planning permission resulted from the presence of a number of archaeological monuments in the close vicinity of the proposed development site. However, there were no known archaeological monuments within the area of the proposed development. The monuments in the vicinity included a possible burnt mound (ME027-028), an inland promontory fort (ME030-014), an earthwork (ME027-002), a souterrain (ME027-006) and the site of a church/castle.

Monitoring of the extensive works at the nearby Platin Quarry has, over the years, revealed a number of archaeological features. In 2002, monitoring revealed a burnt mound (Deehane 2002). That site was excavated in 2003 and the excavator recorded five pits, four possible structures, a trough and a burnt spread (Deehane 2003a). Further monitoring in 2003 (Deehane 2003b) uncovered a barrow (30540, 27117), two more burnt mounds, a medieval settlement (2003b & d), an enclosure, a Neolithic structure and various pits (Deehane 2003c). In 2004 another burnt mound and a series of prehistoric features containing pottery were excavated (Deehane 2004 & O'Carroll 2004).

In addition some stray finds have been found in the vicinity of Carranstown. A bronze pin (NMI reg. 1933:580) was found in a quarry at Cruicerath and a battle axe and hammer (NMI reg. L1934:7-8) were found near White Rock in Newtown.

3. THE DEVELOPMENT

The development is to consist of the construction of a 70 megawatt waste to energy facility that will include a main process building incorporating a waste reception hall, waste bunker operations, boiler/grate furnace, ash bunker, flue gas treatment building, associated

access galleries and a flue stack. In addition there will be a turbine unit, cooler building, pump-house building and water storage tank. Also to be constructed are an education centre/workshop/warehouse building, a transformer compound, contractor laydown area, car parking spaces, an electrical switch room and an on-site effluent treatment system. The development will also involve the realignment of the R152, along the road frontage of the site.

4. SITE DESCRIPTION

The site is situated between the village of Duleek, to the southwest, and the Platin Cement factory, to the northwest. It is bounded on its east/southeast side by the R152 Duleek to Drogheda road. To the west and the immediate south the site is bordered by agricultural land.

Prior to the development the site comprised three fields, each planted with potatoes, and consisted of approximately 25 acres in total. Two fields occupied the southeast portion of the site and the remainder was occupied by a single, large field. Each of the fields were separated by hedge rows and an associated ditch. Between the site and the R152 the site was bounded by a low bank lined with mature trees and, towards the northeast end of the perimeter, by a concrete fence.

The land contained within the site was at its highest in the northeast corner, from where it sloped gradually to the south and southwest. To the west the slope increased leading to the base of a shallow, north to south oriented valley. The western boundary of the site coincided with the base of the valley and from here the topography rose again with the crest of this hill forming the horizon to the west of the site. To the northeast views were dominated by the extensive works at Platin quarry and cement factory. Vegetation lining a train line obscured the view to the north but prior to the construction of the train line the view would have been dominated by the rise of Cruicerath Hill to the northwest and Platin Hill to the northeast. More extensive views are offered by the low lying lands to the east of the site.

5. MONITORING RESULTS

The monitoring of topsoil removal and site development works were carried out over a period of five months from the 4th of September 2008 to the 9th of February 2009. In addition to the removal of topsoil from across the site associated works included the removal of hedge rows, the cleaning out of drainage ditches and the construction of perimeter fences. All of these activities, where they had a subsurface impact, were conducted under archaeological supervision.

Due to the presence of a high voltage power line and a natural gas main, two linear areas of the site were not completely stripped of topsoil. The exceptions included two machine crossing points under the high voltage power line and a linear section, of approximately 80m, of the gas main which was partially excavated and protected with a layer of reinforced concrete slabs.

The removal of topsoil was completed using both tracked machines, fitted with toothless, grading buckets, and bulldozers. The depth of topsoil cover across the site varied between 0.1m at the southwest corner to 0.35m across the remainder of the site. It consisted of dark brown silty clay, becoming lighter towards the base where it became mixed with the underlying glacial till. This material consisted of light brown to orange gritty clay with occasional patches of grey to brown sand and fine gravel.

A total of five features were identified during the course of topsoil removal, namely two isolated pits and a cluster of three pits. The first two pits, in fields 1 and 2 were excavated on the 1st of October, while the final three pits, in field 3, were uncovered at the beginning of December and subsequently excavated on the 9th of February 2009. Each pit was assigned an individual context number; pit in Field 1: [2], pit in Field 2: [6] and the pits in Field 3: [9], [13] and [15].

6. EXCAVATION RESULTS

5.1 PIT [2]

This feature was located in Field 1, towards its northeast corner and hence was situated near the highest point on the site, at National Grid Reference (NGR) 306461 270890 (Fig. 2). The cut of this pit [2] was oval in plan with uneven, steeply sloping sides which sloped down to a rounded, elongated base (Fig. 3, Plate 1). It contained a series of three fills. The upper fill (3) consisted of light grey/brown, silty clay deposit with moderate charcoal flecking throughout the fill and occasional small stones. Below this was a second fill (4) which was dark grey, silty clay with frequent charcoal lumps. Several fragments of burnt clay were recovered from this fill. The basal fill of this pit, (5) consisted of light brown gritty, clayey silt with occasional charcoal flecking (Fig. 4, Plate 2). A burnt flint flake fragment was found within this fill.

5.2 PIT [6]

This feature was located, to the southwest of Pit [1], some 4m to the south of the field boundary separating fields 1 and 2 at NGR 306333 270813 (Fig. 2). The cut of this pit [6] was roughly circular in plan, with steeply to gradually sloping sides and a flat base (Fig. 5, Plate 3). It measured 1.2m by 0.95m in width, 0.11m in depth and contained two separate deposits (Fig. 6, Plate 4). The upper fill (7) consisted of very well compacted light brown gritty clay with occasional charcoal flecking and occasional stones. The basal fill (8) was

very compacted dark grey silty clay with moderate charcoal flecking and frequent angular stones, which may have been burnt. A possibly struck chert chunk was recovered from this fill.

5.3 PIT [9]

This feature occurred towards the southwest corner of the site at NGR 306177 270882. It was located approximately 10m northeast of pit [13] and 18m northeast of pit [15] (Figs 7 and 8, Plate 5). The cut of this pit [9] was roughly circular in plan with steeply sloping sides and a stepped base, with the western half of the pit having been *c.* 0.14m deeper than the eastern part. The pit measured 1.28 by 0.89m and from 0.2 to 0.34m in depth. It contained three fills. The upper fill (10) consisted of very compact light brown/yellow silty clay which extended across the western part of the pit and partly sealed the underlying deposit (11). This upper fill, (10), appears to have been a layer of redeposited natural subsoil. The fill (11) was visible prior to excavation in the eastern part of the cut. It consisted of moderately compact dark brown silty clay which was charcoal rich and had frequent inclusions of burnt angular stones. The basal fill (12) was sealed by (11) and partly sealed by (10) for approximately 0.15m to the west of the cut. This fill (12) consisted of moderately compact medium brown/grey clay with occasional charcoal inclusions and occasional burnt stones (Fig. 9, Plate 6).

5.4 PIT [13]

This feature also occurred towards the southwest corner of the site at NGR 306169 270877. It was located approximately 10m southeast of pit [9] and 5m northeast of pit [15] (Fig. 7). The cut of this pit was linear in plan with sharp vertical sides and measured 1.35m wide and was over 0.7m deep. A section was excavated though this pit but it was not excavated completely as it was interpreted as a modern machine cut trench. The pit contained a single fill (14) which was very loose brown/grey gravely sand that contained pockets of redeposited sod and clay. This fill contained a number of pieces of modern glass and coal (Fig. 10, Plate 7).

5.5 PIT [15]

This feature occurred at NGR 306153 270875. It was located approximately 18m southeast of Pit [9] and 5m southeast of Pit [13] (Fig. 7). The cut of this pit was linear in plan with sharp vertical sides and measured 1.5m wide and was over 0.6m deep. A section was excavated though this pit but it not excavated completely as it was interpreted as a modern machine cut trench. The pit contained a single fill (16) which was very loose brown/grey gravely sand which contained pockets of redeposited sod and clay. This pit appears to have been cut at the same time as pit [4] (Fig. 11, Plate 8).

7. DISCUSSION AND CONCLUSIONS

During the monitoring of topsoil removal and site preparation works a total of five features were identified, namely two isolated pits and a cluster of three pits. All of these features were fully resolved through excavation. Pits [2], [6] and [9] were archaeological in nature, while pits [13] and [15] appear to be modern machine-cut trenches.

Charcoal samples from each of the archaeological features were submitted to the ^{14}Chrono Centre at Queens University, Belfast and a radiocarbon date was returned for each of these samples.

The sample from pit [2] produced a date of 3010-2880 cal BC (UBA-12310, 2 sigma), placing the activity that produced this feature towards the beginning of the Late Neolithic period. Sample number UBA-12311, from the pit [6], produced a date of 2870-2580 cal BC (2 sigma), thereby placing the activity associated with this feature at a slightly later date and within a range covering the Late Neolithic. The last of the features, [9], produced a date of 1930-1770 cal BC (UBA-12312, 2 sigma) indicating that this was the result of activity dating to the Middle Bronze Age.

These dates are broadly reflected in the results of the lithic analysis which, despite the lack of diagnostic artefacts, suggested that this material was indicative of activity in the area in either the Neolithic or Bronze Ages (Lealy 2009, see Appendix IV). Only one of the excavated features, [2], produced lithic material and the Neolithic date from this feature may allow the other lithic artefacts, recovered from the topsoil, to also be assigned to this period. Indeed, the blade (08E670:1:2) was recovered from the topsoil adjacent to the pit [6] and this artefact is typical of those often produced by Neolithic technologies (Woodman *et. al.* 2006).

Two of the features, [6] and [9], contained burnt and heat shattered stone, a type of material that is usually associated with the site-type known as burnt mounds or *fulachta fiadh*. These sites consist of mounds of burnt and heat shattered stone generally associated with a trough which acted as a water container. Stones were heated in a fire and dumped into the water for the purpose of heating the water. A range of uses for this hot water have been suggested that include, among others, cooking, bathing and brewing. Sites of this type generally date to the Bronze Age (Brindley & Lanting 1990) but earlier examples, with Neolithic dates, are also known (FitzGerald 2007).

These were isolated pits without associated features or mounds of burnt stone and, as such, do not correspond with the classic description of these sites. However, it may be that these two features represented the employment of this technology on a very limited basis, with each pit having functioned as a trough but only a small number of occasions.

The pit feature that did not contain burnt stone, [2], did however contain significant quantities of charcoal, and also burnt clay, suggesting that it, at least partially, contained material from a fire spot/hearth.

While little can be said in regard to the specific function of these pits, they are indicative of the non-intensive use of the landscape in an area that, in the form of the monuments of Brú na Bóinne to the northwest, shows the signs of intensive use during the Neolithic and the Bronze Age. Sites dating to both these periods were excavated, to the northwest, at the Platin quarry (e.g. Deehane 2002 & 2003c) and there is a strong possibility that the features excavated at Carranstown represent the remains of activity related to these sites.

Taken in isolation the significance of these features does not seem overwhelming. However, it is suggested that their importance lies in their ability, when dated, to illustrate an aspect of the use of the landscape in prehistory that may, more often than not, be effectively ignored. Such features are often thought to be too insignificant to warrant a radiocarbon date and they, thereby, lose their archaeological value. These features are aspects, and evidence, of the wider use of the landscape outside of the more easily recognised 'sites', that result from more intensive activity. These features could be the remains of temporary settlement, used by people, moving though the landscape, from one location to another or perhaps the remains of a cooking event or camp fire used by those responsible for the activity uncovered at the quarry.

This use of the landscape, on a more informal, short term and casual manner helps to extend and elaborate on the picture of prehistory that archaeology can paint, and it is here that the value of the features excavated at Carranstown lies.

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9. APPENDIX I: CONTEXT LIST

Context	Description of Context
1	Topsoil. Dark brown silty clay that covered the entirety of the site.
2	Cut of pit. Irregular in plan with steeply sloping sides and a rounded base. It measured 1.04 by 0.8m in width and 0.45m in depth. Filled by deposits (3), (4) and (5).
3	Upper fill of [2]. Light grey/brown silty clay with moderate charcoal flecking and occasional stones (0.04m^3). It measured 0.41 by 0.5m in width and 0.14m in depth. Overlay (4).
4	Fill of [2]. Dark grey silty clay with very frequent charcoal flecking. It measured 0.9 by 0.78m in width and up to 0.2m in depth. Overlay (5). Contained burnt clay
5	Basal fill of [2]. Light brown gritty clayey silt with occasional charcoal flecking. It measured 0.9 by 0.5m in width and 0.25m in depth. Contained burnt flint flake.
6	Cut of pit. Oval in plan with gradually sloping sides and a flat base. It measured 0.95 by 1.2m in width and 0.11m in depth. Filled by (7) and (8).
7	Upper fill of [6]. Well compacted light brown gritty clay with occasional charcoal flecking and occasional stones (0.04m^3). It measured 0.55 by 0.63m in width and 0.04m in depth. Overlay (8).
8	Basal fill of [6]. Compact dark grey silty clay with moderately frequent charcoal flecking and frequent angular stones (possibly burnt- 0.04-0.11m^3). Contained a chunk of possibly struck chert.
9	Cut of pit. Subrectangular in plan with steeply sloping sides and a flat, stepped base. It measured 0.89 by 1.28m in width and between 0.2 and 0.34m in depth. Filled by (10), (11) and (12).
10	Fill of [9]. Compact light brown/yellow silty clay with occasional pebbles. It measured 0.53 by 0.98m in width and 0.25m in depth. Overlay (11).
11	Fill of [9]. Moderately compact dark brown silty clay with frequent charcoal flecking and frequent fragments of burnt and heat shattered stone. It measured 0.6 by 0.66m in width and 0.34m in depth. Underlay (10) and overlay (11).
12	Fill of [9]. Moderately compact mid grey/brown clay with occasional charcoal flecking and occasional fragments of burnt and heat shattered stone. It measured 0.4 by 0.89m in width and 0.1m in depth. Underlay (11).
13	Cut of pit. Not fully excavated. Subrectangular in plan with rounded corners and steeply sloping/vertical sides. It measured 1.35m in width and 2.8m in length. Filled by (14).

Context	Description of Context
14	Fill of [13]. Loose, grey/brown gravelly sand with pockets of sod and clay. It measured 1.5m in maximum width and 0.7m+ in depth. Contained modern glass and coal.
15	Cut of pit. Not fully excavated. Subrectangular in plan with rounded corners and steeply sloping sides. It measured 1.5m in maximum width, 5.1m in length and 0.5m+ in depth.
16	Fill of [15]. Loose, grey/brown gravelly sand with pockets of sod and clay. It measured 1.5m in maximum width, 5.1m in length and 0.5m+ in depth.

10. APPENDIX II: SAMPLE LIST

Sample No.	Context No.	No. of bags	Reason for sampling
1.	4	1	Charcoal for radiocarbon dating
2.	8	1	Charcoal for radiocarbon dating
3.	11	1	Charcoal for radiocarbon dating

11. APPENDIX III: FINDS LIST

Context No.	Find No.	Type	Description
1	1	Flint	Broken flint scraper
1	2	Flint	Flint blade
1	3	Flint	Retouched flint flake
1	4	Flint	Flint debitage
4	-	Clay	Several fragments of burnt clay
5	1	Flint	Fragment of burnt flint flake

12. APPENDIX IV: REPORT ON LITHIC ARTEFACTS FROM CARRANSTOWN, CO. MEATH, 08E0670.

Dáire Leahy B.A., October 2009.

A total of five lithic artefacts were recovered during the course of monitoring of topsoil striping and during the excavation of an archaeological feature, at Carranstown, Co. Meath (Licence Number 08E0670). These artefacts consisted of 3 retouched artefacts, 1 flake and 1 piece of angular shatter. All of the artefacts were of flint.

11.1 METHODS

All lithic material recovered was subjected to an initial visual inspection in order for the non-archaeological material to be identified and removed. This was followed by a detailed examination and the creation of an Excel spread sheet catalogue of the material.

Each artefact was recorded on the basis of a number of criteria, i.e. find number, raw material, artefact type, length, breadth, thickness, platform type, platform depth, completeness, condition, patina and platform preparation. Retouched artefacts are also individually described, detailing the nature and location of the retouch. All of this information is presented in the catalogue in section 11.7, at the rear of the report.

