PROJECT DESCRIPTION

PROPOSED EXPANSION

OF

WASTE RECYCLING FACILITY

CAPPOGUE

FINGLAS

DUBLIN 11

Prepared For: -

PANDA Waste Services Ltd.,
Cappogue,
Finglas,
Dublin 11

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10th February 2009

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1. INTRODUCTION

This document presents a description of the proposal to expand the Nurendale Ltd., trading as PANDA Waste Services Ltd (PANDA), waste recycling facility at Cappogue, Finglas, Dublin 11. The existing facility operates under a Waste Permit (Ref WPT 95) issued by Fingal County Council in 2006. A copy of the Permit and AER for 2007 is included in Appendix 1.

The proposed expansion of the activities and infrastructure requires an application for a Waste Licence and this document has been prepared to accompany the application. It is based on the information included in the planning application for the development, which was submitted to Fingal County Council in July 2007. It describes the site setting, facility design, types and volumes of materials that will be accepted and handling procedures. It presents information on the potential environmental impacts associated with the proposed expansion and the proposed mitigation measures to either eliminate or minimise the impacts.

The expansion is intended to contribute to increasing waste recycling rates in the Greater Dublin Area and support the on-going and future waste recycling initiatives implemented by PANDA. In addition to processing recyclable materials collected by PANDA and other permitted waste collectors, the facility will serve as a drop off centre for specific waste streams produced by the commercial and industrial sectors.

1.1 Background

In August 2005 PANDA applied for planning permission at the subject site to develop a Materials Recovery and Transfer Facility. It was intended that the facility would be developed in three stages.

Stage 1 involved the development of a Construction and Demolition (C&D) Recycling Building, with an annual capacity of 50,000 tonnes. Stages 2 and 3 involved the construction of a Commercial and Industrial (C&I) Dry Recyclables, and Municipal Solid Waste (MSW) Recycling Buildings respectively, with a total annual throughput of 250,000 tonnes. The planning authority did not require the preparation of an Environmental Impact Statement (EIS).

In December 2005 Fingal County Council (the Council) granted PANDA planning permission for the development of Stage 1 which allowed acceptance of both C&D and C&I in one building (Planning Ref. F05A/1156 in Appendix 1). Approval was not granted for the Dry Recyclables and MSW Buildings, as it was deemed the local road network did not have the capacity to handle the associated increase in traffic.

PANDA constructed the existing C&D/C&I Building in 2006, obtained the current Waste Permit from Fingal County Council and started site operations in 2006. Following the issue of the 2005 permission the Council progressed works to upgrade the local road network and, in 2007, PANDA applied for permission for Stages 2 and 3 in 2007. Stage 2 was amended to include for two adjoining buildings that would house Dry Recyclables and Paper & Cardboard respectively.

PANDA were granted permission in December 2007 (Planning Ref 070954) to expand the facility to allow for the development of Stage 2. A copy of the planning permission is included in Appendix 1. The permission did not allow for the development of the Stage 3 MSW Building, but PANDA intends to reapply for planning permission for this element.

2. FACILITY OVERVIEW

2.1 Waste Activities

It is proposed to expand the existing facility to allow the acceptance and processing of mixed C&I waste; source segregated dry recyclables from commercial and domestic sources, and residual MSW. The proposed final layout of the facility is shown on Drawing No. 0707701.

Stage 1, which is currently operational, involves the processing of more than 50,000 tonnes of tonnes of C&D and C&I waste per annum (Building A1). The recycled materials are consigned from the facility either for direct use in construction projects, or for further treatment. Stages 2 and 3 involve the expansion of the recycling capacity to process source separated Dry Recyclables and Paper & Cardboard (Buildings B1 and B2) and residual MSW (A2).

The Dry Recyclables will primarily comprise source segregated and mixed C&I and household waste (paper, plastic, tetrapak, glass, cardboard waste electrical and electronic equipment). The Paper & Cardboard will comprise specific grades of source segregated and mixed paper. The residual MSW will comprise the fraction of household/commercial waste remaining after source segregation of the dry recyclables and organics.

The facility is designed to process 250,000 tonnes of potentially recyclable/recoverable materials annually at maximum capacity. However the actual volumes processed will depend on market conditions.

The waste will be off-loaded inside the dedicated buildings. Mixed waste will be processed to separate out the different recyclable components (e.g. soil and stones, paper, metal, plastic etc) and materials that are suitable for reuse (gas canisters, steel joists etc). Single stream waste (paper, cardboard, plastic and cans) will be screened for contaminants and compacted to facilitate efficient transport. The materials will be removed from the facility in enclosed vehicles.

All recyclable waste recovered from the incoming wastes will be sent to appropriately authorised recovery/recycling/reuse facilities. The small fraction of materials that is not suitable for recovery/reuse/recycling will be sent to appropriately authorised disposal facilities. Waste will not be disposed of at the facility.

2.2 Waste Management Policy

National waste management policy is based on the Department of the Environment and Local Government's policy statement of September 1998, *"Changing Our Ways"*. This statement firmly based national policy on the European Union Waste Management Hierarchy. In descending order of preference this is: -

Prevention
Minimisation
Reuse
Recycling
Energy Recovery
Disposal

The policy statement was based on, and is supported by, EU legislation that requires the reduction of biodegradable waste disposed to landfill. EU Landfill Directive 99/31/EC sets out the following reduction targets, which are based on 1995 figures:-

- Minimum 25% reduction by 2006;
- Minimum 50% reduction by 2009;
- Minimum 65% reduction by 2016.

"Changing our Ways" recognised that the achievement of these targets required the development of alternative waste recovery facilities and significant expansion of recycling infrastructure. It emphasised the need for co-operation between neighbouring local authorities and the utilisation of the potential of the private sector to deliver services.

The 2002 government policy statement *'Preventing and Recycling Waste - Delivering Change'* identified initiatives to achieve progress at the top of the Waste Hierarchy in terms of preventing waste arising and increasing the recycling of wastes that are generated.

In 'Waste *Management – Taking Stock and Moving Forward' 2004*, while the significant improvement in recycling rates achieved since 1998 are recognised, the need for further expansion is emphasized. The statement confirms that Ireland's national policy approach remains *'grounded in the concept of integrated waste management, based on the internationally recognised waste hierarchy, designed to achieve, by 2013, the ambitious targets set out in Changing Our Ways'.*

2.2.1 Dublin Region Waste Management Plan

The Waste Management Plan 2005 - 2010 recognises that source separation of household, commercial and industrial waste is crucial to the successful development of sustainable markets for recyclable materials.

The Plan recommends the introduction of source segregation of household waste and such schemes have already been introduced in the Region by PANDA. Policy objectives in relation to Waste Recovery and Recycling include: -

The Plan identifies that there are still significant deficits in the infrastructure to manage wastes generated in Dublin and this is increasing costs and making it more difficult to achieve recycling targets. The Plan maintains the emphasis on maximising recycling and reuse for all waste streams and sets the following recycling targets to be achieved by 2013 (Section 17.7).

Source	Recycling
Household	60%
Commercial/Industrial	41%
Construction and Demolition	82%
Total	**59%**

It is a specific objective of the Plan (Section 18.5.3) to support the concept of Recycling Parks for commercial and industrial waste whereby small scale waste producers can deliver materials for recycling and treatment. Such centres are intended for Small to Medium Sized Enterprises (SME) to relieve pressure on Recycling Centres intended to serve the household sector. It is a policy objective for the local authorities to seek the co-operation of the private waste sector in developing Recycling Parks for C&I wastes generated in the region. The particular services that are required include: -

- Drop off points for WEEE (including WEEE generated by retailers instead of delivery to household Recycling Centres).
- Drop off points for green waste from landscapers, business.
- Delivery points for small scale C&D waste and DIY waste.

The Plan has specific objectives in relation to the introduction and promotion of source separation of the organic waste component of both household and commercial and industrial wastes (Section 18.4 and 18.5.2).

The local authorities are currently involved in the procurement of a 45,000 tonne biological treatment plants at Ballyogan and Kilshane. The introduction of separate collection of biological waste in conjunction with the separate collection of dry recyclables will result in residual MSW. Such waste is amenable to mechanical treatment to produce materials suitable for recycling and energy recovery.

2.2.2 Fingal County Council Development Plan

It is a policy objective of the 2005-2011 Plan to: -

PolicyUTP33
To divert household waste from landfill and to promote the increased re-use and recycling of waste from all waste streams. The Council is committed to achieving an increase to 60% of the proportion of waste recycled in Fingal by the year 2016, in accordance with the Waste Management Plan for the Dublin Region.

‘ *reduce the amount of waste produced and reduce the toxicity and environmental effects of that waste. Following this it is the policy to re-use, repair, recycle/compost remaining waste and to dispose of waste to landfill as a last resort’.*

The 2005-211 Plan emphasises the need to increase re-use and recycling and states that incentives to promote recycling shall include the provision of facilities and good design.

2.3 Need for the Development

The proposed expansion in waste inputs and processing capacity, which is designed to maximise the reuse and recycling of wastes, meets the needs for enhanced recycling capacity identified in national and regional policy statements. The Dublin Region Waste Management Plan 2005-2010 set regional recycling targets, which if they are to be achieved, will require a progressive expansion in recycling capacity in the Dublin Region up to 2013.

The Waste Management Plan recognises that, to meet these targets, it will be necessary to expand on the existing recycling infrastructure in the Region, which will involve the provision of recycling centres for SMEs and business. The proposed expansion is intended to meet the infrastructural deficit which currently limits the recycling of C&I and MSW in the Dublin Region and thereby contribute to achieving regional recycling targets.

3. SITE DESCRIPTION

3.1 Site Location & Description

The site is located on the Cappagh Road, approximately 2.5km South West of Dublin Airport, as shown on Figures 3.1 and 3.2. It encompasses approximately 2.5 hectares (ha). The existing C&D/C&I Recycling Building is at the north eastern site boundary, as shown on Drawing No. 07070901. The site boundary is formed by a palisade fence and block work wall.

3.2 Site History

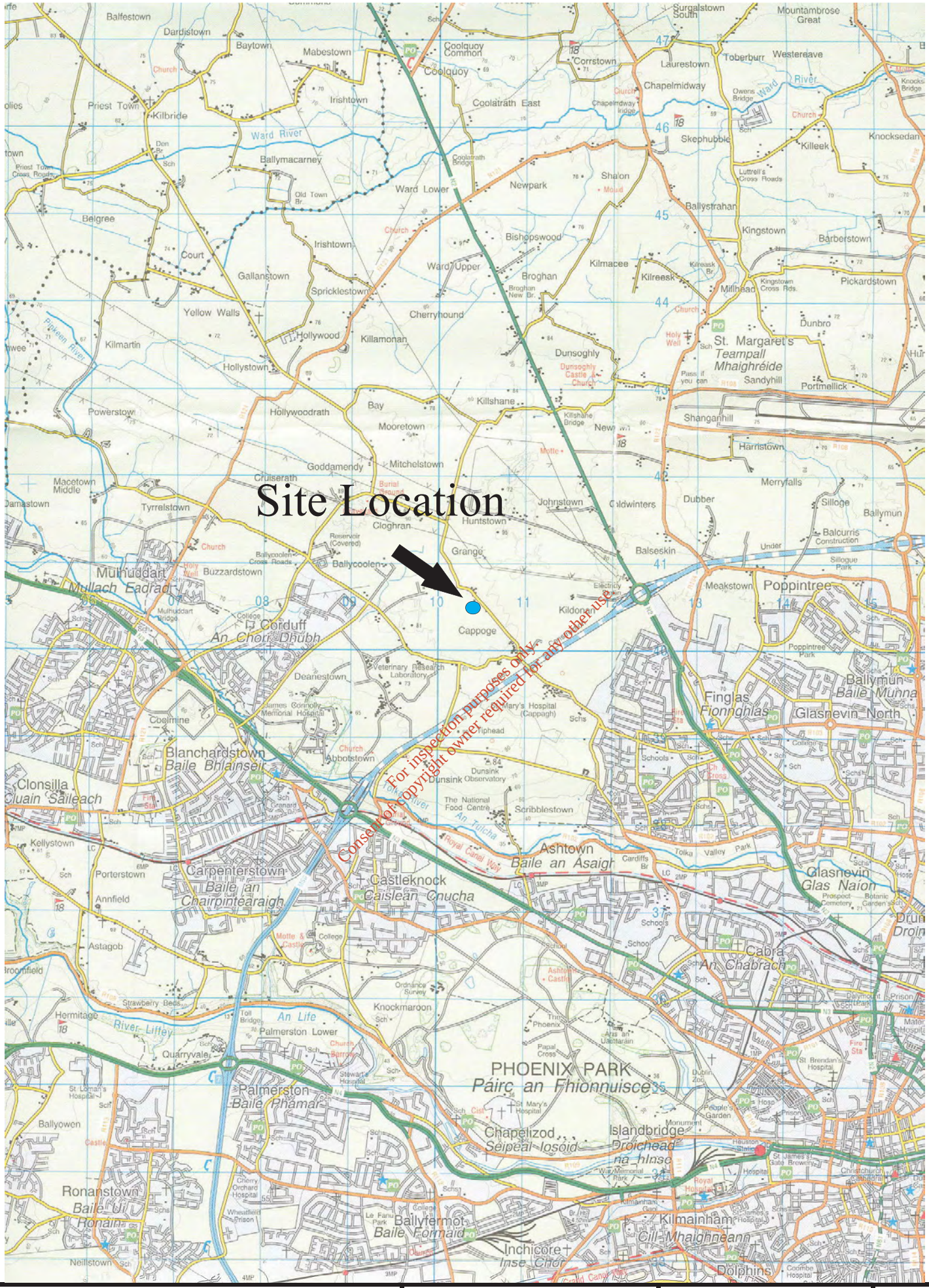
The available information on the site history indicates that prior to development in 2006, the site had been used for agricultural purposes. Fingal County Council issued a Waste Permit in May 2006. The facility opened in October 2006 and has been in continuous operation since then.

3.3 Climate

The description of the climatic conditions is based on meteorological data obtained from the Dublin Airport Meteorological Station located approximately 3 km to the north-east of the site. The climate in the area of Ballycoolin can be described as mild and wet, with the prevailing wind direction from the south west. Average rainfall, temperature, humidity and wind speed and direction are presented in Table 3.1.

Table 3.1 Meteorological Data: Dublin Airport

Rainfall – Annual average Average maximum month (Dec) Average minimum month (July)	 732.7 mm 75.6 mm 49.9mm
Temperature Mean Daily Mean Daily Maximum (July) Mean Daily Minimum (Feb)	 9.6°C 18.9°C 2.5°C
Relative Humidity Mean at 0900UTC Mean at 1500UTC	 82% 72%
Wind (Knots) Frequency of calms Prevailing direction Prevailing sector	 2.2% South West South West



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environmental management for business

CLIENT
Panda

TITLE
Site Location

Details

O.S. Licence Agreement
Number AR 0038702

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Figure
3.1

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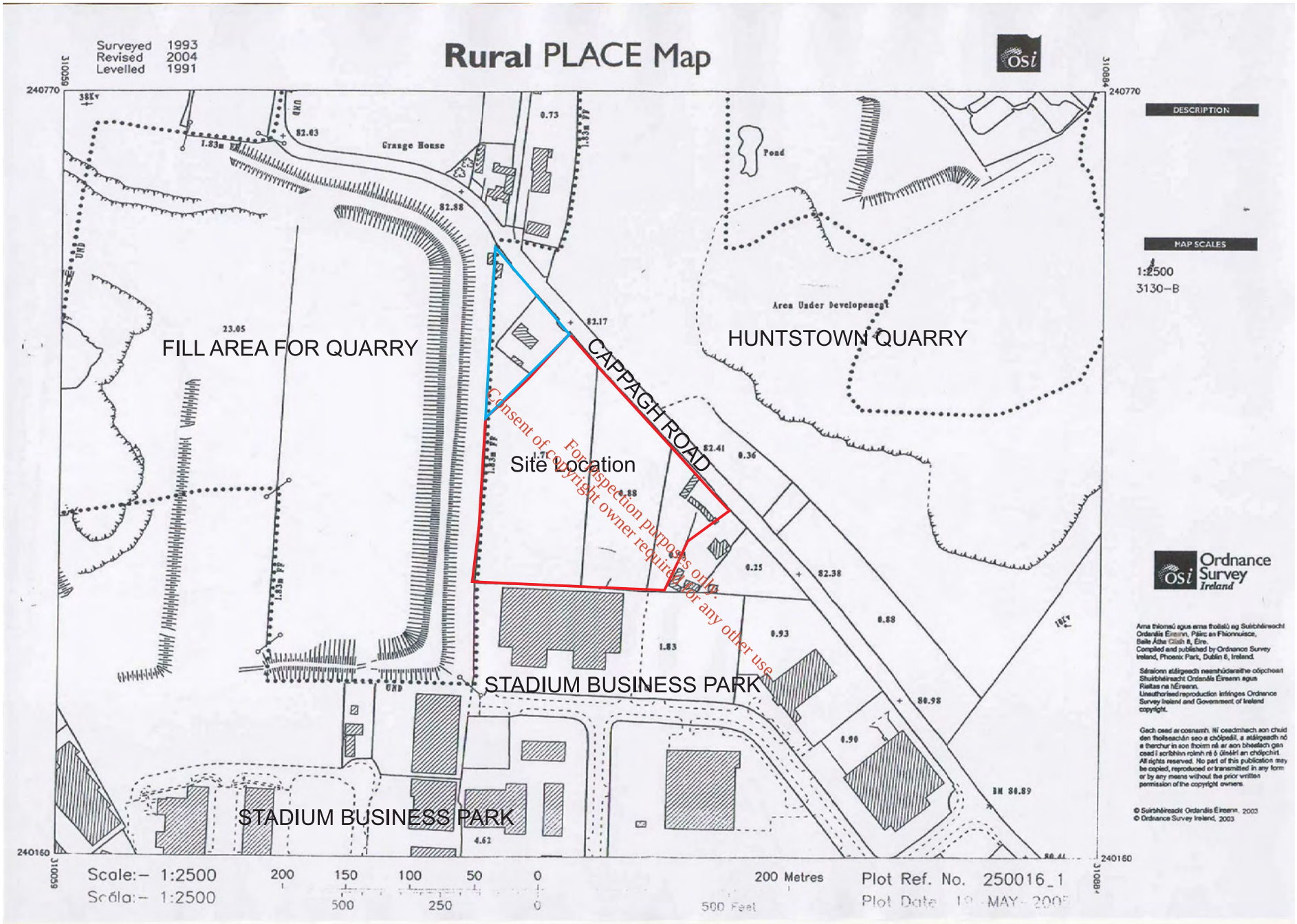

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CLIENT
Panda - WLA Cappagh Road

TITLE
Site Location

Details
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3.4 Geology and Hydrogeology

Information on the local geology was derived from the Geological Survey of Ireland (GSI) Sheet 16, The Geology of Kildare-Wicklow, a search of databases maintained by the GSI and the findings of a site investigation.

3.4.1 Geology

The GSI data suggests that the subsoils in the locality comprise sandy gravelly boulder clays, which range in thickness from less than 1.3 m to more than 8 m. A site investigation comprising the excavation of seven trial pits across the site was completed on 15th July 2005. The trial pit logs and a drawing showing the locations are included in Appendix 2. The investigation revealed approximately 25 cm of top soils overlying a boulder clay. The boulder clay ranged in thickness from 0.8 to 1.35 m. The pits terminated at what was considered to be the top of the weathered bedrock.

The bedrock locally comprises massive unbedded fine grained limestones of the Waulsortian Formation. The bedrock geology is complicated locally by a series of northwest to southeast striking faults and also some fault sets running southwest to northeast. The bedrock in Waulsortian formations has been extensively quarried locally, both immediately to the east of the site and further away to the west and north.

3.4.2 Hydrogeology

The surface water drainage density is low locally and there are no streams on or adjacent to the site. There is an open drain along the western site boundary, which is seasonal. It appears that rainfall predominantly recharges the groundwater locally. The local direction of groundwater flow is likely to be greatly influenced by the quarrying activities to the east and north of the site.

Based on data obtained from the GSI the bedrock aquifer is a locally important (Lm) aquifer that is productive in local zones. Reported groundwater yields in the formation range from 5.45 - 9 cubic meters per hour (m^3/hr). A search of GSI records did not identify any groundwater abstraction wells within 2 kilometres of the site. Wells were identified in Finglas yielding 4.5 - 7.2 m^3/hr: at St. Margaret's yielding 6.8 m^3/hr, and in Swords yielding 4.5 m^3/hr indicating that the aquifer is a suitable source of water supply for domestic purposes. However, extensive dewatering in the quarries to the east and north of the site is likely to have caused a lowering of the water table locally.

The GSI has developed an aquifer classification and vulnerability groundwater protection Matrix to assess the risk of groundwater pollution. This matrix has been further developed in the Groundwater Protection Scheme Guidelines, published in 1999 by the Department of the Environment and Local Government, the Agency and the GSI.

The matrix assesses aquifer vulnerability to pollution in terms of thickness of the overburden soils and their permeability in comparison to the potential yield of the aquifer. Where the overburden is less than 3 metres thick, the matrix indicates that the vulnerability rating is considered extreme (i.e., the potential for contamination to reach the aquifer is extremely high). Where the overburden is greater than 10 metres thick and of low permeability the vulnerability is considered to be low. Based on the available information, the vulnerability of the bedrock aquifer t ranges from High to Extreme across the site.

3.5 Surface Waters

The site is located in the catchment of the Tolka River, which is approximately 2 kilometres to the south west of the site. The open drain along the western site boundary was dry when inspected in April 2008. There are no water courses on the surrounding lands.

3.5.1 Surface Water Drainage System

Surface water run-off from the existing facility discharges to the surface water sewer system that serves Stadium Business Park, which is to the south of the site. It is proposed to direct surface water run-off from the new buildings and paved areas to this sewer. Further details of the drainage system are presented in Section 4.7.

3.6 Landscape

The site and surrounding are is generally low lying, with a gentle slope to the south west. Ordnance datum for the site ranges from 83.80 m in north west to 82.25 m in the south west.

An assessment of the landscape was made using guidelines in the document 'Landscape and Landscape Assessment, Consultation Draft of Guidelines for Planning Authorities' published by the Department of the Environment and Local Government (June 2002). The assessment was based on site inspections carried out in the summer of 2005 prior to the existing facility construction and again in Autumn 2007; analysis of aerial and site photographs and a review of Ordnance Survey maps and the proposed facility design.

The study area was confined to the site. This area was defined based on the predicted visibility of the completed development and an analysis of public viewpoints, which include the roadway along the northern site boundary and nearest private residences and commercial activities.

3.6.1 Landcover

The lands to the west were originally a quarry that has been reclaimed and grassed. The lands to the south are occupied by the Stadium Business Park and there is a large commercial building within 3 m of the southern boundary. There is a hedgerow on the northern site boundary fronting the roadway. A palisade fence forms the northern, southern, and western boundaries. The eastern boundary is a blockwork wall.

The hedgerow along the south western boundary is outside the palisade security fence that surrounds the site. There are no trees/ hedges inside the palisade fence. All the proposed development works will be carried out inside the palisade fence and blockwork wall, which will protect the existing trees along the site boundaries.

3.6.2 Landscape Value

The site is not in an area designated as of scenic or of special amenity importance. It is not designated as a Special Area of Conservation or Special Protection Area. The closest such site is the Royal canal, "proposed Natural Heritage Area" pNHA, approximately 3.2 km to the south of the proposed development. An assessment of the hedgerows and trees prior to the existing development is included in the Tree Survey of the site, which is included in Appendix 3.

There are no known significant archaeological, heritage or socio-cultural features on the development site or adjoining lands. The site is in an area described in the Landscape and Natural Heritage Section of the Fingal Development Plan 2005-2011 as a Low Lying Agricultural Area which is described as '*a mix of pasture and arable farming on level land or land with few views or prospects*'. The site is not located in an area zoned as High Amenity Zoning.

3.6.3 Landscape Sensitivity

Originally the surrounding lands were used predominantly for agricultural purposes, but now they have been extensively developed for commercial use including quarrying and business parks. The sensitivity of the landscape is considered to be low and the proposed expansion will not interfere with either the existing landscape character, or eliminate a landscape value.

3.6.4 View Points

The proposed development site is visible from view points along Cappagh Road are shown on Figures 3.3 and 3.4.

Figure 3.3 – Cappagh Road

Figure 3.4 – Existing Building

3.7 Air

A baseline air quality assessment was carried out in 2005 prior to the development of the C&D Recycling Building. The assessment included dust, $PM_{10,}$ Volatile Organic Compounds (VOC) and Hydrogen sulphide, sulphur dioxide, nitrogen dioxides, BTEX and carbon monoxide. The survey found the air quality in the vicinity of the site good, with levels of pollutants associated with traffic, industrial and residential derived pollution well below the relevant national and EU thresholds. A copy of the report is included in Appendix 4.

3.8 Surrounding Land Use and Material Assets

The surrounding land uses consist of a mix of industrial, quarrying and agricultural activities as shown on Figure 3.5 and on the aerial photo in Appendix 5. As can be seen from the aerial photo the lands surrounding the site have been intensively developed in recent years for industrial, commercial and quarrying uses, with the infrastructure in place for further development.

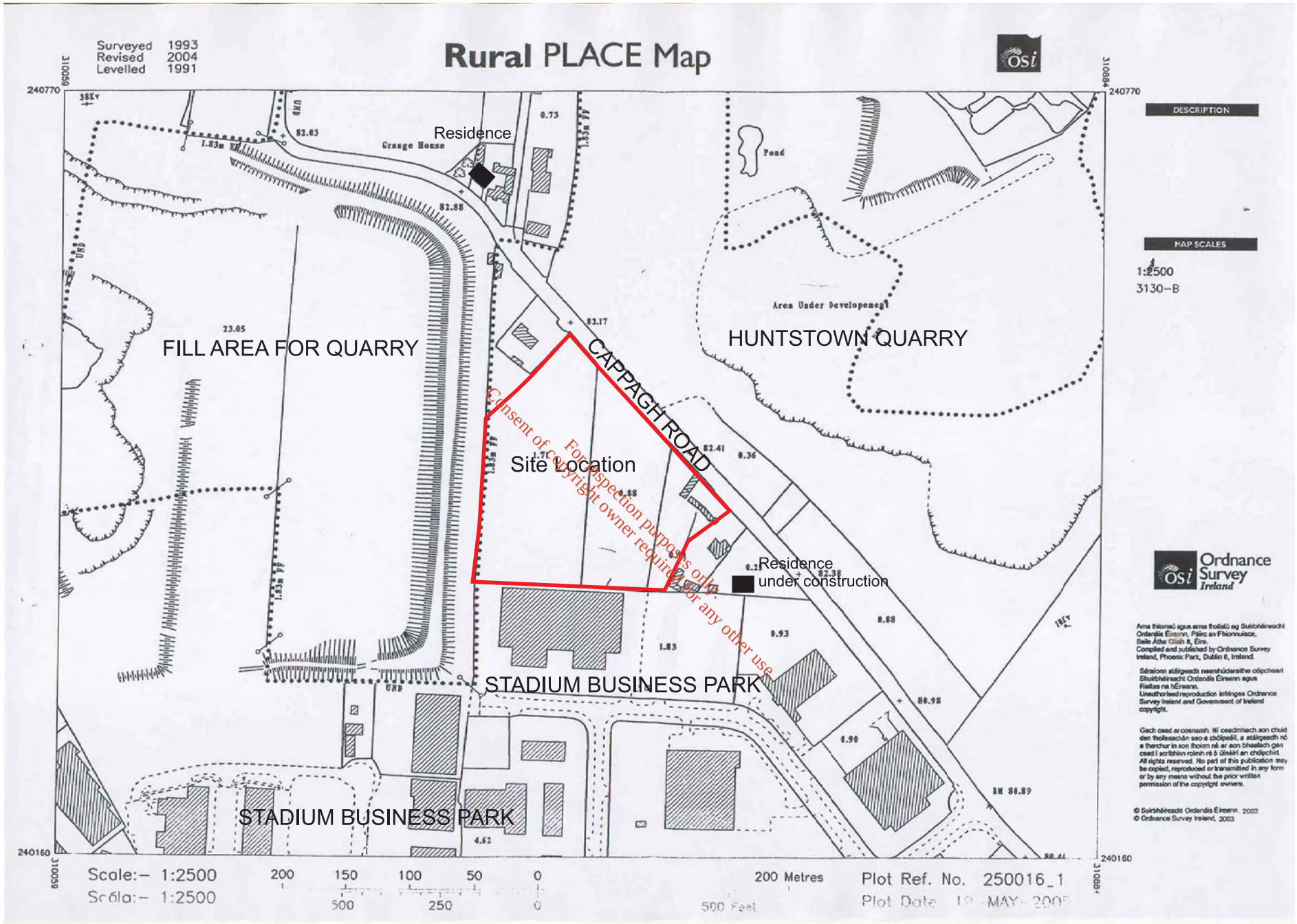
The lands to the west have been restored and are currently grassed. To the north of this are building materials manufacturers-Irish Asphalt and Goode Concrete Ltd and further north is the Northwest Business Park, which is occupied by industrial and commercial enterprises with some heavy industries.

To the east of the site is a quarry, which extends for some 1 - 2 km^2 and has caused extensive scarring to the landscape in the area. Stadium Business Park adjoins the southern site boundary. There are two (2 No) residences within 300 m of the facility, which are located approximately 30m from south eastern boundary and 200 from the northern boundary. More residences (10 No) are approximately 450 m to the south east, also on the southern side of the Cappagh Road.

3.9 Noise

In 2005 a baseline noise survey was carried out to establish ambient noise levels in the vicinity of the site prior to the development of the sit. A second baseline survey was conducted in July 2008. The surveys were conducted generally in accordance with ISO 1996: 1982: *Acoustics - Description and Measurement of Environmental Noise*. The reports are included in Appendix 6.

The Agency normally sets emission limits for noise from a facility measured at the nearest noise sensitive locations at 55dB(A) during the daytime and 45dB(A) during night time hours. The baseline noise survey identified noise levels at the site and close to the noise sensitive locations to be currently in the range 65dB(A) to 71dB(A). The existing noise environment at the site is dominated by traffic on Cappagh Road and aircraft movement's overhead.



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CLIENT
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TITLE
Surrounding Landuse

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FIGURE NUMBER
3.5

Scale
Not To Scale

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4. FACILITY DESIGN

4.1 Site Layout

The site encompasses approximately 2.5 ha and will, when fully developed, be occupied by the C&D Building, the Dry Recyclables Building, Cardboard and Paper Recycling Building and the MSW Recycling Building, hardstanding areas and landscaped areas. The final site layout is shown on Drawing No. 0707701.

It is proposed to develop the site in three stages:-

- Stage 1, which is already complete, included site preparation and provision of site services, construction of perimeter security fencing along the eastern boundary and road frontage, internal access roads and hardstanding areas, foul and surface water drainage system, weighbridge(s), the C&D/C&I Recycling Building, administration area, ESB substation and car parking. The C&D/C/IBuilding encompasses approximately 1620 square metres (m^2);

- Stage 2 will involve the construction of the Dry Recycling and Paper & Cardboard Recycling Building which will encompass approximately 2800m^2 and 4608m^2 respectively;

- Stage 3 will involve the construction of the MSW Building, which will adjoin the C&D/C&I and encompass approximately 2030 m^2.

4.2 Construction Works

It is estimated that Stage 2 and 3 will be completed in approximately 3 and 4 months respectively. Plant and machinery used during construction may include tracked excavators, dumpers, concrete mixers and crane hoists.

4.3 Site Services

An electrical substation was provided in Stage 1. Water is obtained from the municipal water supply. At present, as the numbers of people working at the facility are small (4-5), sanitary wastewater is collected in an underground tank pending removal off-site for treatment in a municipal wastewater treatment plant.

While it is unlikely that process waste water from wash downs will be generated in the C&D/C&I building, the Cardboard & Plastics Building or the Dry Recycling Building, provision has been made for the direction of waste water from the floors of these building to waste water storage tanks. It is more likely that wash downs may be required in the MSW Building and provision has also been provided here for the direction of waste water to a holding tank. Further details on this are presented in Section 5. 10

4.4 Site Access

The facility will only be accessed off the Cappagh Road at the existing entrance, as shown on Drawing No.0707901. A transport impact assessment (TIA) prepared in 2005, but which is still valid, predicted that in Stage 1 the average number of vehicle movements associated with the facility will be in the order of 38 per day. When operating at maximum capacity (250,000 tonnes annually) the average number of vehicle movements will be in the order of 176 per day. A copy of the TIA is included in Appendix 7.

There will be a maximum of 27 HGV traffic movements into the facility and 27 outgoing movements during peak morning (7.30-8.30) and evening hours (17.00-18.00). The facility will have two weighbridges dedicated to incoming and exiting vehicles. This eliminates the risk of exiting traffic obstructing incoming vehicles. Staff cars will not pass over the weighbridge and therefore will not be a cause of obstruction.

Based on the experience in Stage 1, the time taken for a waste delivery vehicle to pass through the weighbridge is 30-60 seconds. In the event that two HGVs arrive at the facility simultaneously the access road and setback from the site entrance to the weighbridge allow both vehicles to enter the site and avoid obstructions on the Cappagh Road.

4.5 Buildings & Hardstanding

When the facility is fully developed there will be four main buildings, as shown on Drawing No. 0707701. Elevations, plan and sections through the buildings are shown on Drawings Nos.0707101, 0707201, 0707301, 0707401, 0707501 and 0707601. A double weighbridge is located in the north of the site, near the site entrance. The remainder of the site will, with the exception of landscaped areas around the site boundary and at the road frontage and the hedgerows along the southern and western site boundary is paved.

4.6 Waste Quarantine Area

Waste quarantine areas will be provided inside each building. Any unsuitable waste loads delivered to the site will be stored in the relevant quarantine areas pending removal off-site.

4.7 Surface Water

Surface water from roofs and paved areas will be collected in the surface water drainage system and directed to the existing attenuation system serving the Stage 1, as shown on Drawing No. 07071101. The attenuation system provides temporary storage of surface water and allows the discharge at a steady rate (6 litres / second) to the surface water sewer system serving the Stadium Business Park. The system comprises an attenuation tank with a storage capacity of 1,310 m^3; a Class 1 full retention klargester oil/water separator; and a hydrobrake to control the discharge to the off site sewer. Details on the separator are included on Drawing No. 07071101.

Run-off from the paved areas, including parking, storage and weighbridge areas, and the building roof water will be collected in drains and discharged to the storm sewer via the attenuation system and the interceptor. The drainage channels will be provided with silt traps before the connection point to the attenuation tank.

The attenuation system is designed to accommodate 1:100 year rainfall events and to ensure a maximum discharge rate from the site of 6 litres/second. This limit is based on conditions set in the current planning permission.

4.8 Oil / Chemical Storage

Facility operations will involve the storage and handling of fuel for the site plant and trucks, and engine and lubricating oils used in plant and equipment maintenance. Disinfectants may be used in the washing of the floor of the MSW Recycling Building. Fuel oil is stored in a double skinned above ground tank.

Lubricating, hydraulic oils and detergents/disinfectants for floor washing and possibly odour neutralizing agents will be stored in designated and contained storage areas and units inside the Buildings. Waste oils generated during plant maintenance will be stored in drums in a dedicated contained area inside the buildings. Oil spill containment and clean-up equipment will be stored in the buildings.

4.9 Security

There is a security fence and block work walls around the entire site boundary. In addition, CCTV cameras have been strategically located throughout the site to prevent unauthorized entry or fly-tipping.

4.10 Landscape Measures

Landscape measures are required under the current planning permission and are in the process of being implemented. The proposed expansion does not require additional landscape measures.

5. OPERATION

5.1 Operational Hours

The current facility operates from 08.00 to 20.00 Monday to Friday and 08.00 to 16.00 on Saturday. However, due to the nature of the waste collection and recycling business it is necessary for vehicles delivering wastes and removing recycled materials to operate outside these hours, for example to meet the demands of customers based in the city in relation to the collection of wastes and the delivery of recycled construction materials.

5.2 Staff

Currently five (5 No) people are employed at the facility. These include a Facility Manager, weighbridge clerk, machine operators and general operatives. Staff numbers will increase as the Dry Recyclables, Paper and Cardboard and MSW Recycling Buildings come on stream. PANDA will ensure that the site management and staff are provided with the appropriate training to ensure that the facility is managed in accordance with the Waste Licence conditions and in a manner that does not result in environmental pollution. The facility manager has completed the FAS Waste Management training course.

5.3 Facility Access

All vehicles will enter and leave the facility via the weighbridge at the site entrance. The location of the entrance and exit from the facility onto Cappagh Roadare shown on Drawing No. 0707701.

5.4 Waste Types and Volumes

The anticipated waste types and volumes that will be accepted at the facility are shown on Table 5.1. Currently Stage 1 is completed and the Waste Permit allows a maximum of 50,000 tonnes/year of recyclable C&D and C&I materials can be accepted at the site. It is anticipated that when the facility is operating at maximum capacity (following completion of Stages 2 and 3), waste inputs will increase to a maximum of 250,000 tonnes of waste per annum.

Based on the recycling rates already achieved by PANDA and the proposed waste treatment technologies that will be applied in the facility it is estimated that approximately 6% of the C&D, 5% of the Dry Recyclables, 5 % of the residual MSW and 3% of the Paper and Cardboard will not be suitable for recycling/recovery and will have to be disposed to residual landfill. A breakdown of the recycling rates and estimates of the unsuitable materials is presented in Table 5.1.

Table 5.1 Total Waste Inputs

Waste Type	Stage 1*	Estimated Volumes Non-recyclable	Maximum Capacity* (Stage 1, 2 and 3)	Estimated Volumes Non-recyclable
C&D	50,000	3,000	75,000 (94% Recycling Rate)	4,500
Dry Recyclables	0		35,000 (95% Recycling Rate)	1,750
Paper & Cardboard			85,000 (97% recycling)	2,250
Residual MSW	0		50,000 (95% Recycling Rate)	2,500
Total	**50,000**	**3000**	**250,000**	**11,000**

*Subject to Market Conditions

5.5 Waste Acceptance Procedures

C&D and C&I wastes delivered to the facility are currently subject to documented waste acceptance procedures to ensure that only suitable wastes are accepted. Similar documented procedures will be developed for the Dry Recyclables, Paper & Cardboard and residual MSW.

The C&D and C&I waste is delivered to the facility by PANDA collection vehicles and by third parties, including permitted waste collectors and commercial waste producers. The facility does not accept waste from either members of the general public or from waste contractors who do not have a contract with PANDA.

The C&D and C&I waste is typically delivered in covered open top trailers and skips. The new waste types will be delivered to the facility in enclosed rear end loaders, curtain sided trailers, compactors and multi lift bins. All waste arriving at the facility is inspected to determine if it is suitable for recycling activities. Any waste loads, which upon inspection are found to contain large amounts of unsuitable wastes, will not be accepted.

All waste delivery vehicles arriving at the facility are obliged to enter onto the weighbridge at the site entrance where they are weighed and accompanying documentation checked. Following an initial inspection of the waste via CCTV, the vehicle will then be directed to the relevant Recycling Building for off-loading.

Designated areas for specific waste types will be assigned inside each of the Buildings (Source separated plastic, cardboard, newsprint). The waste will only be off-loaded inside the building close to the relevant designated area, where it will be inspected.

Any waste identified as not suitable following off-loading will be immediately removed and, where practical, returned to the delivery vehicle. If this is not practical, the waste will be stored in a designated quarantine area pending its removal off-site by either the waste producer, or the contractor who delivered the waste. In the event of the producer or contractor refusing to remove the waste PANDA will ensure that it is removed off-site and disposed of at an appropriate facility as soon as practical. PANDA will maintain records of the waste type, quantity and ultimate disposal/treatment facility.

5.6 Waste Handling

The facility will primarily handle dry recyclable materials, although the residual MSW may contain materials contaminated by foodstuffs. All waste handling and processing will be carried out inside the Buildings. Baled dry recyclables (plastic, paper and cardboard) and metals will be stored externally in open paved areas.

5.6.1 C&D

Construction & Demolition Waste will be off-loaded in the designated area inside the building for inspection. Any unsuitable (contaminated) materials will be removed to the waste quarantine area. Large items of wood, metal or plastic will be removed using a mechanical grab and bought to the appropriate on-site handling/storage area. The remaining material will be screened. The oversize (>150 mm) will be stored on-site pending removal for off-site processing. The undersize (<150 mm) will be stored on-site pending removal for use in off-site recovery operations.

5.6.2 Dry Recyclables

The Dry Recyclables will include pre-segregated and mixed commercial and domestic wastes which will be delivered to the facility in compactors, rear end loaders and skips. On the tipping floor the waste will be inspected for unsuitable wastes and such materials will be immediately removed to a designated internal waste quarantine area. The pre-segregated material will be moved to the baling units or loading bays where, depending on its nature, it will be either baled, or compacted before being loaded onto curtain side trailers for removal off-site.

The mixed waste will initially be sorted using a mechanical grab to remove large items such as timber and metal. Such items will be removed to the appropriate storage/handling areas inside the building. The remaining waste will be separated manually and mechanically into the different waste streams (paper, cardboard, plastic, glass, metal, residual organics). The organic waste will be removed to an off-site composting facility in articulated trucks, while the inert materials will be stored on-site pending removal off-site recovery facilities.

5.6.3 Paper & Cardboard

The sources of waste Paper & Cardboard include: -

- Supermarkets/Shops;
- Factories;
- Printing Houses;
- Newspaper Houses;
- Waste Management Facilities;
- Offices.

The primary grades of waste paper and cardboard that will be accepted at the facility include:-

- OCC Cardboard;
- BMP;
- 2nd Grade Newspaper and Magazines;
- Over Issue News;
- Scan;
- White Heavy Letter;
- Woody One Cuts;
- Printers Mix;
- Sulphite Kraft;
- Wet Strength Kraft;
- Carrier Pack;
- Best White No. 2;
- Coloured Heavy Letter;
- Sorted Office Waste;
- Photo Paper;
- Reels.

In general the higher value, low quantity material will be sorted manually using a conveyor and bin system. Each bin is dedicated to a particular grade. Any unsorted waste paper falls

into an end bin and is graded as mixed papers (the lowest value grade). When a bin is full its contents will be baled.

Where there are large quantities of waste paper of a particular grade in the processing area e.g. Mixed Papers, OCC and Newsprint these would be loaded onto a conveyor feeding a baler.

Mechanical sorting normally takes place when sorting bulk grades i.e. news and magazines/ OCC Cardboard. Hand sorting may be required where the material is delivered in boxes/cages or when it is wrapped in polythene e.g. reams of brochures or books.