Each report details the specific nature of each assemblage based on the artefact types contained within it. The composition of the assemblage, variety within artefact types, the size range of the material and other attributes are illustrated, where relevant, with the use of charts. Where charts are used to illustrate the size range of various artefacts, only complete artefacts have been included. Each assemblage is then discussed and, where possible, dated.

The terminology and classifications used are based on those presented in Andrefsky (1998) and Woodman *et. al.* (2006).

11.2 RETOUCHED ARTEFACTS

There were 3 retouched artefacts in the assemblage (08E0670:1:1, 2 & 3), all of which were recovered from the topsoil. Find number 1:1 was a fragment of the retouched edge of a concave scraper that had been broken at some time following the application of the retouch. The retouch was direct, i.e. applied to outer, dorsal surface of the object, and was abrupt and semi-invasive. No other features were preserved on this artefact.

Find number 1:2 was a well made retouched tertiary blade flake. It had generally parallel sides with retouch to both the left and right lateral margins and to the proximal end. The retouch on the lateral margins was alternating, i.e. alternately switching between the dorsal and proximal surfaces, and was abrupt and short. On the left lateral margin the

retouch, applied to the ventral surface, had produced a notch, mid way along the margin, forming a concave scraping surface. This notch was 3.2mm in depth and 11.9mm in width. The retouch applied to the ventral side of the proximal end had removed the striking platform on this artefact. Although recovered from the topsoil this artefact was recovered in close proximity to the pit [2].

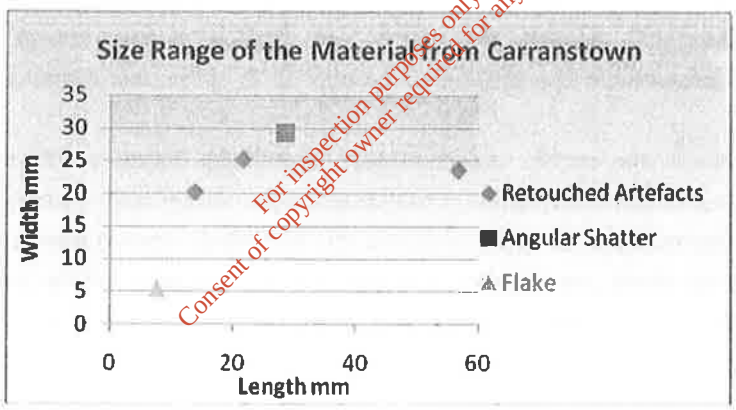
The third scraper was formed on a secondary flake with rough, abrupt, short retouch applied to the dorsal surface on the right lateral margin. It had a plain striking platform that had been prepared prior to the removal of the flake from its core.

11. 3 THE FLAKE

This very small flake was recovered from a fill of the pit [2]. It was a tertiary flake, i.e. with no cortex on the dorsal surface and it had been burnt prior to its deposition.

11.4 ANGULAR SHATTER

This artefact was a piece of non-flake waste from the knapping process with no features on its surface to allow a more precise classification or interpretation.



11. 5 DISCUSSION AND DATING

All of the artefacts recovered from Carranstown were of flint. Only 2 of the artefacts exhibited dorsal cortex and in both cases this was indicative of the use of water-rolled pebbles as raw material. This material could have been sourced either from local glacial or fluvial deposits.

With the exception of the flake, the only artefact from a sealed context, the material was slightly weathered and one artefact, the retouched blade, had a small area of light white patina. These attributes were consistent with the context in which they were found, i.e. the topsoil, where they may have been disturbed, moved and exposed to the elements.

The artefacts represent both elements of primary and secondary technologies, i.e. the products of the knapping process (primary) and retouched artefacts (secondary). This

could be suggestive of the production, use and discard of such artefacts on this site. However, given the disturbed context from which the majority of the material was recovered, these artefacts may have been the product of several separate lithic technologies. The plain, and relatively deep, striking platform on the scraper 1:3 is indicative of the use of a direct hard hammer technique of flake removal being employed in this case. But, as striking platforms were absent from the remainder of the assemblage, it was not possible to assess whether this method was used in their removal.

None of the artefacts were indicative of the practise of any one specific activity at the site and the 3 scrapers could have been employed in a range of cutting or scraping activities and they are typical of the general purpose tools often recovered from a Irish prehistoric sites of varying dates. As none of the artefacts were diagnostic the material is difficult to assign to any specific period in the prehistoric period, and indeed, given the recovery of lithics from medieval contexts (Edwards 1990) some of the material (i.e. the angular shatter and perhaps the rough scraper 1:3) could as much be the product of medieval technologies as prehistoric ones. However, given the similarity of the retouched blade and the scraper fragment to those recovered from sites such as e.g. the court tomb at Aghnaskeagh, Co. Antrim (Herity 1997), it is suggested that a date for this material, either in the Neolithic or the Bronze Age is likely. However, as most of the material was recovered from the topsoil, in a number of locations across the site, and as the only artefact from a secure, and as yet undated context was the least diagnostic of these, these lithics can only be interpreted as an indicator of activity in the area in prehistory.

11.6 BIBLIOGRAPHY

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11.7 Lithic Catalogue

Find Num	Raw Material	Retouched Artefacts	Tertiary Flakes	Blades	Angular shatter	Length	Breadth	Thickness	Platform Type	Platform Depth	Complete	Condition	Patina	platform preparation	Bipolar?	Comment
08E670:1:1	Flint	1				13.7	20.3	6.9			no	Slightly Weathered	none			A fragment of the scraping edge of a concave scraper with direct, abrupt, semi-invasive retouch.
08E670:1:2	Flint	1				56.6	23.6	6.7			yes	Slightly Weathered	light white		no	Retouched tertiary blade flake with alternating, abrupt, short retouch to both lateral margins, also a retouched notch on the left lateral margin. Also indirect, abrupt, semi-invasive retouch to proximal end that removed the striking platform
08E670:1:3	Pebble Flint	1				21.6	25.2	9.7	plain	3.5	yes	Slightly Weathered	none	yes	no	Side scraper formed on secondary flake with rough, direct, abrupt, short retouch to the distal end of the right lateral margin.
08E670:1:4	Pebble Flint				1	28.5	29.3	9.4			no	Slightly Weathered	none			
08E670:5:1	Flint		1			7.6	5.4	1			no	burnt				Proximal and distal ends missing.

13. SUMMARY OF THE RADIOCARBON DATES

[14]Chrono Centre, Queens University Belfast.

UBA-12310

Radiocarbon Age BP 4301 +/- 23

Calibration data set: intcal04.14c

% area enclosed	cal AD age ranges	# Reimer et al. 2004 relative area under probability distribution
68.3 (1 sigma)	cal BC 2914- 2895	1.000
95.4 (2 sigma)	cal BC 3007- 2991	0.030
	2930- 2884	0.970

UBA-12311

Radiocarbon Age BP 4124 +/- 27

Calibration data set: intcal04.14c

% area enclosed	cal AD age ranges	# Reimer et al. 2004 relative area under probability distribution
68.3 (1 sigma)	cal BC 2857- 2829	0.203
	2823- 2811	0.086
	2749- 2723	0.177
	2699- 2626	0.534
95.4 (2 sigma)	cal BC 2866- 2804	0.271
	2776- 2768	0.013
	2764- 2580	0.716

UBA-12312

Radiocarbon Age BP 3529 +/- 22

Calibration data set: intcal04.14c

% area enclosed	cal AD age ranges	# Reimer et al. 2004 relative area under probability distribution
68.3 (1 sigma)	cal BC 1904- 1874	0.398
	1843- 1816	0.350
	1799- 1779	0.252
95.4 (2 sigma)	cal BC 1930- 1859	0.271
	1853- 1772	0.444

FIGURES & PLATES

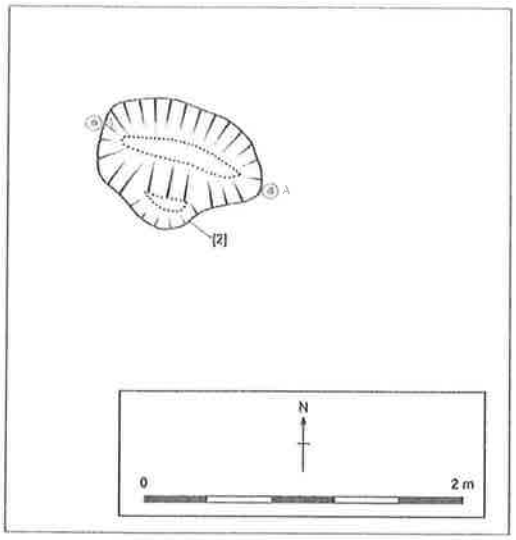

FIG 3: Post-excavation plan of [2]

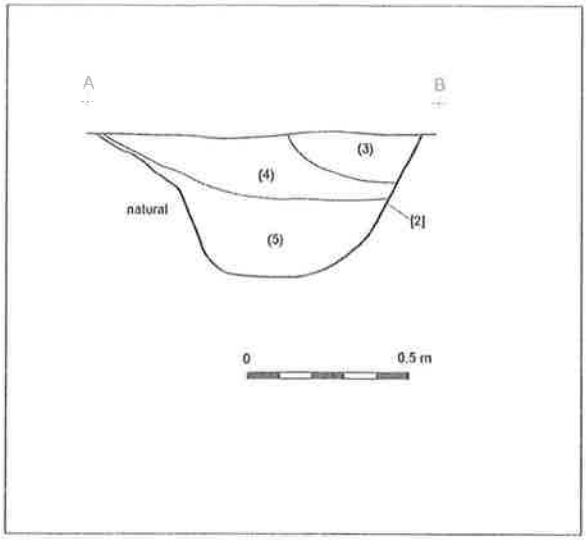

FIG 4: Northeast facing section through [2]

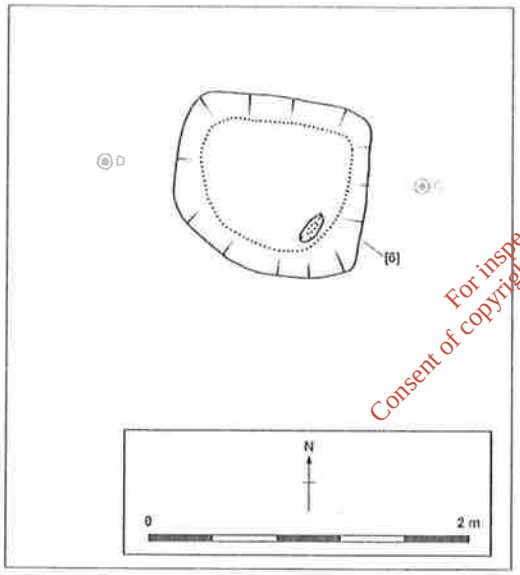

FIG 5: Post-excavation plan of [6]

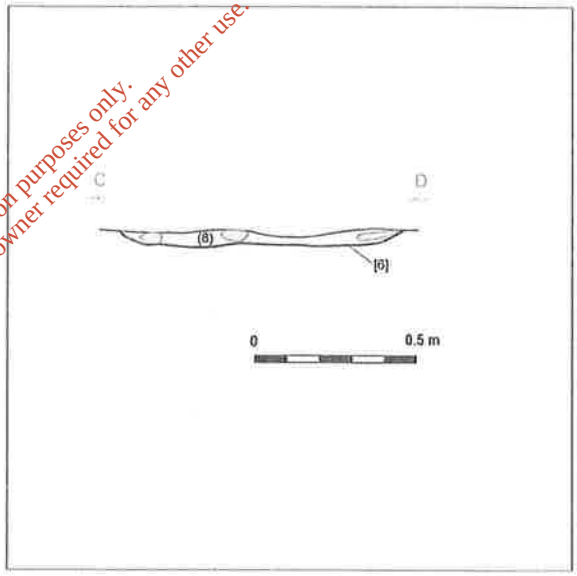

FIG 6: North facing section through [6]

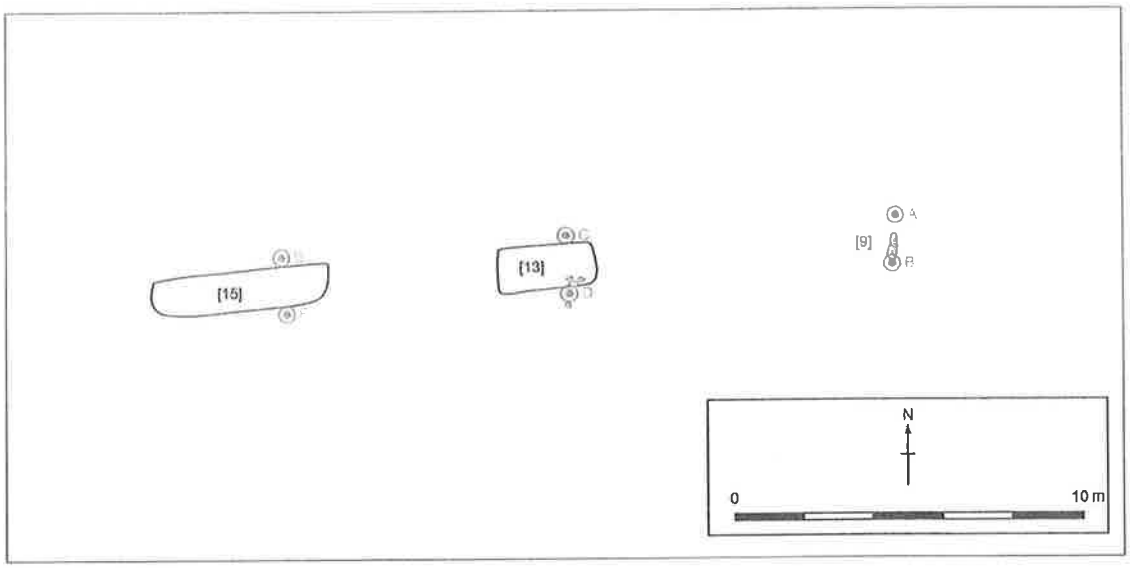

FIG 7: Pre excavation plan of [9], [13] and [15]

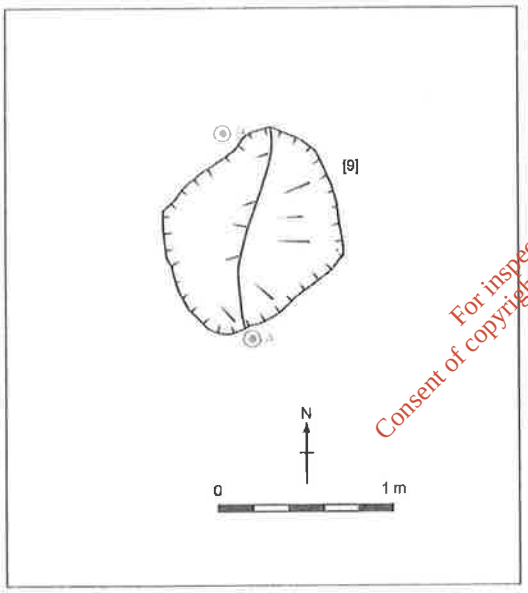

FIG 8: Post excavation plan of [9]

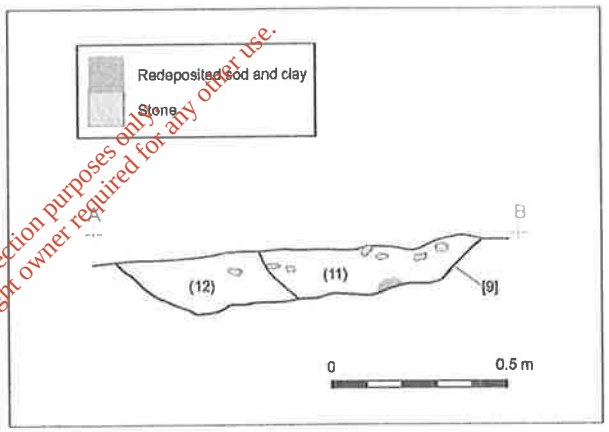

FIG 9: West facing section through [9]

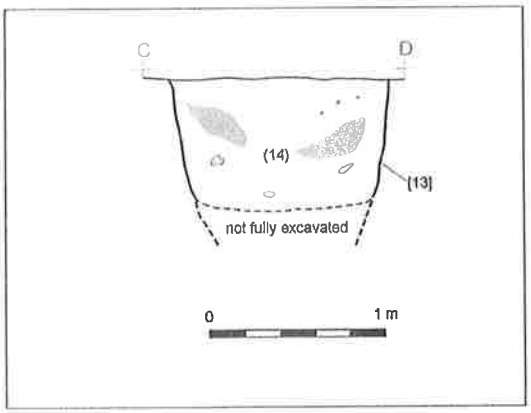

FIG 10: West facing section through [13]