All bales coming from the bailing presses will be tied automatically with wire. The finished bales will be stored internally and externally in areas designated by the grade of paper pending consignment to off-site paper mills.

All non-paper residues e.g. plastic, strapping, polystyrene, wood etc. will be separated and stored in a designated area. They will then be baled and stored in designated areas, both internally and externally, pending consignment off-site.

5.6.4 MSW

MSW comprising dry recyclables and residual mixed materials will be delivered to the facility in refuse collection vehicles. Mixed and pre-segregated dry recyclables will be off-loaded in a designated area inside the Dry Recyclables Building, where it will be inspected to ensure it is suitable for processing i.e. it does not contain any hazardous or other unsuitable material.

Residual mixed MSW containing putrescible materials will be off-loaded in the MSW Recycling Building, where it will be inspected to ensure it is suitable for processing i.e. it does not contain any hazardous or other unsuitable material. The waste will be mechanically treated to remove potential recyclable materials including metals, paper, plastics, compostable materials and materials that are suitable for energy recovery.

The recovered metals, paper and plastic will be stored on-site pending removal to off-site recovery/recycling facilities using curtain side trailers/containers. The compostable materials will be removed off-site for composting at a permitted/licensed facility. The residue will be processed on-site to produce a refuse derived fuel (RDF) which will be shipped overseas in enclosed containers for use as a fuel pending the development of Irish markets for this product.

PANDA has already identified sustainable, long term recycling outlets for the recovered materials. The organics will be collected and sent to PANDA's composting facility in Navan. Timber will be sent to Irish based chipboard processing plants. The ferrous and non-ferrous

metals will be exported to smelters for reuse in the manufacture of metal components. Clean paper and cardboard, which will comprise only a very small portion of the paper and cardboard recovered, will be exported to a paper mill for reuse in the manufacture of paper and cardboard.

The paper, plastic and textiles, which due to contamination cannot be reused in any manufacturing process, will form a refuse derived fuel (RDF). This RDF will be exported for use a fuel supplement in the manufacture of cement. At present there are proven markets for this RDF in Sweden, Estonia and the UK and potential markets in Ireland for this material. Further development of these markets is expected in Ireland in response to waste management policy on energy recovery and diversion of wastes from landfill.

The residual materials, for which there is no current use alternative to disposal, will initially be sent to landfill in Ireland. In the medium term this material will, in the event that sustainable alternative uses have not been established, be sent to Irish based thermal treatment and energy recovery facilities.

5.7 Plant & Machinery

Facility operations will require the use of a range of fixed and mobile plant. At maximum capacity the range of plant and equipment that may be used is shown in Table 5.2.

Table 5.2 Plant and Equipment

Type of Plant	C&D	Dry Recyclables	Paper & Cardboard	MSW Recycling Building
Front Loading Shovel	2	1		1
Trommel	1	-		1
Baler	1	2	2	1
Air Compressor	-	-		1
Grabs	1	1	1	1
Shredder	1	-		-
Conveyor	2	2	2	1
Bag Opener	1	1		1
Forklift	1	2		-
Yardsweeper	1	-		-

This will provide for 100% duty and 50% standby for all key plant items. Additional supporting plant items may be hired for use on-site for short periods, if required to augment standby capability and ensure continued site operations.

Critical spares will be maintained on-site and a preventative maintenance programme will be implemented on-site to ensure safe site operation. The Facility Manager will maintain records of the preventative maintenance programme.

5.8 Wastes Generated

5.8.1 Waste Types & Volumes

The facility generates small volumes of office type wastes. PANDA operates a source segregation policy to maximise the recovery of potential recyclable materials from these waste streams. All current and future recovered materials will be transferred off-site to recovery/recycling facilities.

Unsuitable materials identified in the incoming waste stream and which cannot be removed by the delivery vehicle, will be stored on-site pending removal off-site for disposal at appropriately licensed recycling or treatment facilities.

The mobile plant will be subject to on-site maintenance by a contract mechanic company. Waste oils and batteries generated during maintenance will be removed off-site for disposal/recovery at licensed treatment/recovery facilities.

The oil interceptor and silt traps provided on the surface water drainage system will be routinely cleaned and emptied and the contents removed off-site for disposal/treatment at an appropriately licensed facility.

5.8.2 Waste Disposal / Treatment

PANDA will identify appropriately licensed or permitted waste disposal/treatment facilities for all wastes generated at the facility. All wastes leaving the facility will be weighed at the on-site weighbridge and PANDA will retain records of the waste types (EWC codes), volumes (tonnes) and the destination.

5.9 Surface Water Management

The proposed surface water drainage system is shown on Drawing No. 07071101. Surface water run-off from the paved yard areas and roofs will be collected in the drainage system and discharged to the storm sewer serving the Stadium Business Park.

5.10 Wastewater

Sanitary and sink wastewater from the site offices will be discharged to the facility's foul drainage system, which is shown on Drawing No.07071101. Currently this wastewater is collected in a 13.5 m^3 concrete storage tank the contents of which are removed off-site on a routine basis and disposed of at the municipal wastewater treatment plant at Ringsend operated by Dublin City Council. As employee numbers increase the sanitary wastewater will be discharged to additional storage tanks pending removal offsite

It may on occasion be necessary to wash down the floor of the MSW Building. Given the nature of the materials that will be handled in the Dry Recyclables, C&D and Paper & cardboard Building floor wash down will not generally be required. Provision has however been made for the collection of wash water from each of the buildings in dedicated storage tanks.

The wash water will be collected in collection drains provided in the floor of the buildings, as shown on Drawing No. 07071101. These drains will be connected to the underground concrete storage tanks, one serving each of the buildings. The wastewater will be removed from the tanks on a routine basis and sent for disposal at a municipal wastewater treatment plant.

5.10.1 Wastewater Volumes

The volume of wash water is estimated at 250 litres per 500 m^2 floor area per wash event for the MSW and C&I handling areas. The only area of the floor that will actually be washed is where mixed waste is handled and not the entire floor. However, for storage tank design purposes it was assumed that the entire floor of these buildings would be washed once per week. The sanitary waste water demand is calculated at 200l per person per day.

The existing waste water storage tank which serves the sites welfare facilities and the existing C&D/C&I Building has a capacity of 13,500 litres. The proposed storage tanks for both the Stage 2 and Stage 3 buildings will also be 13,500 litres capacity.

Process Water Demand - 250 litres per 500 m^2 floor area per wash event (1 per day).

Sanitary Water Demand - 200 litres per employee per day.

Stage 1 – 1620m^2. 5 Employees – Existing C&D/C&I Building

Process Water – 810 litres

Sanitary Water – 1000 litres

Tank Capacity – 13,500 litres

Stage 2 –2800 + 4608m^2. 10 Employees – Dry Recyclables & Cardboard,Plastics

Process Water – 0 litres

Sanitary Water – 2,000 litres

Tank Capacity – 13,500 litres

Stage 3 - 2030m^2. 10 Employees

Process Water – 1,015 litres

Sanitary Water – 2,000 litres

Tank Capacity – 13,500 litres

5.10.2 Wastewater Quality

The likely quality of the process wastewater that will eventually be discharged to the holding tanks is shown in Table 5.3.

Table 5.3 Wastewater Quality

Parameter	Concentration
Temperature	42 ^{o}C
BOD	3,500 mg/l
COD	7,000 mg/l
pH	6 – 10
Ammoniacal Nitrogen	100 mg/l
Suspended Solids	2000 mg/l
Sulphates (as SO_4)	1000 mg/l
Detergents (as MBAS)	100 mg/l
Fats, Oils, Grease	100 mg/l

5.11 Environmental Nuisance

The type of waste that will be processed in the C&D, Dry Recyclables Building and the Paper & Cardboard Buildings are not attractive to birds, vermin or flies. The residual mixed MSW will contain putrescible materials that have the potential to give rise to pest and odour nuisance.

5.11.1 Litter

All waste delivered to and transferred from the facility will be in fully enclosed vehicles. All waste handling operations, including waste loading and offloading and processing, will be carried out inside the building.

Waste will not be off-loaded in open areas. Baled waste (plastic, cardboard and paper) will be stored externally. The bales will have been compacted and wire tied and will not normally be a source of windblown litter. In the event of an incident, which results in windblown litter, facility personnel will ensure its immediate collection.

5.11.2 Birds

Birds can be attracted to waste management facilities where there is available foodstuff. The residual mixed waste MSW and a small proportion of the C&I waste will include some foodstuff. Such waste will be delivered in fully enclosed vehicles. All of the waste processing activities will be carried out internally and all wastes will be removed from the facility in fully enclosed vehicles. These waste management practices will eliminate bird attraction. PANDA consulted with the Dublin Airport Authority (DAA) in relation to the proposed development and the measures that will be applied to eliminate bird attraction. A copy of the correspondence to the DAA is included in Appendix 8.

5.11.3 Vermin & Pests

Vermin and insects can potentially be a problem at facilities where putrescible waste is not handled properly. However, this usually arises where waste is either being disposed of (landfill) or being stored for long periods of time. Waste containing putrescible matter will generally be processed and the organic components transported off-site the same day.

Where mixed waste containing putrescible matter has to be retained on-site overnight it will be stored inside the MSW Building. This minimises the potential to attract vermin. The floor of the Building and, in particular, the area handling mixed waste will be swept and washed down at regular intervals.

PANDA have, as a preventative measure, engaged a pest control contractor who implements vermin control measures on a routine basis at the existing facility. The facility is inspected daily for the presence of insects or vermin and de-infestation measures are implemented as necessary by the Facility Manager.

5.11.4 Odours

Odours can potentially be a problem at facilities where putrescible waste is handled properly. The residual MSW Building will be provided with an active odour control system, details of which are provided in Section 6.3.

5.12 Safety and Hazard Control

All site personnel and visitors to the site are obliged to comply with PANDA safety guidelines. The guidelines regulate access to and from the site and traffic movement on the site. All site personnel are provided with and are obliged to wear the requisite personal protective equipment (PPE). PPE may include face masks, gloves, safety glasses, steel-toed footwear, overalls, reflective jackets and helmets.

5.13 Annual Natural Resource Consumption

Facility operations will involve the consumption of water, oil and electricity. The estimated quantities that will be used annually are: -

Table 5.4: Raw Material Consumption

Resource	Quantities
Diesel Oil	200,000 litres
Hydraulic Oil	200 litres
Disinfectant	80 litres
Odour Neutralisers	250 litres
Engine Oil	400 litres
Water	6500m^3
Electricity*	250,000 kW

*Subject to variation depending on the processing plant layout

5.14 Contingency Arrangements

PANDA has prepared an Emergency Response Plan so as to ensure there is a rapid response to any incident by trained staff and minimise the impact on the environment of any associated emissions. The plan addresses post emergency environmental monitoring to assess the impact of the incident and establish the need for and extent of any remedial actions. This Plan will be amended to reflect the expansion of the facility. A copy of the existing plan is included in Appendix 9.

5.14.1 Firewater Retention

Firewater generated within the site will be contained on the paved yard area by kerbing. The site slopes gently to the south east and the levels are such that firewater run-off will enter the storm water drainage system. The total volume of firewater likely to be generated is 225 m^3.

This is based on Agency published guidelines, with a flow rate of 5 m^3/minute for 45 minutes. A fire sprinkler system is not proposed for the facility.

The surface water attenuation system has a design capacity of 1,310 m^3, which is based on a 100 year return storm event. The system is designed to allow the continuous discharge of surface water at a controlled rate which will ensure that retention capacity is maintained. Manually controlled shut off-valves will be installed on the outfalls from the systems. In the event of a fire these valves will be shut to contain firewater run-off within the site.

5.14.2 Assessment of Impact

The proposed environmental monitoring programme (Section 7) will allow an assessment of the impact of any unexpected emissions that may arise as a result of an incident at the facility. This programme can be expanded to quantify particular impacts depending on the nature of the incident.

6. EMISSION CONTROL & MITIGATION

The site design and proposed method of operation is intended to eliminate, or where this is not possible to effectively mitigate any adverse environmental impacts. The actual and potential emissions associated with facility operations include, surface water, wastewater, odours, noise and dust. The receiving media include surface waters and air. There will be no direct or indirect discharge to either soil, or groundwater.

6.1 Surface Water

6.1.1 Assessment

There are no surface water courses within the site boundary and the nearest permanent water course is approximately 2 km to the south of the site. Surface water from the site discharges to the surface water sewer system serving the adjacent Business Park. The on-site attenuation system is designed to accommodate 1:100 year rainfall events and to ensure a maximum discharge rate from the site of 6 litres/second.

Site activities with the potential to impact on surface water quality if uncontrolled, include:-

- Construction of the new Buildings;
- Storm water from the operational areas;
- Spills and leaks;
- Sanitary wastewater;
- Floor washdown.

6.1.2 Mitigation Measures

Potential short-term impacts from the construction of the new Buildings include silting of the municipal sewer. Silt control measures will be provided during the construction phase to ensure that this does not occur. All fuel tanks and oil storage compounds used on-site during construction will be provided with adequate secondary containment to prevent spills or leaks from entering the surface water system.

Surface water from the paved areas may potentially contain silt and small amounts of oils arising from minor leaks from road vehicles and the mobile plant. All surface water from operational areas will be collected in the surface water drainage system and discharged via the surface water attenuation system and the existing Class 1 oil interceptor.

The volume of oils, anti-freeze, detergents and disinfectants stored at the facility is kept to the minimum required for continued operation. These materials are currently stored inside the buildings in specifically designed storage cabinet/units provided with spill containment. Diesel is stored in a properly bounded refuelling area. Spill containment kits are provided and maintained on-site and facility personnel are trained in the proper use of the kits to contain and clean up any major spills.

Sanitary and sink wastewater from the existing building discharges to the facility's foul drainage system, which is separate from the surface water system. Sanitary wastewater and process wastewater generated during floor washing will be collected and stored in the underground storage tanks pending removal off-site for treatment in a municipal wastewater treatment plant.

6.2 Soil and Groundwater

6.2.1 Assessment

The construction of the new buildings will result in a reduction in the volume of rainfall infiltrating to the ground, thereby affecting groundwater recharge. However, it is considered in the context of the site and local hydrogeological conditions that the impact of this reduction will be imperceptible.

When the site is fully developed and operational there will be no direct or indirect long-term emissions to ground or groundwater. The provision of extensive paved areas provided with surface water collection drains, and secondary containment of the oil storage area minimises the potential for short term direct or indirect discharges to either ground or groundwater in the event of spill or leak.

6.2.2 Mitigation Measures

There no requirement for further mitigation measures.

6.3 Odours

6.3.1 Assessment

The processing of residual mixed MSW is a potential source of odours. All such waste will be delivered to the facility in enclosed vehicles and will only be processed inside the MSW Building. All of the waste processing and storage activities will be carried out internally and all wastes will be removed from the facility in fully enclosed vehicles.

The mixed MSW will generally be processed and organic components transported off-site the same day. If mixed waste has to be retained on-site overnight it will be stored inside the Buildings. The floor of the Building and, in particular, the mixed waste processing area will be swept and washed down at regular intervals.

6.3.2 Mitigation Measures

The proposed method of operation minimises the potential for odours to escape the MSW Building. PANDA will, prior to the start of waste activities, install an odour management system in the MSW Building, that will include an appropriately sized air extraction and emissions treatment system. The system design, which will be submitted to the Agency for approval, will be similar to that installed at other licensed facilities that handle MSW, and will include:-

- Internal segregation of the building to allow for separate processing of odorous and non-odorous wastes in a designated Mixed Waste area;
- Provision of a good building fabric skin, with minimal gaps;
- An air extraction system that provides negative air pressure in the areas where odorous wastes are handled. This should provide between 2 and of 4.5 air changes/hour;
- Air collection pipework connected to an air treatment system that will use activated carbon.

In addition to these design aspects PANDA will maintain good housekeeping practices (i.e. keep yard area clean, etc.), closed-door management strategy (i.e. to eliminate puff odour emissions from the building), and clean dirty surfaces regularly.

PANDA will develop and implement a detailed Odour Management Plan (OMP), which will describe the operational and control measures for both normal and abnormal conditions and which will include:-

- A summary of the site, odour sources and the location of receptors;

- Details of site management responsibilities and procedures for reporting faults, identifying maintenance needs, replenishing consumables and complaints procedure;
- Odour management equipment operation procedures (e.g. correct use of equipment, process, materials, checks on equipment performance, maintenance and inspection;
- Operative training;
- Housekeeping;
- Maintenance and inspection of plant (both routine and emergency response);
- Spillage/contaminated surface management procedures;
- Record keeping – format, responsibility for completion and location;
- Emergency breakdown and incident response planning.

6.4 Noise

6.4.1 Impact Assessment & Noise Predictions

A predictive modelling assessment of the impact of the proposed facility when it is operational is presented in the in Appendix 6. The modelling was completed accordance with ISO9613-2:1996 for Industrial Sites and provides a detailed assessment of predicted noise impacts. Details of the noise sources included in the assessment are presented in Table 6.1 and the predicted noise levels at the closest noise sensitive locations is presented in Table 6.2.

Table 6.1 Noise Sources

Building	Plant Item	Number	Lw dB(A)
C&D / C&1 Building	Front Loading Shovels	2	98
	Trommels	1	98
	Grab	1	100
	C&Demolition Crusher/Shredder	1	98
	Conveyor	2	98
Dry Recycling Building	Trommel	1	98
	Hand picking station (conveyor belt)	2	98
	Baling unit	2	98
	Front End Loader	2	98
	Forklift	2	-
MSW Building	Trommel	1	98
	Air Classifier	1	88
	Bailing unit	1	98
	Front Loading Shovel	1	98
	Grab	1	98
	Conveyor	1	93
	Shredder	1	93
General	Truck	7	96

Table 6.2 Predicted Noise Levels at Closest Noise Sensitive Location

Assessment Location Ref.	Daytime Criterion dB(A)	Nightime Criterion dB(A)	Predicted Ranges Daytime/Nightime Noise Level dB(A)
NSL 1 – Residence 30m SE	55	45	43
NSL 2 – Residence 200m N	55	45	45

The predicted levels at the noise sensitive location are at or below the Daytime and Night time criteria set in Waste Licences and will not result in any adverse residual impact at the noise sensitive locations. The predicted daytime and night-time noise levels associated with the site at the nearest dwelling were 43dB LAeq,15min from on-site plant and parked trucks; 22dB LAeq,15min from on-site car parking; and 32dB LAeq,15min from on-site truck movements.

All the predicted noise levels were within the daytime criterion of 55dB LAeq,15min and night-time noise criterion of 45dB LAeq,15min, and the noise impact associated with the development is not considered to be significant.

6.4.2 Mitigation Measures

The initial noise assessment completed in 2005 recommended the construction of a noise attenuation wall along the south-eastern boundary between the facility and the then closest noise sensitive location-an occupied dwelling. The 5 m wall has been constructed and the dwelling is now vacant.

6.5 Dust

6.5.1 Assessment

It is not anticipated that dust will be a significant problem at the facility. All waste processing activities, which have the potential to generate dust (shredding, screening, baling), will be carried out internally. The facility access roads, vehicle manoeuvring and parking areas will be paved and cleaned at regular intervals with an on-site yard sweeper.

6.5.2 Control Measures

Dust control measures currently employed at the facility include a dust suppression system in the existing C&D/C&I Building and dampening down of paved areas in dry weather. A road

sweeper is also stationed permanently at the facility which removes any grit on the concrete surfaces daily.

In addition to the existing dust control measures suppression systems on the individual plant items or within the new MSW building will be provided. The Dry Recycling and Cardboard & Plastic Building will not require dust suppression systems due to the nature of the wastes handled here.

7. ENVIRONMENTAL MONITORING

PANDA will implement an environmental monitoring programme at the facility. The proposed programme includes dust, noise, surface water and wastewater discharges and odour monitoring. As the waste activities will not result in emissions to groundwater and there are non surface water courses within the site it is not proposed to monitor surface water courses or groundwater. Process wastewater will be directed to underground storage tanks which will be emptied and the contents removed off-site to a wastewater treatment plant. The proposed monitoring locations are shown on Drawing 07071201.

7.1.1 Dust

Dust will be monitored at three locations on the property boundary biannually. The measurements will be carried out using Bergerhoff gauges specified in the German Engineering Institute VDI 2119 document entitled "Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method).

7.1.2 Noise

Noise will be monitored at two locations on the site boundary annually and at the nearest noise sensitive location. The monitoring will be representative of daytime 30-minute L(A)eq and will be carried out in accordance with the ISO1996: Acoustics - Description and Measurement of Environmental Noise.

7.1.3 Odour

PANDA will conduct and record the findings of daily odour patrols around the site perimeter.

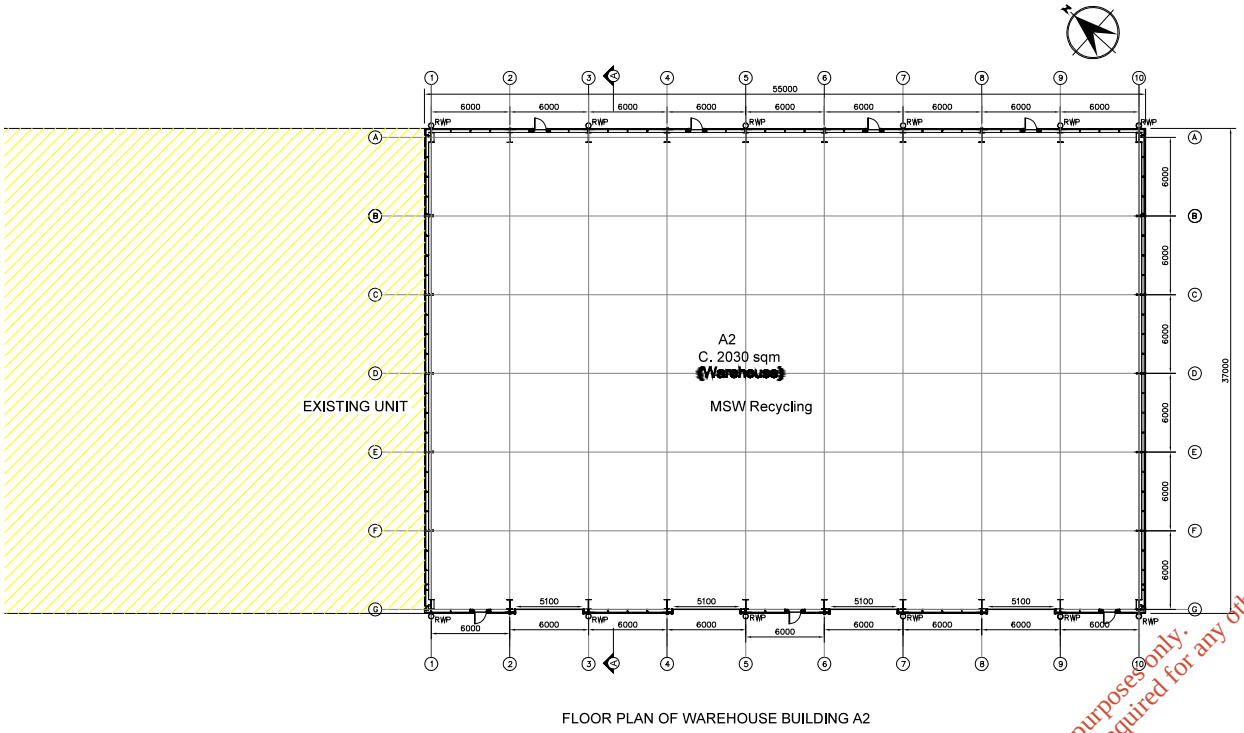
7.1.4 Surface Water

PANDA will monitor the surface water discharge from the oil water separator on a quarterly basis. The parameters will include electrical conductivity, pH and hydrocarbons. As the discharge will be intermittent and linked to rainfall events grab samples will be collected at the monitoring point.

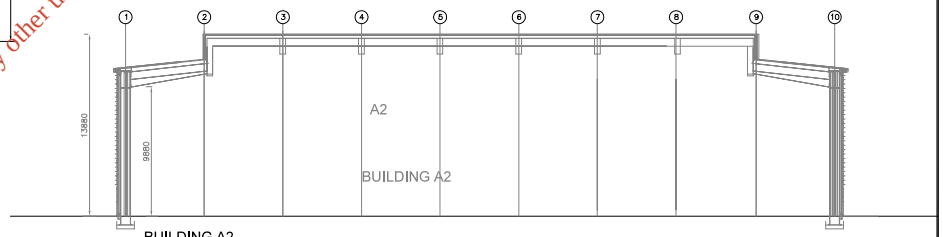
7.1.4.1 Wastewater

PANDA will monitor the quality of wastewater accumulating in the storage tanks on a quarterly basis. The parameters will include Chemical Oxygen Demand, ammonia and suspended solids. As the tanks will be emptied out as needed grab samples will be taken.

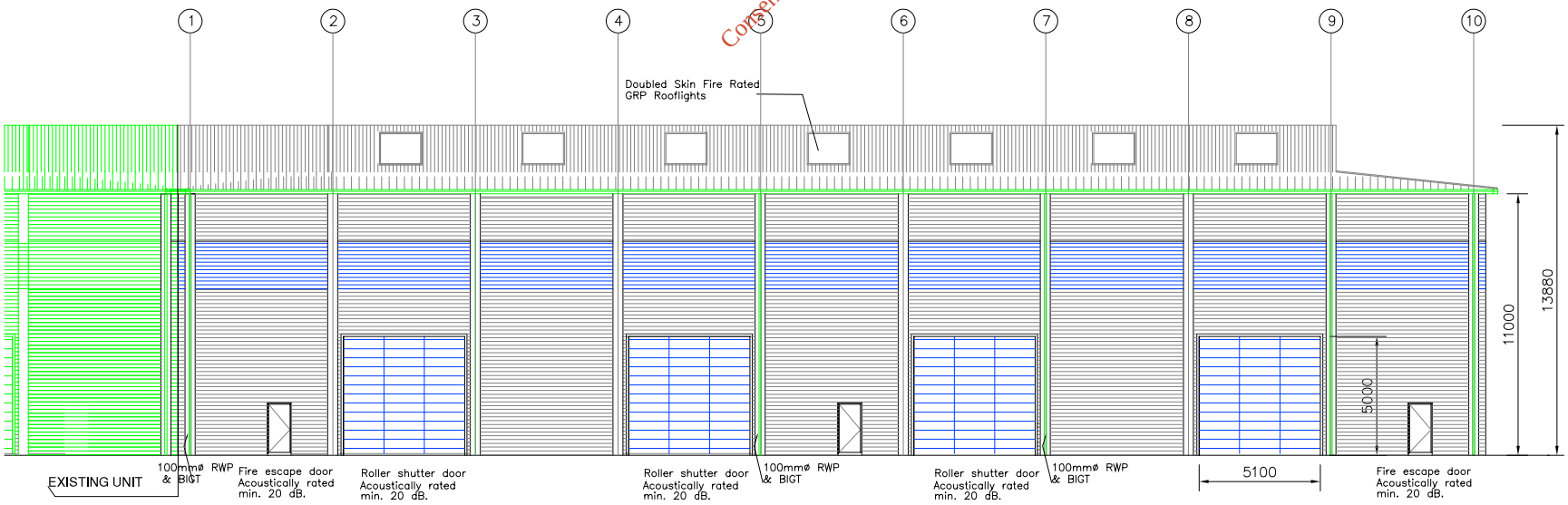
DRAWINGS



FLOOR PLAN OF WAREHOUSE BUILDING A2



BUILDING A2



SOUTH WEST ELEVATION BUILDING A2

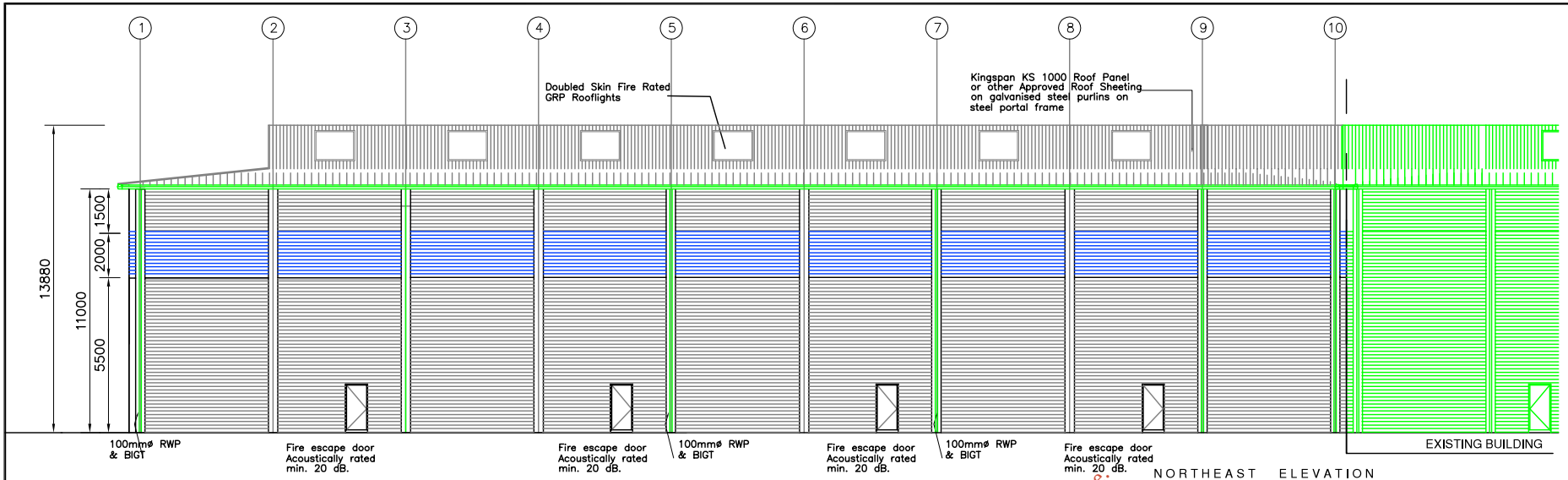
No	REVISION	DATE

G A P architects
53A Carndonagh Park, Donaghmede, Dublin 13
Telephone +353 (0)1 847 5505 / 401 3746
Fax +353 (0)1 847 5504
E-mail: shill.gaparchitects@eircom.ie

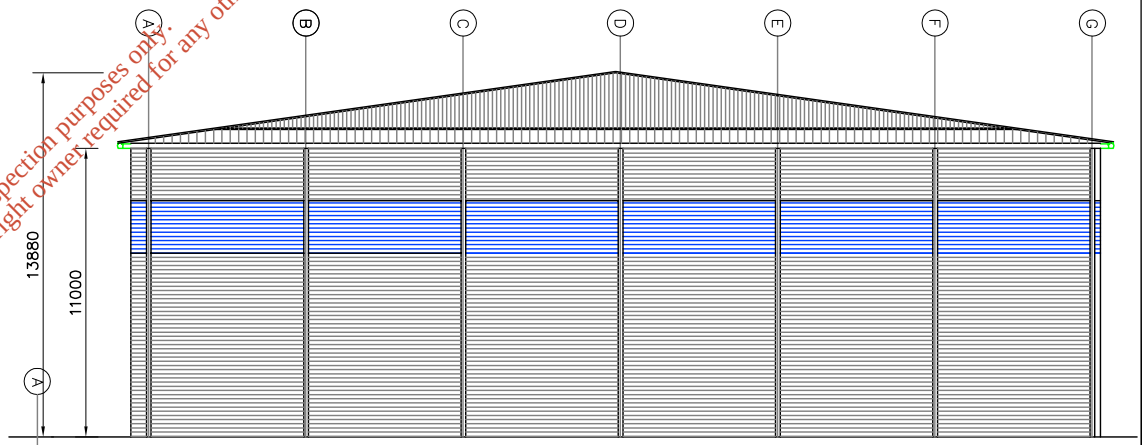
Client: PANDA WASTE

Job: EXTENSION TO EXISTING WASTE FACILITIES AT CAPPAGH & ASSOCIATED SITE WORKS

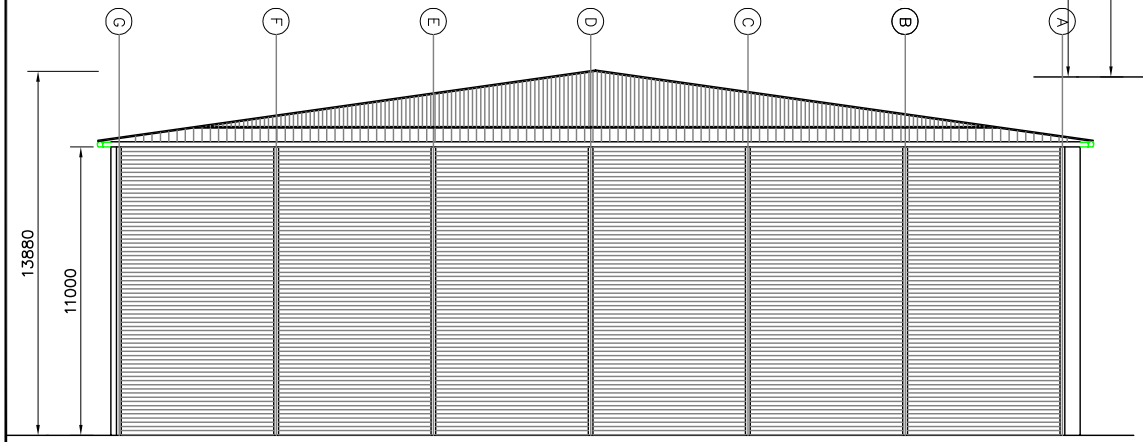
Title:	Scale:	Drawn:
FLOORPLAN & SECTION & ELEVATIONS BUILDING A2	As Shown	RAS
Dwg No: .07.07_1.01 Rev.:	Date: JULY.2007	Stage: LICENCE



NORTHEAST ELEVATION
BUILDING A2



SOUTHEAST ELEVATION
BUILDING A2



NORTH WEST ELEVATION (BUTTING TO EXISTING BUILDING REF: F05A/1156)
BUILDING A2

No	REVISION	DATE

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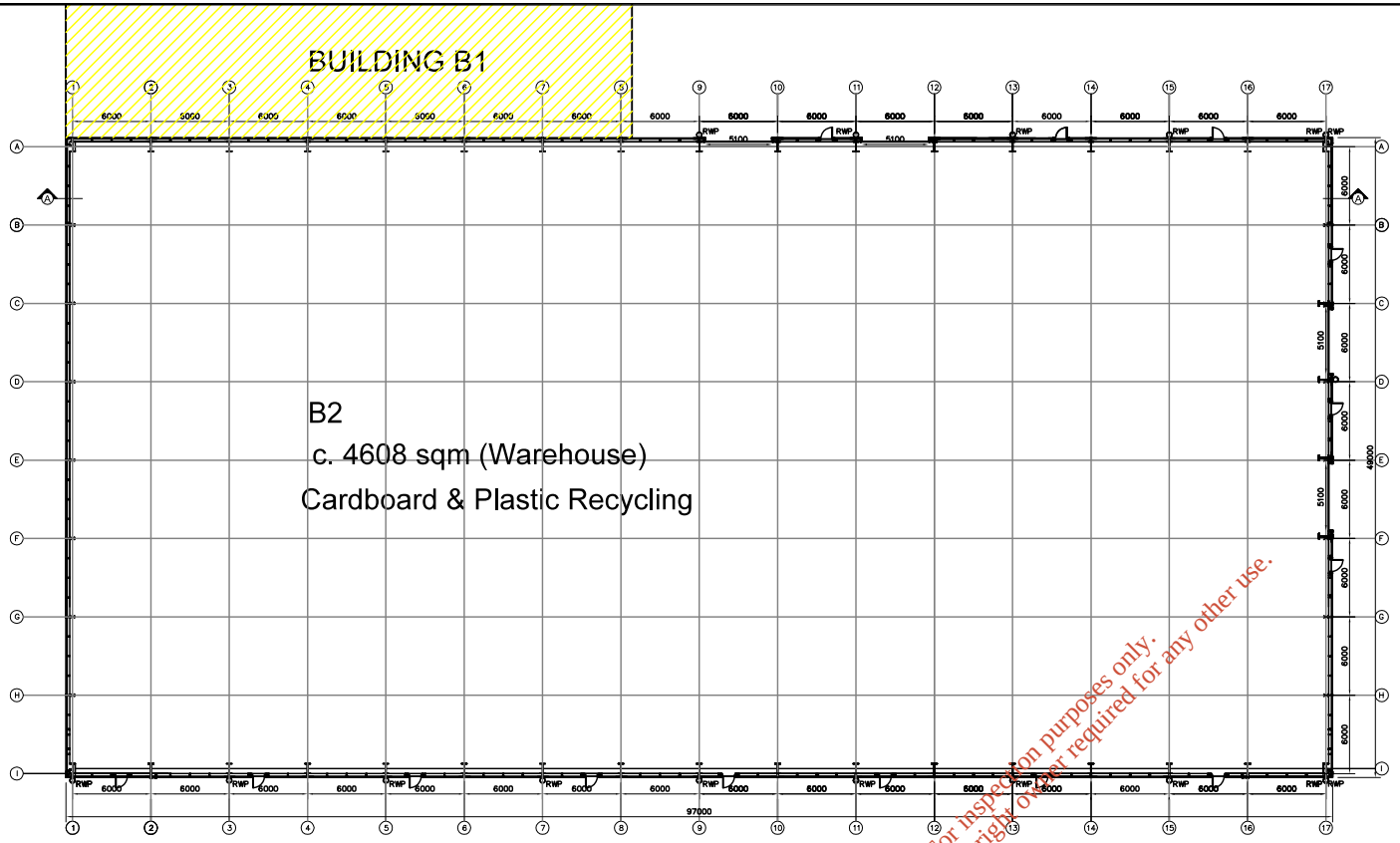
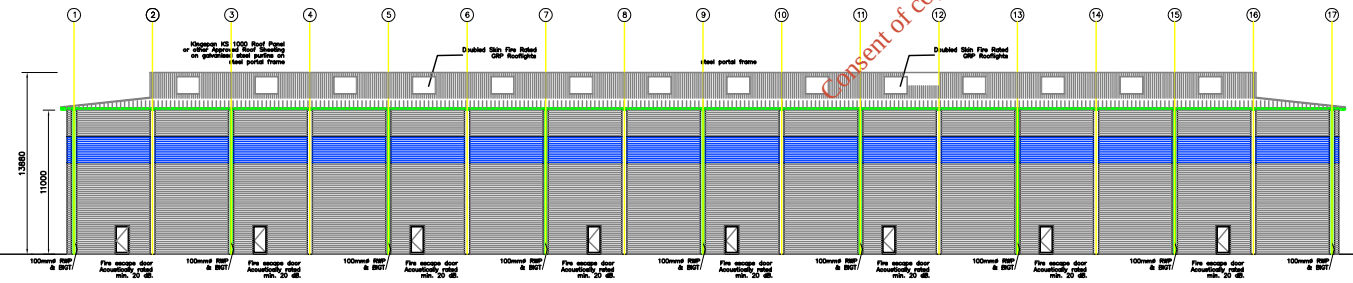
Client: PANDA WASTE

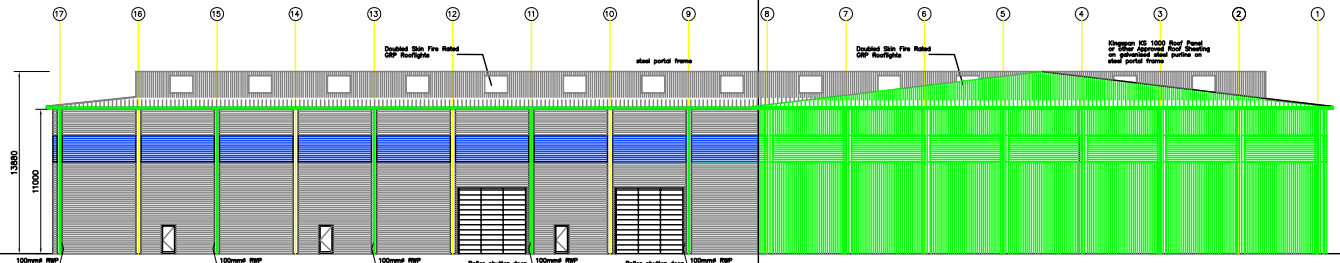
Job: EXTENSION TO EXISTING WASTE FACILITIES AT CAPPAGH & ASSOCIATED SITE WORKS

Title:	Scale:	Drawn:
ELEVATIONS BUILDING A2	As Shown	RAS
Dwg No: .07.07_2.01 Rev.:	Date: JULY.2007	Stage: LICENCE





SOUTH ELEVATION BUILDING B2



NORTH ELEVATION BUILDING B2

NORTH ELEVATION (Dry Recycling Building Attached)

No	REVISION	DATE

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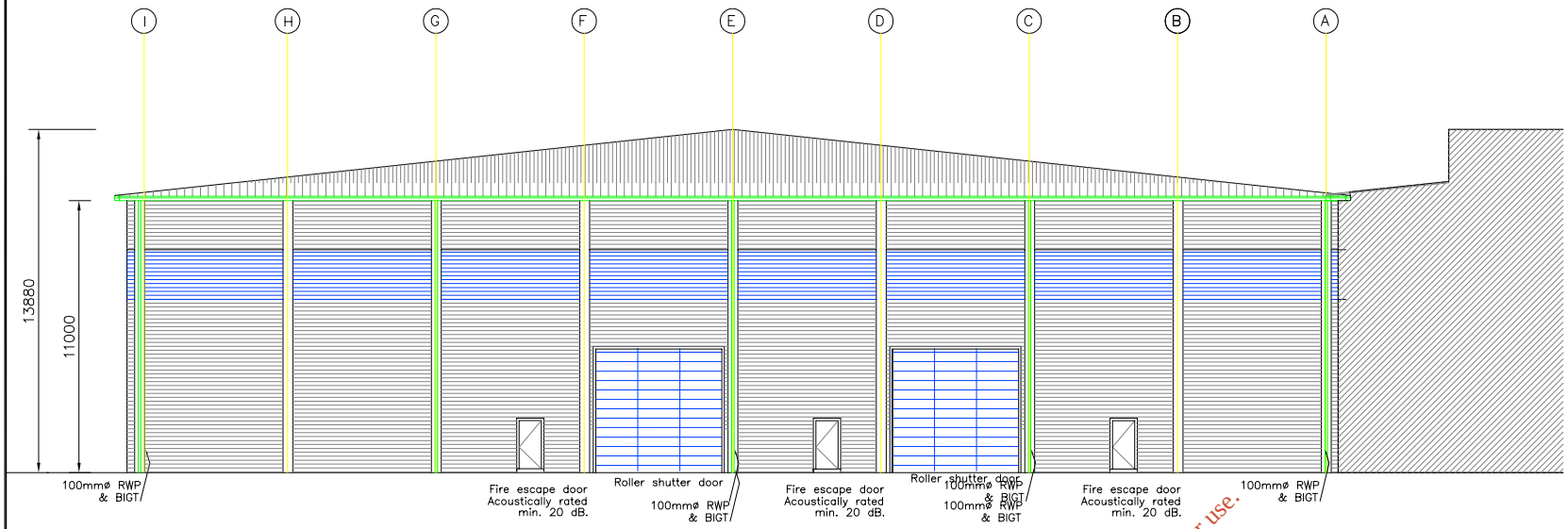
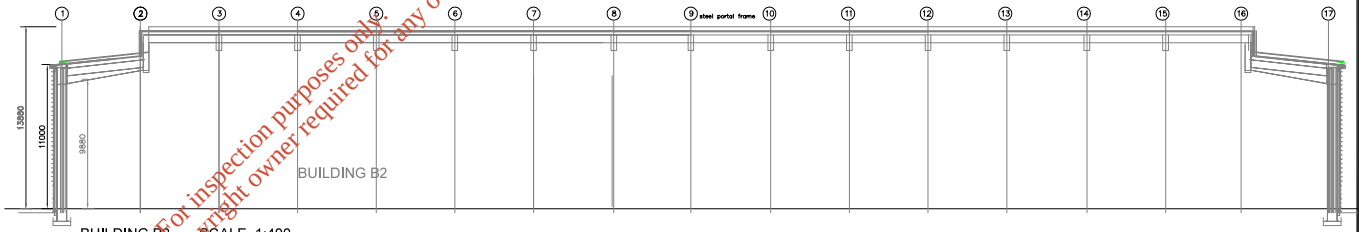
Client: PANDA WASTE

Job: EXTENSION TO EXISTING WASTE FACILITIES AT CAPPAGH & ASSOCIATED SITE WORKS

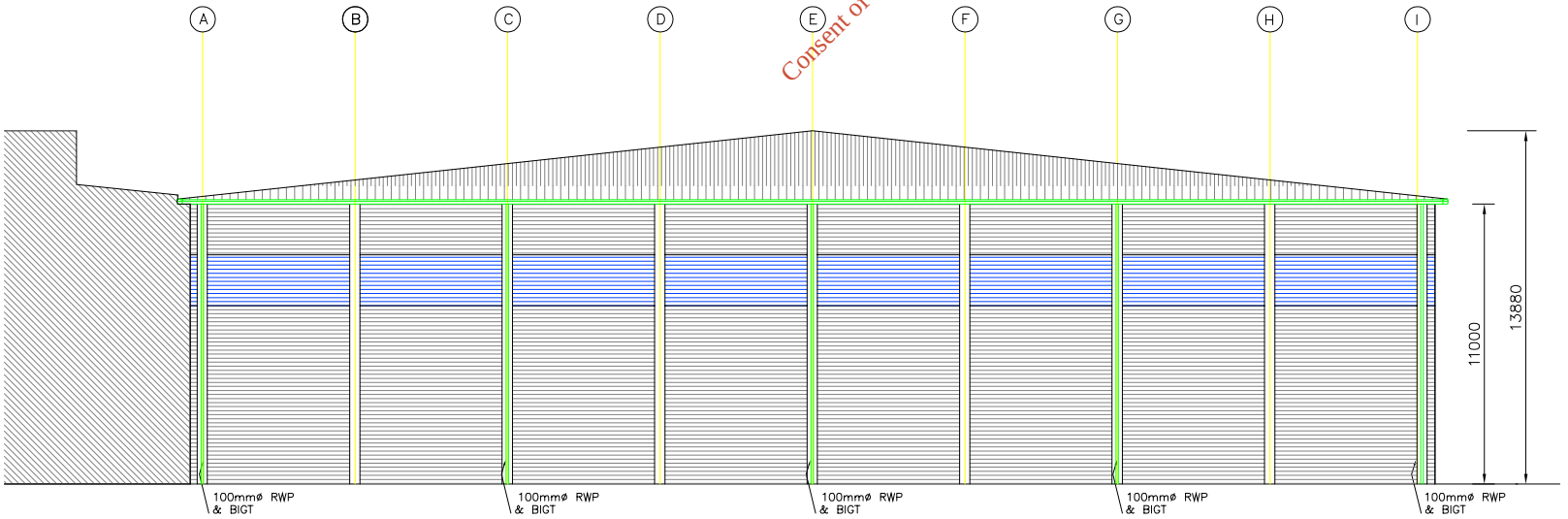
Title:	Scale:	Drawn:
FLOORPLANS & ELEVATIONS BUILDING B2	As Shown	RAS
Dwg No: .07.07_3.01	Rev.: Date: JULY.2007	Stage: LICENCE



EAST ELEVATION BUILDING B2



BUILDING B2 SCALE 1:400



WEST ELEVATION BUILDING B2

No	REVISION	DATE

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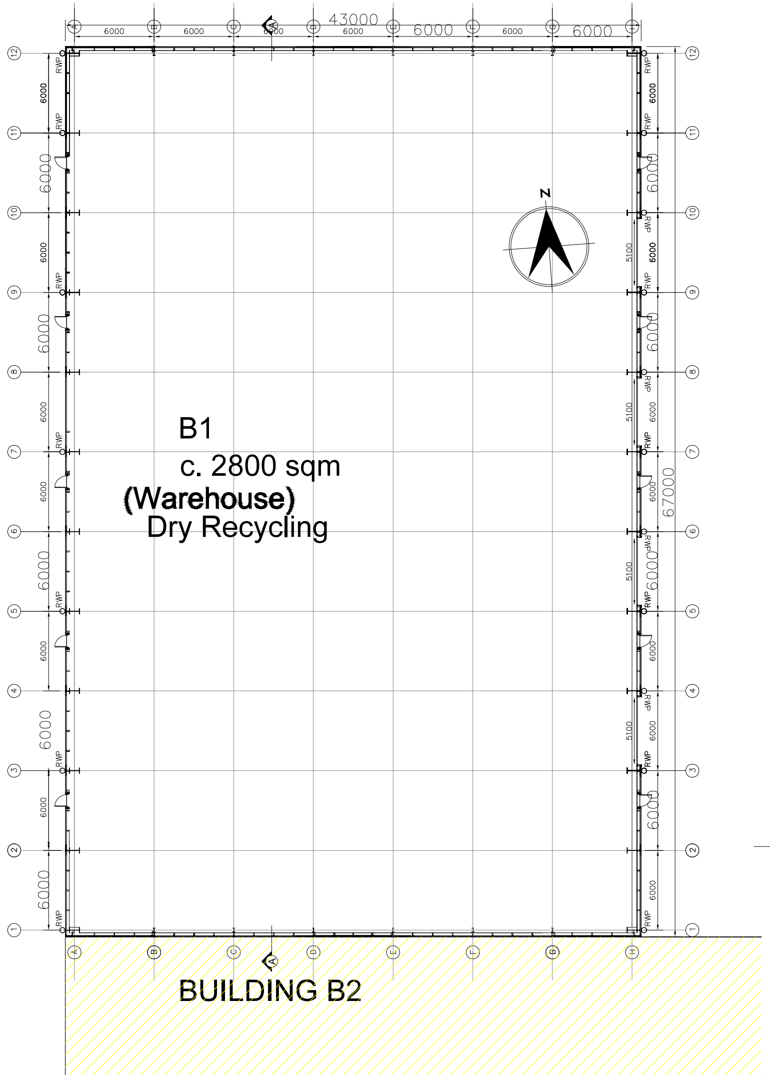
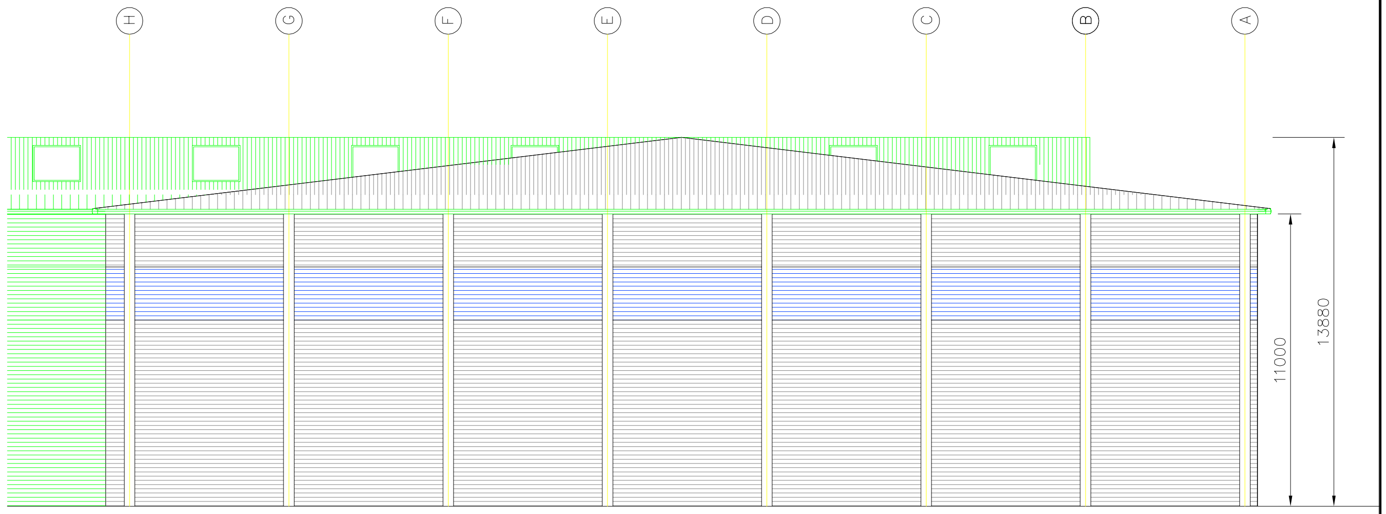
Client: PANDA WASTE

Job: EXTENSION TO EXISTING WASTE FACILITIES AT CAPPAGH & ASSOCIATED SITE WORKS

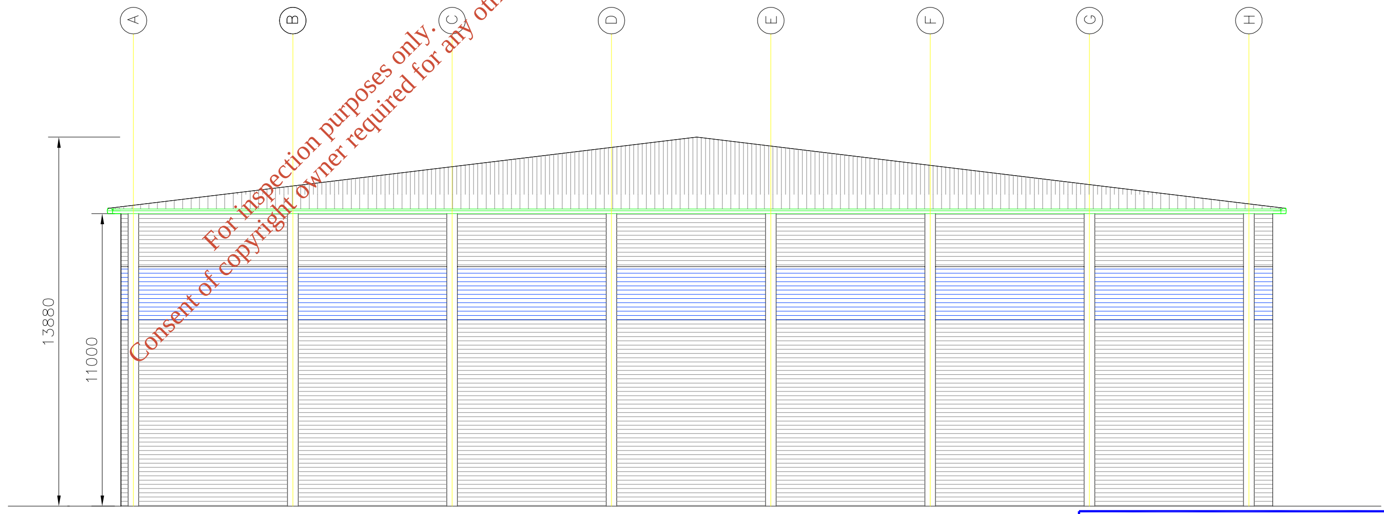
Title:	Scale:	Drawn:
ELEVATIONS & SECTION BUILDING B2	AS SHOWN	RAS
Dwg No: .07.07_4.01	Rev.: Date: JULY.2007	Stage: LICENCE



FLOORPLAN SCALE 1:200



NORTH ELEVATION BUILDING B1



SOUTH ELEVATION BUILDING B1
ABUTTING BUILDING B2

REVISION	DATE

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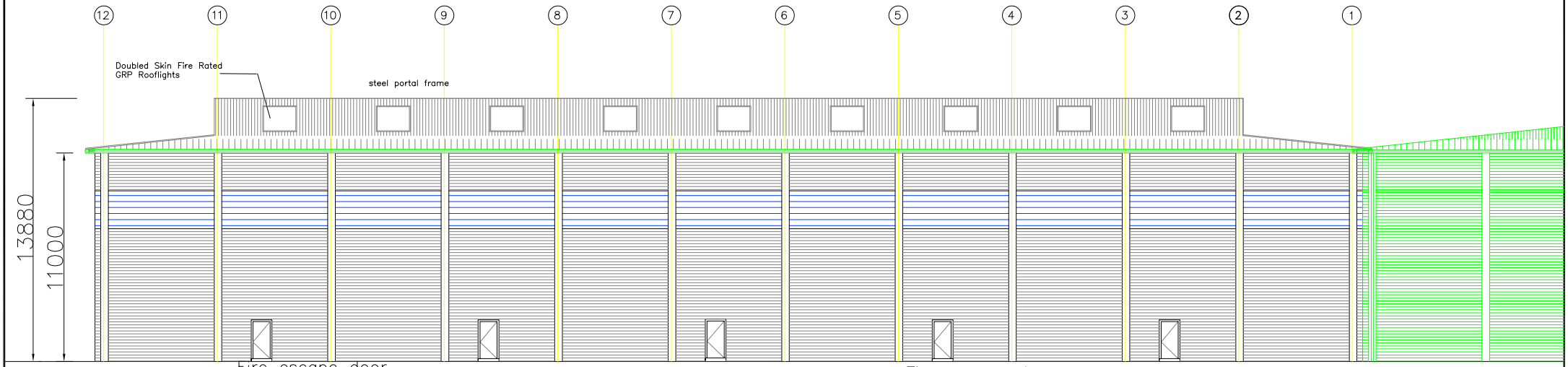
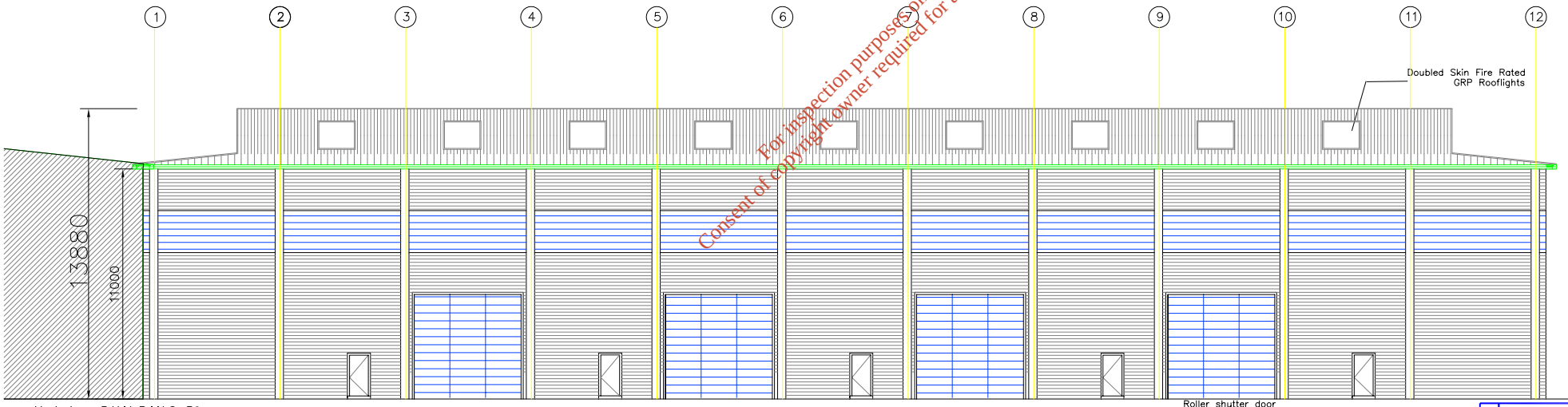
Client: PANDA WASTE

Job: EXTENSION TO EXISTING WASTE FACILITIES AT CAPPAGH & ASSOCIATED SITE WORKS

Title: FLOORPLAN & ELEVATIONS BUILDING B1	Scale: AS SHOWN	Drawn:
Dwg No: .07.07_5.01 Rev.:	Date: JULY.2007	Stage: LICENCE



WEST ELEVATION
BUILDING B1



EAST ELEVATION
BUILDING B1

No	REVISION	DATE

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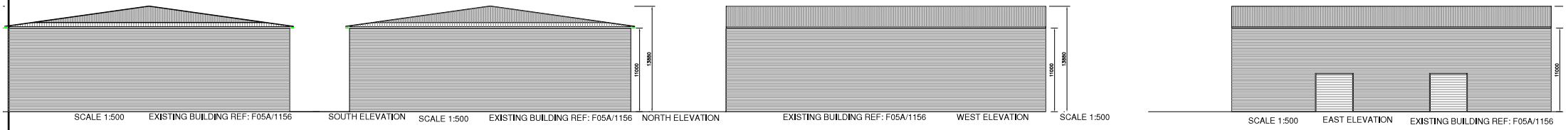
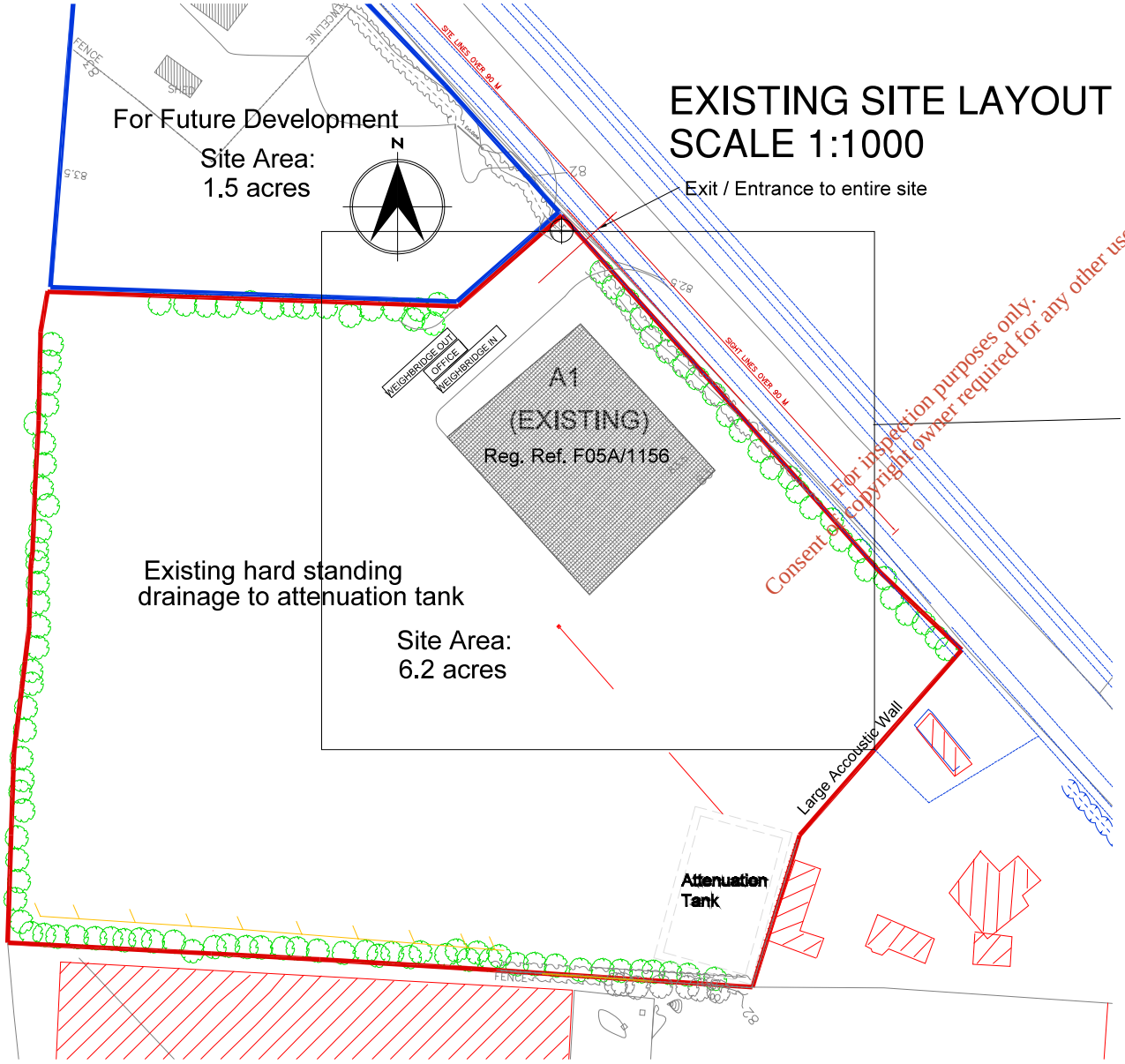
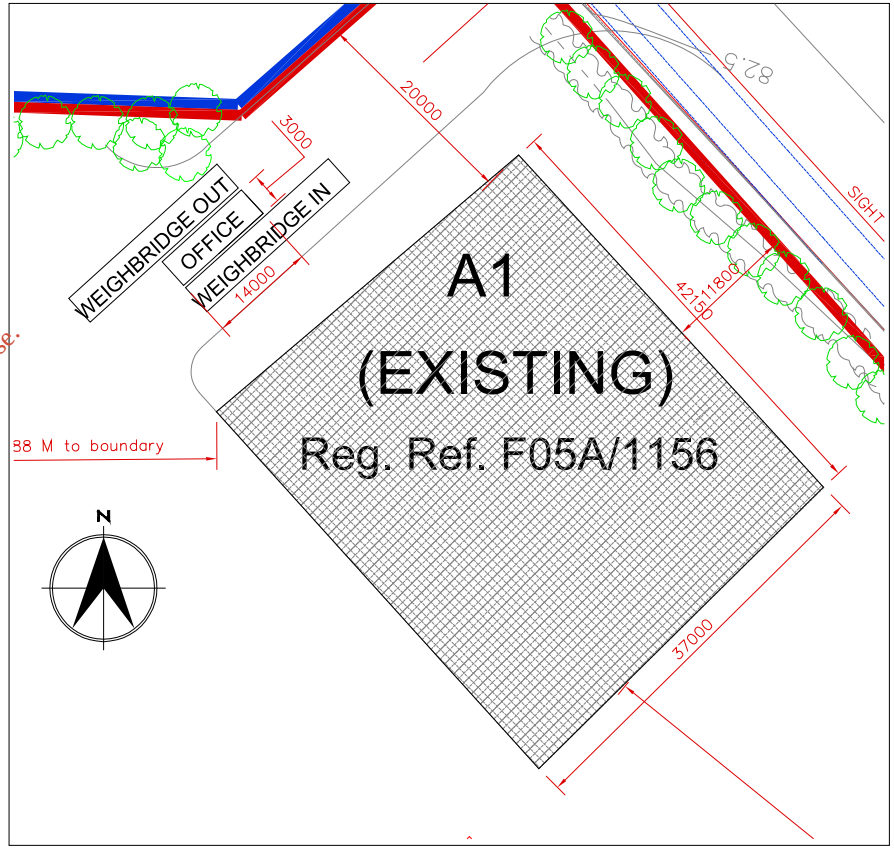
Job: EXTENSION TO EXISTING WASTE FACILITIES AT CAPPAGH & ASSOCIATED SITE WORKS

Title	Scale	Drawn
ELEVATION & SECTION BUILDING B1	AS SHOWN	RAS
Dwg No: .07.07_6.01	Rev.: Date: JULY.2007	Stage: LICENCE



EXISTING SITE LAYOUT
SCALE 1:1000





No	REVISION	DATE

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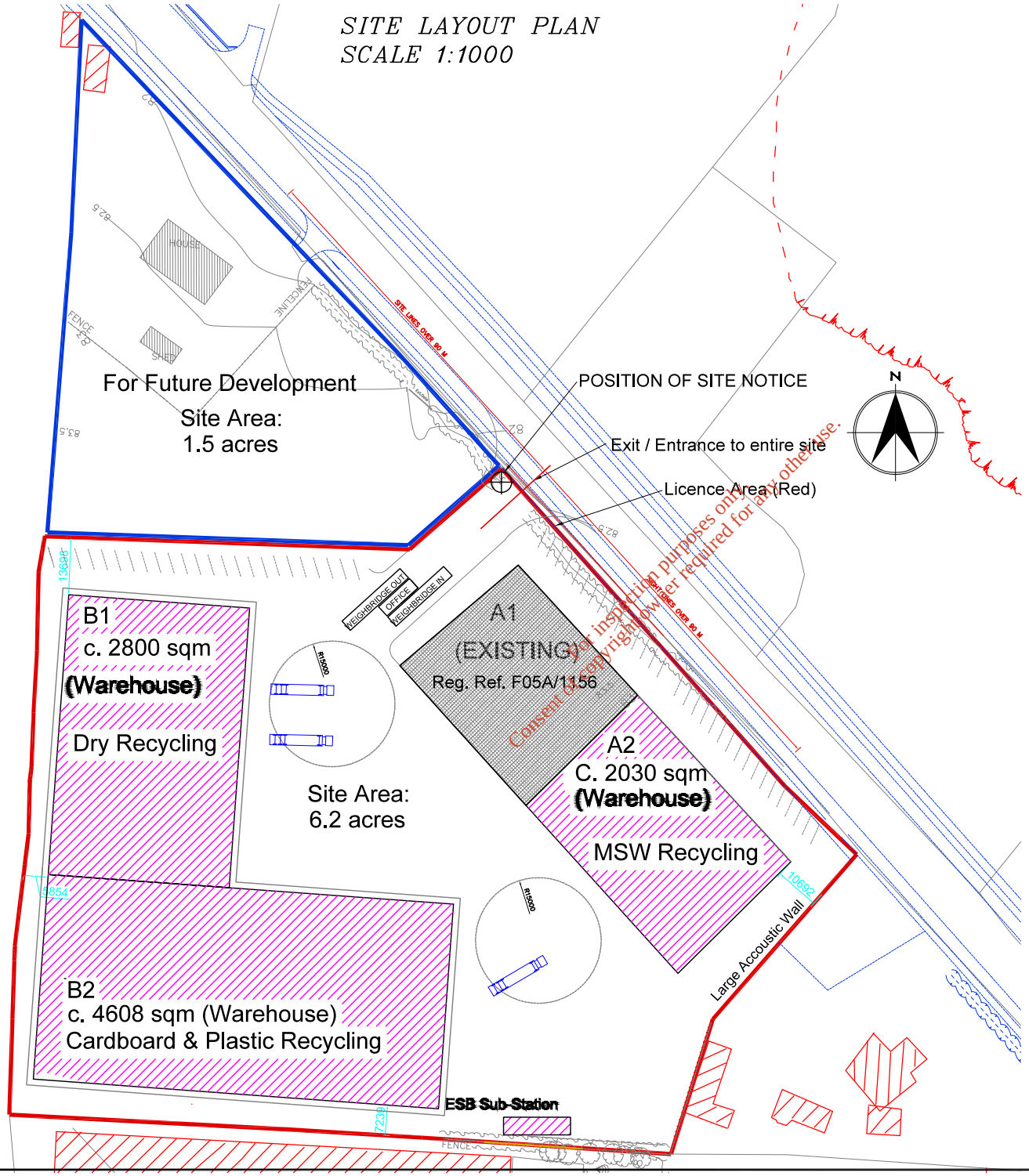
Client: PANDA WASTE

Job: EXTENSION TO EXISTING WASTE FACILITIES AT CAPPAGH & ASSOCIATED SITE WORKS

Title:	Scale:	Drawn:
EXISTING SITE LAYOUT EXISTING BUILDING 'A1'	1:1000 1:500	RAS
Dwg No: .07.07_9.01 Rev.:	Date: JULY.2007	Stage: LICENCE

SITE LAYOUT PLAN
SCALE 1:1000



DENOTES LICENCE AREA

DENOTES OWNERSHIP AREA

DENOTES NEW WORKS

NOTES:

1.2 METRE CONC. PATHWAY SURROUNDING BUILDINGS

TWO NO. 30 METRE TURNING CIRCLES

ADJOINING LANDS IN CLIENT OWNERSHIP OUTLINED IN BLUE

SITE OUTLINED IN RED

ACOUSTIC WALL TO SOUTHEAST BOUNDARY

No	REVISION	DATE

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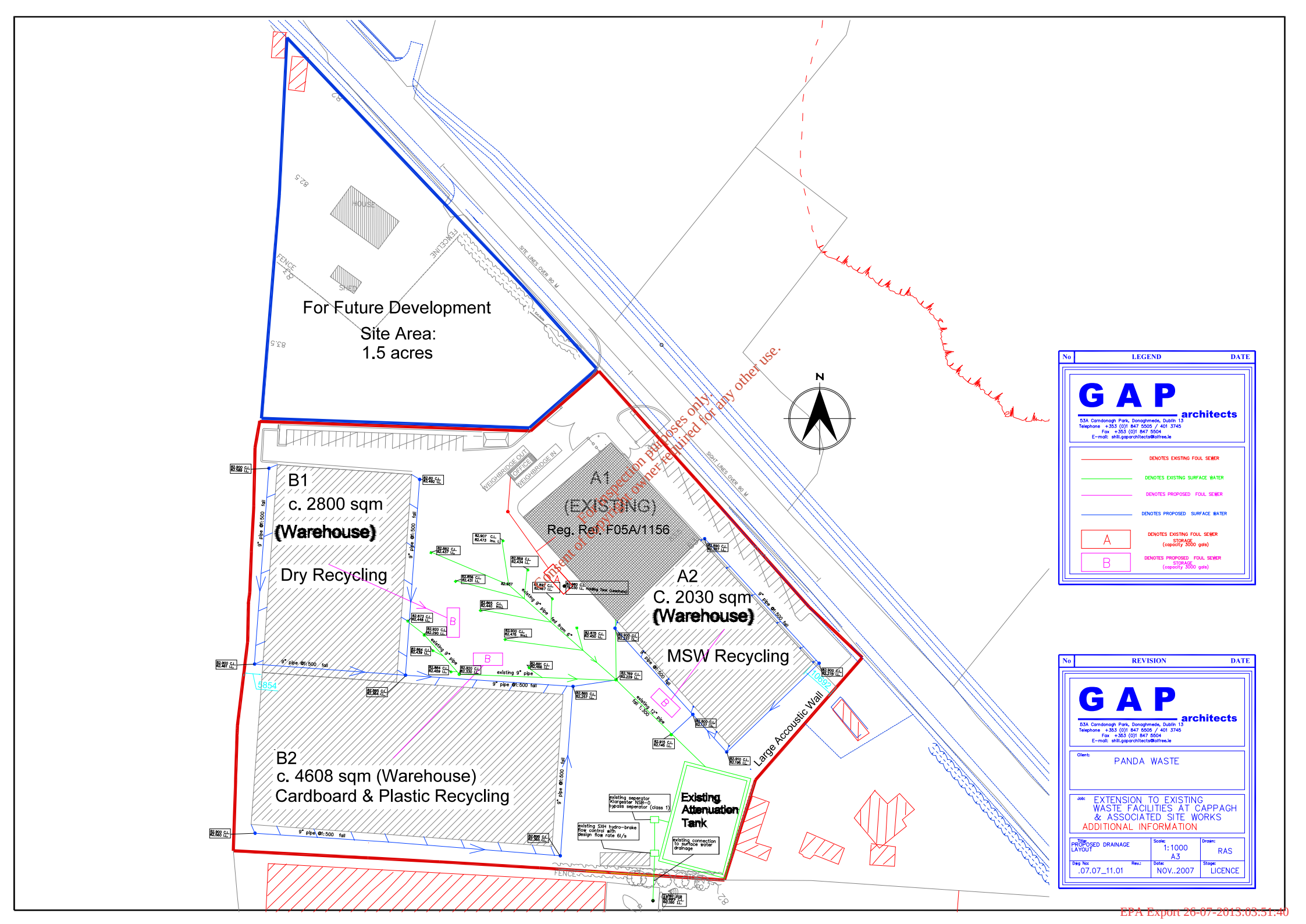
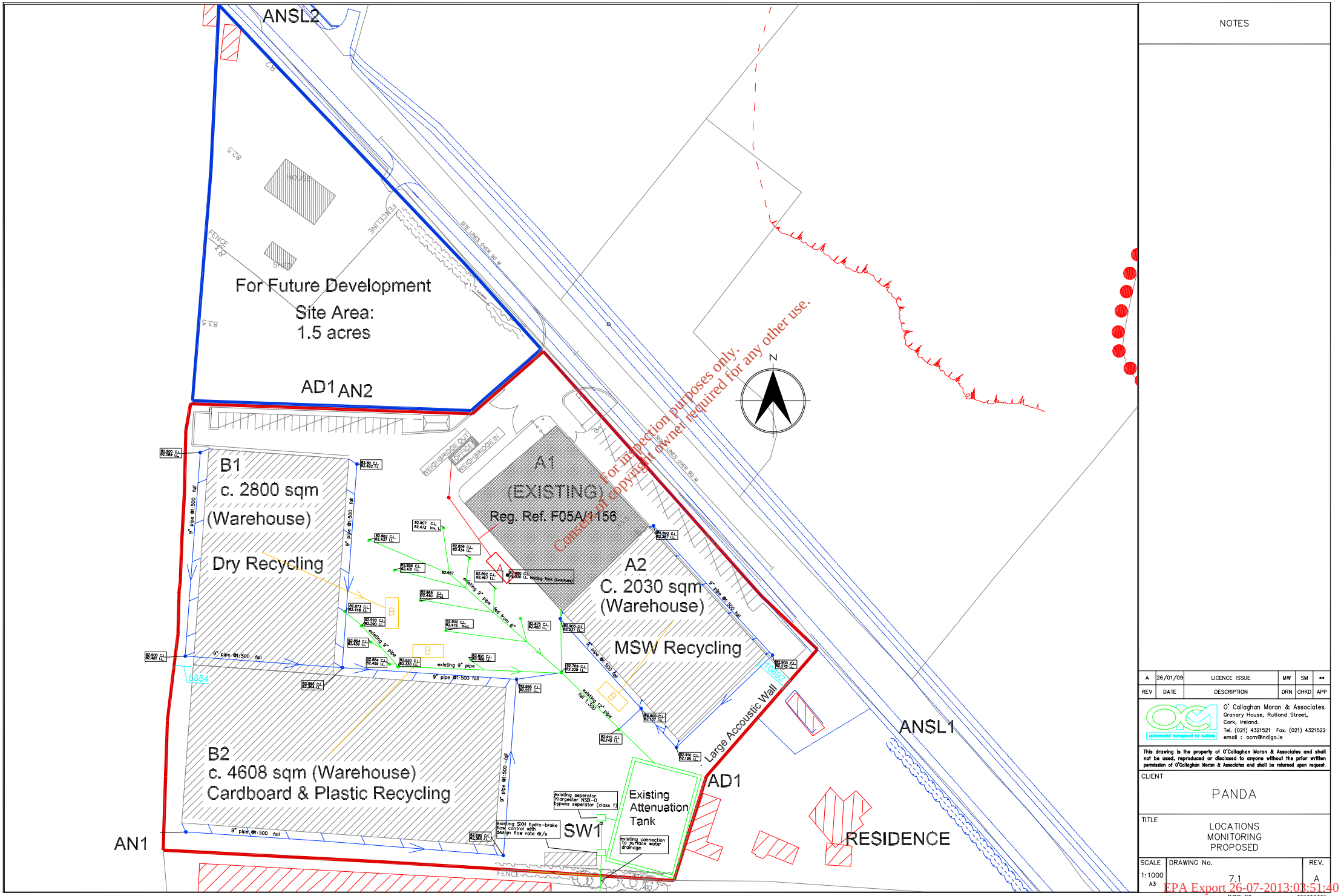
Title:	Scale:	Drawn:
SITE LAYOUT PLAN	1:1000	RAS
Dwg No: .07.07_7.01 Rev.:	Date: JULY.2007	Stage: PLAN/LIC





NOTES

REV	DATE	DESCRIPTION	DRN	CHKD	APP
A	26/01/09	LICENCE ISSUE	MW	SM	**

O' Callaghan Moran & Associates.
Granary House, Rutland Street,
Cork, Ireland.
Tel. (021) 4321521 Fax. (021) 4321522
email : ocm@indigo.ie

CLIENT

PANDA

TITLE

LOCATIONS
MONITORING
PROPOSED

SCALE	DRAWING No.	REV.
1:1000 A3	7.1	A

DOS Filename : *********

APPENDIX 1

Planning Permission

Waste Permit

05-/38-01

PLANNING DIVISION
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Fingal County Council
Comhairle Contae Fhine Gall

Planning Department
Grove Road,
Blanchardstown,
Fingal,
Dublin 15.

RECEIVED 19 DEC 2005

NOTIFICATION OF DECISION TO GRANT PERMISSION
PLANNING AND DEVELOPMENT ACTS, 2000-2004 AND REGULATIONS MADE THEREUNDER

Decision Order No. 4145	**Decision Date** 15 December, 2005
Register Ref. F05A/1156	**Registered** 21 November, 2005

Applicant Nurendale Ltd t/a Panda Waste Services

Development Development of a Materials Recycling Facility at Cappagh Road Cappoge Td Finglas, Dublin 11 comprising A) the following buildings A1) Construction and Demolition, Commercial and Industrial Recycling Unit with associated offices (area c.2076m_, height to eaves 11.2m), A2)Dry Recyclables unit with associated offices (area c.3963m_, height to eaves 11.2m), A3) Municipal Solid Wastes Recycling Unit (area c.5870m_, height to eaves 11.2m). A4) ESB substation and switchroom (area c.21.75m_, height to eaves 3m). B)Weighbridge and Office (area 3.5m2 height to eaves 3.8m) C) 2.5kw Wind Turbine (11m high). D) Associated site works including fencing, acoustic barrier, entrance gates, drainage. A Waste Permit application will accompany this application.

Location Cappagh Road, Cappoge Td, Finglas, Dublin 11

Floor Area 11033.25 Sq Metres

Time extension(s) up to and including

Additional Information Requested / Received 10-Oct-2005 / 21-Nov-2005

In pursuance of its functions under the above mentioned Acts, as Planning Authority, the County Council for the County of Fingal did by Order dated as above make a decision to **GRANT PERMISSION** in respect of the above proposal.

Eamon Waters c/o Panda Waste
Beaupare Business Park
Rathdrinagh
Navan
Meath

Reg.. Ref.: F05A/1156

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Fingal County Council
Comhairle Contae Fhine Gall

Subject to the (19) conditions on the attached Pages.

Signed on behalf of the Fingal County Council

15 December,

2005

for Senior Executive Officer

Reg.. Ref.: F05A/1156

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Conditions and Reasons

1. The development to be carried out in its entirety in accordance with the plans, particulars, specifications, and information lodged with the application as amended by additional information recieved on 21st November 2005, save as may be required by the other conditions attached hereto.

   REASON: To ensure that the development shall be in accordance with the permission and that effective control be maintained.

2. That the proposed development shall be amended as follows;
   (a) That both the Dry Recycling Unit (Building 200) and Municipal Solid Waste Unit (Building 300) shall be omitted from the development
   (b) That Building 100 (Construction and Demolition, Commercial and Industrial Unit) shall be restricted to the processing of 50,000 tonnes of waste per annum

   REASON: In the interests of the proper planning and development of the area and with regard to the existing capacity of the adjoining road network

3. That the fire turning circle at the south eastern corner of the site shall be kept free of vehicles at all times and shall not be used for storage of any machinery, waste or other materials.

   REASON: In the interests of safety and amenity.

4. That waste material shall be off-loaded from delivery vehicles and stored/processed internally within the proposed building. Waste material shall not be stored externally within the site

   REASON: In the interests of the proper planning and development of the area

5. That the following requirements of the Transportation Department, Fingal County Council shall be strictly adhered to in the development:
   (a) The ditch along the site frontage shall be piped with pipes of adequate size and strength to the satisfaction of the Area Engineer, Roads Maintenance, and positive drainage, i.e. gullies, shall be provided along the public road (Cappagh Road) over the entire site frontage. Gullies shall be provided at a minimum rate of 1 per 200m² of road width. At all sag curves and at all other locations were ponding could occur, two gullies, side by side, shall be provided with separate inlets to the surface water drainage system.
   (b) No vehicles shall park, nor shall any goods or objects be stored or located, within the

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entrance area at any time. For the purposes of this condition the entrance area is defined as that area between the sliding security gate and the public road. Double yellow lines (in accordance with the Traffic Signs Manual) shall be provided within the entrance area. The sliding security gate shall remain in the fully open position during all periods that the development is operating or in use.

(c) The entrance area shall be illuminated in order to facilitate users in identifying and accessing the site and to highlight the access point/junction to other road users. Prior to commencement of the development, the applicant shall submit technical details of lamp installations and illumination levels to the Planning Authority. The lighting scheme shall not cause excessive glare or distraction to road users or nuisance to adjoining property owners. In this regard, the level and/or nature of illumination may be reviewed at any time by the Transportation Department and adjustments shall be made by the applicant upon request at his/her own expense.

(d) No vehicles shall park, nor shall any goods or objects be stored or placed, in or about the site in such a manner or location that the truck slip road to the south of the weighbridge becomes obstructed or non-utilisable.

(e) A pedestrian gate shall be provided within the boundary wall/railing at/near the site entrance which shall be linked by footpath to the Office Building. This gate shall link to the proposed footpath/cycleway to be provided under the Cappagh Road Realignment Scheme.

(f) Parking spaces shall be lined/marked in accordance with the "Traffic Signs Manual", 1996 and the "Guidelines on Tender Documentation for Road Marking Materials", 2000, published by the Dept of Environment, Heritage and Local Government. Delineation lines shall be white thermoplastic (to EN 1436, 1997), with a minimum thickness of 3mm and a minimum width of 100mm. Disabled Parking Bays shall be 4.8m long and 3.6m in width and shall be marked and signed (if necessary using contrasting marking colours or materials) so that their location, allocation and use is clearly apparent.