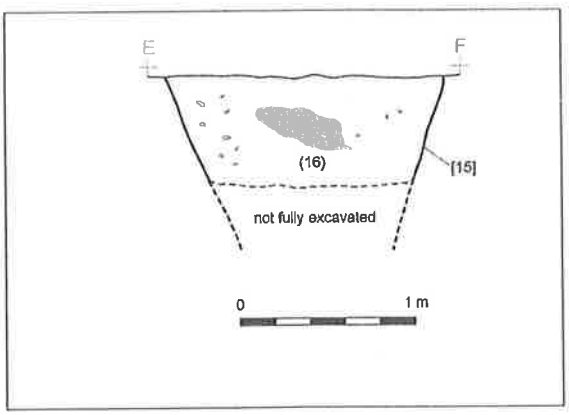

FIG 11: West facing section through [15]

PLATE 1: Post-excavation shot of [2], from the northwest

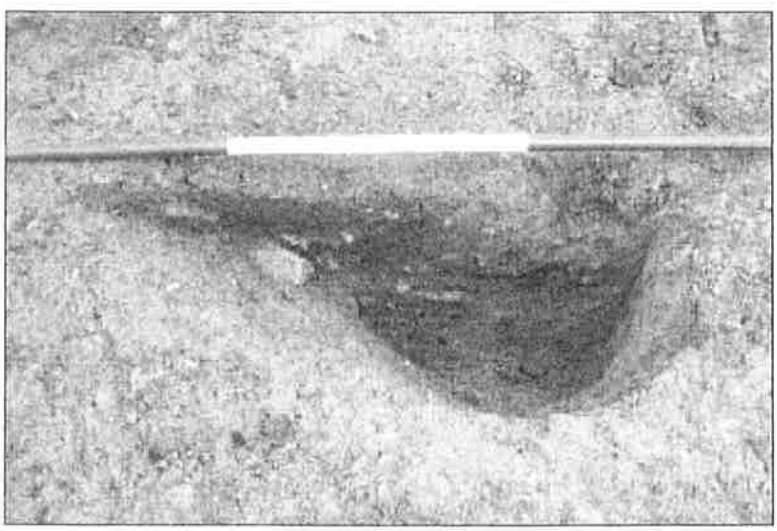

PLATE 2: Northeast facing section through [2]

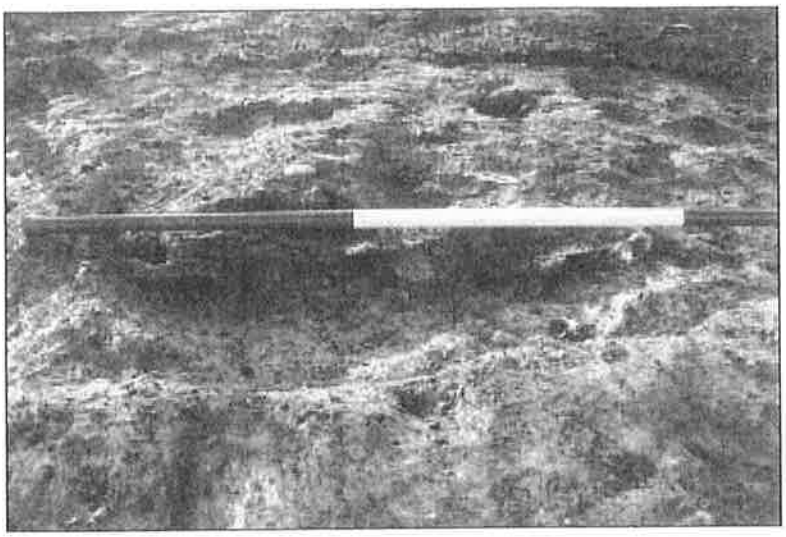

PLATE 3: Post-excavation shot of [6], from the from the north

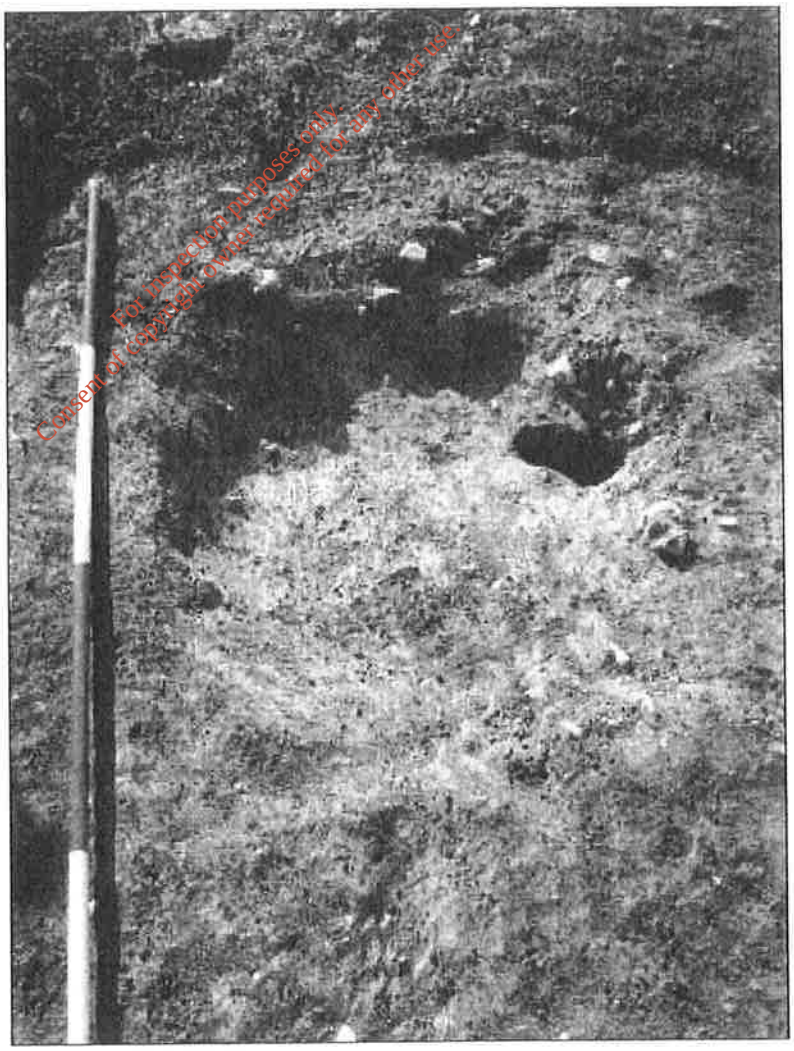

PLATE 4: North facing section through [6]

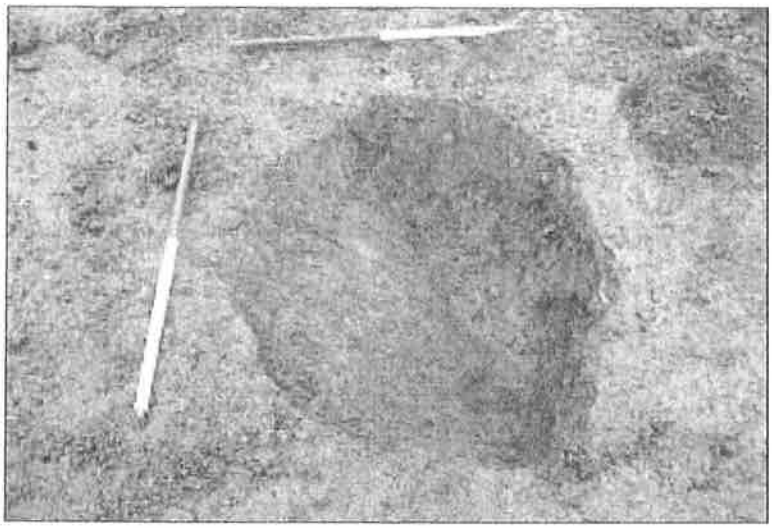

PLATE 5: Post-excavation shot of [9] from the northwest

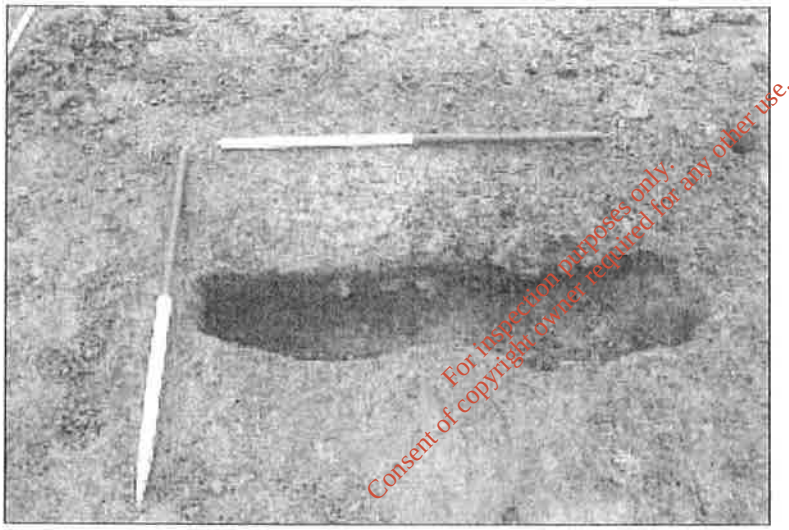

PLATE 6: Northeast facing section through [9]

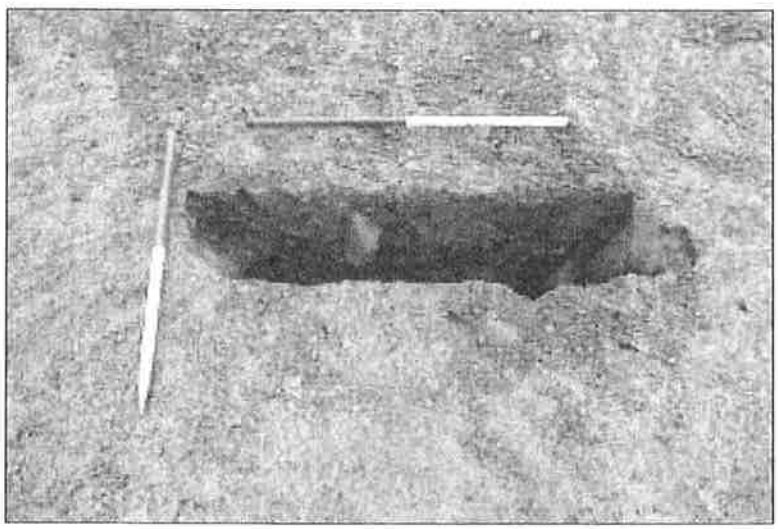

PLATE 7: West facing section through [13]

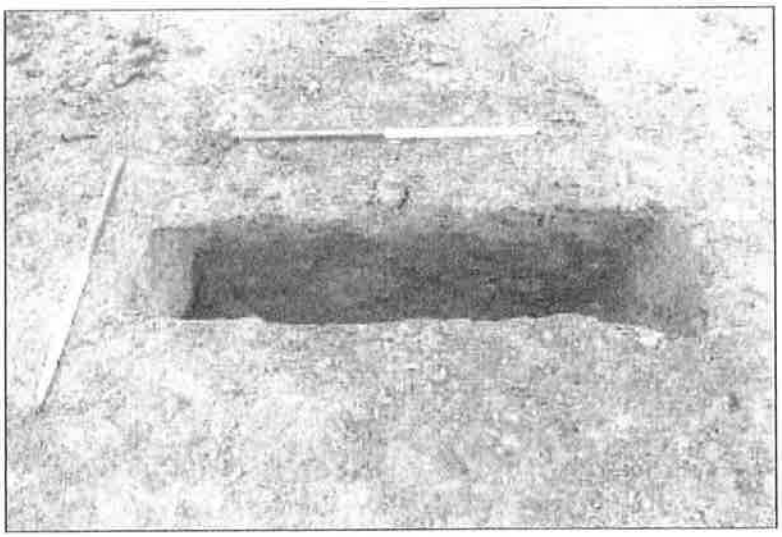

PLATE 8: West facing section through [15]

ADS | Archaeological Development Services

- Project Management
- Consultation
- Archaeological Impact Assessments
- Desk Based Assessments
- Aerial Photography Interpretation
- Site Assessments
- Archaeological Monitoring & Testing
- Excavation and Post Excavation
- Maritime Archaeology
- Peatland Archaeology
- Artefact & Ecofact analysis
- Intertidal Survey
- Monument & Building Survey
- Publications

Appendix 16.2

Summary Of Air Impacts At Brú Na Boinne

The United States Environmental Protection Agency (USEPA) approved AERMOD dispersion model has been used to predict the ground level concentrations (GLC) at Brú na Boinne resulting from compounds emitted from Carranstown Waste Management Facility.

Modelling results for the facility indicate that the ambient ground level concentrations at Brú na Boinne resulting from the Waste Management Facility are significantly below the relevant air quality standards for all species. The results for NO_2 indicate that levels at Brú na Boinne reach only 1% of the limit value. With regard to SO_2, the predicted levels at Brú na Boinne will reach at most 0.5% of the limit value, and for all other species modelled, the predicted levels at Brú na Boinne will reach less than 1% of their respective limit values.

Levels of all species are significantly lower than the Human and Ecosystem Standards set by the EU and other European bodies. Thus, the impact air emissions from the Carranstown Waste Management Facility at Brú na Boinne will be insignificant.

Although there are no specific EU standards relating to the maximum levels of ambient air pollutants on stonework or historical monuments, the focus has been on reducing the emissions of the precursors to acid rain such as NO_X, SO_2 and VOCs. The 1999 Gothenburg Protocol to the Convention on Long-range Transboundary Air Pollution, is one such agreement which has set stringent emissions ceilings for NO_X and SO_2 (emissions of SO_2 and NO_X will be reduced by 76% and 43% compared to 1990 levels by 2010). This Protocol has recently been passed into Irish legislation as S.I. No. 10 of 2004. To put the current facility in context, emissions of NO_X, SO_2 and VOCs from Carranstown Waste Management Facility will reach at most 0.4% of their National Emissions Ceilings in 2010.

17. MATERIAL ASSETS

17.1 INTRODUCTION

This chapter evaluates the impacts, if any, which the development will have on Material Assets as defined in the Environmental Protection Agency (EPA) 'Advice Notes on Current Practice (in the preparation of Environmental Impact Statements'), 2003.

This chapter has been prepared based on a review of previous assessments of the site, the most recent of which was completed as part of an EIS and planning application submitted in 2009. This chapter will assess the impact of proposed amendments to the existing planning permission as described in Chapter 1, on the material assets of the site and environs.

As the primary facility has now been constructed, a number of mitigation measures recommended in previous EIS's have now been implemented. This chapter therefore represents an update of the 2009 assessment to include the results of mitigation measures as implemented and any further mitigation measures now required.

Material assets are defined in the Environmental Protection Agency (EPA) advice notes on current practice in the preparation of Environmental Impact Assessments, 2003 as '*resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons*'. The assessment of cultural heritage is discussed under Chapter16; therefore, this Chapter will evaluate the economic assets only.

Economic assets will be discussed under the following areas including:

- Ownership and access
- Local settlement
- Electricity supply
- Traffic
- Water Supply and Usage
- Waste Management
- Agriculture
- Tourism
- Natural Resources

17.2 OWNERSHIP AND ACCESS

Indaver Ireland is the Irish Branch of Indaver NV and was granted full planning permission in 2007 for the development of a 70 MW Waste to Energy Plant in Carranstown, Duleek, Co Meath. Following a grant of permission for detailed design changes in 2009, the plant has transferred into the ownership of Indaver Ireland Limited, the trading company in Ireland owned by Indaver NV. Indaver Ireland Limited is now applying for planning permission for a number of further amendments to the development as described in Chapter 1.

The recently constructed facility is located on an area of approximately 10 hectares (25 acres) which had been previously used for agricultural purposes. The developed portion of the site is approximately 2 hectares (5 acres), with the remaining undeveloped areas of the site landscaped to minimise the visual impact of the facility. This environmental impact assessment evaluates the 10 hectare (25 acres) site in its entirety.

17.3 LOCAL SETTLEMENT

The nearest local settlements adjacent to the development are the town of Duleek and the village of Donore in County Meath. Duleek is located approximately 2.7 km to the south west of the facility and Donore is approximately 2.6km northwest of the proposed site. These local settlements are evaluated in detail in Chapter 6 Human Beings. Drogheda town is located about 4km to the north east of the site. The local settlements within a 3km radius of the proposed facility are discussed in Chapter 6 Human Beings.