(g) Car-parking spaces numbers 44 & 45 shall be relocated to the satisfaction of the Engineer, Roads Planning, in order to increase their visibility to other users of the facility.

(h) A permanent written record shall be maintained of all goods vehicles entering the site which record shall contain the following details: vehicle description/registration, time and date of weighing, gross/tare/net weights, and nature of the load. This record shall be made available to the Planning Authority for inspection/review upon demand

REASON: In the interests of road safety.

6. That the proposed facility shall be not available for use directly by members of the general public.

REASON: In the interests of the proper planning and development of the area.

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7. That the following requirements of the County Council in relation to foul sewer drainage infrastructure for the proposed development shall be strictly adhered to:
(a) No foul drainage shall discharge to the surface water system under any circumstances

REASON: In the interests of public health.

8. That the following requirements of the County Council in relation to surface water drainage infrastructure for the proposed development shall be strictly adhered to:
(a) Prior to works commencing the applicant shall submit for the written agreement of the Water Services Department drainage details demonstrating:
(i) All runoff from yards and roads shall be routed through suitability sized oil/silt interceptor
(ii) Adequate provision shall be made to retain firewater runoff
(iii)Adequate provision shall be made to prevent runoff from within the buildings including washdown water draining to the surface water system
(b) No surface or rain water shall discharge to the foul sewer system under any circumstances

REASON: In the interests of public health.

9. That the following requirements of the County Council in relation to the water supply infrastructure for the proposed development shall be strictly adhered to:
(a) Supply shall be metered at applicant's prior expense. Applicant shall ensure that the facility for metering both the premises and the individual non-domestic units is to be designed and constructed in order to ensure full conformity with the Government's Water Pricing Framework policy. The Applicant shall obtain written local authority approval for the design of the metering installation prior to construction.
(b) The following works shall be carried out by Fingal County Council at the applicants prior expense:
(i) The connection to the public water main
(ii) The testing, cleansing and sterilisation of all new mains
(iii) The provision of tappings to serve individual properties
(c) The applicant shall provide 24 hour water storage on site.
(d) All water fittings and installations shall incorporate best current practices in water conservation.
(e) Development shall not be occupied pending the commissioning of the Ballycoolin High Level Water Supply Scheme unless the applicants can demonstrate to the satisfaction of the Water Services Department the provision of a temporary boosting system. All costs associated with any interim works shall be borne by the developer.

REASON: In the interests of public health.

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10. That a comprehensive landscape plan with full specifications and bill of quantities including screen planting and management company proposals for the upkeep of these areas to be submitted and agreed in writing with the Planning Authority prior to the commencement of development on site. Landscaping and boundary treatment works shall be completed prior to the operation of the proposed development.

REASON: In the interests of the proper planning and development of the area.

11. That the proposed development shall comply with the Noise Guidelines of Fingal County Council. In this regard:
(a) The premises shall only be used for any purpose including collection and return of vehicles and waste receptacles between the hours of 08:00 to 20:00 Monday to Friday and 08:00 to 16:00 on Saturdays. A monitoring system to ensure compliance with this condition shall be agree with the Council before development commences.
(b) An odour control programme shall be agree with the Council and installed before operation commences in order to minimise odours.

REASON: In the interests of the amenities of the area.

12. No advertising sign or structures shall be erected on the site without prior approval of the Planning Authority.

REASON: In the interests of visual amenity.

13. That the following requirements in relation to the tree and hedgerow coverage of the site be adhered to in the proposed development:
(a) Prior to the commencement of development details of protection measures during construction shall be agreed with the Parks Division, Fingal County Council. These shall comply with B.S. 5837, 1991.
(b) A tree bond of euro10,000 shall be lodged with the Planning Authority prior to the commencement of works to ensure protection of trees and to repair any damage caused during construction. This bond shall be refundable on satisfactory completion of the development.

REASON: In the interest of the visual and landscape amenities of the area.

14. That all public services to the proposed development, including electrical, telephone cables and equipment be located underground throughout the entire site.

REASON: In the interest of amenity.

15. No materials to which the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2000, S.I. No.476 of 2000 (Seveso II)

Reg.. Ref.: F05A/1156

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applies shall be stored in the proposed premises without the prior grant of planning permission by the Planning Authority or An Bord Pleanala. This shall form a clause in any leasing or sale agreement for the development.

REASON: In the interests of the proper planning and development of the area.

16. Prior to the commencement of development a comprehensive and specific plan for the treatment of all boundaries of the site shall be agreed in writing with the Planning Authority.

REASON: In the interest of the visual and landscape amenities of the area.

17. That all necessary measures including the provision of wheel wash facilities be taken by the contractor to prevent the spillage or deposit of clay, rubble or other debris on adjoining roads during the course of the works.

REASON: To protect the amenities of the area.

18. This development shall not be carried out without the payment of a development contribution.

REASON: Investment by Fingal County Council in Local Authority works has facilitated and will facilitate the proposed development. It is considered appropriate and reasonable that the developer should contribute to the cost of same.

19. The developer shall pay the sum of € 201,082 (updated at date of commencement of development, in accordance with changes in the Tender Price Index) to the planning authority as a contribution towards expenditure that was/or that is proposed to be incurred by the planning authority in respect of public infrastructure and facilities benefiting development in the area of the Authority, as provided for in the Contribution Scheme for Fingal County made by the council. The phasing of payments and the giving of security to ensure payment shall be agreed in writing with the planning authority prior to the commencement of development.

REASON: It is considered reasonable that the payment of a contribution be required in respect of the public infrastructure and facilities benefiting development in the area of the planning authority and that is provided, or that is intended will be provided, by or on behalf of the Local Authority.

NOTE: A number of the conditions attached to the planning permission may need compliance submissions to be lodged and agreed prior to commencement of

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Contae Átha Cliath

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Fingal County Council
Comhairle Contae Fhine Gall

development. Failure to comply with a condition of the planning permission is an offence under Section 151 of the Planning and Development Act 2000. Copies of <u>each</u> compliance submission should be made in triplicate.

COMHAIRLE CONTAE FHINE GALL

_____

WASTE PERMIT

TO: **Nurendale Ltd t/a Panda Waste Services**
Cappagh Road
Cappoge Td
Finglas
Dublin 11

Permit Ref: WPT 95
Order Reference No: FENV/ 133/06

Fingal County Council, in exercise of the powers conferred on it by the Waste Management Act, 1996 and Waste Management (Permit) Regulations, 1998, hereby grants a Waste Permit, Reference Number WPT 95, to Nurendale Ltd t/a Panda Waste Services, Cappagh Road, Finglas, Dublin 11 (hereinafter referred to as the Permit Holder) to operate a recycling centre at the location mentioned below: -

Located at: **Cappagh Road**
Cappoge Td
Finglas
Dublin 11

Subject to the 8 conditions as set out on the schedule attached hereto.

Dated this _____ day of _____, 2006

SIGNED: _____
Éamonn Walsh
Senior Engineer

WASTE PERMIT

ISSUED UNDER

THE WASTE MANAGEMENT ACT, 1996

AND

THE WASTE MANAGEMENT (PERMIT) REGULATIONS, 1998

Waste Permit Number:	WPT 95
Applicant:	Nurendale Ltd t/a Panda Waste Services
Address:	Cappagh Road Finglas Dublin 11
Location of Facility:	Cappagh Road Finglas Dublin 11

Contents:

Activities Permitted

In pursuance of the powers conferred on it by the Waste Management Act, 1996 and the Waste Management (Permit) Regulations, 1998, Fingal County Council grants this waste permit under Article 5(1) of the said Regulations to Nurendale Ltd t/a Panda Waste Services, Cappagh Road, Finglas, Dublin 11 to carry on the waste activities listed below at Cappagh Road, Finglas, Dublin 11 subject to eight conditions, with the reasons therefor set out in this permit.

Permitted Waste Activity in accordance with the First Schedule of the Waste Management (Permit) Regulations, 1998:

Activity 5: *The recovery of waste (other than hazardous waste) at a facility (other than a facility for the composting of waste, where the amount of compost and waste held at the facility exceeds 1,000 cubic metres at any time).*

Permitted Waste Recovery Activity in accordance with the Fourth Schedule of the Waste Management Act, 1996:

Activity 2: *The Principal Activity. Recycling or reclamation of organic substances that are not used as solvents (including composting and other biological processes).*
Activity 3: *Recycling or reclamation of metals and metal compounds.*
Activity 4: *Recycling or reclamation of other inorganic materials.*
Activity 13: *Storage of waste intended for submission to any activity referred to in this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.*

NOTE:

GRANTING OF THIS PERMIT AND ANY CONDITION IMPOSED BY IT DOES NOT EXEMPT THE HOLDER OF THE PERMIT FROM COMPLYING WITH THE STATUTORY OBLIGATIONS OF ANY RELEVANT LEGISLATION INCLUDING WATER POLLUTION, AIR POLLUTION, WASTE, LITTER AND PLANNING LEGISLATION.

CONDITION 1: SCOPE

1.1 This waste permit is issued under the Waste Management (Permit) Regulations, 1998 to Nurendale Ltd t/a Panda Waste Services, Cappagh Road, Finglas, Dublin 11 in respect of a facility at Cappagh Road, Finglas, Dublin 11.

1.2 This waste permit is granted for a period not exceeding **36 months** from the date of issue.

1.3 Subject to condition 5, wastes permitted to be accepted at the facility shall consist of commercial & industrial and construction & demolition wastes only.

1.4 No composting of waste is permitted at the facility.

1.5 The maximum amount of waste to be accepted at the facility per annum is 50,000 tonnes. The maximum amount of waste dispatched from the facility and ultimately disposed of, shall not exceed 5,000 tonnes per annum.

1.6 Fingal County Council reserves the right to review and/or revoke this permit at any time and shall give written notice to the permit holder in such an event.

1.7 The waste activities shall be confined to the area outlined in the Proposed Landscape Layout Plan, Drwg. No. PP-201 submitted with the permit application on 17 August 2005 or as amended and shall take place as specified by the terms of this permit.

1.8 The Permit Holder shall give notice in writing to Fingal County Council of any significant changes in the information furnished in the application for the permit. Such notice shall be given within three (3) weeks of any such change arising. On receipt of this information Fingal County Council may require a new waste permit application to be submitted.

1.9 The Permit Holder shall be responsible for ensuring that the waste activities are controlled, operated and maintained in accordance with the terms of the application and/or as modified by the conditions attached to this permit. The Permit Holder shall establish procedures to ensure that corrective action is taken should any condition of this permit not be complied with. Fingal County Council shall be immediately notified of any such breach by telephone/fax, and full details shall be forwarded in writing on the next working day.

1.10 Where Fingal County Council considers that a non-compliance with the conditions of this permit has occurred it may serve a notice on the permit holder specifying: -

(a) that only those wastes as specified, if any, in the notice are to be accepted at the facility after the date specified in the notice and
(b) that the Permit Holder shall undertake the works stipulated in the notice and/or otherwise comply with the requirements of the notice as set down therein within any time-scale contained in the notice.

When the notice has been complied with the Permit Holder shall provide written confirmation to the local authority that the requirements of the notice have been carried out. No waste other than that which is stipulated in the notice shall be accepted at the facility until confirmation is received from the Council that the notice is withdrawn.

1.11 The Permit Holder shall comply at all times with the provisions of the European Community Acts detailed in the table below insofar as such provisions are relevant to the waste activity to be carried out :-

Relevant Provisions	Community Act
Article 9 and 14	Council Directive 75/442/EEC of 15 July 1995 on waste, as amended by Council Directive 91/156/EEC of 18 March, 1991
Articles 4, 5, 8, 9, 10 and 18	Council Directive 80/68/EEC of 17 December, 1979 on the protection of groundwater against pollution caused by certain dangerous substances.

REASON: To clarify the scope of this waste permit.

CONDITION 2: MANAGEMENT OF THE ACTIVITY

2.1 The Permit Holder shall acquaint all staff, employees, lessees and agents, including replacement personnel of the provisions and conditions of this permit. A copy of the permit shall be kept on site at all times.

2.2 The Permit Holder shall appoint a suitably experienced facility manager. The manager or a suitably experienced deputy shall be present at the facility at all times during the hours of waste acceptance and handling, and the facility shall be adequately manned and supervised at all times. It shall be maintained to the satisfaction of Fingal County Council and adequate precautions shall be taken to prevent unauthorised access to the site.

2.3 Waste shall only be accepted at the facility between the hours of 08:00 and 20:00 Monday to Friday inclusive (excluding Bank and Public Holidays) and between the hours of 08:00 and 16:00 on Saturdays.

2.4 Waste shall only be stored, handled or sorted within the confines of the buildings (shown on the landscape layout plan). No waste shall be stored, handled or sorted outside the buildings.

2.5 The Permit Holder shall establish procedures to ensure that corrective action is taken should any condition of this permit not be complied with. In such instances Fingal County Council shall be immediately notified by telephone/fax and full details shall be forwarded in writing on the next working day.

REASON: To make provision for the proper management of the activity.

CONDITION 3: NOTIFICATION AND RECORD KEEPING

3.1 All communications with Fingal County Council shall be addressed to the Senior Engineer, Environment Department

Address:

County Hall,
Main Street,
Swords
Co Dublin

Telephone Number (normal working hours) 01 - 8905000

Fax Number: 01 - 8906270

3.2 The Permit Holder shall maintain a written record of the following details at the facility for a period of three years. (Some of these records may be maintained electronically subject to the prior written agreement of Fingal County Council): -

(a) the date and time of each waste delivery received at, or dispatched from, the facility. In this regard, the sorting of waste materials into individual streams shall not change the status of these materials as a waste.

(b) the name of the carrier and the vehicle registration number of (a) above.

(c) the origin, quantity in tonnes and composition of each load of waste received at the site.

(d) the destination, quantity in tonnes and composition of each load of waste dispatched from the site, together with documentary evidence that each load was subsequently accepted at the destination facility.

(e) the origin, quantity in tonnes and composition of each load of waste rejected at the site and details of where this load was forwarded to, recorded together with (a) and (b) above.

3.3 The Permit Holder shall immediately notify the Senior Engineer, Environment Department, Fingal County Council by telephone/fax of any incident which occurs as a result of the activity on the site and which: -

(a) has the potential for environmental contamination of surface water or ground water or

(b) poses an environmental threat to air or land or

(c) requires an emergency response by the Council.

Full details shall be forwarded in writing on the next working day. The Permit Holder shall include as part of the notification: -

- the date and time of the incident
- details of the incident and circumstances giving rise to it
- an evaluation of environmental pollution caused, if any
- actions taken to minimise the effect on the environment
- steps taken to avoid reoccurrence
- any other remedial action taken.

The Permit Holder shall make a record of any such incident in a register to be maintained on the site.

3.4 The Permit Holder shall maintain on the site a register of all complaints received relating to the operation of the activity. Each such record should give details of the following: -

- time and date of the complaint
- the name of the complainant
- details of the nature of the complaint
- actions taken to deal with the complaint and the results of such actions
- the response made to each complainant

Fingal County Council shall be immediately notified by telephone/fax after the receipt of the complaint and full details shall be forwarded in writing on the next working day. The Permit Holder shall make a record of any such complaint in a register to be maintained on the site.

3.5 The Permit Holder shall make all records maintained on the site available to Fingal County Council staff at all times and shall provide any relevant information when so requested by an authorised officer of Fingal County Council.

3.6 The Permit Holder shall notify Fingal County Council, in writing, within 7 days of: -

- the imposition of any requirement on the permit holder by order under Section 57 or 58 of the Waste Management Act 1996 or
- any conviction of the permit holder for an offence prescribed under the Waste Management Act, 1996.

3.7 The permit holder shall submit to Fingal County Council an Annual Environmental Report (AER) for the preceding calendar year by no later than the 28th of February of each year.

The report shall include a summary of waste types and quantities accepted at the facility during the relevant period along with total quantities and types of waste dispatched from the facility to each individual destination facility. In relation to each destination facility, a breakdown is required showing the amount of the permit holder's waste recovered at the facility and the amount of waste disposed of, if any, during the relevant period. The report shall be in a Microsoft Office recognisable electronic format.

This report shall also include details of any impositions or convictions imposed under the Waste Management Act, together with details of: -

(a) the management and staffing structure of the facility
(b) reportable incidents
(c) details of all complaints.

In addition, the permit holder shall include in the report, a written summary of compliance with all of the conditions attached to this permit.

REASON: To provide for the notification of incidents, to update information on the activity and to provide for the keeping of proper records.

CONDITION 4: SITE ACCESS

4.1 The applicant shall maintain, for the duration of the permit, a substantial sign at the entrance to the facility stating that the operation has been permitted by Fingal County Council under the Waste Management Act 1996 and Waste Management (Permit) Regulations 1998. This sign shall give the reference number of the issued permit (WPT 95).

REASON: In the interest of safety for other vehicular traffic

CONDITION 5: WASTE ACCEPTANCE AND HANDLING

5.1 All waste entering and leaving the facility shall pass over the weighbridge and the weights shall be recorded for the purposes of condition 3. The weighbridge shall be maintained in working order and calibrated annually.

5.2 The following waste types shall **not** be accepted, handled or stored at the facility. The Permit Holder shall ensure that adequate steps are taken to prevent acceptance of any such waste:-

- any waste deemed to be hazardous in accordance with Council Decision (94/904/EC);
- any waste other than those listed in the HWL or EWC which is considered by a Member State to display any of the properties listed in Annex III to Directive 91/689/EEC on hazardous waste;
- any putrescible waste;
- any liquids or sludges;
- any waste material that is liable to undergo decomposition at ordinary temperatures when in contact with air and/or moisture.

5.3 All waste arriving at the facility shall be subjected to a visual inspection by the Permit Holder or his staff, employees, lessees or agents. Materials other than those permitted shall be removed immediately from the site. Such waste shall be disposed of (or recovered) at an alternative facility with an appropriate waste permit or waste license. Following delivery of such unauthorised waste to the site Fingal County Council shall be immediately notified by telephone/fax and full details shall be forwarded in writing on the next working day.

5.4 The Permit Holder shall ensure that adequate steps are taken to prevent unauthorised entry of wastes to the site. The Permit Holder shall make provisions to control access to the site and to prevent the fly tipping of waste by person or persons unknown. Such provisions shall be agreed with Fingal County Council prior to the commencement of waste activities on the site.

5.5 The Permit Holder shall remove immediately any waste placed on or in the vicinity of the site other than in accordance with the requirements of the permit. If such waste is discovered it shall be taken to a facility with a waste license or waste permit authorising acceptance of such waste.

5.6 The Permit Holder shall not allow any over-spill of waste outside the site perimeter as outlined on the site plan submitted with the permit application.

5.7 The Permit Holder shall not accept waste at the facility or dispatch waste from it unless the vehicle transporting that waste to and from the premises is covered by a waste collection permit with the facility reference number (WPT 95) included.

5.8 All waste shipments leaving the facility for export from the state shall comply with the requirements of Regulation EU 259/93 on the supervision and control of shipments of waste within, into and out of the European Community and the Waste Management (Transfrontier Shipment of Waste) Regulations, 1998 (S.I. No.149 of 1998). Only single stream uncontaminated wastes on the green list may be exported for recovery using the green list procedure under Regulation 259/93. Co-mingled green list municipal wastes may only be exported for recovery from the facility if the amber list procedure is used.

REASON:	**To provide for the acceptance and management of wastes authorised under this waste permit.**

CONDITION 6: NUISANCES, EMISSIONS AND ENVIRONMENTAL IMPACTS

6.1 The Permit Holder shall ensure that the waste activities on the site are carried out in such a manner so as not to have an adverse effect on the drainage of adjacent lands, on watercourses, on field drains or on any other drainage system.

6.2 The Permit Holder shall take adequate precautions to prevent undue noise, fumes, dust, grit, untidiness and other nuisances during the course of the works which would result in a significant impairment or a significant interference with amenities or the environment beyond the site boundary. If unacceptable levels occur the Permit Holder shall abide by the Council's abatement requirements which may include immediate cessation of operations.

6.3 The Permit Holder shall take adequate steps to ensure that no material of any sort can fall or be blown from vehicles delivering waste to or transporting waste from the facility.

6.4 The Permit Holder shall be responsible for the removal of any debris deposited within 50 metres of the entrance to the facility. Any material deposited onto the roadway shall be removed without delay.

6.5 No waste shall be burned on the site.

REASON: To ensure compliance with the requirements of the conditions of this permit.

CONDITION 7: ENVIRONMENTAL MONITORING

7.1 Authorised officers of Fingal County Council shall have unrestricted access to the site at all times on production of identification for the purpose of their functions under the Waste Management Act, 1996 including such inspections, monitoring and investigations as are deemed necessary by the Council.

7.2 If so requested by Fingal County Council the Permit Holder shall at his own expense carry out such further investigations and monitoring of the facility as required by the Council. The scope, detail and programme, including report structure and reporting schedule for any such investigations and monitoring shall be in accordance with any instructions issued by the Council. In the event of pollution of waters in the vicinity of the site or of an effluent discharge, input of waste onto the site shall cease and remedial measures shall be carried out immediately as directed by the Council.

7.3 Site noise as defined in BS 5228:1997 shall not give rise to noise levels off site, at any noise sensitive location in the vicinity when measured in accordance with Annex E of BS 5228:1997, Part 1 which exceeds the following sound pressure limits (Leq, 1 hour): -

(1) 08:30 and 17:00 Monday to Friday inclusive (excluding Bank and National Holidays) and between the hours of 08:30 am and 13:00 on Saturdays excluding public holidays): **65 dB(A)**

(2) Any other time **45 dB(A)**

An appropriate correction shall be applied in the case of tonal or impulsive components in the measurements of noise in accordance with the provisions of ISO 1996. If and when required, Fingal County Council shall undertake this monitoring, or arrange for it to be done, at the Permit Holder's expense.

7.4 Dust deposition shall not exceed 350mg/m²/day, averaged over 30 days, when measured at the site boundaries. If and when required, Fingal County Council shall undertake this monitoring, or arrange for it to be done, at the Permit Holder's expense.

7.5 Should environmental pollution occur at the site Fingal County Council shall review this permit.

REASON:	**To ensure compliance with the requirements of the conditions of this permit.**

CONDITION 8: CHARGES AND FINANCIAL PROVISIONS

8.1 The Permit Holder shall pay to Fingal County Council a contribution of €6,250 **per annum** towards the costs incurred by the Council of monitoring the activity to the extent that it considers necessary for the performance of its duties under the Waste Management Act, 1996. This payment is non-refundable. The first payment shall be paid to the Council within one month of the date of grant of this Permit. Subsequent payments shall be paid to the Council at 12-month intervals for the duration of the permit.

In the event that the frequency or extent of monitoring or other functions carried out by Fingal County Council need to be increased for whatever reason the Permit Holder shall contribute such sums as are determined by the Council to defray its costs.

8.2 Prior to the commencement of works and waste activities on site the Permit Holder shall lodge with Fingal County Council a cash deposit of €25,000 or an equivalent bond or other approved financial provision as a security for the satisfactory compliance by the Permit Holder with the terms and conditions attached to this permit. In the event of non-compliance by the Permit Holder with any terms or conditions attached to this permit Fingal County Council shall be empowered to apply the said funds or part thereof for the satisfactory compliance with the terms and conditions attached to this permit as necessary. Any amount not so used by the Council will be released to the Permit Holder when all activities on site have ceased and the Permit Holder has fully complied with the terms and conditions attached to the permit to the satisfaction of Fingal County Council.

8.3 The Permit Holder shall indemnify Fingal County Council in respect of all claims, losses, damages arising out of injury to any person or loss of or damage to any property whatsoever caused by or in connection with the operation and management of the facility.

REASON:	**To provide for adequate financing for monitoring and measures to protect the environment.**

Panda

An Animal for Recycling

Site Office: Cappagh Road, Cappoge Td, Finglas, Dublin 11

Head office: Beaupark Business Park, Navan, Co. Meath

Waste Permit Number WPT 95

Annual Environmental Report

1st January 2007 – 31st December 2007

1. Table of Contents

2. Introduction

Panda Waste Services (PWS) were granted their Waste Permit WPT 95 on the 8th May 2006. Under the Permit, Panda are permitted to accept non-hazardous commercial & industrial and construction & demolition. Panda may accept 50,000 tonnes per annum into their facility. The maximum amount to be dispatched from the facility and disposed of should not exceed 5,000 tonnes per annum.

2.1 Company details

Permit No:	WPT 95
Name:	Nurendale Limited t/a Panda Waste Services
Facility Address:	Cappagh Road Cappoge Td, Finglas Dublin 11
Telephone Number:	1850 65 65 65
Fax Number:	046 9024189
Website:	www.pandawaste.com

2.2 Activities

Under the waste permit WPT 95; Panda Waste Services conducts the following activities:

Permitted Waste Activities, in accordance with the First Schedule of the Waste Management (Permit) Regulations, 1998

Activity 5:

The recovery of waste (other than hazardous waste) at a facility (other than a facility for the composting of waste, where the amount of compost and waste held at the facility exceeds 1,000 cubic metres at any time)

Permitted Waste Recovery Activity in accordance with the Fourth Schedule of the Waste Management Act, 1996:

Activity 2:

The Principal Activity. Recycling or reclamation of organic substances that are not used as solvents (including composting and other biological processes).

Activity 3:

Recycling or reclamation of metals and metal compounds.

Activity 4:

Recycling or reclamation of other inorganic materials.

Activity 13:

Storage of waste intended for submission to any activity referred to in this Schedule, other than temporary storage, pending collection, on this premises where such waste is produced.

2.3 Management Structure

Eamon Waters is the Managing Director of Panda. Brian McCabe is the General Manager. The Environmental Manager in Panda is David Naughton. Eamon Waters, Brian McCabe and David Naughton are based in the primary facility in Beauparc Business Park, Navan, Co. Meath. David Jervis was appointed facility manager. He was employed for the specific daily operation of the facility. He has ample experience in the waste industry to fulfil this position. There are 6 full time employees working at the facility.

2.4 Environmental Policy

Panda endeavours to protect the environment during all activities, both on and off site. The company is committed to complying with all relevant environmental regulations and aims to provide a safe, competitive and sustainable service with specific consideration to the surrounding environment.

This is achieved by:

- Strategic preparation and implementation of operating procedures, including emergency response and corrective action procedures.
- Utilising BAT techniques.
- Actively promoting awareness amongst both staff and clients through appropriate training and communication programmes.
- Operating an effective programme for public information.

3. Discussion.

3.1 Impositions and Convictions:

Panda have received no impositions or convictions imposed under the Waste Management Act in 2006. We received no complaints in that period.

3.2 Reportable incidents:

In 2007 Fingal County Council did not need to be notified of any incident, which: -

a) Had the potential for environmental contamination of surface water or ground water,

b) Poses an environmental threat to air or land, or,

c) Requires an emergency response by the Council, which required Fingal County Council to be notified.

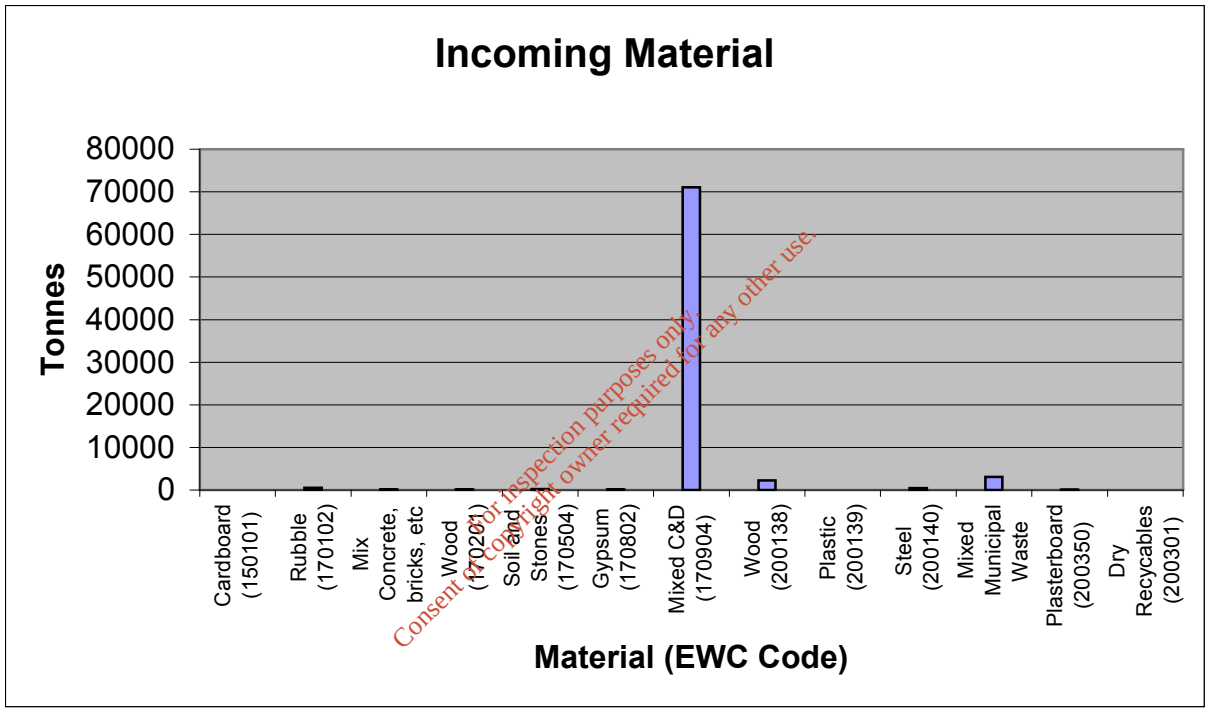
3.3 Complaints.

We have received no complaints in 2007.

3.4 Waste Accepted

Table 1.1 Illustrates the waste steams accepted into WPT 95 in 2007. In 2007, 78,146.30 tonnes of waste was accepted into the facility. From the table below it is evident that the vast majority of waste accepted in, is from construction and demolition activities.

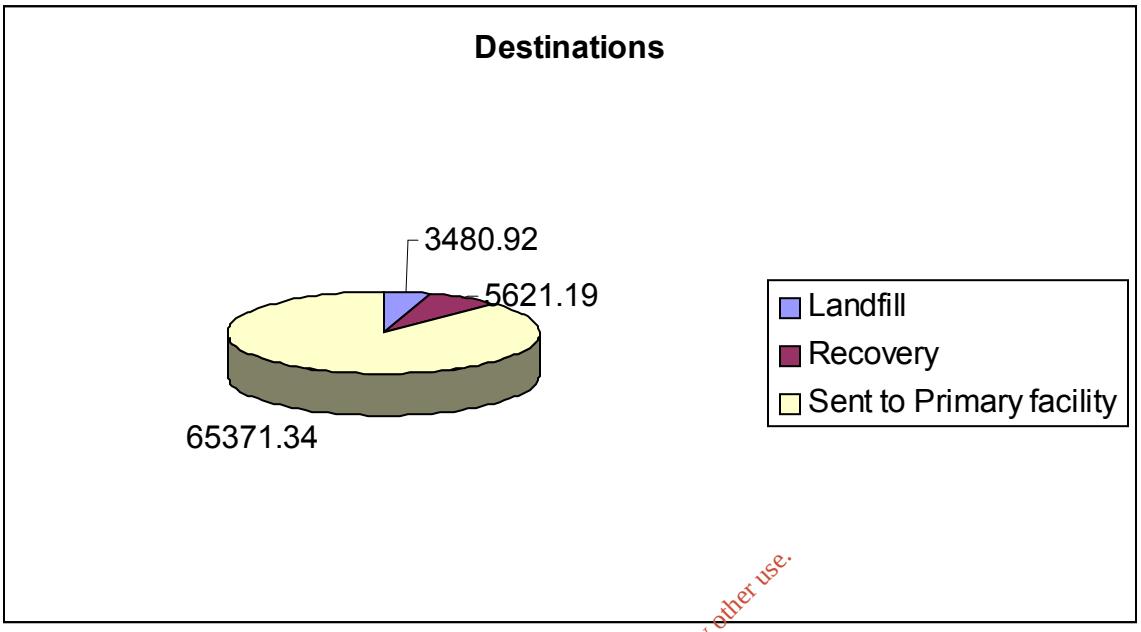
Chart 1.1 Wastes into WPT 95



3.5 Waste Dispatched.

Table 1.2 illustrates the waste streams (in tonnes) that were dispatched from the facility in 2007 and the receiving destinations. 74,473.45 Tonnes of material was sent from the facility. 3,480.92 tonnes of waste was sent straight to landfill. 5,621.19 Tonnes of material were sent for recovery into non-Panda sites, the breakdown is given in appendix 2. The remainder 6,5371.34 tonnes of material was sent to our primary facility (Waste Licence number W0140-02).

Chart 1.2 Destination of Waste



3.6 Condition 1.

Waste accepted into the facility consists of only commercial & industrial and construction & demolition waste. No composting is carried out in the facility. Waste accepted into the facility is above the 50,000 tonnes limit. We accepted 78,146.30 tonnes. 3,480.92 tonnes of waste was disposed of, from this facility. No waste activity was carried out, outside of the area outlined in Drawing No. PP-201. Procedures have been put in place to deal with issues that require corrective action. Panda has complied with the provisions of the European Community Acts i.e. Council Directive 75/442/EEC of 15 July 1995 on waste, as amended by Council Directive 91/156/EEC of 18 March, 1991 and Council Directive 80/68/EEC of 17 December, 1979 on the protection of groundwater against pollution caused by certain dangerous substances.

3.7 Condition 2.

David Jervis was appointed as Facility Manager. David has ample experience in the waste industry, to fulfil his duties, accordingly. A copy of the Waste Permit (WPT 95) is maintained on site along with all procedures relevant to the facility. Waste is only accepted in the facility between the hours 08.00 and 20.00 Monday to Friday inclusive

(excluding Bank and Public Holidays) and between the hours of 08.00 and 16.00 on Saturdays.

3.8 Condition 3.

A record is maintained using a computerised system "IWS5" including details of: -

- The date and time of each waste delivery received, or dispatched from the facility.
- The name of the courier and vehicle registration number of above.
- The origin, quantity in tonnes and composition of each load received.
- The destination, quantity in tonnes and composition of each load dispatched along with documentary evidence that each load was accepted at the destination.
- The origin, quantity in tonnes and composition of each load of waste rejected at the site and details of where the load was forwarded.

There was no incident in 2007 in this facility that required us to notify Fingal County Council. A complaints register is maintained in the facility office.

3.9 Condition 4.

A facility notice was erected at the entrance displaying the relevant information i.e. that the operation was permitted by Fingal County Council under the Waste Management Act 1996 and Waste Management (Permit) Regulations 1998. The sign also displays the site permit number (WPT 95) and contact details.

3.10 Condition 5.

All waste entering and leaving the facility passes in and out over the weighbridge and details recorded in accordance with condition 3. The weighbridge was calibrated before operations commenced and will be calibrated annually. The following waste types were not accepted at the facility: -

- Any waste deemed to be hazardous in accordance with Council Decision (94/904/EC);
- Any waste other than those listed in the HWL or EWC which is considered by a Member State to display any of the properties listed in Annex III to Directive 91/689/EEC on hazardous waste;

- Any putrescible waste;
- Any liquids or sludges;
- Any waste material that is liable to undergo decomposition at ordinary temperatures when in contact with air and /or moisture.

Staff at the facility inspected all incoming waste. On the 7th December a midi skip of food waste did enter the facility, c1 hour prior to a Fingal County Council audit. As explained to the authorised officers, this skip entered the site for health and safety reasons, as a chain on the skip truck broke while travelling, this resulted in the skip becoming unstable. The driver made a judgement call. He dropped the skip in the facility indoor. He did not empty the contents onto the shed floor. The driver then proceeded to get another vehicle to remove the skip to Panda's facility in Slane. As the authorised officers were in the building, the same driver returned with a new truck and removed the skip and brought the food waste to Panda in Slane. As the council officials were present and noted the food waste on site, we deemed it unnecessary to inform the council in writing of the food waste. Security fencing was erected around the facility with coded security gates. CCTV cameras were installed focusing on the immediate area at the gates. Any fly tipping that may occur would be recorded on the CCTV cameras. Any over-spill located at or near the facility entrance was collected immediately and brought to the facility for processing. Only containers that are covered were accepted at the facility. All companies using the facility were informed of the requirement to cover containers prior to admittance. No waste was consigned from this facility for export in 2007.

3.11 Condition 6.

No activity was carried out on site that would cause any adverse effect on the drainage on adjacent lands, on watercourses, on field drains or on any other drainage system. As all plant equipment is located within the buildings, noise and fume emissions are at a minimum. A dust suppression system was installed in the building to minimise dust emission and surfaces outdoors are watered throughout the day to alleviate any problems dust may generate. Our in house road sweeper removes any grit on the concrete surfaces daily. A Panda employee inspects the site and surrounds several times throughout the day

to ensure that that the site and surrounds are kept tidy. Any waste picked is then brought into the facility for further processing. No waste was burnt on site. We believe that we have complied with the requirements of this permit WPT 95.

3.12 Condition 7.

Full access was granted to Fingal County Council on their numerous site inspections. No environmental incident occurred on site that would be in contravention of our Waste Permit WPT 95.

3.13 Condition 8.

Payment as per condition 8 of the Waste Permit has been paid. A bond to the value of €25,000 has been put in place to offset any breach in the terms and conditions of the Waste. Panda believe that we have provided adequate financing for monitoring and measures to protect the environment.

Signed: _____ Date: 28/02/2008

David Naughton

Environmental Manager

Appendix 1

Table 1.1 Waste Accepted in WPT 95

Waste Type	EWC Code	Weight (Tonnes)
Cardboard	150101	15.6
Rubble	170102	537.46
Mixture concrete, Bricks, Tiles and Ceramics other than those mentioned in 170106	170107	146.84
Wood	170201	157.71
Soil and Stones	170504	2,221.92
Gypsum	170802	117.66
Mixed C&D	170904	71,087.18
Wood	200138	2,240.17
Plastic	200139	28.22
Steel	200140	462.44
Mixed Municipal Waste	200301	3,062.72
Plasterboard	200350	64.90
Dry Recyclables	200301	3.48
Total		**78,246.30**

Appendix 2.

Table 1.2 Waste destinations, type of waste and quantity from WPT 95

Destination	Waste	EWC Code	Weight (Tonnes)
Knockharle Landfill, Co. Meath (W0146-01)	Mixed Municipal waste	200301	3299.44
Whiteriver Landfill, Co. Louth (W0060/02)	Mixed Municipal waste	200301	181.48
Moneyhill Recovery, Primatestown, Ashbourne, Co. Meath (WMP2005/43)	Soil & stones	170504	3408.25
The Hammond Lane Metal Co. Pigeon House Rd, Ringsend, Dublin 4. (WP 98107)	Steel out	191202	1845.16
Returnbatt , Old Mill Industrial Estate, Kill, Co. Kildare (W0105-01)	Batteries	20 01 34	0.86
Clearway, 41 Dobbin Rd, Portadown, Co. Armagh (984 510 issued by Craigavon Borough Council)	Steel	19 12 02	11.12
Murphy Environmental, The Naul, Co. Dublin (W0129/1)	Glass	20 01 12	6.60
Rialta Environmental Limited, Block 402, Greenogue Business Park, Rathcoole, Co. Dublin (W0192/1)	Gypsum	17 08 02	349.2
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Cardboard	150101	13.48

Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Dry Recycables	20 03 01	35.88
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Gas cylinders	160505	1.92
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Mixed C & D	170904	61762.36
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Mixed Municipal waste	200301	260.4
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Mixture of concrete, Bricks, Tiles and Ceramics other Those mentioned in 17 01 06	17 01 07	14.88
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Plastic	20 01 39	5.30
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Rubble	170102	60.78
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Steel out	191202	40.80
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Timber -out	191207	2998.78
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Tyres	160103	29.48
Nurendale Ltd, T/a Panda Waste Services, Rathdrinagh, Beauparc, Navan, Co. Meath (W0140-02)	Wood (C&D)	170201	237.28

APPENDIX 2

Trial Pit Logs & Locations

cpm engineering
River House
East Wall Road
Dublin 3
Tel 01 874 5411 Fax 01 835 5779

Project				Job Ref.	
Panda Waste - Lands at Cappoge Road				V083	
Section				Sheet no./rev.	
Site Investigation				1	
Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

Report on Site Investigation

Introduction

A trial pit investigation was carried out to establish subsoil conditions at Cappagh Road, Finglas on 15th July 2005.

The days that preceded the opening of the trial holes were reasonably dry.

Trial pit locations are shown on the attached location map, No V083-E-010

Fieldwork

Trial pits were excavated using a JCB. A total of 7 No trial pits were undertaken.

A visual inspection only of the trial pits was made. The results of this inspection are recorded in the trial pit logs, which follow. No laboratory testing of the excavated materials was undertaken.

No running water was encountered in the trial pits.

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Project				Job Ref.	
Panda Waste - Lands at Cappoge Road				V083	
Section				Sheet no./rev.	
Site Investigation				2	
Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

Trial Pit No.1

Equipment & Methods: Machine (JCB) excavated trial hole	Location No. Location: Lands at Cappoge Road
Carried out for: Panda waste Ltd	Ground Level: 83.1 — Coordinates — Date: 15/07/05

Description	Reduced Level	Depth	Thickness	Sample	Test	
Building Waste (Crushed concrete Etc.)	83.1	0.00m	0.25m			
Vegetable Soil	82.85	0.25m	0.30m			
Light Brown Boulder Clay	82.55	0.55m				
Bottom of pit	81.5	1.60m	1.05m			No water visible
Dark brown/black hard Clay with stones Difficult to excavate						

Remarks:

Notes

Logged by JMcE

SCALE: NTS

cpm engineering
River House
East Wall Road
Dublin 3
Tel 01 874 5411 Fax 01 835 5779

Project				Job Ref.	
Panda Waste - Lands at Cappoge Road				V083	
Section				Sheet no./rev.	
Site Investigation				3	
Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

Trial Pit No.2

Equipment & Methods: Machine (JCB) excavated trial hole

Location No.