17.3.1 Property Prices

In developments of all sizes, types and scales there are often short-term impacts on adjoining assets and properties. This is due to the precautionary nature of people to purchase at a time of construction. Since the facility was granted planning permission, Ireland has experienced a major economic recession and property prices have fallen nationwide. At present it is difficult to assess whether the construction of the facility has had an impact on local property prices as very few transactions are taking place. Overall it is considered unlikely that the proposed amendments will impact on property prices now primary construction is complete. It is likely that the perceived belief that there will be long-term negative impact due to the location of the incinerator was based on mis-information regarding the facility's impact on public health or the environment.

It is now proposed to accept some additional waste streams at the facility which carry a hazardous EWC codes and hence are classified as "hazardous waste". There may be a further perceived risk of negative

impacts by members of the public associated with the acceptance of these waste streams, but as explained in Chapter 2, these waste streams are mainly commonplace materials (such as empty paint tins, rags, etc).

There are over 350 municipal waste incinerators operating in Europe. In line with the proximity principle, many are located in cities, suburbs and other areas close to the main source of waste generation. To date, it appears that the findings of research to determine whether a waste-to-energy facility will have a significant long-term effect on property prices within the area of the facility have been insignificant or inconclusive. As the proposed amendments are small alterations to the existing plant and remain within the property are not considered to have any negative or positive impact on property values.

17.4 ELECTRICITY SUPPLY

As noted in earlier Chapters of the EIS, the 70 MW Waste to Energy Plant generates approximately 16.56MW of electrical output of which c.2MW is used to meet the electrical demands of the facility itself leaving 14.49MW to be exported to the National Grid.

The waste to energy plant exports electricity to the local electrical distribution system via a 38 kV line to Rathmullan Substation about 2.5km north of the site. The line was installed as an underground cable and has not resulted in any visual impact. The proposed amendments will not have any impact on energy generation or energy usage within the plant.

Please refer to Chapter 5 for more information on the site and scheme description.

17.5 TRANSPORT

Details regarding the road network are discussed under Chapter 13, Traffic.

17.6 WATER SUPPLY AND USAGE

17.6.1 Process Water

The plant uses an effluent free flue gas cleaning process and an air cooled condenser rather than cooling towers and as a result it has a significantly lower water requirement than would otherwise be the case. The water requirement for the process has been reduced from 11.6m^3 per hour to 8.5m^3 per hour. The biggest water requirement is for flue gas cleaning. Process water (for the steam cycle), drinking water, domestic potable water and water for cleaning account for the rest of the demand.

Current water requirements are listed in Table 17.1. Approximately 300 litres per hour of additional water demand is anticipated based on the proposed amendments.

Table 17.1 Water requirement

Use	Quality	Quantity (m^3/hr)
Flue gas cleaning	Well water	3.3
Process (steam cycle)	Well water	1.0
Drinking Water	Potable water	1.0
Cleaning & Domestic Supplies	Well water	1.0
Fire fighting	Well water	0.2
Total		**8.5**

The raw water requirement will be supplied by groundwater abstraction and a small supply of potable water from the local water main. Approximately 1m^3/hr will be required from Meath County Council's water main on the R152 for potable supplies.

Since the installation of the site water supply wells the aquifer has been found to have more than adequate capacity to supply the required quantity of water without any significant impact on groundwater levels. This is further detailed in Chapter 10, Groundwater.

The water used in lime milk preparation and in the cooling process is evaporated and only solid waste is produced. This eliminates any process water discharge from the facility as no aqueous effluent is generated. This is further explained in Chapter 5, Description of Proposed Development.

During shutdowns (once or twice per year), the boiler water system will be drained down. This is clean de-mineralised water and the boiler can hold up to 130m^3. This clean water will be discharged to the stormwater system on site.

17.6.2 Potable Water

The mains water supply piped along the R152 road supplies many of the residential dwellings in the area. The Limestone aquifer in the area is also used by a number of groundwater abstractors (See Chapter 10, Ground Water).

The development uses a small quantity of mains water as a potable supply. This is currently supplied to the site via a 1" connection from the mains water on the R152.

17.6.3 Fire Water/ Water Storage Tank

In the event of a fire breaking out in the bunker, the area of waste on fire can be controlled by placing it into the furnace and covering with a layer of waste. However in the unlikely event of the fire not being detected in time, a number of water cannons located in the bunker will be activated to put it out.

All firewater will be contained in the bunker eliminating the need for a firewater retention pond. There is no additional modification required due to the proposed amendments.

17.6.4 Foul Water

Domestic wastewater from toilets, changing and kitchen areas discharges via the foul drainage system into an on site effluent treatment system which passes through a percolation area to ground. The percolation areas, have been constructed in accordance with the guidelines in the various EPA's Wastewater Treatment Manuals and publications.

A separate foul water management system will be installed to service the new office block (previously a temporary building). This system will also comprise an on site effluent treatment system and percolation area. Details on this system are provided in Chapter 5 Scheme Description.

No trade effluent will be discharged from the site to the local surface water or foul drainage system.

17.6.5 Surface Water

Details of the proposed surface water management system are described in Chapter 11, Surface Water.

17.7 WASTE MANAGEMENT

17.7.1 Construction Phase

Disposal of waste during the construction phase is described in Chapter 18, Construction Activities.

17.7.2 Operational Phase

Provisions for recycling collection bins have been made on site where necessary. Domestic waste generated on site from canteen areas etc will be recycled where appropriate and where disposal is required this will be conducted by Indaver. Hazardous wastes generated on site including cleaning agents, oils, batteries, paints etc will be sent to an Environmental Protection Agency approved waste

disposal company for appropriate disposal/ recovery. The operational waste residues produced in the facility are described in detail in Section 5.6.12

17.7.2.1 Bottom Ash Re-Use Options

This ash residue is deemed to be non-hazardous in accordance with the testing regime agreed with the EPA as part of Indaver's Waste Licence W00167-02. If a market for recycled bottom ash comes available in the future, then an ash recycling plant may be built in Ireland. If such an option were available in Ireland then the bottom ash would be sent there. In the absence of such a facility, the bottom ash will be sent to a licensed non-hazardous waste landfill. EPA licensed landfills located in counties Meath, Louth, Cavan and Monaghan would be suitable for the disposal of this material and the Whiteriver Landfill is currently accepting the bottom ash from the site.

Elsewhere in the EU including Belgium, bottom ash from waste incineration is recovered and used in road construction, as railway ballast or as a substitute covering material on landfill, following treatment in an ash recycling plant. Bottom ash has also been trialed in Taiwan as an aggregate for use in concrete production, asphalt concrete production and bricks. Studies in the UK have found that the fine fraction of MSW bottom ash from the incineration of non-hazardous waste can be processed to form new ceramic materials using conventional ceramic processing technology (Bethanis, et al. 2004).

If the ash is to be used for road construction it must generally be of a different grade (higher quality) than if it were to be disposed of in landfill. At present there is no Irish or European legislation or standard in place to govern the quality of ash for use in roads. This improvement in quality can be achieved by treating the ash in an ash recovery plant. In Germany the quality standard of ash for use in road construction is defined by the Federal Working Group on Waste (LAGA) and is based on leachate tests.

The volume of ash produced by a Waste-to-Energy plant is only 10% of the volume of waste and therefore requires less landfill capacity to dispose of it than sending MSW directly to landfill. In addition, due to the inert nature of the ash it will have less adverse impacts than untreated waste which is currently being landfilled.

For further information regarding ash outputs and handling see Chapter 5, Description of Proposed Development.

17.8 AGRICULTURE

Though the site is located in agricultural surroundings and was a former agricultural site itself, it is not considered that the existing facility or the proposed amendments will have any impact on agriculture in the area. The facility is operated under strictest emissions controls and with full regulatory compliance will ensure no significant negative impacts. The potential impacts of this development to agriculture is addressed in relation to soils and discussed in greater detail in Chapter 10 (Soils and Geology). Likewise the assimilative capacity of air and water and their respective potential impacts are discussed in Sections 7 and 10 respectively. See Chapter 6 for potential impact to human health.

As part of the EPA licence for operation of the facility, the Agency is carrying out a programme of monitoring in the areas around the waste-to-energy facility. The programme includes monitoring of food produce in the vicinity in conjunction with the Food Safety Authority of Ireland.

17.9 TOURISM

Tourism is discussed under Chapter 6, Human Beings.

17.10 THE USE OF NATURAL RESOURCES

In so far as possible, any construction materials required for the proposed amendments will be sourced locally and all imported material used on site will be from approved sources. Further details regarding the construction of the development are outlined in Chapter 18.

Raw materials used during the operation of the facility are being and will be sourced in Ireland where possible with others being imported from mainland Europe or the UK. See Section 5.7 for details of the quantities and types of raw materials used. The usage of raw materials will be minimised, but certain margins of safety with respect to emissions will restrict this initiative somewhat.

17.11 MITIGATION MEASURES

As the facility has now been constructed and the proposed construction amendments relate only to the lands within the site boundary, the proposed development will not result in any significant environmental impacts relating to property prices, land severance, land access or disruption to current agricultural land use.

Impacts and specified mitigation measures regarding agriculture, site utilities, groundwater/ hydrogeology, surface water, road network, local settlement and tourism are discussed and evaluated in Sections 17, 10, 11, 13 and 6 respectively.

Waste management on site will be conducted in accordance with best practice to encourage as much segregation and recycling on site. Any waste removed from site will be by carriers in receipt of valid waste permits and to disposal facilities approved by the EPA.

17.12 RESIDUAL IMPACTS

With the above mitigation measures in place, it is anticipated that neither the limited construction required for the proposed amendments nor the subsequent operation of the amended development will result in any significant negative impacts on the existing economic assets.

18. CONSTRUCTION

18.1 INTRODUCTION

As outlined throughout this EIS and in detail in Chapter 1 Introduction, a number of proposed amendments to the existing waste to energy facility are sought by this application. These amendments will entail some very minor construction works.

This section details the construction works required for the proposed amendments and indicates the mitigation measures to be implemented to ensure that potential environmental impacts are minimised.

18.2 PROPOSED WORKS

From a construction perspective, the majority of the proposed physical amendments relates to the change of status of existing temporary structures to permanent status and will therefore only require connection to roadways, drainage systems, installation of footpaths, hardstanding, car parking spaces etc. A new domestic effluent treatment is required for the modular office block. Please refer to Chapter 5 for full details.

18.3 SITE EVALUATION

Multilple site investigations and geotechnical assessments of the site have been completed at the site between 2001 and 2009. Relevant details of these site investigations are included in Section 9 Soils and Geology.

18.4 DURATION AND PHASING

The construction of the primary structure at the facility i.e. the Waste to Energy facility process buildings commenced in June 2009 and was completed in October 2011.

Due to the small scale of the construction works proposed by this application limited preparatory works if any will be required. For the proposed amendments outlined above it is anticipated that all construction works will be completed in one phase and in approximately 2 months.

18.5 CONSTRUCTION TECHNIQUES, MATERIALS AND PLANT

The construction techniques used will be standard and similar to those that would normally be associated with any small scale civil engineering project. Minimal heavy plant will be required but may include;

- Tracked or wheeled excavators
- Teleporters
- Delivery vehicles for concrete and materials

In so far as possible, construction materials will be from local sources. All imported material that will be used on site will be from approved sources.

18.6 EMPLOYMENT

The proposed amendments will require up to 10 construction workers on a temporary basis (in addition to the 44 operational staff currently employed at the site full time).

18.7 ACCOMMODATION/FACILITIES

All necessary staff facilities will be provided for construction workers for the duration of works including:

- Canteen facilities and First Aid Office
- Toilet, wash up and locker facilities and hot water
- Car parking

18.8 CONSTRUCTION OPERATION HOURS

The site construction working hours will be confined to between 0700 and 1900 hours Monday to Saturday, inclusive (excluding public holidays and Sundays). Working hours may vary slightly depending on weather conditions and daylight hours during winter months.

18.9 DRAINAGE WORKS

The drainage works will consist of the provision of alterations/extensions to the existing systems as follows:

Foul drainage:

Foul drainage from the modular office building will be discharged to a new Puraflo® Treatment system which will be located to the east of the building complete with a new percolation area.

Storm water drainage:

Storm water drainage for the new road, car parking and the roofs of the buildings will be routed to the existing system via new drainage lines. In all cases the runoff will be discharged through the storm water attenuation tank and monitoring station.

18.10 WASTE MANAGEMENT

It is anticipated given the nature of the works that minimal construction wastes will be produced at the facility. It is not envisaged that there will be any significant amounts of spoil from construction. All solid waste generated during the construction phase will be adequately stored prior to transfer to an authorised facility for recovery/recycling/disposal.

18.11 FENCING AND SECURITY

The existing facility is fenced and manned security provided. Temporary fencing will be erected around all construction works for their duration. No additional measures are proposed.

18.12 NOISE, VIBRATION AND DUST

Dust emissions during the construction period are expected to be minimal and short in duration as outlined in Chapter 7 Air Quality. Baseline and proposed noise and vibration emissions from construction are presented in Chapter 8 Noise & Vibration.

18.13 TEMPORARY ENVIRONMENTAL PROTECTION MEASURES

Construction works completed at the site are to be small scale and short in duration. All construction works will be completed in accordance with the environmental management plan for the site and the facility licence. The facility licence and the monitoring regime set out by it ensures that all potential nuisances (including traffic management, dust, noise, vibration, litter etc) are managed in accordance with best practice.

18.14 POTENTIAL IMPACTS

Good housekeeping and management during the construction period, including the implementation of the existing site environmental management plan and monitoring regime on the site will ensure that there will be no negative environmental impacts from the construction of the proposed amendments.

19 INTERACTIONS

In accordance with the requirements of EC Directive 85/337/EC (as amended) and Environmental Protection Agency (EPA) "Guidelines on the Information to be contained in Environmental Impact Statements" and "Advice Notes on Current Practice in the Preparation of Environmental Impact Statements", published in 2002 and 2003 respectively, an assessment of the interactions between various environmental factors was completed as part of this environmental impact assessment. An assessment of interactions between the following environmental media was completed:

- human beings,
- flora and fauna,
- soils and groundwater,
- surface water,
- air,
- noise,
- climate,
- material assets, and
- the landscape

Table 19.1 presents a matrix of interactions likely to occur from the proposed development (highlighted in green). The level of interaction between the various media will vary greatly but the table allows the interactions to be identified and detailed where necessary. If the development does not have the potential to impact or affect the interaction then that interaction is not highlighted in Table 19.1.

The interaction matrix is based on the potential interrelationships of the environmental media primarily during the operation phase of the proposed amended development. Interactions relating to the minor construction works proposed are also considered. Details of individual interactions are presented in Table 19.2.

Table 19.1 Interactions between Environmental Media

	Human Beings	Air	Noise	Landscape	Flora & Fauna	Surface Water	Soils & Groundwater	Climate	Material Assets
Human Beings									
Air									
Noise									
Landscape									
Flora & Fauna									
Surface Water									
Soils & Groundwater									
Climate									
Material Assets									

Table 19.2 Discussion of Interactions

Media	Interaction	Discussion
Air	**Human Beings**	Though this application entails only minor construction works these works have the potential to cause a short term impact on air quality primarily generation of dust and the movement of construction traffic. Mitigation measures to prevent such impacts are outlined in Section 19. The amendments detailed in this application entail no significant changes to air emissions as previously modelled. Modelling confirmed that the most stringent ambient air quality standards will not be exceeded. (See Section 7 for additional information relating to air emissions). Similarly, it is considered that the operation of the facility will have no additional impact on human health.
	Flora & Fauna	Dust (relating to minor construction works) and potential air emissions from the process have the potential to affect local flora and fauna. As outlined above in relation to air emissions from the amended facility there will be no significant changes. Detailed air dispersion modelling has shown that the most stringent ambient air quality standards relating to ecology (Council Directive 2000/76/EC) will not be exceeded; therefore no impact on flora and fauna is predicted. (See Section 12 for further information relating to flora and fauna).
	Surface Water	Dust emissions from the facility could affect surrounding watercourses. As the facility is now operated within the limits of Council Directive 2000/76/EC air quality standards, EPA licence W0167-02 and a site specific environmental management plan, no impact on surface water is predicted.

Media	Interaction	Discussion
Air	Soils & Groundwater	A number of Air Quality assessments have been completed for the development of the facility. In 2007, a dioxin uptake study was completed which modelled PCDD/F (dioxin and furan) soil intake using background concentrations in soil and air. This assessment modelled the impact of deposition rates on soil concentrations of dioxins and furans over 30 year operating life of facility. It was concluded that the proposed facility will have no significant impact on dioxin and furan intake for even the theoretical MARI (Maximum at Risk Individual) and that, with respect to intake, the facility will have no impact on human health (See Section 6 for further information regarding dioxins and human health). The proposed amendments result in no change to this conclusion. As the facility is now operated within the limits of Council Directive 2000/76/EC air quality standards, EPA licence W0167-02 and a site specific environmental management plan no impact on soils or groundwater is predicted.
	Material Assets	Considerable research has been undertaken to study the impact of air emissions from waste-to-energy facilities on food produce. As part of the EPAs oversight of the operation of the facility annual surveys are conducted on neighbouring agricultural lands. To date, there is no evidence to suggest that waste-to-energy facilities operating within the stringent emission limits set down in EC Directive 2000/76 on the Incineration of Waste impact on food produce. These stringent emission limits and the World Health Organisation Guidelines have been developed to prevent any impact on public health or the environment, including agriculture. The facility will operate well within these standards will ensure that there will be no negative impacts on agricultural practices.

Media	Interactions	Discussion
Noise	**Human Beings**	During the very minor construction works proposed by this application, sensitive receptors located in close proximity to the development could experience a slight increase in noise. Mitigation measures presented in Chapter 8 will ensure these impacts are minimised. Results of the noise assessment (presented in Chapter 8) indicate that noise from traffic on the regional road passing the site is significantly more than those related to facility operation. All noise emissions from the facility are maintained within EPA regulatory requirements of 55dB and 45dB L_{Aeq} respectively in accordance with the facility licence. Mitigation measures to prevent exceedances of noise emissions are presented in chapter 8). Local residents and other members of the local community continue to have the opportunity to raise any specific issues, concerns or complaints through the Community Liaison Committee which meets regularly.
	Flora & Fauna	Noise emissions associated with the very minor construction works proposed have the potential to impact on birds or other fauna using the site. Previous bird surveys for the construction of the main building concluded that noise associated with the proposed facility during both construction and operation, will not have any adverse impact on any countryside birds found in this area. It is considered that minor construction works will also have no adverse impact.

Media	Interaction	Discussion
Landscape	**Human Beings**	The proposed development comprises minor amendments to an existing industrial development located in a landscape already visually dominated by the industrial complex at Irish Cement, which consists of an array of tall silos and associated industrial sheds. A Landscaping Plan for the existing facility has now been implemented in the form of berming and planting. Though these trees, shrubs and berms are still maturing, they are already softening the visual impact of the facility amongst the surrounding landscape and this will improve with time.

Media	Interaction	Discussion
Surface Water	**Human Beings**	Mitigation measures outlined in Section 11 will ensure that there will be no significant impact on surface water quality or quantity within the vicinity of the proposed development. The proposed development does not entail alteration to the existing drainage network, therefore there will be no potential for flooding of adjacent lands.
	Soils & Groundwater	Though only a limited amount of construction works are required, run-off during these works has the potential to affect the surrounding watercourses if not managed properly. Mitigation measures outlined in Sections 11 and 19 will ensure that run off during the construction period will be controlled.
	Material Assets	The Nanny is an important amenity to the locality in terms of fishing etc. Mitigation measures outlined in Sections 11 and 18 will ensure that the proposed facility does not impact on its water quality.

Media	Interaction	Discussion
Soils & Groundwater	**Human Beings**	Dust from short term construction works has the potential to give rise to nuisance. Mitigation measures proposed in Section 19 will insure such nuisance does not occur.

Media	Interaction	Discussion
Climate	**Material Assets**	The contribution of the Waste-to-Energy Facility to total greenhouse gas emissions in Ireland is equivalent to only 0.09% of the Kyoto target for Ireland in 2012, when energy recovery is taken into account. During the incineration of waste at the facility the thermal energy generated by the burning of waste will be recovered and will give an electrical output of about 16.56MW with a net electrical output from the plant for export to the national grid will be 14.49MW. Thus, the export of power will give a direct benefit in terms of greenhouse gas emissions which would have been released in the production of the same power from power stations. The Waste-to-Energy facility will also recover and recycle ferrous materials during the incineration process. The recycling of metals will require less energy than processes using virgin inputs and thus lead to a direct saving in energy and thus GHG emissions. See Chapter 5, 7 and 15 for further information on the process description, air emissions and climate respectively).

Media	Interaction	Discussion
Material Assets	**Human Beings**	As the facility is now constructed and in operation, it is considered that the impact of the proposed amendments to the facility on property prices will be minimal. There are many similar incinerators operating in Europe many are located in cities, suburbs and other areas close to the main source of waste generation. Due to the strict emissions controls and regulatory compliance that the plant will be working under, no significant negative impacts to adjacent agricultural lands are expected. The potential impacts of this development to agriculture is addressed in relation to soils and discussed in greater detail in Sections 6 and 18.

APPENDIX H

2014 Review Report

awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

2014 Review Report

Technical Report Prepared For

Indaver Ireland

Technical Report Prepared By

Teri Hayes BSc MSc PGeo

Our Reference

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Cork Office
Unit 5, ATS Building,
Carrigaline Industrial Estate,
Carrigaline, Co. Cork.
T: + 353 21 438 7400
F: + 353 21 483 4606

AWN Consulting Limited
Registered in Ireland No. 319812
Directors: F Callaghan, C Dilworth,
T Donnelly, T Hayes, D Kelly, E Porter

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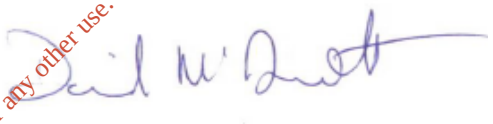
Signature		
Name	Teri Hayes	David McDermott
Title	Director	Principal Consultant
Date	2nd April 2014	2nd April 2014

CONTENTS

1.0 INTRODUCTION

Indaver Ireland is proposing an additional intake of 15,000 tonnes of additional non-hazardous waste up to 31 December 2014, to their facility in Carranstown, Co. Meath. This proposed amendment will not require any material change to the current plant infrastructure, and process flow.

A review of the 2012 EIS findings (submitted with 17.PA0026) has been undertaken with regard to the proposed alteration. The EIS review is summarised below and has shown that all environmental impacts for this alteration has been adequately assessed and addressed. There is no additional impact on the environment other than currently exists for the existing facility. The mitigation measures and monitoring programme proposed by the 2012 EIS and already incorporated in the operation of the facility are more than adequate in minimising any negative impact on the environment.

2.0 REVIEW OF EIS ASPECTS

2.1 Introduction (Chapter 1)

The facility at Carranstown as described in Chapter 1 of the EIS is now in operation since late 2011, the plant is operating under a waste licence (W0167-02). An application for a review of licence (W0167-03) was made to the EPA on April 23rd 2012 and this is currently being reviewed. Due to the change in the application rules (European Union (Industrial Emissions) Regulations 2013, Part IV of the EPA Act 1992), Indaver had submitted to the EPA for an IED Licence in April 2014.

Indaver Ireland is currently proposing a five year alteration up to 31 December 2019 for an additional intake of 15,000 tonnes of additional non-hazardous waste to this facility and has confirmed that there is no resultant impact on the environment.

2.2 Background to the Project (Chapter 2)

The proposed alteration does not result in any change to the nature of the process or waste handling procedures.

2.3 Alternatives and Planning and Policy (chapters 3 and 4)

A review of the alternatives and current planning and policy has been undertaken below to explain the need for this intensification.

Need Assessment

As stated in the 2012 EIS submitted with 17.PA0026, there are three possible alternatives to Waste to Energy for the treatment of residual waste in Ireland currently:

- direct to landfill,
- baling and wrapping waste followed by export to treatment in overseas Waste-to-Energy
- mechanical treatment followed by landfill and/or export.

Due to effective policy measures and waste market economics, landfill capacity is becoming increasingly scarce, while data shows that Ireland is becoming increasingly reliant on the export of municipal waste for recovery. This demonstrates the need for additional recovery capacity within Ireland. The capacity proposed for the Meath facility requires no additional investment cost or infrastructure to be developed and is therefore a highly efficient means of meeting this requirement.

Landfill

Current EU and National Policy is to virtually eliminate landfill. The overall trend in Ireland is in line with this policy, largely due to the imposition of a very high landfill levy. Recently published data from the EPA for 2012 shows that 1,028,000 tonnes of municipal solid waste was sent to landfill in 2012 compared with approximately 750,000 tonnes in 2013[1].

The high landfill levy and competition with exports has driven the closure of many landfills. At the end of 2013, there remained only 9 landfills out of 26 open in 2010.

Within the North East Region, there are three landfills and one waste-to-energy facility. The Whiteriver Landfill in Co. Louth is winding down its operations and only accepted 4397 tonnes in the last quarter of 2013. Knockharley is currently not accepting waste and Scotch Corner Landfill has a remaining capacity for 2/3years in the current cell.

In the Greater Dublin Area, the closure of Kill, KTK, Balleally and Rampere landfills along with the decision not to proceed with the Nevitt landfill and the delay of the Poolbeg waste-to-energy facility has resulted in a lack of residual MSW capacity. The remaining landfills for the greater Dublin area are Drehid and Ballynagran. Drehid has received an intensification for additional tonnage to allow the Pooolbeg facility to come on line. However, this intensification comes to an end in 2015. Therefore as per the Waste Management Plan for the Dublin Region 2005 – 2010 (and evaluated in 2012) the use of other landfills (or recovery facilities) outside of the region is expected.

Indeed, the shortfall in treatment capacity for the immediate future extends to the whole country. The total remaining landfill capacity (of the 9 open landfills) is 720,000tpa. The recovery capacity available includes 220,000tpa[2] at the Meath waste-to-energy facility in Ireland and an additional 363,000tpa at cement kilns (requiring pre-treatment). This brings the total outlet capacity available in the country to 1,303,000tpa compared with approx. 1,447,000 tpa residual waste[3] arising in 2012.

The shortfall in treatment capacity in Ireland can only be addressed in the short term by the opening/reopening of “mothballed” landfills, or by export, as the construction of most types recovery infrastructure if commenced now, would not be complete for a 3-5 year period. Using dormant landfill capacity to address the shortfall in capacity is contrary to EU and National policy as addressed in the following section.

Exports

While exporting waste for recovery helps to drive waste up the waste hierarchy, relying on international recovery capacity increases market risk with competition for capacity from other member states and increases the environmental impacts associated with transport.

At present the main driver for exports is the high landfill levy and lack of alternative treatment capacity in Ireland.

The 2012 EPA waste figures show that a higher percentage of municipal waste was recovered (56%) than disposed of to landfill (44%) for the first time. The EPA state that the increase in the recovery rate for municipal waste was primarily through an increase in the use of municipal waste as a fuel (energy recovery). This is partly due to Ireland’s first municipal waste-to-energy incinerator becoming fully operational in 2012 and the increased use of capacity at cement kilns with the remainder being exported to waste-to-

[1] Based on non-validated landfill returns data obtained from the EPA
[2] With planning permission, waste licence pending
[3] Equivalent to total waste managed less recycling & composting

energy facilities on the continent. While National TFS Office figures for the quantity of MSW wrapped and exported in 2013 are not yet available, Indaver Ireland exported 98,000 tonnes of MSW to Waste to Energy facilities in the Netherlands and Sweden in 2013. There are three other large waste companies that also export MSW, so a figure of 300,000 tonnes would be a conservative estimate.

Current Policy and Waste Planning

The publication of "A Resource Opportunity" – Waste Management Policy in Ireland in July 2012 sets out the approach that all stakeholders in Waste Management need to take in the coming years. The Policy reinforces the waste hierarchy, with landfill a last resort and recognises the role of the Waste Framework Directive, as adopted into Irish law by S.I. No. 126 of 2011, in assigning responsibility to the regulatory authorities for the application of the waste hierarchy in the decision making process. The Policy recognises that waste infrastructure is now provided mainly by private waste industry. The Policy also indicates that by announcing the landfill levy escalator, the Government is giving waste firms clear policy direction so they may invest in waste infrastructure with the focus being on recovery (Section 2.3.4).

The Policy provides confirmation and clarity that in line with both European and Irish waste policy, this amendment, if granted will divert residual municipal waste away from landfill as well as directing waste up the hierarchy.

The proposed alteration would assist in meeting this Policy objective by providing additional recovery capacity.

Waste Management Plans

Evaluations of existing waste management plans have been completed, and the number of waste regions in Ireland have been reduced to three. It is unlikely that publication of the three new waste plans will be before the mid to late 2015. As the existing plans are outdated, we would respectfully submit that regard must be given to the more recent evaluations of the plans as they are indicative of the current situation.

NE Waste Management Plan and Evaluation (Dec 2012)

- The overarching policy aim in the 2005-2010 Waste Management Plan was to move progressively away from reliance on landfill and to strive to implement a regional approach to waste management that is sustainable and based on national and EU legislation and policy. The integrated waste management approach grounded on the EU Waste Management Hierarchy was to be applied to waste generated, implementing maximum recycling, recovery of energy from residual waste, and moving away from landfill disposal.

- The Waste Plan had the target of 18% waste to landfill by end of plan, however only reached 55% in 2010, (table 7.4 of evaluation).

- The evaluation concludes that "overarching policy objectives remain relevant subject to some amendments necessary to reflect developments in legislation and policy."

- The evaluation (Section 7.4) recommends: "Furthermore, providing sufficient biological treatment for separately collected organics and alternative residual treatment capacity is necessary to meet mandatory diversion requirements. Proposals to develop alternative recycling and recovery infrastructure should be in line with EU, national and regional policy".

The Waste Framework Directive Regulations 2011 (SI No 126 of 2011) requires the statutory authorities in Ireland to take measures to establish an integrated network of waste disposal

installation and installations for the recovery of mixed municipal waste. Most Local Authorities have exited the Waste Collection business, and it is recognized that the provision of infrastructure falls to the private sector.

Irelands status in relation to EU Landfill Diversion Targets

The Landfill Directive, which has been transposed into Irish law, sets out the most pressing and challenging targets currently facing the Irish waste sector. It requires that, by 2010, Ireland reduce the amount of Biodegradable Municipal Waste (BMW) going to landfill to 75% of the total amount (by weight) produced in 1995. Subsequently, the amount of BMW going to landfill must not exceed;

• 50% of the total amount (by weight) of BMW produced in 1995 by 2013; and
• 35% of the total amount (by weight) of BMW produced in 1995 by 2016.
Due to its historical reliance on landfill, Ireland obtained a four year extension on the first two targets, which were to be met by other Member States in 2006 and 2009.

Ireland successfully reached the landfill directive targets for biodegradable waste to landfill in 2010 and 2013. The tonnage of biodegradable municipal waste (BMW) disposed to landfill decreased in 2012 (to 588,800 tonnes) which is below the 2013 Landfill Directive target of 610,000 tonnes. However, the latest preliminary solid municipal waste statistics released by the EPA for 2012suggest according to the EPA that meeting the 2016 target is at risk, particularly should economic recovery lead to increased generation. Therefore, it is imperative that outlets other than landfill be available.

2.4 Description of the Development (Chapter 5)

The overall description of the development outlined in Chapter 5 is now constructed and in operation. This section outlines the waste types and relevant EWC codes and it should be noted that Indaver has not and will not be accepting the clinical/healthcare waste EWC code (18 01 03*). In addition it is proposed to take in an additional 15,000 tpa of non-hazardous waste for a period of 5 years (until 2019). There is no additional infrastructure or alteration to process flow as a result of this alteration.

The overall description of the development outlined in Chapter 5 is now constructed and in operation. This section outlines the waste types and relevant EWC codes and it should be noted that Indaver has not and will not be accepting the clinical/healthcare waste EWC code (18 01 03*). In addition it is proposed to take in an additional 15,000 tpa of non-hazardous waste for a period of 5 years (until 2019). There is no additional infrastructure, operation or emissions as a result of this alteration.

Indaver has been operating the Meath waste-to-energy facility for close to three years, since commencing operations it has become apparent that the calorific value of Irish waste is much lower than the estimated 9.35 MJ/kg and is closer to 8 MJ/kg. The tonnage throughput of waste-to-energy facilities is defined by the size of the boiler (thermal capacity), the average expected CV of the waste and the number of operating hours per annum. In the Meath WTE facility, the boiler has a design capacity of 70MW. If the waste has a low calorific value, then more waste needs to be processed to achieve the same thermal output. Conversely, if waste has a higher calorific value then less waste is processed to achieve the same thermal output.

As a result of Indaver's unique operating experience in the Irish waste-to-energy market, we have experienced that Irish waste currently has a lower calorific value, more waste can be processed at the facility than previously expected to meet the thermal capacity of the boiler. As a result, we are confident that an maximum additional 15,000 tonnes for a period until 31st December 2019 is technically available at the Meath WTE facility.