Location: Lands at Cappoge Road

Carried out for: Panda waste Ltd

Ground Level: 83.00

Coordinates

Date: 15/07/05

Description	Reduced Level	Depth	Thickness	Sample	Test	
Vegetable Soil	83.00		0.25m			
Light brown clay	82.75	0.25m				
Bottom of pit	81.7	1.30m	1.05m			No water visible
Dark brown/black hard Clay with stones Difficult to excavate						

Remarks:

Notes

Logged by JMcE

SCALE: NTS

cpm engineering
River House
East Wall Road
Dublin 3
Tel 01 874 5411 Fax 01 835 5779

Project				Job Ref.	
Panda Waste - Lands at Cappoge Road				V083	
Section				Sheet no./rev.	
Site Investigation				4	
Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

Trial Pit No.3

Equipment & Methods: Machine (JCB) excavated trial hole

Location No.

Location: Lands at Cappoge Road

Carried out for: Panda Waste Ltd

Ground Level: 82.90

Coordinates:

Date: 15/07/05

Description	Reduced Level	Depth	Thickness	Sample	Test	
Vegetable Soil	82.90		0.30m			
Light brown clay	82.60	0.30m	0.60m			
Brown/grey mottled silty sandy stiff Clay (boulder clay)	82.00	0.90m				
Bottom of pit	81.40	1.50m	0.60m			No water visible
Dark brown/black hard Clay with stones Difficult to excavate						

Remarks:

Notes

Logged by JMcE

SCALE: NTS

cpm engineering
River House
East Wall Road
Dublin 3
Tel 01 874 5411 Fax 01 835 5779

Project	Job Ref.
Panda Waste - Lands at Cappoge Road	V083
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Site Investigation	5

Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

Trial Pit No.4

Equipment & Methods:
Machine (JCB) excavated trial hole

Location No.

Location: Lands at Cappoge Road

Carried out for:
Panda Waste Ltd

Ground Level
82.87

Date
15/07/05

Description	Reduced Level	Depth	Thickness	Sample	Test	
Vegetable Soil	82.87		0.30m			
Light brown clay	82.57	0.30m	0.40m			
Brown/grey mottled silty sandy stiff Clay (boulder clay)	82.17	0.70m				
Bottom of pit	81.37	1.50m	0.80m			No water visible
Dark brown/black hard Clay with stones Difficult to excavate						

Remarks:

Logged by
JMcE

SCALE:
NTS

Notes

cpm engineering
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East Wall Road
Dublin 3
Tel 01 874 5411 Fax 01 835 5779

Project				Job Ref.	
Panda Waste - Lands at Cappoge Road				V083	
Section				Sheet no./rev.	
Site Investigation				6	
Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

Trial Pit No.5

Equipment & Methods: Machine (JCB) excavated trial hole	Location No. / Location: Lands at Cappoge Road
Carried out for: Panda Waste Ltd	Ground Level: 83.65 / Coordinates / Date: 15/07/05

Description	Reduced Level	Depth	Thickness	Sample	Test	
Vegetable Soil	83.65		0.30m			
Light brown clay	83.35	0.30m	0.50m			
Brown/grey mottled silty sandy stiff Clay (boulder clay)	82.85	0.80m				
Bottom of pit	82.45	1.20m	0.40m			No water visible
Dark brown/black hard Clay with stones Difficult to excavate						

Remarks:

Notes

Logged by JMcE

SCALE: NTS

cpm engineering
River House
East Wall Road
Dublin 3
Tel 01 874 5411 Fax 01 835 5779

Project				Job Ref.	
Panda Waste - Lands at Cappoge Road				V083	
Section				Sheet no./rev.	
Site Investigation				7	
Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

Trial Pit No.6

Equipment & Methods: Machine (JCB) excavated trial hole	Location No. / Location: Lands at Cappoge Road					
Carried out for: Panda Waste Ltd	Ground Level 83.10	Coordinates				Date 15/07/05
Description	Reduced Level	Depth	Thickness	Sample	Test	
Vegetable Soil	83.10		0.30m			
Light brown clay	82.80	0.30m	0.30m			
Brown/grey mottled silty sandy stiff Clay (boulder clay)	82.50	0.60m				
Bottom of pit	82.00	1.10m	0.50m			No water visible
Dark brown/black hard Clay with stones Difficult to excavate						

Remarks:

Logged by JMcE

SCALE: NTS

Notes

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River House
East Wall Road
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Tel 01 874 5411 Fax 01 835 5779

Project	Job Ref.
Panda Waste - Lands at Cappoge Road	V083
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Site Investigation	8

Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

Trial Pit No.7

Equipment & Methods:
Machine (JCB) excavated trial hole

Location No.

Location: Lands at Cappoge Road

Carried out for:
Panda waste Ltd

Ground Level
82.90

Coordinates

Date
15/07/05

Description	Reduced Level	Depth	Thickness	Sample	Test	
Vegetable Soil	82.90		0.30m			
Light brown clay	82.60	0.30m	0.50m			
Brown/grey mottled silty sandy stiff Clay (boulder clay)	82.10	0.80m				No water visible
Bottom of pit	81.70	1.20m	0.40m			
Dark brown/black hard Clay with stones Difficult to excavate						

Remarks:

Notes

Logged by
JMcE

SCALE:
NTS

cpm engineering
River House
East Wall Road
Dublin 3
Tel 01 874 5411 Fax 01 835 5779

Project				Job Ref.	
Panda Waste - Lands at Cappoge Road				V083	
Section				Sheet no./rev.	
Site Investigation				9	
Calc. by	Date	Chck'd by	Date	App'd by	Date
JMcE	22/07/05				

APPENDIX 3

Landscape Survey

Tree Survey,

Panda Materials Recycling Facility Site

Cappagh Road, Co. Dublin

1.0 Introduction

The survey is an assessment of the trees on the site with reference to their general condition and with reference to the impact of proposed developments

The following data was obtained

- Arboricultural survey of all trees
- Impact assessment of proposed building and associated developments on specific trees

2.0 Methodology

Michael Cregan Dip prepared the survey and report. Landscape Architecture, B.Agr.Sc (Forestry), M.Agr.Sc, MILI, MSIE (Michael Cregan and Associates - Environmental Planning).

The survey was carried out on the 25th July 2005. Height measurements were taken on a sampling basis with a Suumo clinometer. Diameters were calculated by random taping of tree stems at 1.4m above ground level. Crown spread was determined by random taping. Tree positions were secured from an existing survey

The survey and impact assessment was undertaken in accordance with BS 5837:1991 ***Code of Practice for Trees in Relation to Construction*** and ***Tree Survey and Inspection*** Arboricultural Association (1994).

3.0 Criteria for Assessment

The criteria used in the assessment of the trees refer to – species, age, crown spread and condition. Recommended tree surgery is identified where necessary. The trees that have been assessed had a stem diameter in excess of 300mm at 1.5m height above ground level.

Account has been taken of the full impact of building development, including foundation works, which would lead to changes of ground level in the vicinity of trees and to soil water dynamics

Technical terms used in the report are defined as follows -:

Reference to age

Young	Trees up to 1/3 of their expected height
Early mature	Trees between 1/3 and 2/3 their expected height
Mature	Trees more or less at full height but still increasing in size
Over Mature	Crown starting to break up and decrease in size

Reference to Condition

Good	Full healthy canopy, possibly including some suppressed or physically damaged branches
Fair	Slightly reduced leaf cover, minor dead wood or isolated dead wood
Poor	Overall sparse leafing or extensive dead wood

Reference to value

The tree are divided into three categories in regard to their value in terms of health, vigour and appearance, and hence their value to the proposed to the setting

Trees whose retention is most desirable – ***high category***

- These are vigorous, healthy with good form and in harmony with the setting
- They would also be useful in providing screening

B *Trees whose retention is desirable* – ***moderate category***

- Tree that might be included in the high category but because of their numbers or impaired condition are downgraded in favour of the best individuals
- Immature trees with potential to develop into the high category

C *Trees that could be retained* – ***low category***

- Trees in adequate condition or which can be retained with minimal tree surgery
- Trees which are immature and of no particular value

D *Trees for removal* - ***fell category***

- Dead or structurally dangerous trees
- Trees with insecure roothold
- Trees with significant fungal decay in the main bole
- Trees with a cavity or cavities of significance for safety

- Trees that will become dangerous after the removal of other trees

Species

Common names for trees are used in the survey text. The botanical names are as follows -:

Hawthorn	*Crataegus monogyna*
Sycamore	*Acer pseudoplatanus*
Ash	*Fraxinus excelsior*
Willow	*Salix species*
Elder	*Sambucus racemosus*

4.0 Survey

The survey has determined -:

- The condition of the trees and hedgerows in general
- The condition of trees/hedgerows which may be impacted by proposed construction

The site consists of two fields bounded by agricultural hedgerows and hedgerow trees. There are a total of four lines of hedgerow around the site. The tree species are predominantly Ash. Hedgerows consist of Ash and Hawthorn with a smaller incidence of Elder. The trees appear to have developed from what had previously been hedgerows. This is indicated by their very close spacing. The trees are essentially very tall hedgerows. There are no specimen trees.

The condition of the trees is set out in the accompanying spreadsheet and annotated on the map. The following notes expand on the pertinent issues.

The trees and hedgerows are mature; they are heavily infested with ivy, and support an extensive shrub layer dominated by Brambles (Rubus fruticosus). They are agricultural hedgerows and suitable to that land use. They are not suitable as boundary vegetation where the land use is industrial. Their future management would require that they be extensively pruned and the brambles and other vegetation be cleaned out. It is likely that they the trees/hedgerows would present a straggly and poor condition following those operations. This applies particularly to hedge lines A, F, and H. It is recommended that selected Ash and one Sycamore – marked along E, G and H on the plan - be retained along the road frontage (while making provision for sight line requirements at the front entrance) and that the remainder of the hedgerows be removed and replaced with a double row of whips (Birch, Ash, Hazel, Elder and Scot's Pine) and heavy standard Ash and Lime trees. Likewise the hedgerow marked A should be removed as it is 'gappy' and in poor condition.

To accommodate the buildings proposed for the site, it is not feasible to retain line B of Ash trees. The buildings will extend across the entire site.

Line D – consisting of Hawthorn with some Elder and Ash adjoins an agricultural field and should be retained intact.

Line C consists of Ash trees in the category mature to over mature with signs of dieback on a number of the trees. There is also a small admixture of poor Thorn and Elder. The proposed buildings will be located 3m from the trees. It is recommended that the trees be felled because of their maturity and because of the proximity of the buildings Construction works will adversely impact on the trees. Their removal at some stage following construction would be necessary, and would prove difficult and costly, given their close proximity to the buildings and to the existing building to the rear on the adjoining lands.

It is recommended that the site be comprehensively planted to compensate for the loss of existing vegetation.

5.0 Summary

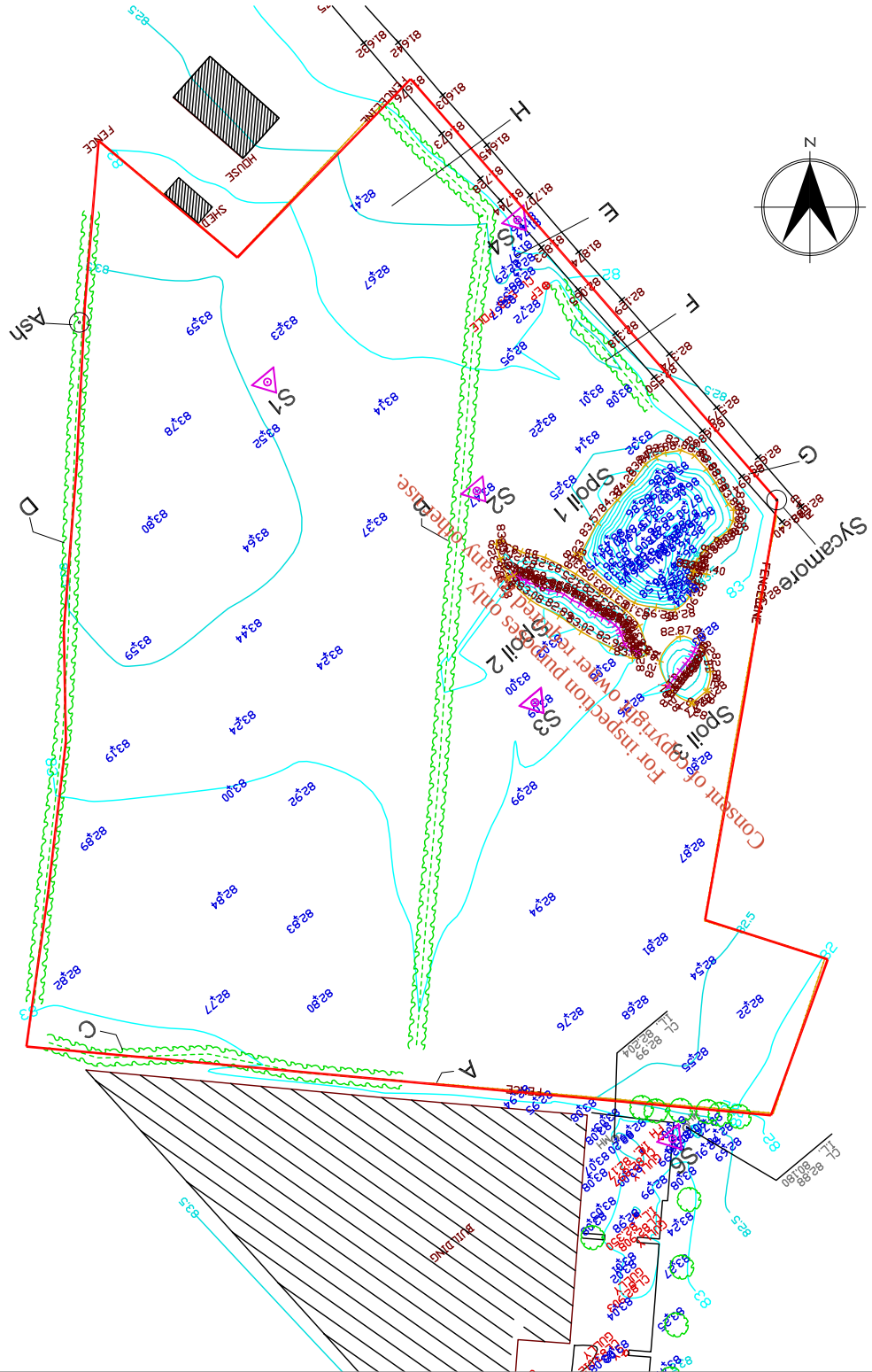
The survey determined that the trees on the site were generally unsuited to the new conditions that will prevail with the proposed change of use. A line of hedgerow, which straddles the centre of the site, will require to be removed to accommodate the buildings. The road frontage vegetation is overgrown and should be replaced with appropriate planting. A major hedge on the rear boundary should be removed. It is over mature and its retention would prove a liability in the future

Michael Cregan and Associates
Environmental Planning
25th July 2005

TREES SURVEY PANDA MRF CAPPAGH ROAD

Hedge	Species	Age	Height	Crown spread	Condition	Action
A	**Hawthorn**	**mature**	**6m**	**3m**	**poor**	**remove**
B	**Ash**	**early mature**	**12m - 14m**	**7.5m**	**good**	**to be removed**
C	**Ash**	**mature**	**14m**	**8m**	**moderate**	**remove**
D	**Hawthorn**	**mature**	**6m**	**3.5m**	**good**	**retain**
E	**Ash group**	**early mature**	**12m - 14m**	**7m**	**good**	**retain**
F	**Hawthorn**	**mature**	**6.5m**	**4m**	**moderate**	**remove**
G	**Ash Willow Sycamore**	**early mature**	**14m**	**7m**	**good**	**retain larger trees**
H	**Hawthorn**	**mature**	**5m**	**3.5m**	**moderate**	**remove**

FIGURE DIMENSIONS ONLY TO BE USED.



A	29/07/05	VB		Issued for Comment
is.	date	rev.	chk.	description

client: Panda

job description: Materials, Recycling Facility at Cappoge Road

drawing title: Tree Survey

date: 29/07/05 | scale: 1:500

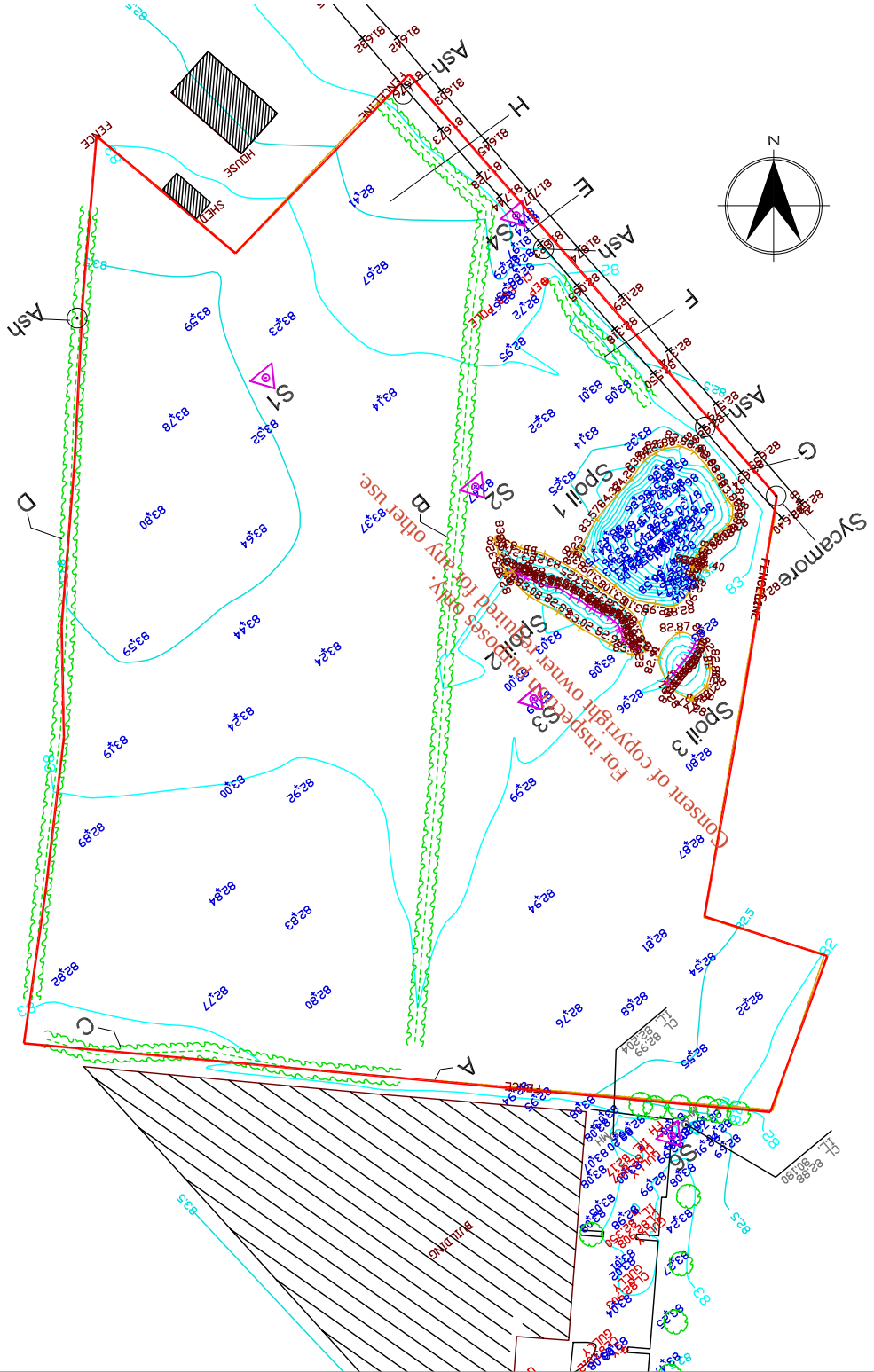
drawing no: 05038 MC TS

path ref:

Michael Cregan and Associates
Environmental Planning

6 Brookville Park
Blackrock
Co. Dublin
Tel/Fax: 01-2882136
email: creganm@eircom.net

FIGURE DIMENSIONS ONLY TO BE USED.



A	02/06/05	VB		Issued for Comment	
is.	date	rev.	chk.	description	

client: Panda Waste

job description: Materials, Recycling Facility at Cappoge Road

drawing title: Tree Survey

date: 02/06/05 | scale: 1:500

drawing no: V083_001/A

path ref:

Michael Cregan and Associates
Environmental Planning

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APPENDIX 4

Air Quality Survey

ODOUR & ENVIRONMENTAL ENGINEERING CONSULTANTS

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BASELINE AIR QUALITY FOR THE PROPOSED WASTE RECYCLING FACILITY TO BE LOCATED IN CAPPOGUE, FINGLAS, DUBLIN 11

PREPARED BY ODOUR MONITORING IRELAND ON BEHALF OF O' CALLAGHAN MORAN AND ASSOCIATES, GRANARY HOUSE, RUTLAND STREET, CORK CITY

PREPARED BY:	Dr. Brian Sheridan,
ATTENTION:	Mr. Jim O'Callaghan
DATE:	28th July 2005
REPORT NUMBER:	2005. A128
DOCUMENT VERSION:	Document Ver. 001
REVIEWERS:	

TABLE OF CONTENTS

1. BASELINE AIR QUALITY

1.1 Introduction

Odour Monitoring Ireland were commissioned to undertake a baseline air quality survey in order to assess the potential impact to air quality and climate from the proposed Waste Recycling Facility to be located in Cappogue, Ballycoolin, Dublin 11. This study will identify, describe and assess the impact of the development in terms of its impact on air quality.

A baseline air quality assessment has been carried out in the area between the time period 23rd June 2005 and 13th July 2005 in the vicinity of the proposed development. This survey will identify the existing pollutant trends in the vicinity of proposed Waste Recycling Facility, and to assess potential impact of the proposed development. This will establish sufficient spatial information in order to determine compliance with relevant ambient air quality legislation. Additionally, comparison with longer period limit values can be used to establish trends and are important in defining baseline air quality.

2. Receiving environment

2.1 General

The site encompasses approximately 2.42 hectares (ha) and is located on Cappagh Road to the north of Stadium Business Park as shown on *Figure 3.1*. The site comprises two fields, which are currently grassed and used for animal grazing. There is a gentle fall across the site from northeast to southwest.

Existing hedgerows form the northern, western and southern site boundaries. (*Ref Figure 3.2*) A hedgerow also forms the internal dividing field boundary. A 2.2 m steel palisade fence has been installed around the eastern and southern site boundaries. Spoil generated during development works at the Stadium Business Park have been stockpiled in the north- eastern portion of the site. These materials will be removed from the site by the previous landowner prior to the start of facility development works.

2.2 Baseline air quality

A total of seven sample locations were chosen to represent the baseline air quality in the vicinity of the proposed development. These locations are listed in *Table 2.1* and presented in *Figure 4.1*.

Table 2.1. Description of air monitoring locations.

Reference	Monitoring parameters	Description and Monitoring location
A 1	Benzene, Toluene, Ethyl benzene, p & o-Xylene, Nitrogen dioxide, Sulphur dioxide, and H_2S	Monitored using passive diffusion tubes, and Jerome metre. Located in north of proposed site
A2	Benzene, Toluene, Ethyl benzene, p & o-Xylene, Nitrogen dioxide, Sulphur dioxide, PM_{10} and H_2S	Monitored using passive diffusion tubes, Jerome metre and OSORIS PM analyser. Located in northeast of proposed site.
A3	Benzene, Toluene, Ethyl benzene, p & o-Xylene, Nitrogen dioxide, Sulphur dioxide, Total Dust and H_2S	Monitored using passive diffusion tubes, Jerome metre and Bergerhoff gauges. Located in east of proposed site.
A4	Benzene, Toluene, Ethyl benzene, p & o-Xylene, Nitrogen dioxide, Sulphur dioxide, Total Dust and H_2S	Monitored using passive diffusion tubes Bergerhoff gauges and Jerome metre. Located in south section of proposed site.
A5	Benzene, Toluene, Ethyl benzene, p & o-Xylene, Nitrogen dioxide, Sulphur dioxide, Total Dust and H_2S	Monitored using passive diffusion tubes, Jerome metre and Bergerhoff gauges. Located in west of proposed site.
A6	Benzene, Toluene, Ethyl benzene, p & o-Xylene, Nitrogen dioxide, Sulphur dioxide, Total Dust, PM_{10} and H_2S	Monitored using passive diffusion tubes, OSORIS PM analyser, Bergerhoff gauges and Jerome metre. Located in south west of proposed site.

As a result of the existing site conditions and the potential for traffic, residential and industrial derived pollution, the following parameters were monitored:

2.2.1 Benzene, Toluene, Ethyl benzene and ortho and para Xylene (BTEX)

The sources associated with individual volatile organic compounds (VOCs) tend to be dependent on the nature of industries in the sample region. Methane is a naturally occurring volatile organic carbon (VOC) from plants and animals but is also generated as a by-product of certain industries. Benzene, Toluene, Ethyl benzene, p/o xylene (BTEX) and other aromatic/alkanes are most likely derived from petrol driven vehicle exhausts. Heavier semi-volatile organic compounds are frequently derived from diesel-powered engines. Benzene is a known carcinogen, poisonous by inhalation and a severe eye and moderate skin irritant.

At each of the six monitoring locations (A1 to A6) (*see Figure 4.1 and Table 2.1*), the air quality was monitored for BTEX, over a 20-day period, using BTEX diffusion tubes. The sample tubes were analysed for BTEX at a UKAS accredited laboratory (ISO 17025) using gas chromatography flame ionisation detector. The results are presented in *Table 2.2*.

Table 2.2. Average BTEX concentrations at each location as measured by passive diffusion tubes.

Location	Benzene Conc.(µg/m^3)[1, 3]	Toluene Conc.(µg/m^3)[1,3]	Ethyl benzene Conc.(µg/m^3)[1,3]	p-xylene Conc.(µg/m^3)[1,3]	o-xylene Conc.(µg/m^3)[1,3]
A1[2]	0.45	1.658	0.941	3.412	1.063
A2[2]	0.458	1.41	0.321	0.637	0.317
A3[2]	0.552	1.688	0.290	0.628	0.396
A4[2]	0.528	2.278	0.315	0.920	0.435
A5[2]	0.514	1.608	0.291	0.774	0.372
A6[2]	0.506	1.822	0.253	0.542	0.404
EPA Crumlin 2002[4]	1.30	-	-	-	-
Limit Value	**5[5]**	**4700[6]**	**10,875[6]**	**5525[6]**	**5525[6]**

Notes: [1] denotes the lower limit of detection was 2.88 ηg of sorbed compound per tube;
[2] denotes sampling period 23rd June to 13th July;
[3] denotes Lower limit of detection 0.01 µg/m^3;
[4] denotes Air quality Monitoring Report, 2002.
[5] denotes Irish and EU Ambient Air Standard (SI 271 of 2002 and 1999/30/EC);
[6] denotes No specific ambient air limits. Rule of thumb is using 1/40th of the 8-hour Occupational Exposure Limit as stated in the National Authority for Occupational Safety and Health 2002 "Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations".

The results illustrated in *Table 2.2* for BTEX at A1 to A6 are all relatively low and in compliance with Irish and EU limit values (i.e. SI 271 of 2002 and EU Directive 2000/69/EC) for Benzene. Average Benzene concentrations were up to 89% lower than the Irish and EU directive limit values. The rule of thumb for guidelines for ambient air quality of volatile organic compounds without legislative limit values is using 1/40th of the 8-hour Occupational Exposure Limit as stated in the National Authority for Occupational Safety and Health 2002 "Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations". Toluene, Ethyl benzene and Xylene isomers are well within their respective fractional exposure limit values.

2.2.2 Nitrogen dioxides (NO_2)

Nitrogen is a constituent of both the natural atmosphere and of the biosphere. When industrial metabolism releases nitrogen to the environment it is considered a "pollutant" because of its chemical form: NO, NO_2, and N_2O. These oxides of nitrogen can be toxic to humans, to biota, and they also perturb the chemistry of the global atmosphere. In the transportation sector, the NOx emissions result from internal combustion engines. In power plants and industrial sources, NOx is produced in boilers. The overwhelming fraction of nitrogen oxide emissions arises from the high temperature combustion of fossil fuels; emissions from metal-processing plants and open-air burning of biomass are insignificant.

Nitrogen dioxide is classed as both a primary pollutant and a secondary pollutant. As a primary pollutant NO_2 is emitted from all combustion processes (such as a gas/oil fired boiler or a car engine). Potentially, the main sources of primary NO_2 for the proposed development will be from vehicle exhausts.

As a secondary pollutant NO_2 is derived from atmospheric reactions of pollutants that are themselves, derived mainly from traffic sources (e.g. volatile organic compounds). Secondary pollution is usually derived from regional sources and may be used as an

indicator of general air quality in the region. Nitrogen dioxide has been shown to reduce the pulmonary function of the lungs. Long-term exposure to high concentrations of NO_2 can cause a range of effects, primarily in the lungs, but also in the liver and blood.

At each of the six monitoring locations (A1 to A6) (*see Figure 4.1 and Table 2.1*), levels of NO_2 were measured using diffusion tubes, which were left on site for a 20-day period. The tubes were then analysed using UV spectrophotometer, at a UKAS accredited laboratory (ISO 17025), giving an average concentration over the 20-day period. The results are presented in *Table 2.3*.

Table 2.3. Average NO_2 concentrations at each location as measured by passive diffusion tubes.

Location	Sampling Period	Average NO_2 conc. ($\mu g/m^3$)[2]
A1	23rd June to 13th July	12.64
A2	23rd June to 13th July	15.70
A3	23rd June to 13th July	13.94
A4	23rd June to 13th July	13.33
A5	23rd June to 13th July	16.55
A6	23rd June to 13th July	11.41
EPA Crumlin-Annual mean	2002	21
Limit value	-	**40**[3]

Notes: [1] denotes Lower limit of detection 0.01 $\mu g/m^3$;
[2] denotes Air Quality Monitoring Report, 2002;
[3] denotes Irish and EU Ambient Air Standard (SI 271 of 2002 and 1999/30/EC) (as an annual average).

The dominant source of NO_2 in the area appears to be from motor vehicle exhausts and the burners/boiler of space heating of local light industry and business units. The measured concentrations of NO_2 at all monitoring locations are within the Irish and EU Ambient Air Standards. Monitoring locations A1 to A6 are an average 58% lower than currently established ambient air regulatory levels.

2.2.3 Sulphur dioxide (SO_2)

Sulphur dioxide is a colourless gas, about 2.5 times as heavy as air, with a suffocating faint sweetish odour. Sulphur dioxide occurs in volcanic gases and thus traces of sulphur dioxide are present in the atmosphere. Other sources of sulphur dioxide include smelters and utilities, electrical generation, iron and steel mills, petroleum refineries, pulp and paper mills, metallurgical processes, chemical processes and the combustion of the iron pyrites, which are contained in coal. Small sources include residential, commercial and industrial space heating.

SO_2 can be oxidised to sulphur trioxide, which in the presence of water vapour is readily transformed to sulphuric acid mist. SO_2 is a precursor to sulphates, which are one of the main components of respirable particles in the atmosphere. Health effects caused by exposure to high levels of SO_2 include breathing problems, respiratory illness, changes in the lung's defences, and worsening respiratory and cardiovascular disease. People with asthma or chronic lung or heart disease are the most sensitive to SO_2. It also damages trees and crops. SO_2, along with nitrogen oxides, are the main precursors of acid rain. This contributes to the acidification of lakes and streams, accelerated corrosion of buildings and reduced visibility. SO_2 also causes formation of

microscopic acid aerosols, which have serious health implications as well as contributing to climate change.

At each of the six monitoring locations (A1 to A6) (*see Figure 4.1 and Table 2.1*), levels of SO_2 were measured using diffusion tubes, which were left on site for a 20-day period. The tubes were then analysed using Ion chromatography, at a UKAS accredited laboratory (ISO 17025), giving an average concentration over the 20-day period. The results are presented in *Table 2.4*.

Table 2.4. Average SO_2 concentrations at each location as measured by passive diffusion tubes.

Location	Sampling Period	Average SO_2 conc. ($\mu g/m^3$)[1]
A1	23rd June to 13th July	7.10
A2	23rd June to 13th July	0.51
A3	23rd June to 13th July	6.85
A4	23rd June to 13th July	1.27
A5	23rd June to 13th July	3.30
A6	23rd June to 13th July	1.78
EPA Dublin City-Annual mean	2002	6[2, 3]
Limit value	**-**	**20**

Notes: [1] denotes lower limit of detection 0.04 $\mu g/m^3$;
[2] denotes Air Quality Monitoring Report, 2002;
[3] denotes Irish and EU Ambient Air Standard (SI 271 of 2002 and 1999/30/EC) (as an annual average).

The dominant source of SO_2 in the area appears to be from motor vehicle exhausts and the burners/boiler/solid fuel heating local single residences and industrial units. The measured concentrations of SO_2 at all monitoring locations are within the Irish and EU Ambient Air Standards. Monitoring locations A1 to A6 are an average 64.5% lower than currently established ambient air regulatory levels.

2.2.4 Carbon monoxide (CO)

Carbon monoxide is produced as a result of incomplete burning of carbon-containing fuels including coal, wood, charcoal, natural gas, and fuel oil. It can be emitted by combustion sources such as un-vented kerosene and gas heaters, furnaces, woodstoves, gas stoves, fireplaces and water heaters, automobile exhaust from attached garages, and tobacco smoke. Carbon monoxide interferes with the distribution of oxygen in the blood to the rest of the body. Depending on the amount inhaled, this gas can impede coordination, worsen cardiovascular conditions, and produce fatigue, headache, weakness, confusion, disorientation, nausea, and dizziness. Very high levels can cause death. The symptoms are sometimes confused with the flu or food poisoning. Foetuses, infants, elderly, and people with heart and respiratory illnesses are particularly at high risk for the adverse health effects of carbon monoxide.

Due to power and equipment safety issues existing baseline monitoring data from EPA monitoring sites was used for assessment of baseline Carbon monoxide air quality. The EPA monitoring location and results are presented in *Table 2.5*.

Table 2.5. Average ambient baseline CO concentrations for the proposed site development.

Location	Sampling Period	Ambient CO conc. (mg/m^3)
EPA-8 hour running average, Crumlin	2002	0.38
EPA-8 hour running average, Colraine St	2002	0.60
Limit Value	-	**10**[1]

Notes: [1]denotes Irish and EU ambient air standard (SI 271 of 2002 and 2000/69/EC) as an 8 hour running average;

CO monitoring is also very limited in Ireland. Data sets developed by the EPA indicate 8 hour running average CO levels of 0.38 and 0.60 mg m^{-3}, respectively for Dublin city locations. The dominant source of CO in this area would appear to be vehicle emissions, boilers (i.e. Home heating and Industrial heating), industrial processes and construction activities. The CO emissions measured in Dublin City would be considered worst case in comparison to the proposed site location. CO emissions are on average 94% lower than Irish and EU ambient air limit values at the monitoring locations within Dublin City (*see Table 2.5*).

2.2.5 Particulate matter (PM_{10})

Major sources of particulates include industrial/residential combustion and processing, energy generation, vehicular emissions and construction projects. The particulate matter created by these processes is responsible for many adverse environmental conditions including reduced visibility, contamination and soiling, but also recognised as a contributory factor to many respiratory medical conditions such as asthma, bronchitis and lung cancer. PM_{10} (Particulate Matter 10) refers to particulate matter with an aerodynamically diameter of 10 µm. Generally, such particulate matter remains in the air due to low deposition rates. It is the main particulate matter of concern in Europe and has existing air quality limits. In order to obtain a baseline PM_{10} for the proposed work area, a PM_{10} analyser was used to monitor the PM_{10} ambient concentration levels at two locations (A2 & A6) within the proposed site boundary. Continuous monitoring was performed over a 2-day period. The monitoring location is presented in *Table 2.1* and results are presented in *Table 2.6*.

Table 2.6. Average ambient PM_{10} concentrations for the proposed development.

Location	Sampling Period	Ambient PM_{10} conc. ($\mu g/m^3$)
A2-24 hour average	11th July	36
A6-24 hour average	12th July	22
EPA measured conc. – Phoenix Park, Annual mean[4]	2002	15
Limit Value at 98.07th percentile	-	**50**[1, 2]
Limit value-annual mean		**20**[3]

Notes: [1]denotes Irish and EU ambient air standard (SI 271 of 2002 and 1999/30/EC) as a 24-hour average;
[2] denotes maximum number of exceedences 7 times in a one-year period;
[3] denotes annual limit value for Stage 2 implementation;
[4] denotes Air quality Monitoring Report, 2002.

PM_{10} monitoring in Ireland is limited to continuous monitoring stations operated by the Local Authorities and the Irish EPA, mainly in large urban centres. Average 24-hour ambient air concentrations monitored in the Phoenix Park and Whitehall,

respectively by Dublin Corporation are in the range of 16 µg m^{-3} and 17 µg m^{-3} for an annual mean in 1999. The EPA measured an annual mean of 15 µg m^{-3} at a monitoring station located within the Phoenix Park. The dominant source of PM_{10} in the area appears to be vehicle emissions, boilers (i.e. Home heating and Industrial heating), industrial processes and construction activities. The average ambient PM_{10} concentrations are comparable to those monitored by Dublin Corporation. Maximum recorded ambient PM_{10} emissions were on average 28% lower than the Irish and EU ambient air limit value (*see Table 2.6*).

2.2.6 Total Dust

Total dust deposition was measured at the site using Bergerhoff gauges specified in the German Engineering Institute VDI 2119 entitled "Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method)." Samples were collected at four locations (i.e. A3, A4, A5 and A6), as shown in *Figure 4.1*. The purpose of these monitors is to assess the baseline total depositional dust impact in the vicinity of the site. The glass jars containing the dust were submitted to an accredited test house (Alcontrol Laboratories) for analyses. The results are presented in *Table 2.7*.

Table 2.7. Total Dust Levels at each monitoring location.

Sample Reference	Sampling period	Total Dust Deposition (Summer sampling period) (mg/m^2day)
A3	23rd June to 13th July	73
A4	23rd June to 13th July	82
A5	23rd June to 13th July	21
A6	23rd June to 13th July	74
EPA recommended Limit value	-	350

Currently in Ireland there are no statutory limits for dust deposition, however, EPA guidance suggest "a soiling of 10mg/m2/hour is generally considered to pose a soiling nuisance" (TA Luft 2002). This equates to 240mg/m2/day of Total Depositional Dust The EPA recommend a maximum level of 350 mg/m^2day of dust deposition when measured according to TA Luft standard, which includes both soluble and insoluble matter (EPA compliance monitoring is based on the TA Luft Method). This value was not exceeded at any of the sample locations with all measured values at least 76.5% lower than the maximum recommended limit value.

2.2.7 Hydrogen sulphide (H_2S)

H_2S is commonly associated with waste handling operations. It is used as an indicator gas for the assessment of significant odour nuisance in the vicinity of many facilities including waste water treatment and waste handling operations. The World Health Organization (WHO) recommends that in order to avoid substantial complaints about odour annoyance among the exposed population, hydrogen sulphide concentrations should not be allowed to exceed 0.005 ppm (5 ppb; 7 µg m^{-3}), with a 30-minute averaging time. The OEHHA (2000) adopted a level of 8 ppb (10 µg m^{-3}) as the chronic Reference Exposure Level (cREL) for use in evaluating long-term emissions from hot spots facilities. The only instrument capable of providing comparison with such reference levels is a Jerome meter. This is a real time data-logging H_2S gold leaf analyser for the measurement of ambient hydrogen sulphide levels (Sheridan, 2003).

An ambient baseline H_2S profile monitoring exercise was carried out in the vicinity of the proposed recycling site using a pre-calibrated Jerome 631 X H_2S gold leaf continuous analyser with data logging capabilities. Samples were taken approximately 1.0 meter above ground level. The Jerome meter is a real time analyser with a range of detection from 3 ppb to 50 ppm. The Jerome meter was allowed to sample continuously at each monitoring locations A1 to A6. Every 1-minute for a period of 10 minutes, the average H_2S ambient air concentration was recorded.

Various odour detection thresholds as determined by various researchers are presented in *Table 2.8*. The H_2S monitoring results from Monitoring locations A1 to A6 on-site 23rd June 2005 using a real time Jerome analyser are presented in *Table 2.9*. Computation between both tables allows for the determination of H_2S contributed odour concentration on-site and in the vicinity of the site due to the presence of any odour sources. It also allows for the assessment of H_2S ambient concentration levels in accordance with the assessment criteria discussed within.

Table 2.8. Various odour detection thresholds for H_2S based on library data

H_2S odour detection threshold (ppb)	H_2S odour detection threshold ($\mu g\ m^{-3}$)	References
0.515	0.77	Valentine (1981)
0.510	0.76	Steward (1998)
0.670	1.00	Sheridan, 1998
0.135	0.20	Sheridan, 2001
1.34	2.00	Sheridan, 2000

Table 2.9. Equivalent odour concentration contribution of H_2S monitoring locations on 23rd June 2005.

Location identity[1]	Minimum/Maximum Odour detection threshold [ppb]	H_2S [ppb]	Odour concentration range in ambient air ($Ou_E\ m^{-3}$)
A1	0.135 to 1.35	4	2.96 to 29.63
A2	0.135 to 1.35	4	2.96 to 29.63
A3	0.135 to 1.35	2	1.48 to 14.81
A4	0.135 to 1.35	3	2.22 to 22.22
A5	0.135 to 1.35	2	1.48 to 14.81
A6	0.135 to 1.35	3	2.22 to 22.22
WHO Limit value	-	**5**	-

It is apparent from the H_2S data presented in *Table 2.9* that no significant sources of H_2S exist in the vicinity of the proposed site with all monitored locations within the recommended World Health Organisation guidance value.

2.3 Assessment Criteria

The EU has introduced several measures to address the issue of air quality management. In 1996, Environmental Ministers agreed a Framework Directive on ambient air quality assessment and management (Council Directive 96/62/EC). As part of the measures to improve air quality, the European Commission has adopted proposals for daughter legislation under Directive 96/62/EC. The first of these directives to be enacted, 1999/30/EC, has set limit values which replaced existing limit values under Directives 80/779/EEC, 82/884/EEC and 85/203/EEC in April 2001. The new directive, as relating to limit values for sulphur dioxide, lead, PM_{10} and nitrogen dioxide, is detailed in *Table 2.10.* EU Council Directive 2000/69/EC defines limit values for both carbon monoxide and benzene in ambient air and is presented in *Table 2.11.*

The National Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002) transpose those parts of the "Framework" Directive 92/30/EC on ambient air quality assessment and management not transposed by Environment Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (S.I. No. 33 of 1999). The 2002 Regulations also transpose, in full, the 1st two "Daughter" Directives 1999/30/EC relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air and 2000/69/EC relating to limit values for benzene and carbon monoxide in ambient air.

Table 2.10. Irish and EU Ambient Air Standard (SI 271 of 2002 and 1999/30/EC).