2.5 Human Beings (Section 6)

The Human Beings chapter of the 2012 EIS has been reviewed with regard to the proposed amendment intake and processing of non-hazardous waste (15,000 tonnes) to the existing Indaver facility. This chapter considered the 'existence, activities and well being of people' with respect to 'topics which are manifested in the environment such as new land-uses, more buildings or greater emissions'. The proposed change will not require any change in land use or buildings and the revised air model has confirmed that all regulated air pollutants emitted from the facility remain fully in compliance with their ambient air quality standards. Thus, the impact of the increased throughput from the facility in terms of human being is insignificant.

2.6 Air Quality (Section 7)

A revised air modelling study has been undertaken by AWN to assess the impact of the increase in throughput at the facility compared to the findings of the 2012 EIS. The assessment included the maximum licensed volume flow, the maximum licensed emission concentration and actual temperature, oxygen and moisture levels. This assessment has been undertaken in order to ascertain whether any signficant variation in ambient ground level concentrations of the regulated pollutants occurs due to the variation in the amount of material processed.

Full details of the air dispersion modelling input parameters and modelling methodology are as per the Carranstown WTE Facility EIS which was undertaken in 2012 with the exception that the USEPA air dispersion model, AERMOD, has been updated from version 12060 to version 13350. This has only a minor effect on the ambient ground level concentrations.

A comparison between the ambient ground level process contributions of the regulated pollutants shows only a very minor variation to the results previously reported. Under the proposed scenario, all regulated air pollutants emitted from the facility remain fully in compliance with their ambient air quality standards. Thus, the impact of the increased throughput from the facility in terms of ambient air quality is insignificant.

Note The air quality assessment report prepared by Dr Edward Porter (AWN) is attached.

2.7 Noise Assessment (Section 8)

A review of the noise section in the 2012 EIS was undertaken. This chapter assessed the impact of the anticipated noise and vibration associated with the proposed amendment contained within this 2012 application at nearby sensitive locations. The main potential for a change in the previously assessed noise impact would be as a result of additional traffic needed to transport waste to the plant and additional bottom ash from the plant. There will be no requirement for further construction works or change to the current process arrangements. As the transport assessment has confirmed that the overall traffic to and from the plant will be less than originally anticipated in the 2012 there will be no change to the assessed noise impact.

As outlined in the 2012 EIS, activities on site will be controlled so as not to exceed typical EPA Waste Licence daytime and night-time criteria of 55dB and 45dB L_{Aeq} respectively at the façade of nearby residential properties. The resultant noise impact from the proposed development on the local community is in significant.

2.8 Soils & Geology (Section 9)

The proposed change will not have any direct or indirect impact on soils and geology. No additional construction is required, and mitigation measures are in place to manage any accidental spills or leaks that could occur in the transport and processing of the waste. With the mitigation measures outlined in the 2012 EIS, the additional non-hazardous waste intake to the facility will not have a significant impact on the soils and geology on the site or the surrounding lands.

2.9 Hydrogeology (Section 10)

There is no additional assessment, mitigation measures or monitoring requirements as a result of the proposed amendment to waste intake. The proposed change will not result in any direct discharge to groundwater and the existing plant has adequate mitigation measure to cope with any accidental discharge. The proposed alteration will have no impact on the groundwater regime within the underlying water body. The potential for accidental discharge during construction or operation is low and mitigation measures are in place to minimise any risk to the underlying aquifer.

2.10 Surface Water (Section 11)

The existing surface water management system is adequately designed to prevent uncontrolled discharges to the outfall ditch by the provision of two layers of monitoring and a controlled discharge system. The impacts considered in the 2012 EIS are unchanged by this amendment as no further construction is required to manage the intake and processing of the additional waste. As a result the alteration will have an insignificant impact on the existing surface water environment.

2.11 Ecology (Section 12) & Habitat Screening Statement

As the proposed alteration will not result in any additional construction, have any direct discharge to ground or receiving waters and the air quality assessment has confirmed that all regulated air pollutants emitted from the facility will remain fully in compliance with their ambient air quality standards, the findings of the 2012 EIS ecology assessment are unchanged by the proposed amendment. As in 2012, there will be an insignificant impact on the ecology of the site and mitigation measures in place should ensure that any potential impacts to flora, fauna and birds are minimised.

As the air quality assessment has confirmed that all regulated air pollutants emitted from the facility will remain fully in compliance with their ambient air quality standards and there are no additional discharges to receiving waters, there is no need to no need to reconsider the Habitats Screening Statement.

2.12 Traffic (Section 13)

Roughan O Donovan Consulting Engineers has completed a revised traffic assessment to determine the impact of waste traffic required for proposed amendment in relation to the findings of the 2012 EIS traffic assessment. Information submitted in the EIS set out a worst case scenario for traffic movements for the development based on traffic movements for 220,000 tonnes. The occurrence of this scenario however was considered the worst case assessment as it assumed that 8,500 tonnes of healthcare waste would be delivered in average 1.75 tonne truck loads compared to the non-hazardous waste with an average 18 tonnes truck loads, i.e. significantly smaller and more frequent truck loads.

The revised traffic assessment has shown that it is not expected that there will be an increase of HGV trips generated, despite a proposed increase in capacity at the facility to 235,000 tonnes/annum. This is down to the facility no longer intending to accept healthcare

waste. Comparing the previous worst case trip generation estimates to those expected due to this proposed increase in capacity, the anticipated additional traffic generated by the is 22 vehicles per day. This is a 52% reduction of the worst case scenario traffic generation estimate of 46 vehicles per day for the previously permitted capacity expansion.

Note The traffic assessment report prepared by John Bell (Roughan O' Donovan Consulting Engineers) is attached.

2.13 Landscape (Section 14)

The proposed amendment in waste intake and processing will not require any change to the facility design or layout assessed in the 2012 EIS. All visual impacts for the existing plant were assessed in the 2012 EIS and previous 2009 EIS. As a result the proposed amendment to the development will not result in any visual impacts.

2.14 Climate (Section 15)

The climate assessment undertaken in 2009 and reviewed in 2012 comprehensively addressed the potential impacts of the emissions from the existing development on the climate of the site and its environs. The additional waste intake is not considered to have any measureable impact on climate and therefore the findings of the 2012 assessment are unchanged. There were as follows:

The contribution of the Waste-to-Energy Facility to total greenhouse gas emissions in Ireland is equivalent to only 0.09% of the Kyoto Target for Ireland in 2012, when energy recovery in taken into account. Moreover, compared to the "Do Nothing" scenario, emissions will increase by only 0.05% of the Kyoto Target for Ireland in 2012, when energy recovery in taken into account. Thus, the overall annual impact of the existing plant on climate is to increase greenhouse gas emissions by approximately 0.05% of the total greenhouse gas emissions in Ireland in 2012 and thus will be imperceptible in terms of Ireland's obligations under the Kyoto Protocol.

2.15 Archaeology (Section 16)

As the proposed amendment does not require any further soil stripping or additional construction, there will be no changes to the impacts and mitigation measures outlined in the 2012 EIS.

2.16 Material Assets (Section 17)

Economic assets considered in the 2012 EIS included the following: Ownership and access, Local settlement, Electricity supply, Traffic, Water Supply and Usage, Waste Management, Agriculture, Tourism and Natural Resources. The proposed amendment does not materially change the impact on any of these assets and as the facility has been constructed the proposed amendment will not result in any significant environmental impacts relating to property prices, land severance, land access or disruption to current agricultural land use. The increase in waste intake will result in a slight increase in ash residue (c 10% of volume of waste). This residue is non-hazardous and will continue to be disposed of in a non-hazardous landfill or an ash recycling bottom ash facility if built in the future. As outlined in the 2012 EIS, there is adequate capacity for this waste in EPA licensed landfills located in counties Meath, Louth, Cavan and Monaghan.

As previous the local community will also benefit from each additional tonne of waste accepted and processed by the plant.

2.17 Construction (Section 18)

No additional construction is required for this amendment. The existing plant is capable of the intake and processing of the additional 15,000 tonnes of waste.

2.18 Interactions (Section 19)

There is no change to the overall interaction matrix presented in the EIS by this amendment. Interactions relating to the minor changes in overall traffic and emissions have been considered and it is considered that the mitigation measures and monitoring programmes currently in place are more than adequate in minimising risk to the environment.

3.0 CONCLUSION

In conclusion, the proposed alteration for an additional waste acceptance of 15,000 tpa of non hazardous waste up to 31 December 2014 is not considered to have a negative impact on the environment and the assessment undertaken in 2012 remains valid.

In addition there is no other requirement to prepare an EIS under the Planning and Development Regulations as outlined below.

Schedule 5 Part II Class 13

Any change or extension of development which would

(i) result in the development of a Class listed in Part 1 or Paragraph 1 to 12 of Part 2 of this Schedule, and

(ii) result in an increase in size greater than

- 25 percent, or
- an amount equal to 50 percent of the appropriate threshold whichever is greater.

Schedule 7

A sub-threshold development which is likely to have significant effect.

APPENDIX A

Traffic Assessment

APPENDIX B

Air Quality Assessment

Indaver Carranstown Waste-to-Energy Facility

Traffic & Transportation Report

Roughan & O'Donovan

Draft
March 2014

Client:
Indaver
4 Haddington Terrace
Dun Laoghaire
Co. Dublin

Consulting Engineer:
Roughan & O'Donovan
Arena House
Arena Road
Sandyford
Dublin 18

Indaver Carranstown Waste-to-Energy Facility

Traffic & Transportation Report

Document No: 14.136.10

Made: ..... Deirdre Neff

Checked:..... John Bell

Approved:..... Seamus MacGearailt

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Indaver Carranstown Waste-to-Energy Facility

Traffic & Transportation Report

TABLE OF CONTENTS

1. INTRODUCTION

This report has been prepared to supplement a Planning Application for the proposed expansion of the waste-to-energy facility located off the R152 at Carranstown, Co. Meath.

The existing plant has planning permission to operate a 70MW waste to energy facility with a 220,000 tonne per annum capacity. An increase of 15,000 tonnes is now being proposed, giving a total proposed capacity expansion to 235,000 tonnes. This report sets out the potential traffic and transport impacts that may arise from the expansion of the existing facility to a 235,000 tonne capacity facility.

2. EXISTING ROAD NETWORK

2.1 Site Location and Access

The site of the existing development is located on the R152 Regional Road linking Drogheda to Duleek (see Figure 1 below).

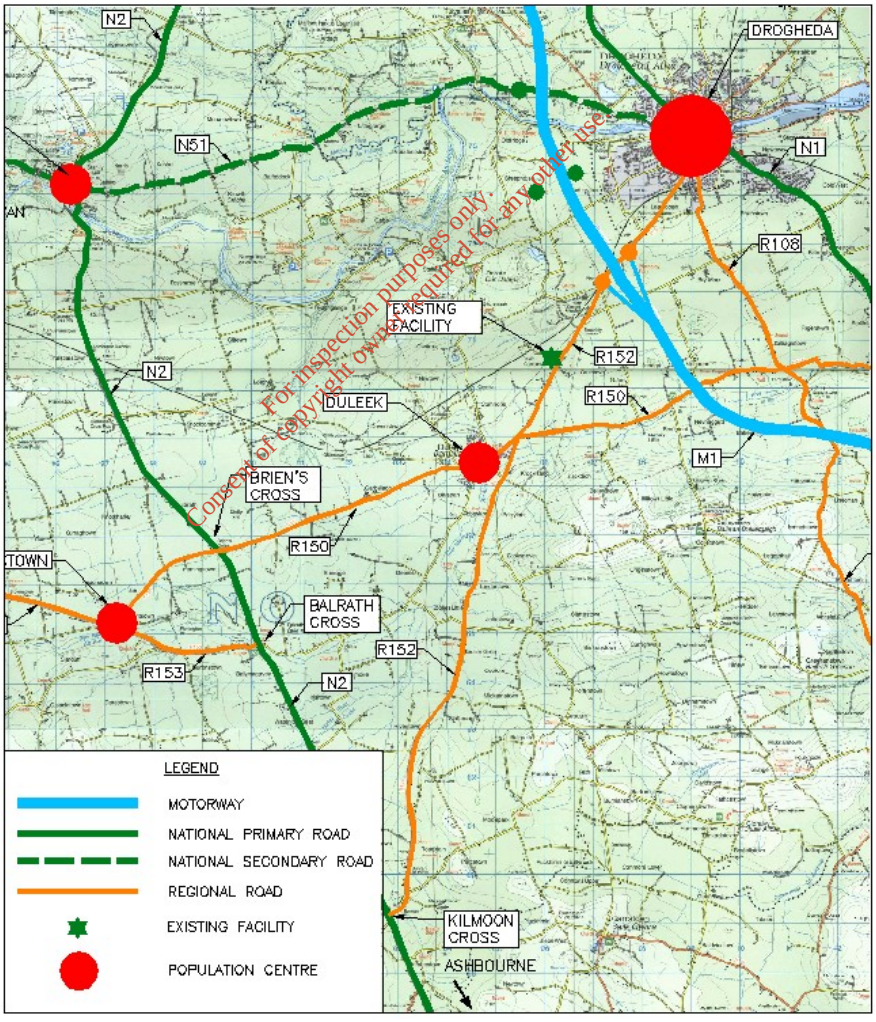

Figure 1 Site Location

The R152 in the vicinity of the site is a single carriageway road with a typical road width of 7.0m and at the site entrance, includes a right turning lane and a deceleration lane for traffic turning left into the site as seen in Photo 1 below. A speed limit of 80kph applies on the R152 in the vicinity of the site.

Photo 1 R152 Layout North of the Indaver Facility

To the north of the site, the R152 connects to the M1 motorway via the Drogheda South Interchange approximately 2.5km from the site. To the south of the site, the R152 forms a priority-controlled junction with the R150 to the east of Duleek approximately 2km from the site.

The junction at the site is a four arm priority junction which includes an access to a small warehouse opposite the entrance to the Indaver site.

There is stacking space for up to 10 Heavy Goods Vehicles (HGV) inside the site off the R152 in advance of the weighbridge and first barrier when entering the site, which ensures delivery trucks don't have to queue on the R152 when a number arrive simultaneously as seen in Photo 2 below.

Photo 2 Indaver Site Entrance

2.2 Haul Routes

The main haul routes to the facility are shown in Figure 2 below. The main routes that carry traffic to and from the development are the R152, the N2 and the M1 motorway. There are 5 main haul routes as follows:

- From Drogheda via the R152;
- From Louth and Monaghan via the M1 Motorway and R152;
- From Navan and surrounds via the R153 through Kentstown, across then N2 and then via the R150 through Duleek to join the R152;
- From Ashbourne via the N2 and R152 from Kilmoon Cross;
- From east Meath via the R150 through Julianstown.

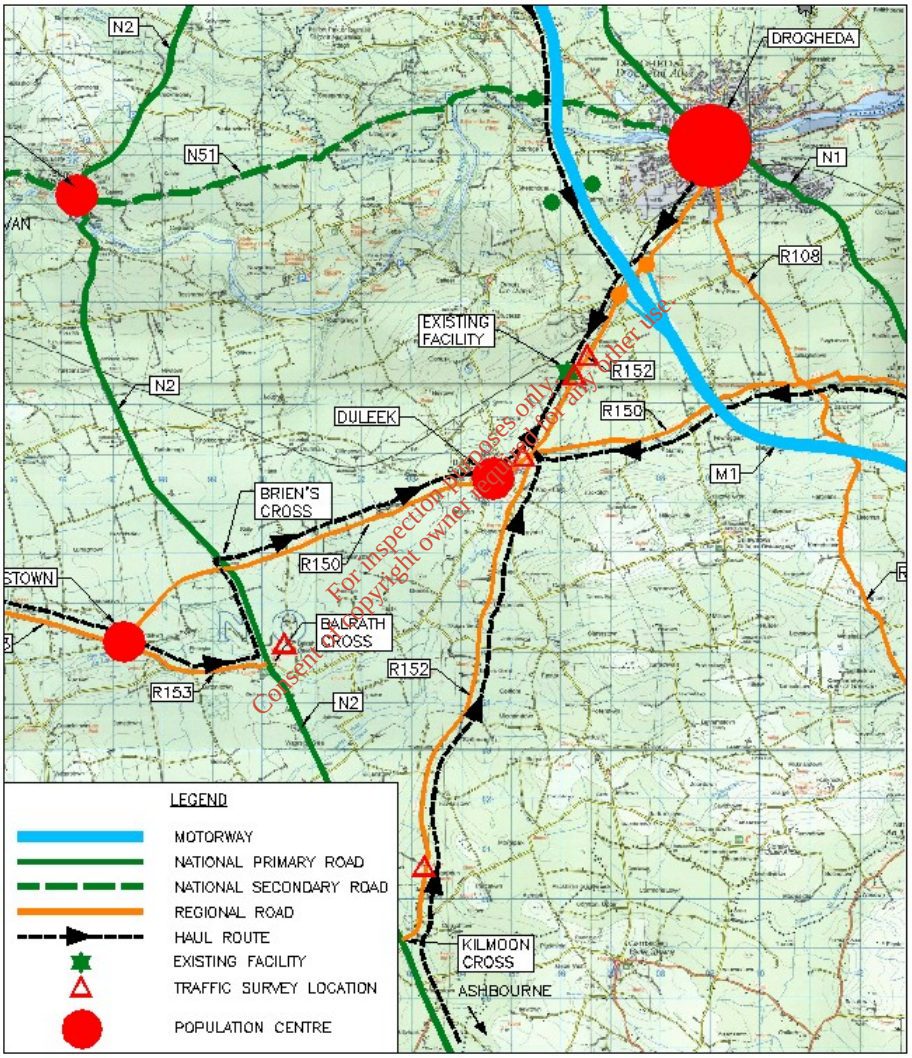

Figure 2 Haul Routes

2.3 Traffic Conditions

A Manual Classified traffic count was carried out at the access to the facility during its operation in December 2011. This traffic count indicates that during the weekday AM peak hour between 08:00-09:00, the two-way flow on the R152 was 1,035 vehicles/hr. The weekday PM peak hour between 17:00-18:00 had a two-way traffic flow of 1,110 vehicles/hr.

These traffic volumes may be factored to 2014 estimated traffic volumes using the annual growth factors provided in National Roads Authority (NRA) Project Appraisal Guidelines (PAG) *Unit 5.5: Link-Based Traffic Growth Forecasting*. The AM peak traffic volume is expected to have risen to 1,070 vehicles/hr while the PM peak is expected to have risen to 1,148 vehicles/hr for medium vehicular growth.

The priority junction at the Indaver site was analysed using these factored traffic volumes to assess its ability to cater for these traffic volumes. Using the PICADY software package, the capacity of the priority junction can be determined and the results presented in terms of the ratio of flow to capacity (RFC). The RFC of an arm in a junction is a measure of the proportion of the capacity of an approach arm in a junction being availed of by traffic. It is considered good practice to ensure the RFC on any arm of a priority junction should not exceed 0.850 (that is to say that the junction should not operate above 85% of its theoretical capacity) as turbulent factors above that threshold may inhibit the optimal performance of the junction. The vehicle queue length can also be assessed and is presented in terms of number of vehicles.

The results of the assessment are presented in Table 2.1 below.

Table 2.1 PICADY Analysis

Directional Movement	AM		PM	
	RFC	Queue Length	RFC	Queue Length
Indaver site to R152 North	0.02	0.02	0.02	0.02
Indaver Site to R152 South	0.01	0.01	0.01	0.01
R152 North to Indaver site	0.02	0.02	0.00	0.00

The analysis shows that the junction works well with significant spare capacity in comparison with the desirable minimum RFC of 0.85.

3. PROPOSED DEVELOPMENT

The existing waste-to-energy facility, which has been granted permission (ABP ref: PL17 .PA0026) to expand its waste capacity from 200,000 tonnes per annum to 220,000 tonnes per annum, intends to further increase its capacity to 230,000 tonnes per annum. This increase would incorporate the 20,000 tonne capacity granted previously and an additional 15,000 tonnes of residual waste however the facility no longer intends accept healthcare waste under their EPA licence.

The waste to be accepted by the facility will comprise Bottom Ash, Non Hazardous Waste and Other Hazardous Waste. The intention not to accept healthcare waste and the increase in residual waste accepted will impact on the level of daily traffic generated by the proposed expansion of the facility.

4. TRAFFIC ASSESSMENT

4.1 Previous Environmental Impact Statement

Traffic surveys of the delivery activity of the site, undertaken as part of the planning application for the plant expansion in 2011 (ABP ref: PL17 .PA0026) indicated an average of 92 HGV's per day at the full 200,000 tonne capacity of the facility at the time. Information submitted as part of the submission to An Bórd Pleanála set out a

worst case scenario for traffic movements for the proposed expansion, from 200,000 to 220,000 tonnes, if the facility accepted all forms of waste, including healthcare waste. This scenario anticipated 46 additional HGV movements on average per day for the expansion amounting to 138 HGV's per day for the entire plant. The occurrence of this scenario however was considered the worst case assessment as it assumed that 8,500 tonnes of healthcare waste would be delivered in average 1.75 tonne truck loads compared to the non-hazardous waste with an average 18 tonnes truck loads, i.e. significantly smaller and more frequent truck loads.

4.2 Traffic Generation

It is not expected that there will be an increase of HGV trips generated, despite a proposed increase in capacity at the facility. This is down to the facility no longer intending to accept healthcare waste. This decision has eliminated potentially 34 two-way HGV movements per day or 4,857 truck loads per year from the activities at the facility based on the 8,500 tonnes used in the worst case analysis in the previous planning permission as referred to above.

Comparing the previous worst case trip generation estimates to those expected due to this proposed increase in capacity, the anticipated additional traffic generated by the is 22 vehicles per day. This is a 52% reduction of the worst case scenario traffic generation estimate of 46 vehicles per day for the previously permitted capacity expansion.

A breakdown of the HGV traffic generation associated with the proposed increase in capacity of the facility compared to that currently permitted is given in Table 4.1. The traffic generation is broken down into types of waste, average weight of trucks transporting each waste type and the amount of waste expected for each type.

Table 4.1 HGV Traffic Generation

Waste	Worst Case Scenario +20,000 tonnes per annum	Proposed Scenario 35,000 tonnes per annum
Healthcare waste (average weight 1.75t per load)	8,500t = 4,857 truck loads/yr or 34 two-way movements/day	0
Other Hazardous waste (average weight 6t per load)	6,500t = 1,083 truck loads/yr or 8 two-way movements/day	10,000t = 1,667 truck loads/yr or 12 two-way movements/day
Non hazardous waste (average 18t per load)	5,000t = 278 truck loads/yr or 2 two-way movements/day	25,000t = 1,389 truck loads/yr or 10 two-way movements/day
Bottom Ash (average 18t per load)	5,000t = 278 truck loads/yr or 2 two-way movements/day	8,750t = 486 truck loads/yr or 3 two-way movements/day
Total Movements	**6,496 veh/yr or 46 veh/day**	**3,542 veh/yr or 25 veh/day**

5. CONCLUSIONS

The proposed expansion of the plant capacity by 15,000t to a total of 235,000t is not expected to result in an increase in traffic. The decision not to accept healthcare waste will in fact reduce the HGV traffic generation of the facility from 46 veh/day to 25 veh/day or equivalent to a 43% reduction to that currently permitted.

awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

AIR QUALITY ASSESSMENT FOR INDAVER CARRANSTOWN WASTE TO ENERGY FACILITY

Technical Report Prepared For

Indaver Ireland Ltd
4th Floor, Block 1
West Pier Business Campus
Old Dunleary Road
Dun Laoghaire

Technical Report Prepared By

Edward Porter PhD C Chem MRSC MIAQM

Our Reference

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01 April 2014

Cork Office
Unit 5, ATS Building,
Carrigaline Industrial Estate,
Carrigaline, Co. Cork.
T: + 353 21 438 7400
F: + 353 21 483 4606

AWN Consulting Limited
Registered in Ireland No. 319812
Directors: F Callaghan, C Dilworth,
T Donnelly, T Hayes, D Kelly, E Porter

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1.0 AIR QUALITY

1.1 INTRODUCTION

The air quality assessment undertaken in 2012 comprehensively addressed the potential impacts of the emissions from the Indaver Ireland Carranstown Waste To Energy facility on the ambient air quality in the environs of the facility. The 2012 study has been updated to assess the air quality impact for an increase in waste accepted from 220,000 tonnes / annum to a maximum of 235,000 tonnes / annum.

The 2012 assessment was modelled based on the maximum emission concentrations outlined in the Waste Incineration Directive (2000/76/EC), and assuming 125% of the nominal flue gas flow rate and also assuming 100% availability of the plant based on 8760 hours per year. This study found that the impact on air quality would not be significant. The air modelling study has been updated based on the maximum allowable volume flow outlined in Indaver Ireland's Waste Licence (W0167-02) and based on the average temperature, oxygen level and moisture level measured at the facility in 2013.

A summary of the key findings of the updated air quality assessment is presented below.

1.2 EXISTING ENVIRONMENT

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality "Air Quality Monitoring Annual Report 2012"[1] details the range and scope of monitoring undertaken throughout Ireland.

As part of the implementation of the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), four air quality zones have been defined in Ireland for air quality management and assessment purposes[1,2]. Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 21 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D. In terms of air quality management, the facility is defined as Zone D[1,2].

Long-term NO_2 monitoring is carried out at two rural Zone D locations, Glashaboy and Kilkitt[1,2]. The NO_2 annual average in 2012 for both sites was 9 and 4 $\mu g/m^3$, respectively. The results of NO_2 monitoring carried out at the urban Zone D location in Castlebar in 2012 indicated an average NO_2 concentration of 8 $\mu g/m^3$ with no exceedances of the 1-hour limit value[1,2]. Hence, the long-term average concentrations measured at these locations were significantly lower than the annual average limit value of 40 $\mu g/m^3$. Based on the above information and previous baseline monitoring data carried out at the site as reported in the 2009 EIS, a conservative estimate of the background NO_2 concentration is 20 $\mu g/m^3$

Long-term PM_{10} monitoring was carried out at the urban Zone D locations of Castlebar and Shannon Town in 2012[1]. The average concentrations measured at both sites were 12 and 11 $\mu g/m^3$, respectively. Long-term PM_{10} measurements carried out at the rural Zone D location in Kilkitt in 2012 gave an average level of 9 $\mu g/m^3$[1]. Data from the Phoenix Park in Dublin also provides a good indication of urban background levels, with an annual average in 2012 of 11 $\mu g/m^3$[1]. Based on the above information and previous baseline monitoring data carried out at the site

as reported in the 2009 EIS, a conservative estimate of the background PM_{10} concentration is 20 µg/m^3.

The results of $PM_{2.5}$ monitoring at Claremorris (Zone D) in 2010[(1)] indicated an average $PM_{2.5}/PM_{10}$ ratio of 0.60. Based on this information, a conservative ratio of 0.70 was used to generate a rural background $PM_{2.5}$ concentration of 14 µg/m^3.

A summary of the background concentrations used for the air dispersion model is detailed in Table 1.1.

1.3 AIR DISPERSION MODELLING ASSESSMENT

Full details of the air dispersion modelling input parameters and modelling methodology are as per the Carranstown WTE Facility EIS which was undertaken in 2012 with the exception that the USEPA air dispersion model, AERMOD, has been updated from version 12060 to version 13350. This has only a minor effect on the ambient ground level concentrations.

Modelling and a subsequent impact assessment was undertaken for the following substances released from the site:

- Nitrogen dioxide (NO_2)
- Sulphur Dioxide (SO_2)
- Total Dust (as PM_{10} and $PM_{2.5}$)
- Gaseous and vaporous organic substances expressed as total organic carbon (TOC)
- Hydrogen Chloride (HCl)
- Hydrogen Fluoride (HF)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- PCDD/PCDFs (Dioxins/Furans)
- Mercury (Hg)
- Cadmium (Cd) and Thallium (Tl)
- And the sum of Antimony (Sb), Arsenic (As), Lead (Pb), Chromium (Cr), Cobalt (Co), Copper (Cu), Manganese (Mn), Nickel (Ni) and Vanadium (V).

The worst-case meteorological conditions for Dublin Airport over the five year period 2001-2005 have been used for each individual pollutant and averaging period. The worst-case year with regard to annual average and maximum concentrations was 2004, with annual average concentrations 23% higher than the five-year average and the maximum value 13% higher than the five-year average. With regard to the 1-hour percentiles (i.e. 99.8th%ile, 99th%ile & 98th%ile), the worst-case year (2005) ranges from 6% to 17% higher than the five-year average. For the 8-hour period and 24-hour averaging period (i.e. 90.4th%ile, 99.2nd%ile), the worst-case year is 13% and 25% higher respectively than the five year average.

As a result of these conservative assumptions, there will be an over-estimation of the emissions from the site and the impact of the proposed facility on human health and the surrounding environment.

Modelled Locations

In relation to the spatial assessment of emissions from the site, modelling has been carried out to cover locations at the boundary of the site and beyond, regardless of

whether any sensitive receptors are located in the area. Ambient air quality legislation designed to protect human health (i.e. by setting ambient limit values for a range of pollutants) is generally based on assessing ambient air quality at locations where the exposure of the population is significant relevant to the averaging time of the pollutant. However, in the current assessment, ambient air quality legislation has been applied to all locations regardless of whether any sensitive receptors (such as residential locations) are present for significant periods of time. Thus, again, this represents a worst-case approach an examination of the corresponding concentrations at the nearest sensitive receptors relative to the actual quoted maximum concentration indicates that these receptors generally experience ambient concentrations significantly lower than that reported for the maximum value.

Emissions from the proposed site has been modelled using the AERMOD dispersion model which is the USEPA's regulatory model used to assess pollutant concentrations associated with industrial sources[3]. Emissions have been assessed under the maximum emissions limits of the EU Directive 2000/76/EC.

1.3.1 Process Emissions

Indaver Ireland has one main process emission point (stack) at the Carranstown facility. The operating details of this major emission point has been taken from information supplied by Indaver Ireland and are outlined in Table 1.2. The table outlines the maximum allowable volume flow outlined in Indaver Ireland's Waste Licence (W0167-02) and is based on the average temperature, oxygen level and moisture level measured at the facility in 2013.

Emissions from the site have been assessed for maximum operating conditions. The AERMOD model was run using a unitised emission rate of 1 g/s. The unitised concentration output has then been adjusted for each substance based on the specific emission rate of each pollutant.

1.3.2 Study Results

The main study conclusions are presented below for each substance in turn:

NO_2

NO_2 modelling results indicate that the ambient ground level concentrations are below the relevant air quality standards for the protection of human health for nitrogen dioxide under maximum operation of the site. Thus, no adverse impact on public health or the environment is envisaged to occur under these conditions at or beyond the site boundary. Emissions at maximum operations equate to ambient NO_2 concentrations (including background concentrations) which are 31% of the maximum ambient 1-hour limit value (measured as a 99.8th%ile) and 52% of the annual average limit value at the worst-case receptor.

SO_2, PM_{10} & $PM_{2.5}$

Modelling results indicate that ambient ground level concentrations are below the relevant air quality standards for the protection of human health for sulphur dioxide, PM_{10} and $PM_{2.5}$ under maximum operation of the site. Thus, no adverse impact on public health or the environment is envisaged to occur under these conditions at or beyond the site boundary. Emissions at maximum operations equate to ambient

concentrations (including background concentrations) ranging from 5% - 50% of the respective limit values at the worst-case receptors.

TOC, HCl & HF

Modelling results indicate that the ambient ground level concentrations are below the relevant air quality guidelines for the protection of human health for TOC (assumed pessimistically to consist solely of benzene) and HCl under maximum operation of the site. Thus, no adverse impact on public health or the environment is envisaged to occur under these conditions at or beyond the site boundary. Emissions at maximum operations equate to ambient concentrations (including background concentrations) for HCl and TOC of only 4% and 15% respectively of the ambient limit values.

HF modelling results indicate that emissions at maximum operations equate to ambient HF concentrations (including background concentrations) which are 8% of the maximum ambient 1-hour limit value (measured as a 98th%ile) and 37% of the annual limit value.

PCDD / PCDFs (Dioxins/Furans)

Currently, no internationally recognised ambient air quality concentration or deposition standards exist for PCDD/PCDFs (Dioxins/Furans). Both the USEPA and WHO recommended approach to assessing the risk to human health from Dioxins/Furans entails a detailed risk assessment analysis involving the determination of the impact of Dioxins/Furans in terms of the TDI (Tolerable Daily Intake) approach. The WHO currently proposes a maximum TDI of between 1-4 pgTEQ/kg of body weight per day.