Pollutant	Regulation	Limit Type	Margin of Tolerance	VALUE
Nitrogen Dioxide	1999/30/EC SI 271 of 2002	Hourly limit for protection of human health - not to be exceeded more than 18 times/year-1 hour average	50% until 2001 reducing linearly to 0% by 2010 for 199/30/EC 40% from the date of entry into force of these Regulations, reducing on 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2010 for SI 271 2002	200 $\mu g/m^3$ NO_2
		Annual limit for protection of human health-Annual	50% until 2001 reducing linearly to 0% by 2010 for 1999/30/EC 40% from the date of entry into force of these Regulations, reducing on 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2010 for SI 271 2002	40 $\mu g/m^3$ NO_2
		Annual limit for protection of vegetation-Annual	None	30 $\mu g/m^3$ NO + NO_2
Lead	1999/30/EC	Annual limit for protection of human health-Annual average	100% until 2001 reducing linearly to 0% by 2005	0.5 $\mu g/m^3$
Sulphur Dioxide	1999/30/EC SI 271 of 2002	Hourly limit for protection of human health – not to be exceeded more than 24 times/year-1 hour average	43% until 2001 reducing linearly until 0% by 2005 for 199/30/EC 90 g/m^3 from the date of entry into force of these Regulations, reducing on 1 January 2003 and every 12 months thereafter by 30 □g/m^3 to reach 0 □g/m^3 by 1 January 2005 for SI 271 of 2002	350 $\mu g/m^3$
		Daily limit for protection of human health – not to be exceeded more than 3 times/year-24hr average	None	125 $\mu g/m^3$
		Annual & Winter limit for the protection of ecosystems-Annual	None	20 $\mu g/m^3$

Table 2.10. Continued Irish and EU Ambient Air Standard (SI 271 of 2002 and 1999/30/EC).

Particulate Matter Stage 1	1999/30/EC SI 271 of 2002	24-hour limit for protection of human health - not to be exceeded more than 35 times/year-24 hour average	50% until 2001 reducing linearly to 0% by 2005 for 1999/30/EC 30% from the date of entry into force of these Regulations, reducing on 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2005 for SI 271 of 2002	50 μg/m^3 PM_{10}
		Annual limit for protection of human health-Annual	20% until 2001 reducing linearly to 0% by 2005 for 1999/30/EC 12% from the date of entry into force of these Regulations, reducing on 1 January 2003 and every 12 moths thereafter by equal annual percentages to reach 0% by 1 January 2005	40 μg/m^3 PM_{10}
Particulate Matter Stage 2	1999/30/EC SI 271 of 2002	24-hour limit for protection of human health - not to be exceeded more than 7 times/year-24 hour average	To be derived from data and to be equivalent to Stage 1 limit value for 1999/30/EC Not to be exceeded more than 28 times by 1 January 2006, 21 times by 1 January 2007, 14 times by 1 January 2008, 7 times by 1 January 2009 and zero times by 1 January 2010 for SI 271 of 2002	50 μg/m^3 PM_{10}
		Annual limit for protection of human health-Annual	50% until 2005 reducing linearly to 0% by 2010 for 1999/30/EC and SI 271 of 2002	20 μg/m^3 PM_{10}

Table 2.11. Irish and EU Ambient Air Standard (SI 271 of 2002 and 2000/69/EC).

Pollutant	Regulation	Limit Type	Margin of Tolerance	VALUE
Benzene	2000/69/EC SI 271 of 2002	Annual limit for protection of human health	100% until 2003 reducing linearly to 0% by 2010 for 2000/69/EC 100% from the date of entry into force of these Regulations, reducing on 1st January 2006 and every 12 months thereafter by 1 μg/m^3 to reach 0 μg/m^3 by 1st January 2010	5 μg/m^3
Carbon Monoxide	2000/69/EC SI 271 of 2002	8-hour limit (on a rolling basis) for protection of human health	50% until 2003 reducing linearly to 0% by 2005 for 2000/69/EC 6 mg/m^3 from the date of entry into force of these Regulations, reducing on 1st January 2003 and every 12 months thereafter by 2 mg/m^3 to reach 0 mg/m^3 by 1st January 2005	10 mg/m^3

2.4 Potential Impacts of the Proposal

2.4.1 Construction Phase

There is the potential for a number of emissions to atmosphere during the construction of the development. Wind blown dust emissions may arise during the construction phase of the proposed development, which may impact upon the surrounding environment. The deposition of dust and mud on the local roads is both unsightly and dangerous. Dust may be a particular problem during periods of dry windy weather. There is no anticipated impact from dust emissions when the development has been constructed.

Potential sources of dust include the following:

- Vehicles carrying dust on their wheels
- Unvegetated stockpiles of construction materials
- The handling and recovery of construction and demolition waste materials

The construction vehicles, generators, etc., will also give rise to petrol and diesel exhaust emissions, although this is of minor significance compared to dust.

2.5 Operation Phase

2.5.1 Scheduled Emissions

Regarding operations at the proposed development, the activities to be located in the development are planned for residential and commercial uses. As a result, there are no major scheduled emissions (i.e. through stacks, industrial vents, etc.) planned for the development and site activities are unlikely to cause any deterioration in local air quality.

2.5.2 "Do-nothing" Scenario

The baseline survey results suggest that air quality in the vicinity of the proposed development is reasonable and shows typical levels for a sub urban area with all pollutants within the relevant Irish and EU limits. The air quality may improve slightly in future years due to improvements in engine technology and greater controls on petrol, diesel, coal and gas composition and purity.

If the proposed development were not to take place, the current air pollutant concentrations will remain unchanged followed by potential decreases in future years for the reasons outlined above. In relation to dust non-development of the site would result in no movement of soils and no construction activity and therefore no dust creation as a result of construction/demolition works.

2.6 Remedial or Reductive Measures

2.6.1 Construction Phase

Construction activities are likely to generate some dust emissions. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speed and wind direction. In order to ensure that no dust nuisance occurs, a series of measures will be implemented. Site roads shall be regularly cleaned and maintained as appropriate. Hard surface roads shall be swept to remove mud and aggregate materials

from their surface. Any un-surfaced roads shall be restricted to essential site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust may be regularly watered, as appropriate, during dry and/or windy conditions.

Vehicles using site roads shall have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road and on hard surfaced roads that site management dictates speed shall be restricted to 20 km per hour.

Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.

In relation to the completion of the proposed development, the car park surface, and all roads surrounding the Recycling centre site will be tarmacadamed/concreted. In periods of dry weather when dust emission would be greatest, a road sweeper, which would also dampen the road, may be employed in order to prevent the generation of dust.

It is not anticipated that dust will be a significant problem during the operation of the facility. All waste processing activities, which have the potential to generate dust (shredding, screening, baling) will be carried out internally. Dust control measures that may be employed include the provision of dust suppression systems on the individual plant items.

It is envisaged that the proposed development will not have a significant impact on the surrounding air quality. However, as discussed previously a number of mitigation measures have been suggested. Moreover, dust monitoring could be carried out during the construction phase of the development if deemed necessary by the planning authority. If the level of dust is found to exceed 350 mg/m2day in the vicinity of the site, further mitigation measures will be incorporated into the construction of the retail development.

2.7 Monitoring

2.7.1 Construction Phase

It is envisaged that the proposed development will not have a significant impact on the surrounding air quality. However, as discussed previously a number of mitigation measures have been suggested. Moreover, dust monitoring could be carried out during the construction phase of the development if deemed necessary by the planning authority. If the level of dust is found to exceed 350 mg/m^{2}day in the vicinity of the site, further mitigation measures will be incorporated into the construction of the Recycling centre.

3. Non-Technical Summary

A baseline ambient air quality survey was carried out in the vicinity of the proposed Waste Recycling Facility to be located in Cappogue, Finglas, Co. Dublin. Currently the air quality is good with levels of criteria pollutants for traffic, industrial and residential derived pollution (BTEX, NO_2, NO, CO, PM_{10} and Dust) well below the relevant Irish and European Union limits. The main source of air pollution in the area is from motor vehicle exhausts, construction activities and associated urban emissions. It is anticipated that if mitigation measures are strictly adhered to, then no long-term associated impacts will occur with the associated development.

4. Appendix I-Monitoring locations

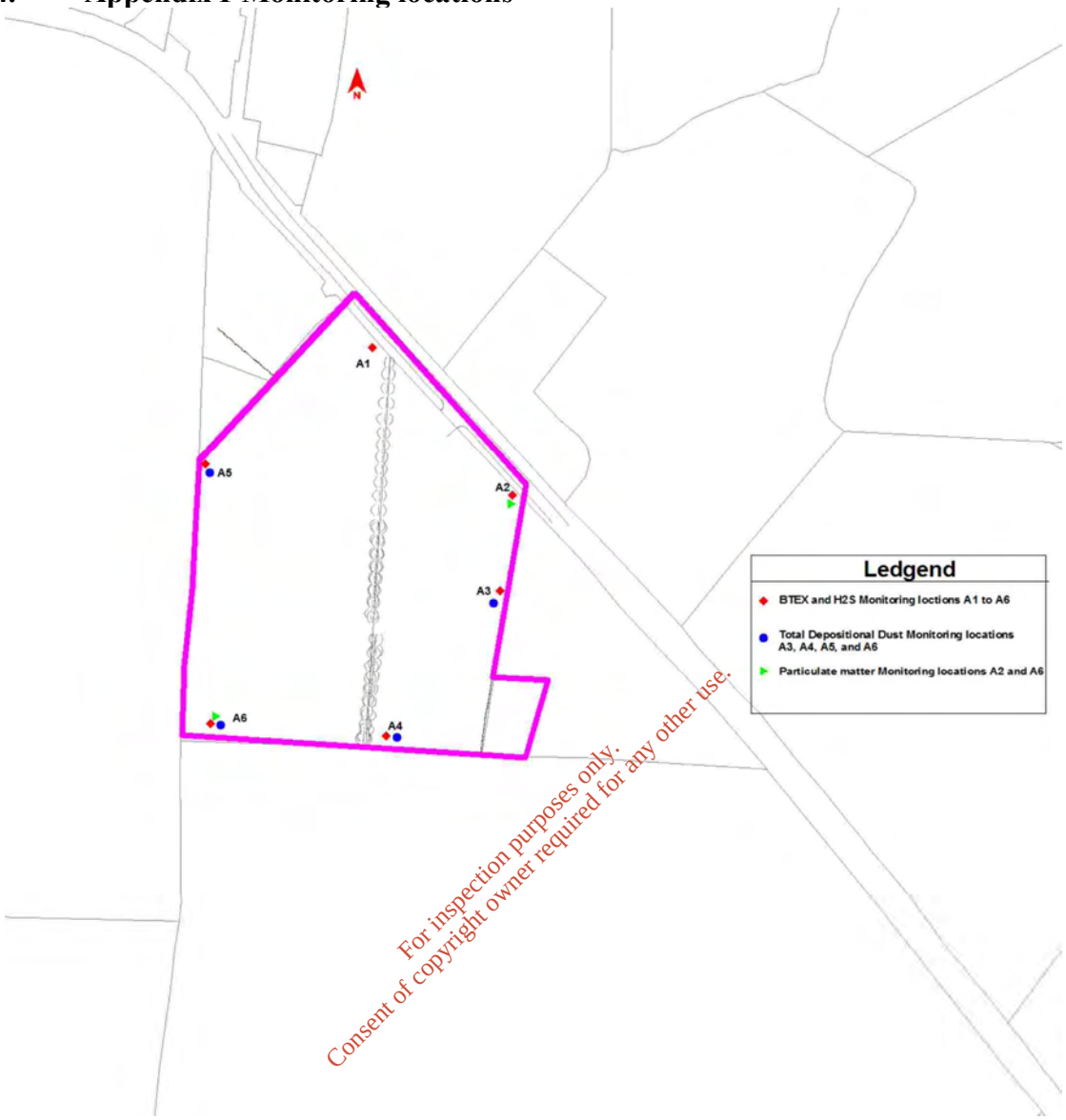


Figure 4.1. Overview of monitoring locations A1 to A6.

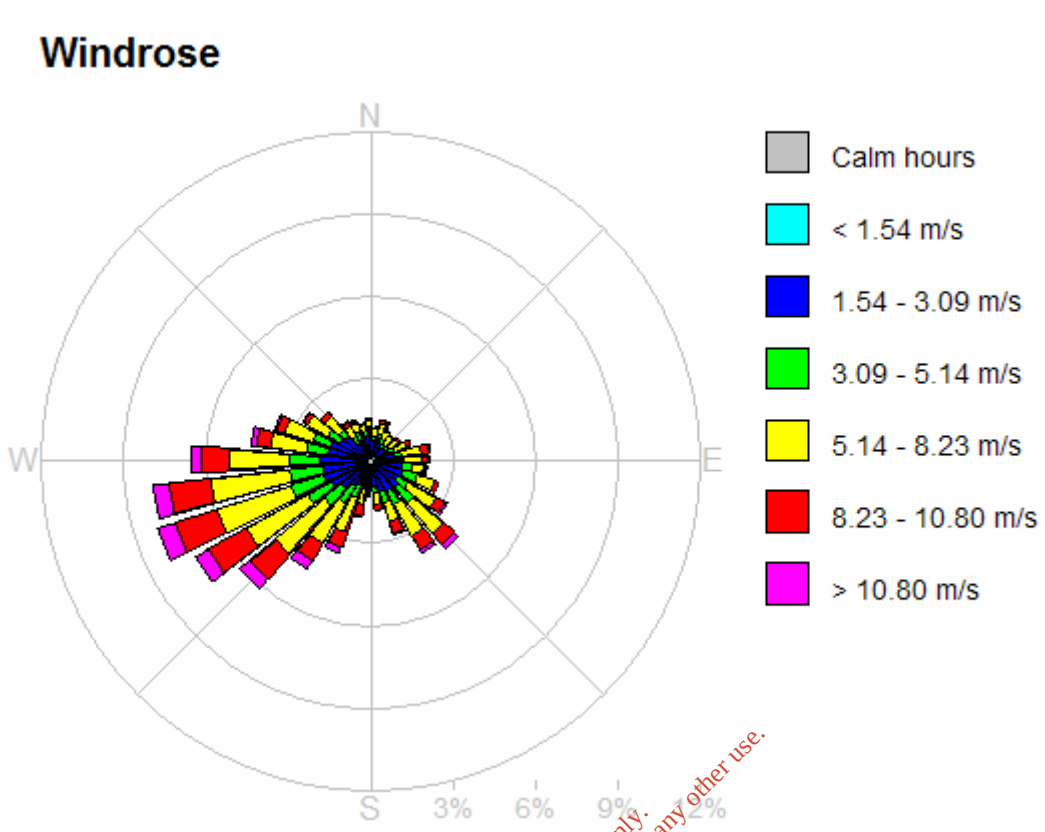


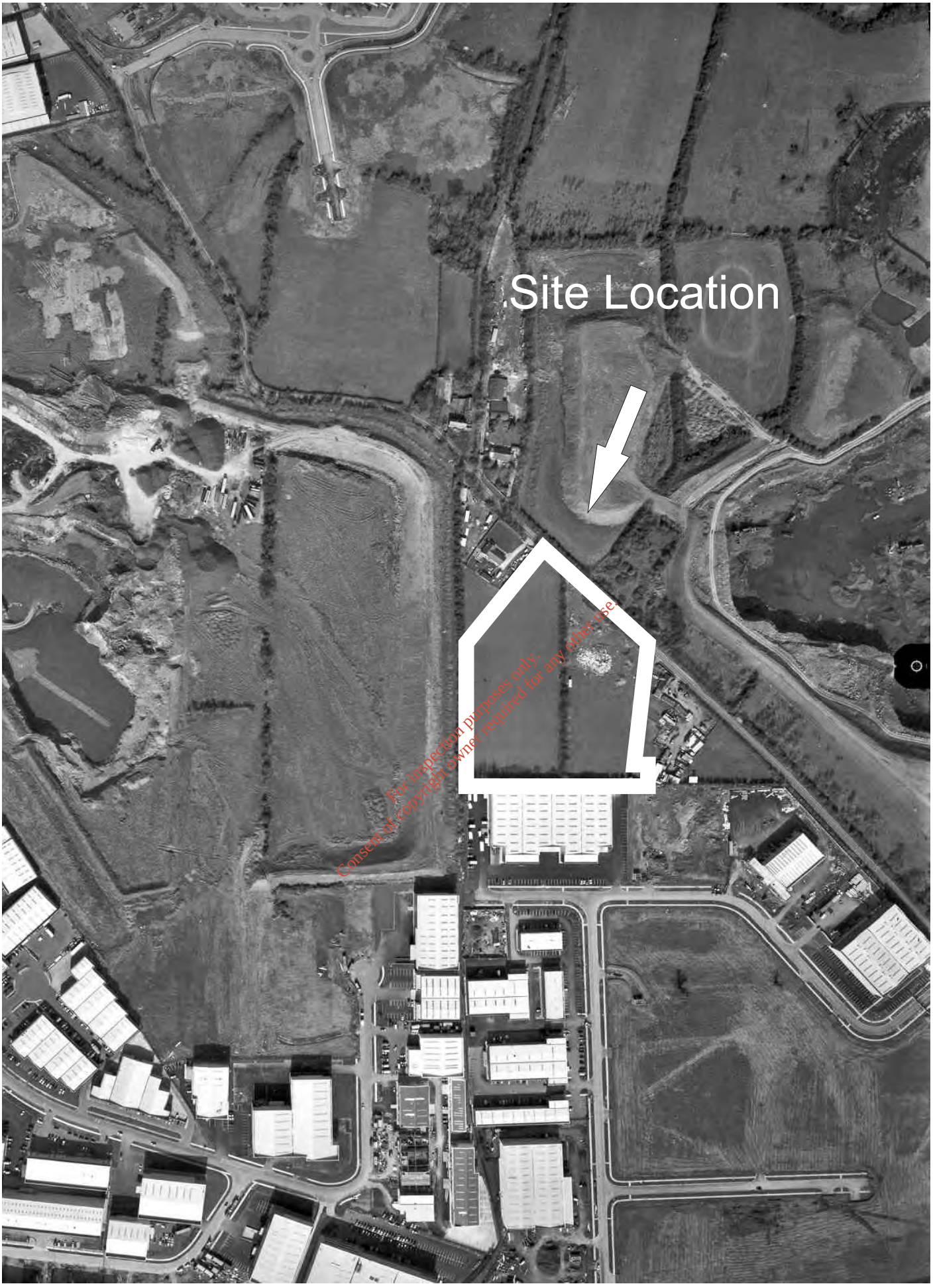
Figure 4.2. Schematic illustrating windrose for meteorological data Dublin Airport-1999 to 2003.

Table 2.12. Cumulative wind speed and direction for meteorological data Dublin Airport-1999 to 2003.

Cumulative Wind Speed Categories							
Relative Direction	**> 1.54**	**>3.09**	**>5.14**	**>8.23**	**> 10.80**	**< 10.80**	**Total**
0	220	221	76	79	13	10	619
11.3	53	237	69	108	18	9	494
22.5	41	282	78	180	36	6	623
33.8	40	240	64	135	34	4	517
45	24	182	88	146	40	5	485
56.3	35	182	96	155	53	1	522
67.5	29	214	115	210	71	14	653
78.8	22	286	151	291	131	49	930
90	44	268	156	303	87	38	896
101.3	50	383	172	205	31	4	845
112.5	57	427	237	288	73	13	1095
123.8	44	396	210	498	151	37	1336
135	64	464	324	629	230	71	1782
146.3	64	420	263	572	240	71	1630
157.5	62	386	185	343	187	29	1192
168.8	65	298	97	179	93	21	753
180	49	183	76	139	53	22	522
191.3	46	238	121	252	174	49	880
202.5	37	324	210	571	277	78	1497
213.8	45	379	303	745	326	140	1938
225	45	510	337	1032	549	188	2661
236.3	53	607	438	1117	677	229	3121
247.5	67	672	549	1249	699	268	3504
258.8	49	658	535	1290	648	276	3456
270	47	706	486	953	452	158	2802
281.3	52	602	333	583	228	82	1880
292.5	64	570	292	482	122	24	1554
303.8	59	442	250	361	86	14	1212
315	68	397	148	270	92	14	989
326.3	65	227	121	192	71	7	683
337.5	69	258	125	147	39	10	648
348.8	77	258	96	104	21	6	562
Total	1806	11917	6801	13808	6002	1947	42281
Calms	-	-	-	-	-	-	1519
Missing	-	-	-	-	-	-	0
Total							43800

APPENDIX 5

Aerial Photo



O' Callaghan Moran & Associates.
Granary House, Rutland Street,
Cork Ireland.
Tel. (021) 4321521 Fax. (021) 4321522
email : ocm@indigo.ie

CLIENT

Panda Waste Ltd

TITLE

Site Location

Details

O.S. Licence Agreement
Number AR 0038702

Ordnance Survey Ireland.
Government of Ireland.

Scale

NTS

Rev.

APPENDIX 6

Noise Report

awnconsulting

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

T: + 353 1 847 4220
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W: www.awnconsulting.com

DM/08/4337NL01
28 July 2008

Michael Watson
O'Callaghan Moran & Associates
Granary House
Rutland House
Cork

Dear Michael,

RE: PANDA DEVELOPMENTS – NOISE ASSESSMENT OF PROPOSED WASTE RECYCLING FACILITY

We are pleased to forward the following assessment of potential noise impact associated with the proposed PANDA Waste Services Ltd (Panda) Recycling Facility, Cappoge, Dublin 11.

1.0 INTRODUCTION

AWN Consulting Limited has been commissioned to assess the potential noise impact associated with a proposed waste recycling facility at Cappoge, Dublin 11, adjacent to the Stadium Business Park.

The site encompasses approximately 6.2 acres and will, when fully developed, be occupied by a Municipal Solid Waste Recycling Building, Cardboard Recycling Building and a Dry Recycling Building, hardstanding areas, parking spaces and landscaped areas. There is a 1.5 ha plot of land adjacent to the north of the site marked for future development. Large extents of the southern and western boundaries of the site adjoin an existing industrial estate (Stadium Business Park).

This document details noise predictions at the 'Five Lamps' dwelling (NSL 1) close to the south-eastern boundary of the site, and 'Grange House' (NSL 2) to the North of the site, as indicated in Figure 1. These are the only noise sensitive locations in the vicinity of the site.

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Located between the Panda site and the dwelling is a small commercial area with a single prefabricated building, approx. 6m high, providing screening between the dwelling and the site. In addition, a large acoustic wall, approx. 5m high, has been constructed along most of the southern boundary, between the dwelling and the site.

Cappagh Road runs adjacent to the eastern boundary of the site. It is a well trafficked two-way road and is the main source of noise in the area.

The proposed normal waste acceptance hours are 06:00 to 20:00 Monday to Saturday inclusive. The facility will not normally open on Sundays. The proposed operational hours are 06:00 to 22:00.

2.0 NOISE CRITERIA

Given the nature of the development under consideration, appropriate guidance is taken from the EPA publication "*Guidance Note for Noise in Relation to Scheduled Activities*" as follows.

… the noise level at sensitive locations should be kept below an L_{ArT} value of 55dB(A) by daytime. At night, to avoid disturbance, the noise level at noise sensitive locations should not exceed an L_{AeqT} value of 45dB(A).

In summary, the following criteria apply at the façades of the noise sensitive properties closest to the development:

- Daytime (08:00hrs to 22:00hrs) 55dB $L_{Aeq,15min}$
- Night-time (22:00hrs to 08:00hrs) 45dB $L_{Aeq,15min}$

3.0 RECEIVING ENVIRONMENT

The initial stage of this assessment is to quantify the existing noise environment in the vicinity of the noise sensitive property.

3.1 Environmental Noise Survey

Environmental noise surveys were conducted in order to quantify the existing noise environment in the vicinity of the proposed development site. This survey was conducted in general accordance with *ISO 1996: Acoustics – Description, measurement and assessment of environmental noise*. Specific details are set out in the following sections.

3.2 Choice of Measurement Locations

Noise measurements were undertaken at two locations. These locations are described below and shown in Figure 1.

Location A is located to the east of the proposed development site, set back some 3m from Cappagh Road.

Location B is located near the entrance of the driveway to the dwelling adjacent to the south of the site, set back some 5m from Cappagh Road.

3.3 Survey Periods

A daytime noise survey has been carried out previously by AWN at this site on the 13 July 2005. Additional surveys have been conducted to confirm the results obtained in the 2005 survey and are commented upon in the following sections.

Noise measurements were conducted over the following survey periods:

- Daytime 1: 12:15hrs to 15:50hrs on 13 July 2005;
- Daytime 2: 10:15hrs to 10:45hrs on 02 July 2008;
- Early Morning: 06:00hrs to 08:00hrs on 03 July 2008.

Daytime survey periods were selected in order to provide a typical snapshot of the existing noise climate in the vicinity of the site.

The early morning period was selected to measure ambient noise climate in the area around the start of operations at the proposed site.

The weather throughout both the attended daytime surveys was dry and mild with a slight breeze.

The weather during the early morning survey was generally dry and calm. However there was some light drizzle present during the final 30mins of the survey.

3.4 Personnel and Instrumentation

James Mangan (AWN) conducted the noise level measurements during the 2005 survey; and David Mannion (AWN) conducted the surveys undertaken in 2008.

The noise measurements were performed using a Brüel & Kjær Type 2260 Sound Level Analyser (manned survey measurements) and a Type 2238 Sound Level Meter (continuous monitoring). Before and after the surveys the measurement apparatus was check calibrated using a Brüel & Kjær type 4231 Sound Level Calibrator.

3.5 Procedure

Noise measurements were conducted at the three monitoring locations on a cyclical basis for sample periods of 15 minutes. The survey results were noted onto a Survey Record Sheet immediately following each sample, and were also saved to the instrument memory for later analysis where appropriate. Survey personnel noted the primary noise sources contributing to noise build-up.

3.6 Measurement Parameters

The noise survey results are presented in terms of the following five parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{Amax} is the instantaneous maximum sound level measured during the sample period.

L_{Amin} is the instantaneous minimum sound level measured during the sample period.

L_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing.

All sound levels in this report are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

3.7 Results and Discussion

Location A

The results for Location A are summarised in Table 1 below.

Date	Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)				
		L_{Aeq}	L_{Amax}	L_{Amin}	L_{A10}	L_{A90}
13 July 2005	13:27 – 13:42	68	85	48	72	51
	13:42 – 13:57	68	90	48	70	50
	15:17 – 15:32	68	85	48	72	50
	15:32 – 15:47	70	94	48	74	51

Table 1 Summary of Measured Noise Levels at Location A

Noise levels monitored at this location were dominated by traffic noise on the Cappagh Road and influenced by aircraft movement's overhead, distant plant noise and birdsong. Construction noise was noted as an audible source of noise at this location. Noise levels were also influenced by a degree of wind generated noise.

Noise levels were in the range of 68 to 70dB L_{Aeq} and 50 to 51dB L_{A90}. Maximum noise levels at this location were typically dominated by road traffic movements along the nearby local road.

Location B

The results for Location B are summarised in Table 2 below.

Date	Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)				
		L_{Aeq}	L_{Amax}	L_{Amin}	L_{A10}	L_{A90}
02 July 2008	10:15 – 10:30	67	81	48	72	52
	13:31 – 13:46	67	82	47	72	51
03 July 2008	06:00 – 06:15	65	81	41	69	47
	06:15 – 06:30	66	82	44	71	48
	06:30 – 06:45	67	80	43	72	48
	06:45 – 07:00	68	88	43	72	49
	07:00 – 07:15	70	82	46	74	55
	07:15 – 07:30	70	84	48	74	55
	07:30 – 07:45	70	81	50	73	57
	07:45 – 08:00	71	85	46	74	60

Table 2 Summary of Measured Noise Levels at Location B

Daytime noise levels monitored at this location were again dominated by traffic noise on the Cappagh Road, and also influenced by a degree of aircraft noise. Noise levels were the order of 67dB L_{Aeq} and 51 to 52dB L_{A90}, and were of a similar order to those measured at the site in 2005.

Early morning noise levels were also dominated by traffic noise on the Cappagh Road, which was well trafficked for the duration of the survey period, and also influenced by aircraft. Noise levels were the order of 65 to 71dB L_{Aeq} and 47 to 60dB L_{A90}. Maximum noise levels at this location were typically dominated by road traffic movements along the nearby local road.

4.0 PREPARATION OF THE NOISE MODEL

As part of the assessment a noise model has been developed in order to predict noise levels associated with plant items and stationary on-site delivery trucks. Details of the noise modelling software and the noise prediction calculation have been reproduced in the following sections for clarity and information purposes.

4.1 Noise Propagation Calculation

Brüel & Kjær *Predictor* Type 7810 is a proprietary noise calculation package for computing noise levels in the vicinity of industrial sites. Calculations are based on *ISO9613-2:1996 Acoustics - Attenuation of sound outdoors - Part 2: General method of calculation.*

This method has the scope to take into account a range of factors affecting the attenuation of sound, including:

- the magnitude of the noise source in terms of sound power;
- the distance between the source and receiver;
- the presence of obstacles such as screens or barriers in the propagation path;
- the presence of reflecting surfaces;
- the hardness of the ground between the source and receiver;
- attenuation due to atmospheric absorption;
- meteorological effects such as wind gradient, temperature gradient, humidity (these have significant impact at distances greater than approximately 400m).

Calculations have been performed in octave bands from 63Hz to 8kHz as well as in overall dB(A) terms.

4.2 Configuration of the Noise Model

The input data for the noise model was an overall site plan, a set of buildings, ground contours including the acoustic wall, and noise sources.

4.2.1 Building Information

The buildings in the model encompass those on the Panda site and nearby noise sensitive locations and facilities.

Building extents and elevations, including the high acoustic wall, have been included into the model based on drawings supplied by O'Callaghan Moran and Associates and information noted during on-site inspection.

4.2.2 Noise Sources

Each noise source was input as sound power in octave bands. *Predictor* accepts sound power levels in octave bands from 63Hz to 8kHz. Each source also has its own position, height and directivity.

Detailed below in Table 3 are the notable items of plant proposed for use in each of the buildings on site, along with the associated A-weighted L_w sound power levels utilised in the noise model.

Building	Plant Item	Number	L_w dB(A)
General Recycling Building	Front Loading Shovels	2	98
	Trommels	1	98
	Grab	1	100
	Construction and Demolition Crusher/Shredder	1	98
	Conveyor	2	98
Dry Recycling Building	Trommel	1	98
	Hand picking station (conveyor belt)	2	98
	Baling unit	2	98
	Front End Loader	2	98
	Forklift	2	-
Commercial and Domestic Buidling	Trommel	1	98
	Air Classifier	1	88
	Bailing unit	1	98
	Front Loading Shovel	1	98
	Grab	1	98
	Conveyor	1	93
	Shredder	1	93
General	Truck[1]	7	96

Table 3 Items of Plant and L_w dB(A) Sound Power Levels utilised in assessment

Sound data used in the model was based upon information from the following sources:

- Information supplied by O'Callaghan Moran & Associates;
- Bies and Hansen, Engineering Noise Control.

4.2.3 Assessment Locations (Receivers)

Noise predictions for have been carried out for the location as detailed in Table 4, and as shown in Figure 1.

Location	Comment
NSL 1	North western façade of dwelling to the south east of the development approximately 40m from the MSW Recycling Building.
NSL 2	South facing façade of dwelling to the north of the development approximately 200m from the Dry Recycling Building

Table 4 Noise Assessment Locations

[1] It has been assumed that 7 trucks will be parked on site for noise prediction purposes. It is considered that this represents a 'worst case' scenario. Furthermore is has been assumed that all openings associated with the proposed buildings will be fully opened.

5.0 IMPACT ASSESSMENT

This section of the report asses the predicted noise levels from on-site plant and stationary trucks; along with noise associated with on-site car-parking and truck movements. The predicted noise levels are assessed against the recommended daytime and night-time criteria outlined in Section 2.

5.1 Plant Noise and Stationary Trucks

The noise levels associated with plant and machinery located within the various recycling buildings, and stationary trucks serving the buildings, have been predicted using noise modelling software, as detailed above in Section 4. The predicted noise levels are detailed below, in Table 5.

Location	Height (m)	Octave Band Centre Frequency (Hz)							dB(A)
		63	125	250	500	1000	2000	4000	
NSL 1	1.6	30	35	33	36	38	35	25	43
NSL 2	1.6	28	34	32	36	42	38	23	45

Table 5 L_p dB(A) Noise Levels at Sensitive Location

The predicted noise level from plant items within the recycling buildings and stationary trucks in the yard is 43dB $L_{Aeq,15min}$ at NSL 1 and 45dB $L_{Aeq,15min}$ at NSL 2.

This level is well within the daytime criterion of 55dB $L_{Aeq,15min}$ and night-time criterion of 45dB $L_{Aeq,15min}$, and the likely noise impact at the nearest noise sensitive location is not significant.

5.2 Car Parking

In this instance the car-parking facilities for the development will be provided by means of a surface car park areas located along the boundary with Cappagh Road and the northern boundary. Noise level measurements have previously been conducted in the vicinity of car parks in support of other planning applications. The typical noise level 10m beyond the boundary of these car parks during busy daytime periods has been found to be of the order 48dB $L_{Aeq,15min}$.

NSL 1 is situated some 65m from the car parking area along the Cappogue Road Boundary and some 180m from the car parking area along the northern boundary. Furthermore, in both cases line of sight to the areas in screened by the MSW Recycling building and by the large acoustic wall along the south-eastern boundary of the site. Taking into account the attenuation due to distance and screening, the predicted noise level at NSL 1 due to car parking areas is 22dB $L_{Aeq,15min}$.

NSL 2 is situated some situated some 190m from the car parking area along the Cappogue Road Boundary and some 240m from the car parking area along the northern boundary. The predicted noise level at NSL due to car parking noise is 15dB $L_{Aeq,15min}$.

These predicted levels are well within the daytime criterion of 55dB $L_{Aeq,15min}$ and night-time criterion of 45dB $L_{Aeq,15min}$, and the likely noise impact of car parking at the nearest noise sensitive locations is not significant.

5.3 Truck Movements On-Site

The noise level associated with an event of short duration, such as a car or truck movement along a road, may be expressed in terms of its Sound Exposure Level (L_{AX}). The Sound Exposure Level can be used to calculate the contribution of an event or series of events to the overall noise level in a given period.
The appropriate formula is given below.

$$L_{Aeq,T} = L_{AX} + 10\log_{10}(N) - 10\log_{10}(T) + 10\log_{10}(r_1/r_2) \quad dB$$

where:

$L_{Aeq,T}$	is the equivalent continuous sound level over the time period T (in seconds);
L_{AX}	is the "A-weighted" Sound Exposure Level of the event considered(dB);
N	is the number of events over the course of time period T;
r_1	is the distance at which L_{AX} is expressed;
r_2	is the distance to the assessment location.

The mean value of Sound Exposure Level for a truck at low to moderate speeds (i.e. 10 to 30mph) is of the order of 82dB L_{AX} at a distance of 10 meters from the vehicle. This figure is based on a series of measurements conducted under controlled conditions.

Two turning circles are detailed on site drawings. One is indicated for the south of the site and another for the centre of the site. Using the equation detailed above and assuming a worst case scenario of 50 vehicle trips in a peak hour period on the site (25 using each turning circle) and taking account of attenuation due to distance and noise screening provided by the acoustic wall, the predicted noise level at NSL 1 is of the order of 35dB $L_{Aeq,15min}$; and the predicted noise level at NSL 2 is of the order of 33dB $L_{Aeq,15min}$.

These levels are within the daytime criterion of 55dB $L_{Aeq,15min}$ and night-time criterion of 45dB $L_{Aeq,15min}$, and the likely noise impact at the nearest noise sensitive locations is not significant.

6.0 SUMMARY

AWN Consulting have been commissioned by to assess the potential noise impact of a waste recycling facility at Cappogue, Dublin 11. Noise predictions have been prepared for two noise sensitive locations in the vicinity of the site.

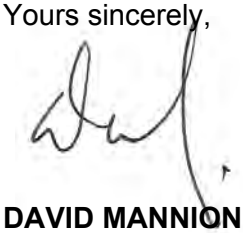
At NSL 1, the predicted daytime and night-time noise levels associated with the site at the nearest dwelling were 43dB $L_{Aeq,15min}$ from on-site plant and parked trucks; 22dB $L_{Aeq,15min}$ from on-site car parking; and 35dB $L_{Aeq,15min}$ from on-site truck movements.

At NSL 2, the predicted daytime and night-time noise levels associated with the site at the nearest dwelling were 45dB $L_{Aeq,15min}$ from on-site plant and parked trucks; 15dB $L_{Aeq,15min}$ from on-site car parking; and 33dB $L_{Aeq,15min}$ from on-site truck movements.

All the predicted noise levels were within the daytime criterion of 55dB $L_{Aeq,15min}$ and night-time noise criterion of 45dB $L_{Aeq,15min}$, and the likely noise impact associated with the development is not considered to be significant.

Please do not hesitate to contact this office if you have any further queries in relation to issues highlighted in this document.

Yours sincerely,



DAVID MANNION
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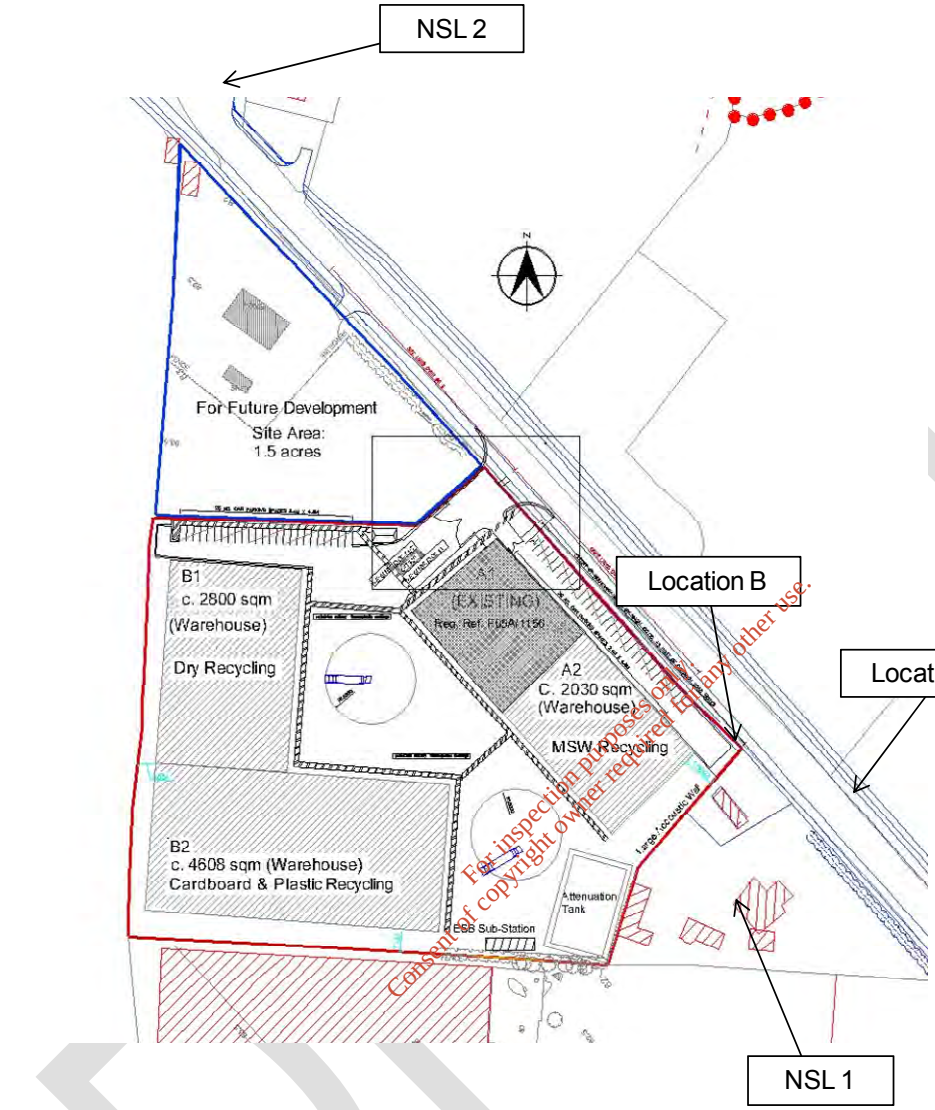
DAMIAN KELLY
Principal Acoustic Consultant



Project
Panda Developments

Reference
DM/08/4337

Figure 1
Noise Monitoring Locations

awnconsulting
The Tecpro Building, Clonshaugh Business and Technology Park, Dublin 17
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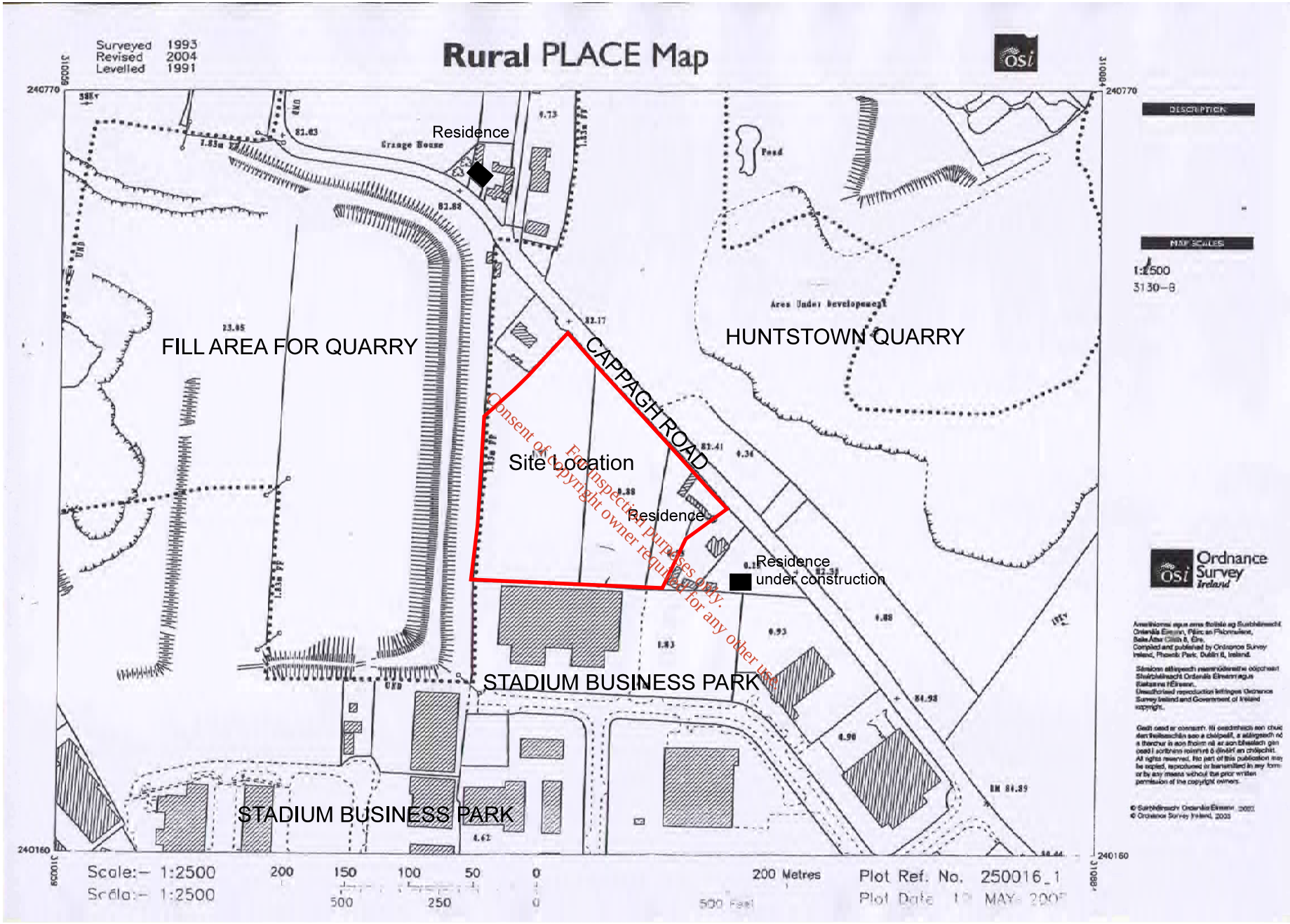

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CLIENT
Panda

TITLE
Surrounding Landuse

Details
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FIGURE NUMBER
3.5

Scale
Not To Scale

Revision
A

APPENDIX 7

Traffic Impact Assessment

PANDA WASTE RECYCLING FACILITY, BALLYCOOLIN INDUSTRIAL ESTATE, CAPPOGUE, FINGAL, CO DUBLIN

Transportation Study

August 2005

02692/FR/0803/JK

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Appendix A

Traffic Survey Data

Copy of Classified Traffic Surveys

1 INTRODUCTION

1.1 General

1.1.1 **Traffic***wise* Ltd. has been retained by PANDA Waste Services Ltd. to provide guidance on the traffic and transportation and access issues relating to the development of a waste recycling facility which it is proposed will be located in Cappogue, Fingal, Co Dublin. Access to the site will be from the adjoining carriageway of the Cappagh Road.