Background levels of Dioxins/Furans occur everywhere and existing levels in the surrounding area have been extensively monitored as part of this study. Monitoring results indicate that the existing levels are significantly lower than urban areas and typical of rural areas in the UK and Continental Europe. The contribution from the site in this context is minor, with levels at the worst-case receptor to the north-east of the site, under maximum operation, remaining significantly below levels which would be expected in urban areas. Levels at the nearest residential receptor will be minor, with the annual contribution from the proposed facility accounting for less than 2% of the existing background concentration under maximum operating conditions.

PAHs

PAHs modelling results indicate that the ambient ground level concentrations are below the relevant air quality target value for the protection of human health under maximum operation of the site. Thus, no adverse impact on public health or the environment is envisaged to occur under these conditions at or beyond the site boundary. Emissions at maximum operations equate to ambient benzo[*a*]pyrene concentrations (including background concentrations) which are only 9% of the EU annual average target value at the worst-case receptor.

Hg

Hg modelling results indicate that the ambient ground level concentrations are below the relevant air quality standards for the protection of human health under maximum operation of the site. Thus, no adverse impact on public health or the

environment is envisaged to occur under these conditions at or beyond the site boundary. Emissions at maximum operations equate to ambient mercury concentrations (including background concentrations) which are only 0.15% of the annual average limit value at the worst-case receptor.

Cd and Tl

Modelling results indicate that the ambient ground level concentrations will be below the relevant air quality standard for the protection of human health for cadmium under maximum operation of the site. Emissions at maximum levels equate to ambient Cd and Tl concentrations (excluding background concentrations) which are 6% of the EU annual target value for Cd close to the site boundary (the comparison is made with the Cd limit value as this is more stringent than that for Tl).

Sum of As, Sb, Pb, Cr, Co, Cu, Ni, Mn and V

Modelling results indicate that the ambient ground level concentrations are below the relevant air quality standards for the protection of human health for arsenic (As) and antimony (Sb) (the metals with the most stringent limit values) under maximum, average operation of the site (based on the ratio of metals released from a similar facility in Belgium). Thus, no adverse impact on public health or the environment is envisaged to occur under these conditions at or beyond the site boundary. Ambient concentrations have been compared to the annual target value for As and the maximum 1-hour limit value for Sb as these represent the most stringent limit values for the suite of metals. Emissions at maximum operations equate to ambient As concentrations (excluding background concentrations) which are only 6% of the EU annual target value at the worst-case receptor whilst emissions at maximum operations equate to ambient Sb concentrations (excluding background concentrations) which are only 0.3% of the maximum 1-hour limit value at the worst-case receptor.

1.4 SUMMARY

Modelling results indicate that the ambient ground level concentrations are below the relevant air quality standards or guidelines for the protection of human health for all compounds under maximum operation of the site. The modelling results indicate that this maximum occurs near the site's northern and eastern boundaries. Maximum operations are based on the emission concentrations outlined in EU Directive 2000/76/EC.

An appropriate stack height has been selected to ensure that ambient air quality standards for the protection of human health will not be approached even under worst-case operating scenarios. The stack height determined by air dispersion modelling which will lead to adequate dispersion was 65 metres.

Concentrations fall off rapidly away from this maximum and the short-term limit values at the nearest residential receptor (not including background concentrations) will be less than 5% of the short-term limit values. The annual average concentration has an even more dramatic decrease in maximum concentration away from the site with concentrations from emissions at the proposed facility accounting for less than 1.4% of the limit value (not including background concentrations) at worst case sensitive receptors near the site. Thus, the results

indicate that the impact from the proposed facility is minor and limited to the immediate environs of the site.

In the surrounding main population centres, Duleek and Drogheda, levels are significantly lower than background sources with the concentrations from emissions at the proposed facility accounting for less than 0.1% of the annual limit values for the protection of human health for all pollutants.

A comparison of the modelling results from this assessment with those from 2012 shows that predicted pollutant concentrations are slightly decreased as a result of the revisions to the air dispersion model based on actual operational data.

1.5 REFERENCES

(1) Environmental Protection Agency (2013) Air Quality Monitoring Report 2012 (& previous annual reports 1997-2011)
(2) EPA Website (2014) http://www.epa.ie/whatwedo/monitoring/air/
(3) USEPA (2005) AERMOD - Description of Model Formulation

Table 1.1 Estimated annual background concentrations In Carranstown Region ($\mu g/m^3$).

	NO_2	SO_2	PM_{10}	$PM_{2.5}$	CO	TOC[(1)]	HCl	HF	Dioxins[(3)]	PAHs	Cd	Hg	Sb	As	Ni
Baseline Monitoring Data[(1)]	18	3	18	13	-	0.6	0.01	0.005	0.046 pg/m^3 0.028 pg/m^3	0.001	0.001	0.001	0.001	0.001	0.002
Traffic Impact Assessment[(4)]	1	-	0.3	0.3	100	0.01	-	-	-	-	-	-	-	-	-
Cumulative Assessment	1	1	0.7	0.7	-[(2)]	-[(2)]	-[(2)]	-[(2)]	-[(2)]	-[(2)]	-[(2)]	-[(2)]	-[(2)]	-[(2)]	-[(2)]
Annual Background Concentration	**20**	**4**	**20**	**14**	**200**	**0.7**	**0.01**	**0.005**	**0.046pg/m^3** **0.028 pg/m^3**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.002**

(1) Surveys undertaken in 2001/02 and 2005/06. TOC assumed to be composed of benzene solely as a worst-case

(2) Cumulative Assessment outlined in 2009 EIS. No cumulative assessment carried out for some pollutants as emissions from the site (or nearby sites) are less than significance criteria (defined as greater than 2% of ambient limit value)

(3) Baseline results for dioxins given as firstly (i) Non-detects = limit of detection, (ii) Non-detects = 50% of limit of detection.

(4) See Appendix 7.4 of the 2012 EIS for full details of the traffic impact assessment. Results given are a worst-case as traffic levels will be lower with the current application than that used in the assessment.

Table 1.2 Process Emission Design Details – Current & 2012 Assessment

Scenario	Stack Height (m) OD	Exit Diameter (m)	Cross-Sectional Area (m^2)	Temp. (K)	Volume Flow (Nm^3/hr)[(1)]	Actual Oxygen (%)	Actual Moisture (%)	Exit Velocity (m/sec actual)
110% Maximum (2012 Assessment)	95.8	2.2	3.80	422	183,700	5.6	20.7	18.77
Current Assessment	95.8	2.2	3.80	423	151,000	8.8	23.6	23.92

Note 1 Normalised to 273K, 11% Oxygen, dry gas.

Table 1.3 Ambient Ground Level Concentrations Based On Maximum Licenced Volume Flow In The EIS & Actual Temperature, Oxygen Level & Moisture Level

Compound	Background ($\mu g/m^3$)	Process Contribution ($\mu g/m^3$) Maximum 110% Volume Flow (2012 Assessment)	Process Contribution ($\mu g/m^3$) Maximum Licenced Volume Flow Current Assessment	Variation ($\mu g/m^3$)	Predicted Environmental Concentration (PEC) ($\mu g/m^3$)	Limit Value ($\mu g/m^3$)	PEC As % Of Ambient Limit	Variation As % Of Ambient Limit
NO_2 (1-Hr)	40	31.1	21.8	-9.3	61.81	200	31%	-4.66%
NO2 (Ann)	20	0.93	0.86	-0.074	20.86	40	52%	-0.19%
NOX (Ann)	25	1.25	1.14	-0.109	26.14	30	87%	-0.36%
SO2 (1-Hr)	8	29.7	20.8	-8.9	28.80	350	8%	-2.54%
SO2 (24-Hr)	4	2.68	2.26	-0.415	6.26	125	5%	-0.33%
PM10 (24-Hr)	20	0.20	0.19	-0.014	20.19	50	40%	-0.03%
PM10 (Ann)	20	0.062	0.060	-0.005	20.06	40	50%	-0.01%
PM2.5 (Ann)	12	0.062	0.060	-0.005	12.06	25	48%	-0.02%
CO (8-hr)	400	23.5	18.8	-4.7	418.8	10000	4%	-0.05%
Benzene (Ann)	0.7	0.062	0.060	-0.005	0.76	5	15%	-0.10%
HCl (1-hr)	0.01	5.29	3.72	-1.569	3.73	100	4%	-1.57%
HF (1-hr)	0.005	0.35	0.25	-0.105	0.253	3	8%	-3.49%
HF (Ann)	0.005	0.0062	0.0057	-0.0005	0.011	0.3	37%	-0.17%
Hg (Ann)	0.001	0.00032	0.00029	0.000	0.0013	1	0.13%	0.004%
Cd (Ann)	0.001	0.00032	0.00029	-0.00003	0.0013	0.005	26%	-0.70%
As (Ann)	0.001	0.00034	0.00030	-0.00004	0.0013	0.006	22%	-0.68%
Sb (1-hr)	0.001	0.0176	0.0143	-0.0033	0.0153	5	0.3%	-0.07%
Dioxin / Furans (Ann)	0.0028 – 0.0046 pg/m^3	0.00062 pg/m^3	0.00057 pg/m^3	-0.00005 pg/m^3	0.0052 pg/m^3	N/A	N/A	N/A
PAH(Ann)	0.090 ng/m^3	0.0018 ng/m^3	0.00172 ng/m^3	-0.00008 ng/m^3	0.0917 ng/m^3	1 ng/m^3	9%	-0.01%

APPENDIX I

Copy of Letter to An Bord Pleanala and

Receipt for Submission

INDAVER

www.indaver.ie

Strategic Infrastructure Development Section
An Bord Pleanála
64 Marlborough Street
Dublin 1

2th April 2014

Dear Sir or Madam,

Re: An Bord Pleanála Reference Number: 17.PA0026

Alteration request under Section 146B of the Planning Acts

We refer to Indaver Ireland Ltd's strategic infrastructure permission reference 17.PA0026 in respect of our waste-to-energy facility at Carranstown, Duleek, County Meath.

We would like to request an alteration to the terms of the development, specifically to Condition 3(1) of permission reference 17.PA0026.

Condition 3(1) currently reads:

> *"The tonnage of waste accepted for treatment at the facility shall not exceed 220,000 tonnes per annum".*

We would like to request that Condition 3(1) be amended as follows:

> *"The tonnage of waste accepted for treatment at the facility until 31 December 2019 shall not exceed 235,000 tonnes per annum. Thereafter the tonnage of waste accepted for treatment at the facility shall not exceed 220,000 tonnes per annum, unless a further permission in this respect is granted".*

The proposed alteration to the terms of the development would therefore allow the acceptance of an additional 15,000 tonnes of municipal non-hazardous waste per annum on a temporary basis until 31 December 2019. There is no proposal to increase the tonnage of hazardous waste accepted for treatment; this change would relate to non-hazardous waste only.

ISO 9001
ISO 14001
OHSAS 18001

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Indaver Ireland Ltd submits the following report with its request for alteration under Section 146B:

1. 2014 Review Report

(a) describes the need for the alteration, including in the policy context.

(b) has been prepared by reference to the environmental impact statement submitted for 17.PA0026, and the further information submitted during the course of that application.

2 The development for which this alteration is being sought requires consideration by the EPA for an Industrial Emissions Directive licence.

3 Application Fee.

4 A CD is provided with the 2012 EIS for ease of reference.

We would appreciate a copy of written confirmation that An Bord Pleanala is considering an application for an alteration (under section 146B) and that an EIS is not required. This confirmation is required for the IED process.

Indaver Ireland Ltd believes that these documents should enable the Board to decide that this change does not constitute the making of material alteration to the terms of the development and is not likely to have significant effects on the environment. It is Indaver Ireland Ltd's belief that the proposed change in tonnage does not require the preparation of an environmental impact statement.

We look forward to hearing from you.

Yours faithfully,

Jane Hennessy
Communications Manager

AN BORD PLEANÁLA
GENERAL RECEIPT
ADMHÁIL

No. IR 85290
Uimh. IR

An Bord Pleanála

RECEIVED FROM
FUARTHAS Ó

Indaver Ireland Ltd

The sum of
Suim

€ 30,000

in respect of:
ar:

Alteration request under S.146b of the Planning Acts.

Appeal or other Statutory Fee
Achomharc nó ar Tháille Reachtúil eile

Cheque

Purchase of Statutory Documents
Doiciméid Riachtúil a cheannach

Other - Please specify
Eilé - Sonraigh le do thoil len bhur dtoil

(2) Documents in relation to:
Doiciméid a bhaineann le:

Heath Co. Council

SEE NOTE ON BACK OF RECEIPT
LÉIGH AN NÓTA AR CHÚL

Signed
Sínithe

Maeve Williams

Date
Dáta

02.04.14

www.indaver.ie

Strategic Infrastructure Development Section
An Bord Pleanála
64 Marlborough Street
Dublin 1

2nd April 2014

Re: Indaver Ireland (Licence ref WO167-03) Application for IED Licence

Dear Sir or Madam,

As required by Article 4 Regulation 9 of European Union (Industrial Emissions) Regulations 2013, we wish to inform you that we, Indaver Ireland 4th Floor, Block 1 West Pier Business Campus, Old Dunleary Road, Dun Laoghaire, Co. Dublin, intends to apply to the Environmental Protection Agency for a licence for the Meath Waste Management Facility, Carranstown, Duleek, Co. Meath, National Grid Reference 3063E, 2709N.

The classes and nature of the industrial emissions directive activities in accordance with the First Schedule to the Environmental Protection Agency Act 1992 as amended will be as follows:

11.3 Disposal or recovery of waste in incineration plants or in waste co-incineration plants (a) for non-hazardous waste with a capacity exceeding 3 tonnes per hour, (b) for hazardous waste with a capacity exceeding 10 tonnes per day.

11.4 (b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, (other than activities to which the Urban Waste Water Treatment Regulations 2001 (S.I. No. 254 of 2001) apply): (iii) treatment of slags and ashes;

An application for a waste licence review (W0167-03) was made to the EPA on 23rd April 2012. As outlined in a letter received from the EPA on 19th February 2014, we note the change in the applicable rules, Pursuant to the European Union (Industrial Emissions) Regulations 2013, Part IV of the Environmental Protection Agency Act 1992.

Indaver Ireland has submitted an application to An Bord Pleanala in relation to an alteration up to 31st December 2019 for 15,000 tonnes of additional non hazardous waste to this facility. A review of the environmental impact for this additional alteration has been undertaken and has been shown to have no additional impact on the environment.

This application is accompanied by an Environmental Impact Statement (EIS) as was submitted to An Bord Pleanala and Meath County Council in 2012. The Environmental Impact Statement together with any further information relating to the effects on the environment of the emissions from the activity which has been or may be furnished to the Agency in the course of the Agency's consideration of the application, will be available from the headquarters of the Agency.

A copy of the application for the licence may be inspected on the Agency's website or inspected at or obtained from the headquarters of the Agency as soon as is practicable after the receipt by the Agency of the application for the licence.

Yours sincerely,

Jane Hennessy
Communications Manager

APPENDIX J

Copy of Letter to Meath County Council

INDAVER

www.indaver.ie

Michael Griffin
Planning Department
Meath County Council
County Hall
Navan
Co. Meath

02 April 2014

Re: Indaver Ireland (Licence ref WO167-03) Application for IED Licence

Dear Michael,

As required by Article 4 Regulation 9 of European Union (Industrial Emissions) Regulations 2013, we wish to inform you that we, Indaver Ireland 4th Floor, Block 1 West Pier Business Campus, Old Dunleary Road, Dun Laoghaire, Co. Dublin, intends to apply to the Environmental Protection Agency for a licence for the Meath Waste Management Facility, Carranstown, Duleek, Co. Meath, National Grid Reference 3063E, 2709N.

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11.3 Disposal or recovery of waste in incineration plants or in waste co-incineration plants (a) for non-hazardous waste with a capacity exceeding 3 tonnes per hour, (b) for hazardous waste with a capacity exceeding 10 tonnes per day.

11.4 (b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving the following activity, (other than activities to which the Urban Waste Water Treatment Regulations 2001 (S.I. No. 254 of 2001) apply): (iii) treatment of slags and ashes.

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ISO 9001
ISO 14001
OHSAS 18001

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This application is accompanied by an Environmental Impact Statement (EIS) as was submitted to An Bord Pleanala and Meath County Council in 2012. The Environmental Impact Statement together with any further information relating to the effects on the environment of the emissions from the activity which has been or may be furnished to the Agency in the course of the Agency's consideration of the application, will be available from the headquarters of the Agency.

A copy of the application for the licence may be inspected on the Agency's website or inspected at or obtained from the headquarters of the Agency as soon as is practicable after the receipt by the Agency of the application for the licence.

Yours sincerely,

Jane Hennessy
Communications Manager