1.1.2 As detailed in the planning application, the facility will be developed in a series of phases or stages. In Stage 1 it is expected that the facility will accept and recycle approximately 50,000 tonnes of Construction and Demolition, and Commercial and Industrial waste per annum. Stages 2 and 3 will involve the expansion of the recycling capacity to process Dry Recyclables and Municipal Solid Wastes.

1.1.3 When fully developed it is intended that the facility will have the capacity to process 250,000 tonnes of potentially recyclable materials per annum. The proposed capacity is designed to allow for the progressive expansion of the recycling activities. PANDA Waste Services Ltd. will then be in a position to tender for local authority contracts in relation to the collection and recycling of Municipal Solid Wastes.

1.1.4 It is envisaged that processing of the levels proposed under Stages 2 and 3 would not be realised at the site prior to both the opening of the N2 Road Improvement Scheme and the realignment and upgrade of the Cappagh Road.

1.1.5 Published data indicates that the N2 is due to be complete two and half years after the construction start date of May 2004; therefore the latter part of 2006.

1.1.6 As we understand Compulsory Purchase Orders were issued along the corridor of the proposed Cappagh Road realignment some time ago. The appointment of consultants to prepare detailed designs for the scheme is pending and it is expected that construction work could commence sometime close to March 2006.

1.1.7 Allowing, say a year to eighteen months for planning and construction, the proposed waste treatment facility could reasonably be expected to be open for Stage 1 operations near the end of 2006 or early in 2007.

1.1.8 For the purposes of the assessments provided in this report it is assumed that the facility would open in mid to late 2006. As can be appreciated, the forecast opening date is likely to coincide with the predicted opening date for the N2 Improvement and quite possibly the Cappagh Road Realignment as it is expected that construction works for the Cappagh Road Realignment works would be well underway by the end of 2006.

1.1.9 The existing site currently enjoys a full planning permission under Planning Register Reference No. F04A/1123. The Applicant in the case of the current permission is Heatherly Securities Ltd. The permitted development is described in the permission as follows.

> *"Industrial/Office development of 10,579sq.m which would consist of 7No. 2 storey Industrial/Office Units varying from 523sq.m. to 2,273sq.m. and in height from 8.3m to 9.85m including ESB substation and switching room of 28.8sq.m. with associated parking for 304 cars, boundary fencing, landscaping, berming, site works and a new access road from the existing Stadium Business Park on a 2.58 hectare site adjacent to the Cappagh Road."*

1.2 Study Methodology

1.1.1.1 In this report we identify the existing traffic conditions and assess the relative level of impact the proposed development is likely to have on the local road network. We also identify how the traffic associated with the proposed development can be accommodated on the existing and future emerging local road network. Where appropriate, measures are discussed regarding the management of traffic associated with the proposed development.

1.2.2 This report which addresses the likely traffic impact of the proposed development and provides a description of the physical characteristics and land-use requirements in relation to the transport needs of the proposed development is structured in accordance with the general advice provided in the Institution of Highways & Transportation document 'Guidelines for Traffic Impact Assessment' (September 1994). This document is recognised by Transportation Planners to represent a structured approach to the preparation of Transport Assessments (formerly Traffic Impact Assessments).

1.2.3 The Institution of Highways & Transportation guidelines provide suggested headings based on current best practice and it is these headings, where relevant or appropriate, under which the report is written.

1.2.4 The existing site currently enjoys full planning permission for Industrial/Office uses, nonetheless this development has not been realised. It is expected that the traffic generation of the current permitted development would have been given due consideration by the Local Authority. The conditions appended the current permission clearly show involvement of the Transportation Department of Fingal County Council when that application was determined and subsequently granted.

1.2.5 The Institution of Highways and Transportation recommends that traffic to permitted, yet unrealised developments should normally be accounted for in the assessment of future likely traffic conditions on the receiving roads environment.

1.2.6 In the interest of a comprehensive and comparative assessment of the likely impact of the 'development site' on the operation of the receiving roads environment we assess the levels of traffic which the site might reasonably be expected to generate both under the current permission and under that for which permission is sought.

1.2.7 In accordance with the Institution of Highways and Transportation guidelines, the true measure of the impact of the current proposed development will be the incremental difference in the respective volumes of traffic which the existing permitted and current proposed developments are likely to generate.

1.2.8 It is anticipated that this Institution of Highways and Transportation recommended approach will provide the decision makers with a comprehensive picture of likely traffic impact and thus likely traffic conditions on the receiving roads environment, which is, the emerging road network serving the general Ballycoolin Industrial Area.

2 EXISTING CONDITIONS

2.1 General Location in Relation to Roads Network

2.1.1 The application lands are located in the Blanchardstown catchment area and on lands adjacent to the southern side of the Cappagh Road, in Cappogue, Fingal, Co Dublin.

2.1.2 In relation to the national primary roads network, the area in which the site is located is generally defined by the N2 National Primary Road to the North which intersects with the M50 at Finglas, the N3 National Primary Road to the south which intersects the M50 at Blanchardstown and the M50 Motorway to the East.

2.1.3 The proposed development is located on the Cappagh Road which crosses the M50 at an overbridge located between the Blanchardstown and Finglas Interchanges.

2.2 Current Local Authority Policy and Roads Objectives

2.2.1 In summarising the current transport policies for the Ballycoolin Area in particular, reference has been made to The National Development Plan 2000-2006 and the Fingal County Development Plan 2005-2011.

2.2.2 The National Development Plan 2000-2006, in terms of infrastructure considerations aims to build upon and enhance Ireland's continuing economic and social development by means of a concentrated and focused development strategy for the national primary road network. In relation to the impact on Fingal, the strategy can be broadly related to the provision of enhanced road and public transport infrastructure.

2.2.3 The development strategy for the general roads network in the Blanchardstown catchment area includes the following road improvement objectives as set out in Table 6.1 of the County Development Plan 2005-2011.

- N2 (Cherryhound) to Harristown Distributor Road
- St. Margarets Road (Ballymun) Improvement Measures
- Ballymun Interchange to Harristown Road

- Phoenix Park (N2 Interchange)
- Access off Corduff roundabout to Ballycoolin Industrial Estate
- Ballycoolin / Snugborough Road Junction Improvement
- Ballycoolin Road Realignment
- Clonsilla Road Junction Improvements
- Mulhuddart Interchange Improvement
- Cappagh Road Realignment
- Dunsink Lane to Cappagh Road
- N2-N3 Church Road Tyrellstown-Rathoath Road (N2 link)
- N2-N3 Link Ballycoolin Road to Cherryhound (N2)
- N2-N3 Link Church Road Tyrellstown to Damastown
- Mitchellstown Road to Kilshane Cross Road Improvement Measures
- Link via SDZ Lands to Porterstown
- Possible alternative Railway Crossing and Link Road at Clonsilla
- Castaheaney Interchange Improvement
- M50 Upgrade
- M2 Motorway

2.2.4 The application site will enjoy the benefit of the continuing development of the emerging roads network in the general vicinity of Ballycoolin Industrial Area together with the Blanchardstown and Mulhuddart areas to the south of the development site and the N2 route alignment which is currently under construction to the north.

2.2.5 The historic development strategy for the general roads network in the Blanchardstown catchment area under the superseded County Development Plan 1999 included the following objectives as set out in Section 5.2.1 of that document. Where possible we attempt to highlight in *italics*, those schemes we understand to have been completed to date, whilst we <u>underline</u> those schemes which have been carried over to the current County Development Plan 2005-2011 as listed above.

Motorway

- *The completion of the M1 motorway from Dublin Airport to the County Meath boundary will facilitate both private vehicle and bus movement and the completion of this road is a fundamental requirement for the facilitation of development in Fingal. It will be a major contributor to the development*

of Swords, Balbriggan and other urban areas in the Dublin - Belfast Economic Corridor.

- *The upgrading of the existing interchange at Turnapin (M50/M1 intersection) in conjunction with the Port Access Tunnel*
- The upgrading of the M50 including the possible provision of a third lane.

National Routes

- *N1 Belfast Road: Airport to Swords By-Pass - dualling,*
- *N2 Ashbourne Road: Motorway interchange to County boundary - dualling.*(Partial)

District Distributors

- *Ballycoolin Road: Rosemount to Cappagh Road - road improvement and re-alignment and junction improvement with Cappagh Road, .*(Partial)
- *Blanchardstown Road North - road improvement,*
- *Upgrading junction at entrance to Castaheany/Damastown Industrial Estate,*
- *Corduff Road - road improvement and realignment,*
- *Corduff Road to Kilshane Cross - new link road* (Partial)
- Rathoath Road: Corduff to Cappagh Road - road improvement,
- Cappagh Road: Corduff to Rathoath Road - road improvement,
- *Snugborough Road: Blanchardstown Road South to Castaheany*
- Construction of the Castaheany Western Distributor Road and Ongar Way,
- *Provision of an interchange at Snugborough Road/Navan Road,*
- Blanchardstown Road South: Clonsilla Road to point north of Luttrellstown Road - new road,
- Extension of the Outer Ring Road from Blanchardstown to the St. Margaret's By-pass,
- Relocation of the section of the Outer Ring Road at present running from Blanchardstown to the N4 (and south) to the periphery of the development area will be pursued with other relevant authorities. This will result in the deletion of the road reservation running through Luttrellstown Golf Club, the Strawberry Beds and over the River Liffey.

Local Distributor Roads

- Cruiserath Road: Ballycoolin Cross to Church Road - new road,
- Tyrellstown Road - completion of link to Ladyswell Road,

- Ladyswell Road Extension: Church Road to Blanchardstown Road North ,
- Carpenterstown Road - completion of link to Blanchardstown Road South.

2.2.6 In summary therefore, with regards to the National Roads Network in the vicinity of the development site the N2 is programmed to be upgraded to dual carriageway standard between the M50 and Ashbourne. This project, which includes a motorway grade separated interchange at Cherrywood will provide an excellent quality route to the north from the Ballycoolin area. Construction on this major road scheme commenced in May 2004 and is expected to take two and a half years to complete. Given the length of the works, it is expected that southern portions of the N2 scheme may reasonably be in use before completion of the entire scheme.

2.2.7 There are a number of general interchange improvements proposed for the existing M50 and these include a revision to the N2/M50 interchange associated with the N2 improvement as detailed above, and an upgrade to the N3 Blanchardstown junction to a partial free-flow arrangement aimed at reducing congestion at Scott's Roundabout.

2.2.8 There are proposals for the upgrade of the M50 to provide three lanes in both directions.

2.2.9 In addition to the above improvement works it is proposed to construct a link road, most likely to dual carriageway standard (or with adequate land reservation to allow an upgrade from wide single carriageway) between the N2 and N3 which will be located to the western edge of the Ballycoolin industrial area. This road will link the proposed Cherryhound interchange on the N2 to an upgraded interchange at Castaheaney.

2.2.10 From previous discussions with the Local Authority, it has been established that the N2 improvement works and the N2-N3 link road will be pivotal to the operation of the general roads infrastructure proposed to serve the greater Blanchardstown area as described in the local authority objectives listed above.

2.2.11 In planning terms it has been indicated to us in previous discussions with the Local Authority that development of the zoned lands in the Ballycoolin area, which are likely to give rise to 'appreciable' levels of traffic generation, will in general not be supported by the roads authority until such time as the proposed infrastructure improvements envisaged as required to serve the area have been implemented.

2.2.12 Notwithstanding the above, in view of the infrastructural nature of the facility and its perceived need within the Fingal area and considering the low traffic generation expected in the early stages of such a facility, it is believed reasonable that the roads authority might not be opposed in principle to the implementation of the proposed waste facility, in part or full, prior to the completion of the 'entire' programme of roads improvements for the area.

2.3 Specific Objectives Influencing Traffic Conditions

2.3.1 The development strategy for the national primary roads will include the development and improvement of the N2 Dublin to Derry route. The N2 Realignment Scheme will include a Bypass of Ashbourne.

2.3.2 The completed scheme will run from the terminal point of the N2 realignment in Fingal County Council in the townland of Ward Lower to an interchange south of Ashbourne in the townland of Fleenstown and from the interchange south of Ashbourne, bypassing Ashbourne to the west, to an interchange north of Ashbourne in the townland of Rath. In total the estimated distance is 17km.

2.3.3 The new Ardee Link Road has been completed and connects to the M1/N1 in the east to the Ardee Bypass and N2 in the west. In the original Environmental Impact Assessment prepared in support of this road scheme it had been estimated that there would be a benefit to the N2 National Primary Route in that the Ardee Link Road should reduce the levels of through traffic in Ardee, Ashbourne and Slane (and past the proposed site) by approximately 27%.

2.3.4 Although the traffic figures in the original Environmental Impact Assessment are at this stage historic in terms of the actual daily traffic flows, both Louth County Council and the National Roads Authority are in agreement that the estimated proportion of traffic relief to the N2 should still be valid. Indeed from discussions with the National Roads Authority, in light of the significant growth in the population of the Greater Dublin Area in the past number of years the estimate of 27% could be considered conservative.

2.3.5 From a review of National Roads Authority traffic counter data, N2 traffic just north of the M50 (N02-23) has reduced every year for the past three years. NRA counter data on the N2 south of Ardee (Ref: N02-15) shows year-on-year reductions in traffic flows for the past five years.

2.3.6 There are plans to upgrade the N3 National Primary route within the County of Meath from Clonee-Dunshaughlin-Navan-Navan(Bypass)-Kells. The road scheme will involve the construction/improvement of approximately 45km of road including the bypass of Dunshaughlin, Navan and Kells at an estimated cost of approximately IR£223M.

2.4 Quantification of Current Traffic Flows on Links and Junctions

2.4.1 In establishing the scope of a traffic impact assessment the Institution of Highways and Transportation recommends the following:

> *"Although most TIAs relate to large or extensive developments it should be recognised that the movement of two milk tankers to a remote farm down a country lane may, in certain circumstances, be deemed to be unacceptable by the planning authority. In contrast, some city centre developments may attract a large proportion of their trips by public transport. This is often ignored because, whilst car trips form a much lower relative trip proportion, their impact often requires more detailed analysis." (Reference - IHT Guidelines for Impact Assessment: para 7; page 5)*

"It is, therefore, not possible to provide any hard and fast rules as to what constitutes a significant traffic impact and hence one for which a full traffic impact assessment should be undertaken. The Guidelines therefore recommend that a TIA should normally be produced where one or other of the following thresholds are exceeded:
(Reference - IHT Guidelines for Impact Assessment: para 8; page 5)

- *Traffic to and from the development exceeds 10% of the two-way traffic flow on the* ***adjoining highway***
- *Traffic to and from the development exceeds 5% of the two-way traffic flow on the* ***adjoining highway****, where traffic congestion exists or will exist within the assessment period or in other sensitive locations*

These thresholds should be applied in the absence of alternative guidelines from the highway (roads) authority in the form of approved or adopted policy."
(Reference- IHT Guidelines for Impact Assessment: para 9; page 6)

"It is recommended that the threshold approach should also be used to establish the area of influence of the development. Hence the study should include all links and associated junctions where traffic from the development will exceed 10% of the existing traffic (5% in congested or other sensitive locations) or such other threshold as may have been adopted by the highway (roads) or planning authority."
(Reference - IHT Guidelines for Impact Assessment: para 13; page 6)

2.4.2 In accordance with the above advice we have included in our assessment locations on the local roads network considered as having the 'potential' to experience increases in traffic flow of +10% as a direct result of traffic generated by the proposed development.

Data Collection - Traffic Surveys

2.4.3 In establishing the scope of the study, given the nature of developments in the general vicinity of the proposed site, it was thought that the influence of any additional traffic generation manifest on the local roads network was not likely to be significant beyond the immediate vicinity of the existing site.

2.4.4 In the interest of a comprehensive assessment of traffic patterns on the local roads network in the vicinity of the proposed development **Traffic***wise* Ltd. has commissioned Abacus Transportation Surveys to carry out 12 hour classified traffic turning count surveys at the existing roundabout junctions located at either end of the existing Cappagh Road onto which it is proposed the development will be provided with direct vehicular access.

2.4.5 The above traffic surveys were carried out on Tuesday 5th July over the period 0700-1900hrs using video surveillance (A copy of the video surveys can be made available upon request).

2.4.6 It is normal practice that traffic surveys are carried out on a 'neutral' day of the week, that being Tuesday. A Tuesday was selected as the traffic flows manifest on this 'neutral' day of the week are normally representative of typical traffic conditions on the local roads network.

2.4.7 It is acknowledged that July is not generally accepted as a neutral month in traffic terms. The primary reason for this is the absence from the roads network of schools related traffic, which has a significant impact on the operation of the general roads network during the commuter peak hour.

2.4.8 Given the industrial nature of the surrounding developments, although there is likely to be commuter traffic on this network, it is not though likely that significant schools traffic would be manifest on the Cappagh Road, and the above traffic surveys of 5th July are therefore considered likely to be representative of normal daily traffic flows on the Cappagh Road.

2.4.9 The locations where the 12 hour traffic surveys were undertaken are the new roundabout junction at the intersection of the Cappagh Road and the Kilshane Road, and the roundabout intersection of the Cappagh Road and the Ballycoolin Road. For ease of reference hereafter these junctions will be referred to in the report as the Kilshane Road Roundabout and the Ballycoolin Road Roundabout, respectively.

2.4.10 In addition to the above traffic survey data we are in possession of traffic count data collected at an existing facility operated by the Applicant adjacent to the N2 National Primary Road at Rathdrinagh in Co Meath. These surveys were commissioned by **Traffic***wise* Ltd. and conducted by Abacus Transportation Surveys on Tuesday 18th November 2003.

2.4.11 It is proposed that these previous surveys will be used to identify the general daily site traffic patterns and other traffic related parameters associated with such waste facilities operated by the Applicant.

2.4.12 **Traffic***wise* Ltd. are in possession of several such counts at similar facilities and care has been taken to generally validate the Rathdrinagh facility count data against our experience in the development and operation of similar waste treatment facilities throughout the country.

Identification of Network Peak Hour

2.4.13 The morning and evening peak hour periods on the Cappagh Road past the site were recorded in the traffic surveys as being 0730-0830hrs and 17:00-18:00hrs respectively.

2.4.14 The peak hour accumulative two-way traffic flow on the Cappagh Road in the morning shows 641 movements, 604 of which are cars and light vans and 37 HGV. Of these vehicles 121 cars and 16 HGV travelled northbound whilst 483 cars and 21 HGV travelled southbound.

2.4.15 The peak hour accumulative two-way traffic flow on the Cappagh Road in the evening shows 968 movements, 941 of which are cars and light vans and 27 HGV. 756 cars and 22 HGV travelled northbound whilst 185 cars and 5 HGV travelled southbound.

2.4.16 A copy of the survey data together with a location map of the junctions surveyed is provided in Appendix A.

2.4.17 In Figure 2.1 below we provide a graph showing northbound and southbound recorded two-way traffic flows on the Cappagh Road past the site during the traffic surveys.

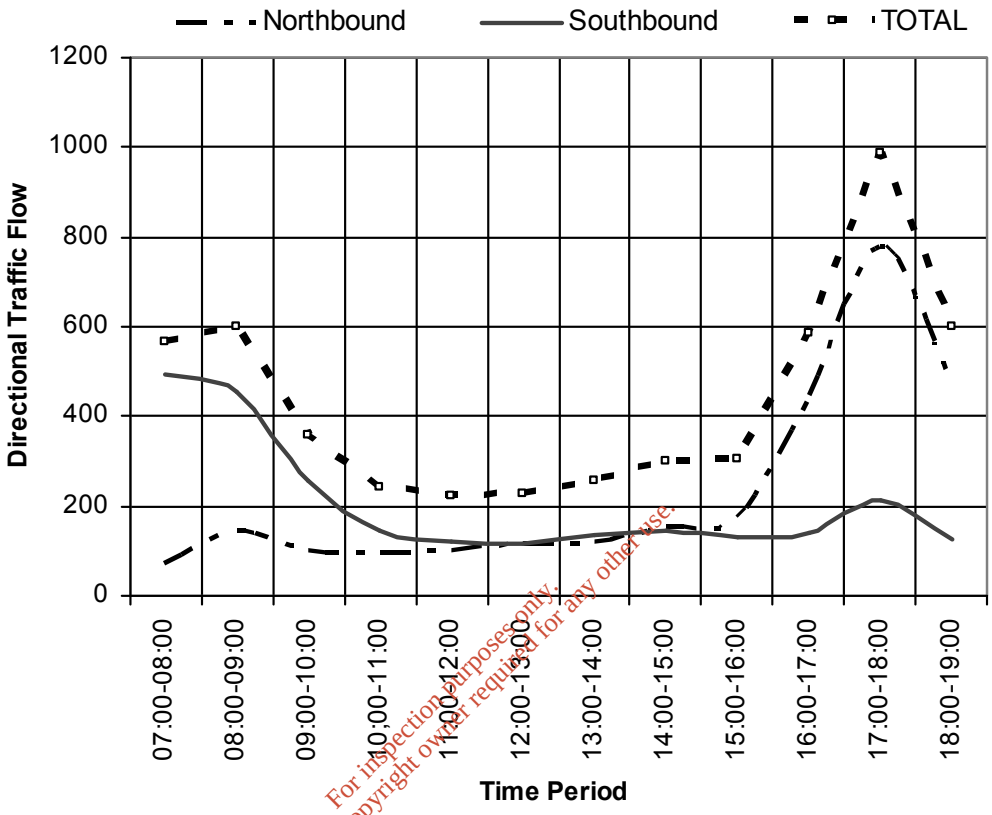


Figure 2.1 Mainline Cappagh Road Recorded Hourly Traffic Flows (2005)

2.4.18 Figure 2.1 above shows that during the day there is a relatively consistent volume of traffic in both directions. Between 10am and 4pm the recorded traffic flows in either direction are practically equal. Over this time period, which constitutes the majority of the working day, traffic flows in both directions are typically 115 cars and 15HGV.

2.4.19 The data in the morning and evening peak periods highlights the tidal nature of traffic movements on the Cappagh Road and it noted that the evening peak is significantly greater than the morning peak.

Estimate of Development Peak Hour

2.4.20 In order to establish the likely maximum period of impact of development generated traffic on the operation of the existing roads network we have prepared Figure 2.2 below which is a graph of all inbound and outbound vehicle movements at the existing PANDA operated waste facility located on the N2 at Rathdrinagh, Co Meath.

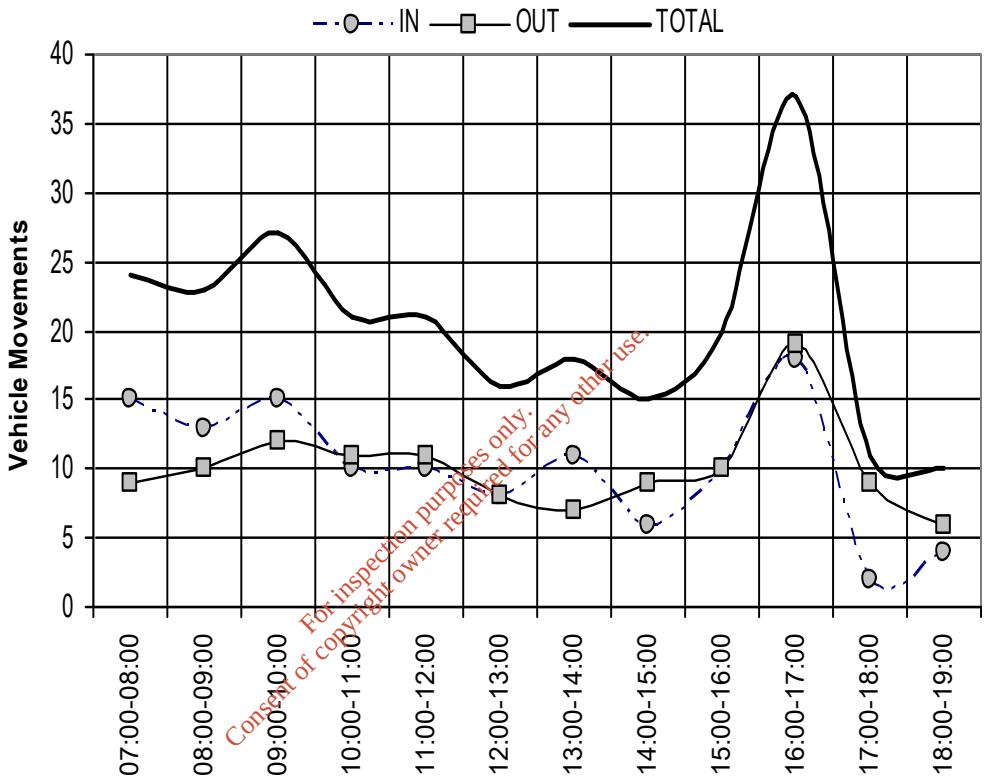


Figure 2.2 Rathdrinagh PANDA Facility Recorded Total Hourly Traffic Flows

2.4.21 From the data recorded at the existing Rathdrinagh waste facility entrance, the average number of inbound vehicles per hour was recorded as 10 and the outbound equivalent was also 10.

2.4.22 As can be seen from Figure 2.2 above there is a modest peak in traffic generation in the period 09:00-10:00hrs with a total two-way traffic flow of 27 vehicles.

2.4.23 The maximum period of activity recorded at the existing entrance occurs between 16:00-17:00hrs with a total two-way flow of 37 vehicles, 18 inbound and 19 outbound.

2.4.24 The evening development peak generation equates to approximately 15% of the total daily traffic generation both inbound and outbound at the facility, in the morning the equivalent percentage is in the region of 8.3%.

2.4.25 From the above therefore it can be seen that the time period during the 2003 traffic surveys which show an identifiable development peak in traffic flows is 16:00-17:00hrs. It is therefore expected that the period of likely maximum impact of the proposed development generated traffic will be manifest during the 16:00-17:00hr period, one hour prior to the typical commuter network peak hour.

2.4.26 Notwithstanding the above, and the identified development peak of 16:00-17:00hrs, in the interest of a robust assessment, which can be compared against the existing permitted development, and in the interest of providing the Local Authority with some degree of comfort in determining the application the evening assessment scenario we have selected will consider the coincident occurrence of the development peak of 16:00-17:00hrs with the road network peak of 17:00-18:00hrs.

2.4.27 It can be seen from Figure 2.2 above that, contrary to the assumed assessment scenario, the site generated traffic is in fact likely to be at its lowest during the recognised evening commuter peak hour of 17:00-18:00hrs. Nevertheless, the assessments to follow in this report will be based on the development peak hour traffic generation flows (16:00-17:00hrs) being assumed to occur in the network peak period.

2.4.28 Combining the two peaks will in theory represent an extreme 'worst case' scenario with respect to potential impact on the operation of the local roads network. As stated above this scenario, however likely or unlikely, is assessed in order to provide the Local Authority with sufficiently robust traffic data upon which to determine the traffic implications of the application with high degree of surety or confidence.

2.4.29 In the morning the modest development peak coincides with the network peak and therefore no adjustments will be made to the traffic figures for the morning peak hour assessments.

3 PROPOSED DEVELOPMENT

3.1 General Operation

3.1.1 PANDA Waste Services (PANDA) propose to construct and operate a recycling facility at Cappogue, Fingal. As outlined in the planning application documents, the facility will be developed in a series of distinct Stages.

3.1.2 In Stage 1 the facility will accept and recycle approximately 50,000 tonnes of tonnes of Construction and Demolition (C & D) and Commercial and Industrial (C & I) waste per annum. Stages 2 and 3 will involve the expansion of the recycling capacity to process Dry Recyclables and source Municipal Solid Wastes (MSW).

3.1.3 As discussed earlier, it is not envisaged that processing of the levels proposed under Stages 2 and 3 would be realised at the site prior to both the opening of the N2 Road Improvement Scheme and the realignment and upgrade of the Cappagh Road. It is though that both of these schemes will be realised before 2007.

3.1.4 When fully operational it is intended to accept and process 250,000 tonnes of potentially recyclable materials per annum. The proposed capacity is designed to allow for the progressive expansion of the recycling activities that can be processed and thus facilitate PANDA in tendering for local authority contracts in relation to the collection and recycling of MSW.

3.2 Facility Layout and Development

3.2.1 The site is located on Cappagh Road to the north of Stadium Business Park. The Cappagh Road forms the northern boundary of the application lands. It is proposed that the facility will be developed in 3 distinct Stages as detailed below.

3.2.2 Stage 1 will include site preparation and provision of site services, construction of perimeter security fencing, internal access roads and hard-standing areas, foul and surface water drainage system, weighbridge(s), the Construction and Demolition and Commercial and Industrial Waste Recycling Building, administration area, ESB substation and car parking. The main building will encompass approximately 1,956 square metres (m^2) The processing equipment will be fitted with dust control systems

3.2.3 Stage 2 will involve the construction of the Dry Recyclables Building which will encompass approximately 3,362 m^2.

3.2.4 Stage 3 will involve the construction of the Municipal Solid Waste Recycling Building. The Building will encompass approximately 5,546 m^2 and will be provided with an odour management system.

3.3 Hours of Operation

3.3.1 The proposed normal waste acceptance hours are 06:00 to 20:00hrs, Monday to Saturday inclusive. The facility will not normally open on Sundays. The proposed operational hours are 06:00 to 22:00hrs. However due to the nature of the waste recycling business on occasion it may be necessary for vehicles delivering wastes and removing recycled materials to operate outside these hours, for example to meet customer demands in relation to the collection of wastes and the delivery of recycled construction materials.

3.4 Waste Types and Volumes

3.4.1 The anticipated waste types and volumes that will be accepted at the facility are shown on Table 3.1. In Stage 1 it is estimated that a maximum of 50,000 tonnes of recyclable materials, comprising Construction and Demolition, and Commercial and Industrial waste will be accepted at the site.

3.4.2 It is anticipated that when the facility is operating at maximum or ultimate capacity (following completion of Stages 2 and 3 and the receipt of a Waste Licence from the Environmental Protection Agency) waste inputs will have grown to a maximum of 250,000 tonnes of waste per annum.

Waste Type	Operational Capacity	
	Stage 1	Ultimate Capacity
C & D and C & I	50,000	120,000
Dry Recyclables	0	30,000
Municipal Solid Wastes	0	100,000
TOTAL	**50,000**	**250,000**

Table 3.1 Total Waste Input to Facility

3.4.3 Initially, the majority of the C & D and C & I waste will be generated by, and delivered to the facility, by PANDA collection vehicles. This will minimise the risk of the delivery of unsuitable material. As the business develops it is envisaged that increasing amounts of waste will be delivered by third parties, including permitted waste collectors. Wastes will not be accepted from individual householders.

3.5 Waste Processing

3.5.1 Although the processing of waste is described elsewhere in the application documentation, it is considered worthwhile to outline the traffic related detail of how wastes are transported to the site, handled and exported. In the following a brief description of the processing procedure is provided for each waste stream.

Construction and Demolition Waste

3.5.2 The waste will be delivered in covered skips. All waste delivered to the facility will be inspected to determine if it is suitable for recycling activities. Any waste loads, which upon inspection are found to contain large amounts of unsuitable wastes, will not be accepted at the site but diverted to PANDA's Waste Licensed facility in Meath. The accepted wastes will be off loaded inside the C & D and C & I Recycling Building.

3.5.3 As outlined above, initially, the majority of the C & D and C & I waste will be generated by and delivered to the facility by PANDA collection vehicles. Form recent empirical data gathered at the PANDA waste facility at Rathdrinagh in Co Meath we have established that the average payload per skip is 6.3 tonnes. This average is derived from recent weighbridge data and is based on the use of modern vehicles.

3.5.4 From our experience of the operation of similar facilities, mixed construction and demolition waste can be expected to arrive in larger loads (20 tonnes), but on average the payload is typically expected to be between 5.5 and 8.0 tonnes per vehicle, accordingly the above figure of 6.3 tonnes adopted from the Meath facility is expected to be representative.

3.5.5 Wood and metal will be separated manually using a mechanical grab and subsequently removed off-site to approved recovery/recycling facilities. The residual material will be shredded and screened to remove the fine fraction containing subsoil and topsoil, which will be removed of site in articulated trucks for use in land reclamation projects. The heavy fraction containing concrete, brick etc. will then pass through a crusher to produce an inert aggregate suitable for use in construction projects. The materials will be removed off-site in articulated trucks for use in construction projects.

3.5.6 As is the typical operation and indeed function of such facilities in transportation terms, all outbound movements of processed materials will be in the most commercially viable payloads.

3.5.7 It is in the interest of the operator to ensure that outbound payloads are maximised. Modern articulated vehicles are typically capable of 24 tonne payloads. In the interest of a robust assessment of the likely traffic generation of the proposed development it is assumed that the average outbound payload will be 20 tonnes. This is a typical outbound payload and takes into account any increases in outbound traffic volumes which might occur as a result of some incidences of partial loads.

Commercial & Industrial Waste

3.5.8 The Commercial and Industrial wastes will include pre-segregated and mixed wastes which will be delivered to the facility in compactors, rear end loaders and skips. In the initial stages the pre-segregated wastes will be off loaded in the C & D and C & I Recycling Building in separate bays from the mixed waste. Following the construction of Stage 2 this waste stream will be diverted to the Dry Recyclables Building.

3.5.9 From our experience of the operation of similar sites, and from the data at the Rathdrinagh site, it is estimated that the typical average load delivered to facilities in the above vehicle types is 6 to 8 tonnes. For the purposes of the traffic assessments herein it is assumed that the average inbound vehicle payload will be 6.5 tonnes.

3.5.10 On the tipping floor the waste will be inspected for unsuitable wastes and such materials will be immediately removed to a designated internal waste quarantine area. The pre segregated material will be moved to the baling units or loading bays where, depending on its nature, it will be baled, or compacted before being loaded onto curtain side trailers for removal off-site.

3.5.11 For the purposes of this assessment and in the interest of simplifying the calculations, it is assumed that outbound C&I waste payloads will be 20 tonnes, although it should be noted that bailed wastes are often transported in larger tonnages (up to 30 tonnes).

3.5.12 The mixed waste will initially be sorted using a mechanical grab to remove large items such as timber and metal. Such items will be removed to the appropriate storage/handling areas inside the building. The remaining waste will be separated manually and mechanically into the different waste streams (paper, cardboard, plastic, glass, metal, organics).

3.5.13 The organic waste will be removed to an off-site composting facility in articulated trucks, while the inert materials will be stored on-site pending removal off-site recovery facilities. As above typical outbound vehicle payloads are 20 tonnes, and this is the figure we have adopted for the purposes of this traffic study.

Municipal Solid Wastes

3.5.14 Municipal Solid Wastes comprising mixed and pre segregated materials will be delivered to the facility in refuse collection vehicles. Although the tonnages carried by refuse vehicles can vary widely (max payloads are in excess of 10 tonnes). The proposed facility will employ modern refuse vehicles similar to those now in use at the Rathdrinagh facility. From a review of recent weighbridge data at that facility it has been established that the current average inbound payload of vehicles transporting Municipal Solid Wastes to the site is 7.99 tonnes. Considering that the same type of vehicles will be used at the proposed facility it is considered reasonable to adopt an average inbound payload of 8.0 tonnes for the purposes of this assessment.

3.5.15 Mixed and pre-segregated dry recyclables will be unloaded in a designated area inside the Dry Recyclables Building, where it will be inspected to ensure it is suitable for processing i.e. it does not contain any hazardous or other unsuitable material.

3.5.16 It is proposed to mechanically separate the mixed waste to remove recyclable materials including metals, paper, plastics, compostable materials and materials that are suitable for energy recovery. The recovered metals, paper and plastic will be stored on-site pending removal to off-site recovery/recycling facilities using curtain side trailers/containers. The compostable materials will be removed off-site for composting at a licensed facility. The residue will be processed on site to produce a refuse derived fuel (RDF) which will be shipped overseas in enclosed containers for use as a fuel pending the development of Irish markets for this product. It is assumed for the purposes of this assessment that all outbound loads will be an average of 20 tonnes per vehicle.

3.6 Existing Planning Permission

3.6.1 The existing site currently enjoys a planning permission Planning Register Reference No. F04A/1123. The Applicant in the case of the current permission is Heatherly Securities Ltd. The development is described in the permission as follows.

"Industrial/Office development of 10,579sq.m which would consist of 7No. 2 storey Industrial/Office Units varying from 523sq.m. to 2,273sq.m. and in height from 8.3m to 9.85m including ESB substation and switching room of 28.8sq.m. with associated parking for 304 cars, boundary fencing, landscaping, berming, site works and a new access road from the existing Stadium Business Park on a 2.58 hectare site adjacent to the Cappagh Road."

3.6.2 As described in the introduction, in the interest of a comprehensive and comparative assessment of the traffic characteristics of the existing 'development site' we will provide an assessment of the traffic generation potential of the existing permitted Industrial/Office development together with that of the proposed waste treatment facility.

4 MODAL CHOICE/TRIP ATTRACTION

4.1 Current Permitted Development – Potential Traffic Generation

4.1.1 As outlined above the current planning permission includes for 10,579sq.m Industrial/Office development with parking provision for some 304 vehicles. The conditions appended the permission stipulates in 5(a) that the office element can occupy up to 25% of the total floor area. The detail of Condition 5(b) infers that dual warehouse and or production activities are expected at the site in the granting of permission.

4.1.2 In the interests of establishing the likely levels of traffic expected to be attracted by a development of the nature permitted we have interrogated the TRICS v4.7 database (Trip Rate Information Computer System). The current version of TRICS contains over 1,200 development sites and 3,000 survey days, within 81 separate land uses across the development spectrum. The flexibility of the system allows the user to calculate trip rates from individual, or a group of selected development sites, which can be selected by the user imposing a wide range of database field criteria (such as Site Area, Gross Floor Area, Retail Floor Area, number of employees etc.).

4.1.3 In forecasting the likely traffic generation at a proposed development through reference to a database, the Institution of Highways and Transportation guidelines advise as follows,

> *"having assessed the database to derive an estimate of trip attraction, professional judgement has to be applied in determining how the information should be used. It will be noted that that for most land uses the spread of data is very large and hence the use of average trip rates as a guide to the design of junction layout or the sizing of a car park could lead to under or over-provision. As the real cost of undersizing infrastructure is frequently very considerable, since additional land cannot be made available later, it is recommended that developers and highway authorities should adopt a robust forecast i.e. a value higher than the average.*

An approach that is currently in widespread use is to consider a range of values with the higher value being the 85th percentile of the data sample (i.e. .the trip rate exceeded by only 15% of the sample) and the lower value being reflected by the average trip rate."

4.1.4 We have interrogated the TRICS database under the following land-use categories.

- Employment – Office
- Employment – Warehousing
- Employment – Industrial

Office Development - Assessment Trip Rate

4.1.5 Results for office developments were returned based on a selection of some 122 individual surveys. To determine the 85th percentile site in accordance with the above advice of the Institution of Highways and Transportation, the database survey sites were ranked in order of traffic generation. The ranking parameter was the total number of vehicle movements to and from the survey sites over the peak hour traffic periods on the Cappagh Road, identified as 07:30-08:30hrs and 17:00-18:00hrs respectively.

4.1.6 TRICS site reference WS-02-A-04 is the 85th percentile survey site for both the morning and evening peak periods. By way of further information, this is the site of Southern Water's Offices of 6,502sq.m in Worthing, West Sussex, England. TRICS detail on the 85th percentile site is as follows. *"This site was part of the TRICS Seasonality Research project, and was surveyed continuously over the duration of a year. The site is located at the edge of the Durrington-on-Sea part of Worthing, at the western edge of the town. It is off the A2032, which heads west out of Worthing and past Angmering, and east through Worthing and past Sompting. Other local roads head towards the coastal areas. A college is located to the east of the site, whilst non built-up areas to the east and north-east include woodlands and campsites. More built-up areas are in the other directions.'*

4.1.7 The 85th percentile assessment traffic generation rates forecast at typical office developments is as shown in Table 4.1 below. Based upon 25% of the GFA accommodating office type uses the potential traffic generation of this element of the permitted development is also provided in Table 4.1.

Peak Time Period	Forecast Assessment Trip Rate per 100sq.m		Potential Traffic Generation	
	Arrival Rate	Departure Rate	Arrivals	Departures
Morning 07:30-08:30hrs	2.17	0.35	**57**	**9**
Evening 17:00-18:00hrs	0.50	2.40	**13**	**63**

Table 4.1 Forecast Potential Peak Hour Traffic Generation - Offices
(Source TRICS v4.7)

Warehouse Assessment Trip Rate

4.1.8 The selection of sample sites in the TRICS database is not as extensive in this category of development, accordingly rather than estimate or interpolate an 85th percentile site, we have chose the 100th percentile trip rates for all sites. Results for warehouse developments were returned based on a selection of some 6 individual surveys.

4.1.9 The 100th percentile peak hour assessment traffic generation rates forecast at warehouse developments are as shown in Table 4.2 below. Based upon 75% of the total GFA accommodating warehouse uses the potential traffic generation to this element of the permitted development is also provided in Table 4.2.

Peak Time Period	Forecast Assessment Trip Rate per 100sq.m		Potential Traffic Generation	
	Arrival Rate	Departure Rate	Arrivals	Departures
Morning 07:30-08:30hrs	0.73	0.37	**58**	**29**
Evening 17:00-18:00hrs	0.10	0.48	**8**	**38**

Table 4.2 Forecast Potential Peak Hour Traffic Generation - Warehouse
(Source TRICS v4.7)

Industrial Units Assessment Trip Rate

4.1.10 The selection of sample sites in the TRICS database for industrial uses is similarly not as extensive as for offices. Nonetheless there are 16 individual survey days. The 85th percentile site is not reported by TRICS since the sample size is less than 20 sites, accordingly judgement has been used in the selection of trip rates considered representative of the 85th percentile.

4.1.11 The estimated 85th percentile peak hour assessment traffic generation rates forecast at industrial unit developments are as shown in Table 4.3 below. Based upon 75% of the total GFA accommodating industrial units the potential traffic generation to this element of the permitted development is also provided in Table 4.3.

Peak Time Period	Forecast Assessment Trip Rate per 100sq.m		Potential Traffic Generation	
	Arrival Rate	Departure Rate	Arrivals	Departures
Morning 07:30-08:30hrs	2.2	0.17	**175**	**13**
Evening 17:00-18:00hrs	0.13	0.68	**10**	**54**

Table 4.3 Forecast Potential Peak Hour Traffic Generation – Ind. Units
(Source TRICS v4.7)

Overall Development Considered as an Industrial Estate

4.1.12 It might not be unreasonable to assume that the permitted development would in traffic terms operate in a manner similar to an Industrial Estate. In the interest of a comprehensive study of the potential traffic generation of the permitted development in the following we provide an estimate of the peak hour assessment traffic generation of the permitted development under the TRICS category of 'Industrial Estate'.

4.1.13 The selection of 85th percentile peak hour trip rates is based on a sample of 189 survey sites. The estimated 85th percentile peak hour assessment traffic generation rates forecast at industrial estate type developments are as shown in Table 4.4 below. Based upon 100% of the total GFA being modelled as an industrial estate the potential traffic generation to the permitted development is also provided in Table 4.3.

Peak Time Period	Forecast Assessment Trip Rate per 100sq.m		Potential Traffic Generation	
	Arrival Rate	Departure Rate	Arrivals	Departures
Morning 07:30-08:30hrs	RE-02-D-04 1.19	RE-02-D-04 0.35	**126**	**37**
Evening 17:00-18:00hrs	LC-02-D-03 0.37	ST-02-D-02 1.37	**39**	**145**

Table 4.4 Forecast Potential Peak Hour Traffic Generation – Ind. Estate.
(Source TRICS v4.7 – 85th%ile Site Referenced)

Summary of Potential Traffic Generation of Permitted Development

4.1.14 The following Table 4.5 is a summary of the above traffic generation rate assessments and provides a range of traffic generation which could reasonably be expected at the permitted development land uses during the peak hour periods.

4.1.15 Four separate scenarios are considered as follows:

- Scenario A: 25% Office Use + 75% Warehouse
- Scenario B: 25% Office Use + 75% Industrial Units
- Scenario C: 25% Office Use + 37.5% Industrial Units + 37.5% Warehouse
- **Scenario D: 100% Industrial Estate**

Assessment Criteria	Peak Time Period	Potential Traffic Generation	
		Arrivals	Departures
Morning 07:30-08:30hrs	Scenario A	115min	38
	Scenario B	232max	22min
	Scenario C	173	30
	Scenario D	126	37
	AVERAGE	**161**	**32**
Evening 17:00-18:00hrs	Scenario A	21min	101min
	Scenario B	23	117
	Scenario C	22	109
	Scenario D	39max	145max
	AVERAGE	**26**	**118**

Table 4.5 Potential Peak Hour Traffic Generation – Permitted Development

4.1.16 From the above data of Table 4.5 it can be seen that the traffic generation forecast for the site under the various scenarios is relatively similar. The average inbound traffic generation in the morning peak hour is 161 vehicles and the average outbound generation in the evening is 118 vehicles.

4.1.17 Although under Scenario D the morning peak is less intense than the average, the evening peak is higher. On balance it is considered that the Scenario D (Industrial Estate) is likely to provide a reasonable estimate of traffic generation to the permitted site development on a daily basis. For the purposes of the assessments herein it is assumed that 20% of the traffic to the permitted development, modelled as an Industrial Estate, would be HGV.

4.1.18 Form the TRICS database under the category of Industrial Estate the 85th percentile trip rates for the 12 hour period 07:00-19:00hrs are 6.71/100sq.m. and 6.61/100sq.m for departures and arrivals respectively.

4.1.19 Over the course of the entire working day it is therefore estimated that the permitted development would be likely to generate approximately 710 inbound vehicles movements, and 700 outbound movements.

4.2 Proposed Development – Potential Traffic Generation

4.2.1 PANDA Waste Services (PANDA) propose to construct and operate a recycling facility at Cappogue, Fingal. As outlined in the planning application documents, the facility will be developed in a series of Stages.

4.2.2 In Stage 1 the facility will accept and recycle approximately 50,000 tonnes of tonnes of Construction and Demolition (C & D) and Commercial and Industrial (C & I) waste per annum. Stages 2 and 3 will involve the expansion of the recycling capacity to process Dry Recyclables and source Municipal Solid Wastes (MSW).

4.2.3 When fully operational it is intended to accept and process 250,000 tonnes of potentially recyclable materials per annum.

4.2.4 In the following, combined with the information provided in Section 3.5 *'Waste Processing'* we provide an estimate of the number of works vehicles which might reasonably be expected to be generated by the proposed development when fully operational. The methodology adopted in the assessment is based on empirically derived data from similar waste facilities throughout the country (predominantly within 20km of Dublin) together with data recorded at the PANDA waste facility located adjacent to the N2 at Rathdrinagh, Co Meath.

4.2.5 In Section 3.5 empirically derived data is provided regarding the typical payloads of the various vehicles which are normally used to transport the various waste streams imported and exported from similar waste facilities. Given the estimated ultimate quantities of waste it is proposed will be processed in each waste stream, it is possible to estimate likely traffic generation rates at the proposed development site over the course of a typical working day. Derivation of traffic generation by this methodology is endorsed by the Institution of Highways and Transportation.

Waste Transportation Related Traffic Generation – Stage 1

4.2.6 In Stage 1 of the proposed development it is proposed to accept an ultimate quantity of some 50,000 tonnes of waste in C&D and C&I waste streams. From Section 3.5 the typical payload of Skip Lorries importing C&D waste is shown to be 6.3 tonnes. The equivalent typical inbound payload for Rear End Loaders, Skips and Compactors delivering C&I waste is estimated to be approximately 6.5 tonnes. In the interest of simplifying the calculations it is assumed that the average inbound payload for both waste streams is the lower of the two values.

4.2.7 Based on all waste, be it C&D or C & I, imported in payloads of 6.3 tonnes, the annual import of a combined total of 50,000 tonnes is estimated as likely to generate in the region of 7,936 vehicle trips per annum.

4.2.8 As is typical practice at similar facilities, it is expected that the operator of the site will exploit insofar as practicable the load carrying capacity of the articulated vehicles used to export waste from the site. The typical payload of vehicles exporting was is approximately 20 tonnes. Based on 50,000 tonnes of waste being processed at the facility it is likely that some 2,500 vehicles would be generated by the export of materials during Stage 1 operations.

4.2.9 Stage 1 is therefore likely to generate in the region of 7,936 smaller rigid body HGV (skip lorry) importing waste and some 2,500 articulated HGV exporting processed wastes.

4.2.10 Allowing for bank holidays and half-day working on Saturdays there are approximately 272 working days per year when wastes will be received at the facility. Accordingly it can be appreciated that the typical daily traffic generation of the proposed Stage 1 facility, when fully developed, will be some 29 vehicles importing waste and 9 exporting waste.

4.2.11 In the above assessment all vehicles importing waste are presumed to leave the site empty and we have presumed there will be no backhaul of materials. Given that skip lorries are presumed to leave empty, those movements associated with the delivery of skips to customers are considered to be included for in the calculations. In the interest of clarity, the above data is summarised in Table 4.6 below.

Waste Type	Quantity	Daily Vehicle Trip Generation Stage 1		
		Import	Export	Total
		Veh/day	Veh/day	Veh/day
C & D and C & I	50,000	29	9	38
Dry Recyclables	0	0	0	0
MSW	0	0	0	0
TOTAL	**50,000**	**29**	**9**	**38**

Table 4.6 Daily Works Traffic Generation of Proposed Facility – Stage 1
(Assessment Traffic Flows)

4.2.12 From Table 4.6 the proposed facility is forecast as likely to generate 38 daily vehicle trips with respect to waste transportation. A trip incorporates two separate vehicle movements, in and out of the site, in total therefore the site is estimated as likely to generate 38 vehicle movements both to and from the site giving a total number of individual vehicle movements in the order of 76 per day.

4.2.13 From our review of the operation of similar sites together with the operation of related waste and landfill sites, significant peaks in traffic generation are not normally experienced in relation to works traffic.

4.2.14 Save for a peak in the morning during which typically 14% of daily works traffic is generated, normally such sites generate in the region of 9% of daily traffic for each hour of off-peak operation. It is normal for works traffic generation to reduce significantly after about 17:00hrs. In general, save for a unique peak between 16:000-17:00hrs, these patterns of traffic generation are reflected in the 2003 traffic surveys of the existing PANDA waste facility at Rathdrinagh.

4.2.15 Form the 2003 data recorded at the Rathdrinagh site it has been estimated that peak morning traffic to that site is approximately 8.3% of daily traffic, whilst in the evening the equivalent figure is 15%. This shows a reversal in peak activity over the norm outlined above. Given this disparity with respect only to the peak hours, in the interest of a robust assessment it is assumed that there would be a peak traffic generation of 15% of daily traffic generation in both the morning and evening network peak hours. Clearly this assumption is robust.

4.2.16 Based on the above assumption it is expected that during the peak hours the proposed site will generate an 'assessment' traffic flow of approximately 4.35 trips by smaller rigid body HGV such as skips and the like and 1.4 articulated HGV trip exporting waste.

4.2.17 Works traffic generation beyond the hour ending 17:00hrs is likely to drop from the average, nevertheless for the purposes of the assessments herein it is assumed that the evening peak hour period will see the above peak development traffic generation of 15% of daily traffic generation, which is indeed considered robust.

4.2.18 A summary of the forecast peak hour assessment traffic generation of Stage 1 is provided in Table 4.7 below.

Time Period	Works Vehicle Trip Generation – Stage 1					
	Rigid Body		Articulated		Total	
	In	Out	In	Out	In	Out
Morning 07:30-08:30hrs	4	4	1	1	5	5
Off Peak Times	3	3	1	1	4	4
Evening 17:00-18:00hrs	4	4	1	1	5	5

Table 4.7 Peak Works Traffic Generation at Proposed Facility – Stage 1
(Assessment Traffic Flows)

Waste Transportation Related Traffic Generation – Ultimate Capacity

4.2.19 It is proposed that the development will have the ultimate processing capacity of some 250,000 tonnes per annum. The proportion of handling capacity for each waste stream is estimated to be 120,000 tonnes of C&D and C&I, 30,000tonnes of Dry Recyclables and 100,000 tonnes of MSW.

4.2.20 From Section 3.5 the typical payload of Skip Lorries importing C&D waste is shown to be 6.3 tonnes. The equivalent typical inbound payload for Rear End Loaders, Skips and Compactors delivering C&I waste is estimated to be approximately 6.5 tonnes. In the interest of simplifying the calculations a typical payload of 6.3 tonnes is assumed in both waste streams. Based on the import of 120,000 tonnes this element of the facility would be likely to generate in the region of 19,047 vehicles per annum.

4.2.21 By way of information only, if all waste were C&I and were imported in 6.5 tonne loads this figure would reduce to 18,460 vehicles per annum due to the increased average payload normally associated with C&I waste streams.

4.2.22 In the Dry Recyclable and MSW waste streams the inbound typical loads are estimated to be approximately 8.0 tonnes per vehicle. Based on the import of 130,000 tonnes, this element of the facility is forecast as likely to generate in the region of 16,250 vehicle movements per annum.

4.2.23 As is typical practice at similar facilities, it is expected that the operator of the site will exploit insofar as practicable the load carrying capacity of the articulated vehicles used to export waste from the site. The typical payload of these vehicles is approximately 20 tonnes. Based on 250,000 tonnes of waste being processed at the facility it is likely that some 12,500 vehicles per annum would be generated by the export of materials if the site were operating at Ultimate processing capacity.

4.2.24 In summary therefore, when fully operational the facility is estimated as having the potential to generate in the region of 19,047 smaller rigid body HGV and 16,250 refuse vehicles importing waste and some 12,500 articulated HGV exporting processed wastes.

4.2.25 Allowing for bank holidays and half-day working on Saturdays there are approximately 272 working days per year when wastes will be received at the facility. Accordingly it can be appreciated that the typical potential daily traffic generation of the proposed facility if operating at ultimate capacity will be some 70 smaller rigid body HGV together with 60 refuse vehicles importing waste and 46 articulated vehicles exporting waste.

4.2.26 In the above assessment all vehicles importing waste are presumed to leave the site empty and we have presumed there will be no backhaul of materials. Given that skip lorries are presumed to leave empty, those movements associated with the delivery of skips to customers are considered to be included for in the calculations. In the interest of clarity, the above data is summarised in Table 4.8 below.

Waste Type	Quantity	Vehicle Trip Generation		
		Import	Export	Total
		Veh/day	Veh/day	Veh/day
C & D and C & I	120,000	70	22	92
Dry Recyclables	30,000	60	24	84
Municipal Solid Wastes	100,000			
TOTAL	**250,000**	**130**	**46**	**176**

Table 4.8 Works Traffic Generation of Proposed Facility – Ultimate Capacity
(Assessment Traffic Flows)

4.2.27 From Table 4.8 the proposed facility is forecast as likely to generate 176 vehicle trips with respect to operations traffic in the import and export of waste. A trip incorporates two separate vehicle movements, in and out of the site, in total therefore the site is estimated as likely to generate 176 vehicle movements both to and from the site giving a total number of individual vehicle movements in the order of 352 per day.

4.2.28 Earlier calculations based on the TRICS database indicate that the likely daily traffic generation of the permitted Industrial development is in the order of 700 vehicle trips per day or 1,400 vehicle movements to and form the site.

4.2.29 Even allowing for a robust 50 additional traffic movements to and from the proposed facility by staff and sundry visitors it can be seen that the potential daily traffic generation of the proposed facility operating at ultimate capacity is likely to be in the region of a quarter that of a typical Industrial Estate as is currently permitted on the subject site.

4.2.30 From our review of the operation of similar sites together with the operation of related waste and landfill sites, significant peaks in traffic generation are not normally experienced in relation to works traffic. Save for a peak in the morning during which typically 14% of daily works traffic is generated, normally such sites generate in the region of 9% of daily traffic for each hour of operation. It is normal for works traffic generation to reduce significantly after about 17:00hrs.

4.2.31 Notwithstanding this information, as in the derivation of assessment flows for Stage 1, given the evening peak (16:00-17:00) recorded in the data at the existing Radthdrinagh facility it is assumed for the purposes of assessment that 15% of daily development generated traffic will be manifest in both the morning and evening peak periods on the local roads network. Off-peak traffic generation is assumed to be 9% of daily traffic generation per hour over the course of the working day.

4.2.32 Based on the above assumption it is expected that during the peak hours when operating at Ultimate Capacity the proposed site will generate an 'assessment' traffic flow of approximately 12 trips by smaller rigid body HGV such as skips, 27 trips by refuse vehicles and 7 articulated HGV trip exporting waste and product.

4.2.33 Works traffic generation beyond 17:00hrs is likely to drop from the average, nevertheless for the purposes of the assessments provided in this report it is assumed that the evening peak hour period will see the above peak development traffic generation of 15% of daily traffic generation, which is indeed considered robust.

4.2.34 A summary of the forecast peak hour traffic generation of Stage 1 is provided in Table 4.9 below.

Time Period	Works Vehicle Trip Generation – Stages 2 & 3							
	Rigid Body		Refuse Veh		Articulated		Total	
	In	Out	In	Out	In	Out	In	Out
Morning 07:30-08:30hrs	11	11	9	9	7	7	27	27
Off Peak Times	6	6	5	5	4	4	15	15
Evening 17:00-18:00hrs	11	11	9	9	7	7	27	27

Table 4.9 Works Traffic Generation of Proposed Facility – Ultimate Capacity (Assessment Traffic Flows)

Staff and Sundry Traffic Generation

4.2.35 In addition to the above works vehicles, clearly there will be other sources of traffic generation at the site. This traffic will arise primarily from staff, sundry visitors etc. From traffic surveys undertaken at the PANDA facility located on the N2 at Rathdrinagh, Co Meath we have established that at that facility, in total over the course of the working day there were 68 inbound and 64 outbound car movement recorded. The following Figure 4.2 shows the 2003 daily profile of pcu or passenger car units to and from the Rathdrinagh Facility.

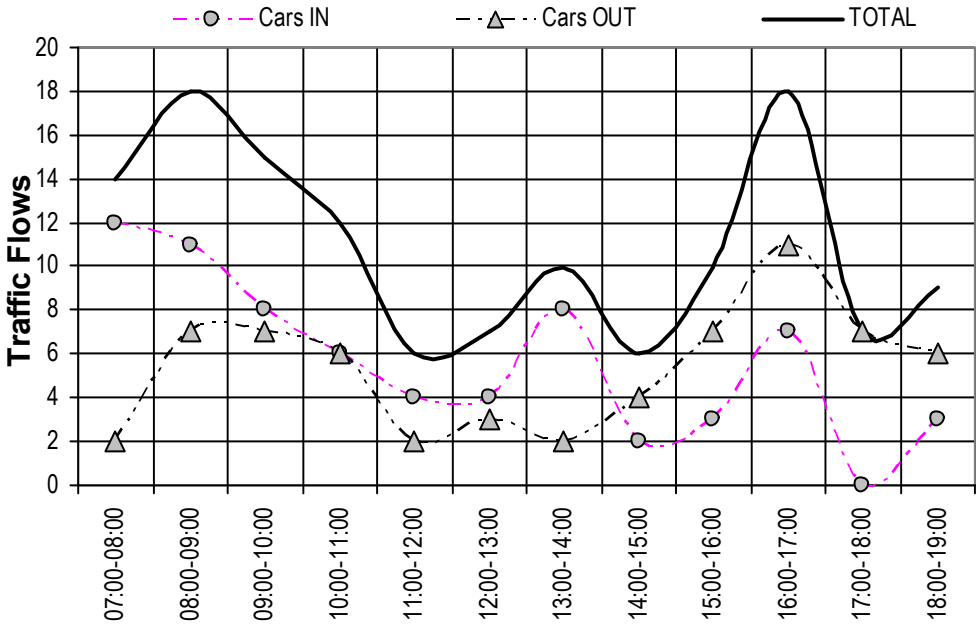


Figure 3.3 Typical 2003 Daily Pattern of Car Bourne Arrivals/Departures
(Source Abacus Transportation Surveys Count of 18th Nov 2003 - Rathdrinagh)

4.2.36 It can be seen that the peak associated with staff arrivals has already occurred prior to the 07:00hrs commencement of the surveys. During the morning peak hour period of 08:00 - 09:00hrs there were 11 inbound and 7 outbound car movements. In the evening development peak hour 16:00 - 17:00hrs there were 11 inbound and 7 outbound movements by private car.

4.2.37 From discussions with the Applicant it is expected that the proposed site would have a lower level of employment than at the Rathdrinagh survey site and indeed should by virtue if its commercial operation (no public access) generate less sundry car traffic than at Rathdrinagh.

4.2.38 The proposed Stage 1 facility will process a similar quantity of waste as was processed at the Rathdrinagh facility in 2003 albeit that there will be only two waste streams processed in Stage 1. Accordingly, it is expected that staffing numbers in Stage 1 will be less than at the existing PANDA facility at Rathdrinagh.

4.2.39 When operating at ultimate capacity in the subsequent phases it is considered reasonable to assume a doubling in the initial Stage 1 staff and sundry vehicle movements generated at the facility over the course of the working day. From discussions with the Applicant and future operator of the site it is estimated that final staffing levels will be less than at Rathdrinagh. For the purposes of this assessment it is assumed that the in the ultimate stage of operation, staffing levels will be approximately 2/3 of that at the Rathdrinagh facility. During Stage 1 it would accordingly be 1/3.

4.2.40 The surveyed pcu (passenger car unit) traffic generation at the Rathdrinagh site shows that 7 inbound and 11 outbound vehicles are recorded during the identified morning peak hour periods. As discussed above, these are assumed to be sundry car movements since staff vehicles generally arrive prior to 07:00hrs.

4.2.41 During the evening peak hour it can be seen form the above Figure 4.2 that activity at the site generally reduces after a peak in and around 17:00hrs. Typical pcu traffic generation is shown as a reversal in the morning situation with 11 inbound vehicles and 7 outbound.

4.2.42 Given that staff should arrive at the site well before the morning peak and leave well after the evening peak this traffic is not included in the peak hour assessments. Unlike the Rathdrinagh facility, the proposed development will not be open to the public, accordingly it is reasonable to expect that sundry car movements would be less at the proposed facility than recorded at Rathdrinagh.

4.2.43 Notwithstanding the above, It is assumed for the proposes of a robust assessment that 5 sundry vehicles (services, postman, late staff etc.) will enter and exist over both the morning and evening peak hour periods. In the interest of simplicity this assumption spans all stages of the project.

Forecast Peak Hour 'Assessment' Traffic Generation

4.2.44 From the above the following Table 4.10 shows the forecast peak hour and off-peak traffic generation at the proposed facility for Stage 1 whilst Table 4.11 shows the equivalent traffic 'assessment' flows for when the facility is operating a ultimate processing capacity of 250,000tonnes per annum.

Time Period	Works Vehicle Assessment Trip Generation – Stage 1					
	Rigid Body		Articulated		Private Cars	
	In	Out	In	Out	In	Out
Morning 07:30-08:30hrs	4	4	1	1	5	5
Off Peak Times	3	3	1	1	2	2
Evening 17:00-18:00hrs	4	4	1	1	5	5

Table 4.10 Morning and Evening Assessment Traffic Flows – Stage 1

Time Period	Works Vehicle Assessment Trip Generation – Stages 2 & 3							
	Rigid Body		Refuse Veh		Articulated		Private Cars	
	In	Out	In	Out	In	Out	In	Out
Morning 07:30-08:30hrs	11	11	9	9	7	7	5	5
Off Peak Times	6	6	5	5	4	4	2	2
Evening 17:00-18:00hrs	11	11	9	9	7	7	5	5

Table 4.11 Morning and Evening Assessment Traffic Flows - Ultimate Capacity

4.2.45 The robust assessment traffic flows assumed for the peak hours of Stage 1 above, show that in total some 10 vehicle movements are expected inbound and outbound at the proposed site access. In the subsequent stages of the project, assuming the site realises its full operational potential, the equivalent assessment traffic flows show some 32 vehicle movements inbound and outbound.

4.2.46 It should be noted that these 'assessment' traffic flows are considered robust and should not be viewed as 'typical' flows expected at the facility. As discussed earlier, robust assessment traffic flows are used so as to provide the Local Authority with an appraisal of the proposed development under extreme operational conditions or under a 'worst case scenario'.

4.2.47 As can be seen form the above Tables 4.10 and 4.11 typical traffic flows during off-peak times are likely to be significantly lower with 6 trips per hour expected in Stage 1 and 17 trips per hour when operating a full capacity and receiving 250,000 tonnes of material per annum.

Construction Related Traffic Attraction

4.2.48 It is proposed that the development would be implemented in distinct phases. It is expected that a significant proportion of overall development should be completed before Stage I or at mid to late 2006 in order to facilitate Stage 1 operations. It is proposed that practically all infrastructure and ancillary buildings etc. would be constructed before Stage 1 becomes operational.

4.2.49 Clearly the construction phases of the project will generate traffic on the local road network. We consider that the primary generators of traffic will be deliveries of construction materials and construction staff.

4.2.50 In the assessment of traffic attraction to the development we have made the following assumptions, based on the experience of the consultants involved in the preparation of the Planning Application. General workforce for construction is expected to constitute approximately 30 staff which it is assumed would constitute 25 vehicles into the development in the morning and 25 vehicles out in the evening, whilst delivery of materials has been assumed to account for no more than 10 vehicles throughout the day.

4.2.51 In terms of the importation of construction materials for the facility it is expected that the site will have a high degree of self-sufficiency in this respect. We have been advised that site preparation works are likely to be minimal. It is assumed that earth/materials would be moved about the site in large site vehicles therefore, save for the transportation of these vehicles to the site at the beginning of each of the phased construction period, there is likely to be no traffic generation as a result of these operations.

4.2.52 Given below in Table 4.12 is a summary of the assumed arrival/departure patterns associated with the construction related traffic. Figures are provided for total daily traffic movements and the assumed likely distribution of traffic throughout the day.

Time Period	Construction Traffic		IN	OUT	Comment
	Staff	Deliveries			
0700-0800	25 All Staff	2	27	2	Construction start at 0800hrs
0800-0900	2	2	4	4	
0900-1000	1	1	2	2	
1000-1100	0	1	1	1	
1100-1200	1	1	2	2	
1200-1300	0	0	0	0	
1300-1400	5	0	5	5	Lunch Hour
1400-1500	0	1	1	1	
1500-1600	1	1	2	2	
1600-1700	0	1	1	1	
1700-1800	0	0	0	0	
1800-1900	25 All Staff	0	0	25	Construction finish 1800
TOTALS	**60 veh**	**10**	**45**	**45**	

Table 4.12 Estimate of Construction Related Traffic Generation

4.2.53 In the above Table 4.12 we have assumed that all construction staff would arrive prior to 0800hrs in the morning and would depart after 1800hrs in the evening, this is based on the hours of construction between 0800-1800hrs.

4.2.54 It is assumed that a nominal number of trips would be undertaken by staff throughout the day, these trips are assumed to be associated with the likes of trips to hardware stores for sundry equipment and trips to purchase lunch etc. In terms of the deliveries of construction related materials we have assumed a concentration in the morning with a decrease in the number of deliveries later in the day.

4.2.55 Comparing the figures of Table 4.12 above with the assessment traffic generation of Stage 1 shown in Table 4.6, it can be appreciated that the traffic generated during the construction period is likely to be relatively similar in volume and make-up to the works generation of Stage 1.

4.2.56 Given such similarity it is not intended to provide a separate assessment of traffic impact during the construction period since the results of the assessments for Stage 1 are likely to provide a reasonable estimate of any such impacts.

4.3 Threshold Approach and Need for Traffic Impact Assessment

General

4.3.1 You will recall the threshold approach of the Institution of Highways & Transportation outlined in 2.4.1 above. In the following we will determine the need for a detailed assessment (computer modelling analysis of road link and junction performance) of traffic impact arising from the proposed development.

4.3.2 The total existing two-way peak hour traffic flows on the Cappagh Road or adjoining roads network has been shown in the traffic surveys to be 641 movements in the morning; 604 of which are cars and light vans and 37 HGV. Of these vehicles 121 cars and 16 HGV travelled northbound whilst 483 cars and 21 HGV travelled southbound.

4.3.3 The peak hour accumulative two-way traffic flow on the Cappagh Road in the evening shows 968 movements, 941 of which are cars and light vans and 27 HGV. 756 cars and 22 HGV travelled northbound whilst 185 cars and 5 HGV travelled southbound.

Forecast Peak Hour Percentage Traffic Increase - Proposed Development

4.3.4 The total peak hour 'assessment' traffic generation of the proposed development is estimated to be 10 vehicles in Stage 1 and 32 vehicles when operating at full capacity.

4.3.5 Clearly the Stage 1 traffic flows are considerably less than the 10% threshold recommended by the Institution of Highways and Transportation for both the morning and evening peak hours.

4.3.6 The increase in traffic on the Cappagh Road during Stage 1 is estimated to be between **1.5% and 3.1%** in the morning and **1.0% and 2.1%.** The lower percentages are based upon a 50/50 directional split of development traffic at the site access, the greater figure assumes all traffic arrives and departs by one direction.

4.3.7 During Stages 2 and 3, when operating at ultimate capacity the likely percentage increases in peak hour traffic under the robust assessment forecast generation is in the order of **4.9% and 9.9%** in the morning and **3.4% and 6.8%** in the evening.

Forecast Peak Hour Percentage Traffic Increase - Permitted Development

4.3.8 The current permitted Industrial Estate type development (which the Applicant could reasonably implement if so desired) is shown as likely to generate an assessment traffic flow of 126 inbound and 37 outbound movements in the morning peak hour and 39 inbound and 145 outbound movements in the evening peak hour.

4.3.9 The forecast increase in traffic on the Cappagh Road due to the permitted development is likely to be in the order of **12.5% to 25%** in the morning peak and **9.7% to 19.5%** in the evening peak hour period.

4.3.10 Notwithstanding the fact that the percentage HGV content of the waste related traffic streams is likely to be greater for the proposed facility than for the industrial estate, the increase in vehicle numbers due to the possible implementation of the permitted development is likely to be between two to four times that of the proposed waste facility.

Forecast Traffic Impact of Proposed Development

4.3.11 It is expected that the Local Authority, would in granting the current planning permission, have been satisfied that the emerging roads network has the capacity to cater for the expected traffic generation of the 'permitted' industrial development.

4.3.12 Assuming the site were a greenfield development the forecast percentage increase in traffic on the adjoining highway (Cappagh Road) as a result of the proposed waste facility development would be lower than the thresholds normally applied under the recommendations of the Institution of Highways and Transportation.

4.3.13 Nonetheless, the site is not strictly greenfield as it currently enjoys a full planning permission, in which regard it has been shown above that the proposed development is likely to generate between ½ and ¼ of the likely traffic forecast at the permitted industrial development.

4.3.14 On balance, the implementation of the proposed development would bring about a reduction in the potential volume of traffic on the adjoining roads network. It follows that the traffic impact of the proposed development is likely to be 'positive' and accordingly detailed capacity assessments are considered unnecessary.

4.4 Proposed Development Access

Current Permitted Development - Conditions Regarding Future Access

4.4.1 In respect to the provision of future access to the site, the conditions appended the current permission outline the approach desired by the Trnasporation Department of the Local Authority. Condition 7 of the permission relates (Reg. Ref. F04A/1123). In the interest of clarity the relevant sections of the condition are transcribed below.

> *Condition 7*
>
> *"The following requirements of the Transportation Dept. shall be strictly adhered to:*
>
> *a) Revised details of connection to the future realigned Cappagh Road shall only be made subject to the prior written approval of the Transportation Department,*
>
> *b) Details of any future entrance to the Cappagh Road shall be submitted for the written agreement of the Transportation Department prior to the commencement of any works on the entrance,*

c) *Prior to the connection of the Development to the future realigned Cappagh Road the internal/parking/traffic layout shall be revised to accommodate the connection. A through road to the Stadum Business Park shall not be permitted.*

d) *Revised footway details shall be submitted to the Transportation Department for written agreement, prior to the commencement of development,*

e) *Prior to the occupation of any units within the development, the realigned Ballycoolin Road from the existing roundabout at the entrance to Stadium Business Park to the roundabout north of the M50 shall be designed in accordance with submitted drawing 03/003/011 by Clifton Scannell Emerson Associates and be completed and open to traffic.*

Future Connection to the Cappagh Road Realignment

4.4.2 From the current conditions of planning for the permitted development, it can be appreciated that the Local Authority has in principle made provision for direct access to the site form the Cappagh Road realignment.

4.4.3 Given the likely future capacity of the upgraded road, together with lower traffic generation of the proposed development over that currently permitted, clearly the proposed site would be satisfactorily served by a similar arrangement to the current permitted development.

4.4.4 Under the current terms of the permitted development, the design of a future connection to the realigned Cappacgh Road will be prepared for agreement with the Local Authority.

4.4.5 From a review of the current application drawings together with the future preliminary alignment of the Cappagh Road, it is expected that only minor revision works will be required to connect the proposed access to the realigned road which it is proposed will run across the site frontage.

Operation of Proposed Development Access to Existing Roads Network

4.4.6 The forecast likely traffic generation of Stage 1 is shown to be 38 vehicle trips per day. During construction of Stage 1 the forecast traffic flows are similar with 45 vehicle trips generated. The total two-way traffic flow on the Cappagh Road over the course of the 12 hour surveys was 5,215 vehicles.

4.4.7 From these 'assessment' figures it can be seen that the traffic associated with the construction and operation of Stage 1 (38 -45 daily trips) is likely to equate to an approximate 1.5% increase in daily traffic volumes on the Cappagh Road between the hours of 07:00-19:00hrs. Clearly if based upon Annual Average Daily Traffic Volumes (24hr) this percentage would be even lower.

4.4.8 The increase in traffic associated with construction and operation of Stage 1 are considerably less than the typical daily fluctuation of ±10% expected on the general roads network and accordingly should be considered negligible in terms of traffic impact. Indeed the impact of this Stage 1 traffic is likely to be imperceptible to existing users of the Cappagh Road, save for directly at the proposed access to the site.

4.4.9 Although each case must be adjudged on its own unique merits, you will recall the advice of the Institution of Highways and Transportation which advises that impact is not generally considered significant if increases in traffic on the adjoining highway are less than 10%.

4.4.10 It follows form the above that the likely increase in traffic on the Cappagh Road as a direct result of the construction and operation of Stage 1 of the proposed development will be wholly insignificant in terms impact on the operation of the surrounding roads network.

4.4.11 Should the Cappagh Road realignment not be realised before 2007, given the very modest levels of traffic associated with the construction and operation of the proposed Stage 1 it is considered reasonable that the facility could be constructed and Stage 1 put into operation using an upgrade of the existing direct vehicular site access to the Cappagh Road as show on the application drawings.

4.4.12 It is proposed that an interim or temporary access to the proposed development will be implemented, and will provide direct vehicle access from the existing Cappagh Road. Clearly there is a reasonable likelihood that this access may never need to be used, should the Local Authority implement the Cappagh Road realignment before development commences.

4.5 Layout of Proposed Site Access to Existing Cappagh Road

4.5.1 The speed limit along the Cappagh Road in the vicinity of the proposed facility is not very clear, however it is assumed from signs on the Ballycoolin Road that the current speed limit is 80kph. From observation of vehicular speeds past the site it is expected that the existing 'Design Speed' on the Cappagh Road is likely to be lower if measured through speed surveys.

4.5.2 From a review of the emerging improved roads network it is expected that the single lane Cappagh Road realignment will be subject to a 60kph speed limit, as is the wide single carriageway of the Cruiserath Road. This lower limit is considered more appropriate in a built-up industrial are where traffic flows and turning movements are expected to be relatively high and junctions and access points frequent.

4.5.3 Notwithstanding the above, in accordance with the NRA: Design Manual for Roads and Bridges (TD9. Table 3) the required visibility 'y' distance corresponding to a design speed of 85kph is 160m (equal to the Stopping Sight Distance).

4.5.4 CPM Drawings No. V083_003/B, V083_002/A shows the visibility criteria achievable at the proposed upgraded existing entrance. The sightlines shown on the drawings have been measured in accordance with the NRA: Design Manual for Roads and Bridges TD42 Figures 7/1 and 7/2 as appropriate. The sightlines are depicted for the upgraded access entering onto the existing Cappagh Road carriageway only and clearly show that the NRA:Design Manual for Roads and Bridges prescribed distances are achievable.

4.5.5 It can be seen from the drawings that the proposed development access is satisfactory and will, upon completion of the proposed development and associated road works, be strictly in accordance with the current requirements of the NRA: Design Manual for Roads and Bridges albeit that the existing Cappagh Road is not compliant with such National Primary Roads design standards.

4.5.6 Upon completion of the Cappagh Road Realignment the set-back of development boundaries is such (measured as 6.5m) that satisfactory visibility sightlines in both directions will be easily achieved.

4.6 Distribution of Development Traffic

Stage 1 – Development Traffic Distribution

4.6.1 In terms of the distribution of development traffic on the local roads network, it is established practice and recommended by the Institution of Highways & Transportation that, in the absence of other more reliable information, development traffic can be assumed to distribute to the local roads network in the proportions yielded in the survey of existing traffic.

4.6.2 Notwithstanding the above, given the current roads layout it is expected that all traffic in Stage 1 will arrive and depart via. the existing Kilshane Road Roundabout. Until such time as the Cappagh Road Realignment is realised. and in the interest of limiting the use of the existing Cappagh Road insofar as practicable, the Applicant is not averse to a condition in respect of limiting access to the northern end of the Cappagh Road for the construction and operation of Stage 1.

Stages 2 & 3 – Development Traffic Distribution

4.6.3 It is acknowledged that the traffic associated with the development operating at ultimate capacity of 250,000 tonnes is in the region of the 5% to 10% which is approaching the threshold of the Institution of Highways and Transportation. Given the current alignment of the receiving roads environment it is not considered reasonable to expect the 'full' development to be serviceable from the existing Cappagh Road.

4.6.4 Notwithstanding the above, construction of the various additional buildings provided under Stages 2 & 3 is not likely to have any appreciable impact on the operation of the receiving roads environment, nonetheless it is recommended that Stages 2 & 3 should not be put into operation prior to the Cappagh Road Realignment. Clearly such a decision is at the discretion of the Local Authority and it may well be that some fraction of Stage 2 & 3, subject to restrictions in the overall number of vehicle movements, may reasonably be permitted to operate prior to the completion of the Cappagh Road Realignment.

4.6.5 For the purposes of this assessment, after the construction of the Cappagh Road Realignment, site traffic will be afforded practically equal opportunity to enter the site from either side of the proposed access, accordingly it is assumed for Stages 2 & 3 that traffic to and from the site will distribute to the network with half entering and leaving by either direction (i.e. 50/50 split at entrance).

Permitted Development – Development Traffic Distribution

4.6.6 In the interest of a comparative assessment we also examine the likely traffic impact of the permitted Industrial Estate development.

4.6.7 In terms of the distribution of development traffic on the local roads network, given that the development is of a similar nature to the surrounding employment opportunities this potential development traffic is assumed to distribute to the local roads network in the proportions yielded in the survey of existing traffic (as recommended by the Institution of Highways and Transportation).

5 ASSESSMENT YEAR(S) AND FUTURE TRAFFIC FLOWS

5.1 Development Traffic

5.1.1 The levels of traffic generation and distribution assumed at the proposed development site are outlined above. The figures presented for the various stages, represent those stages as operating at full capacity. It is expected nonetheless that it will take some time for business to develop and thus for such tonnages to be realised at the site.

5.1.2 Considering that the development site will receive a finite or capped amount of material every year during the lifetime of the facility it is assumed that the waste facility will have a relatively finite or consistent level of traffic attraction over its life span.

5.1.3 We do not consider that the levels of traffic to and from the development site assumed in this report will fluctuate appreciably and therefore we do not consider that the forecast levels of traffic at the site could reasonably be expected to experience significant growth in relation to time.

5.2 Estimation of Network Traffic Growth

5.2.1 In the National Roads Authority publication 'National Roads Needs Study' it is assumed that traffic growth rates on the national roads system between the years 1995 and 2020 can be reasonably represented by a uniform annual traffic growth rate of 3.5%.

5.2.2 Traffic growth on the Primary Road Network, in general terms, results from development associated with economic growth. Traffic from new developments filters into the Primary Road Network system via the regional and distributor road network, resulting in traffic growth on the primary roads.

5.2.3 The road network in the vicinity of the proposed site is made up principally of distributor routes, which under normal circumstances would usually experience a lower growth rate than the National Primary Road Network.

5.2.4 The Ballycoolin Industrial Estate is however continuously developing and it is considered appropriate in the interest of a reasonable assessment that a higher value of network growth on the Cappagh Road should be used. For the purposes of this assessment therefore we have assumed that traffic volumes in the vicinity of the proposed development will experience a level of growth in the region of 6.0% per annum.

5.2.5 It must be appreciated that in our analysis of the roads network we have applied the above traffic growth rate directly to the peak hour period. However these growth rates are not always applicable to the peak hour period and it is generally accepted by traffic engineers that the peak hour, instead of increasing or intensifying as a peak, tends to spread over a longer period. Furthermore, the traffic generate by the proposed facility could be considered to contribute to the overall growth rate on the network, nonetheless we have simply added the development generated traffic to the factored network figures, thus compounding the total percentage growth on the network.

5.2.6 From the above, we consider that the assessment of future traffic growth on the local roads network in the vicinity of the proposed development will yield a realistic basis for a 'comparative' assessment of the traffic situation likely to prevail in future years before and after implementation of the proposed development.

5.3 Assessment Scenarios

5.3.1 The proposed development is likely to generate considerably less traffic than the permitted development during the peak hours, and indeed over the course of a full day. It follows that it should not be absolutely necessary for the Applicant to examine in detail the likely impact of the proposed development.

5.3.2 Nevertheless, in the following we provide an assessment of the impact of site generated traffic on the operation of the local roads network and specifically on the operation of both the Ballycoolin Road Roundabout and Kilshane Road Roundabout.

5.3.3 It should be noted that the assessments are provided for information and in the interest of a comprehensive and transparent assessment of the likely influences of the proposed and permitted developments.

5.3.4 For the purposes of providing comparative assessments of the traffic situation on the roads network in the vicinity of the proposed development we have chosen a series of assessment scenarios as follows:

Scenario 1 - Opening Year 2006 – Do Nothing (No Development at Site)

Scenario 2 - Opening Year 2006 – Permitted Development Implemented

Scenario 3 - Opening Year 2006 – Stage 1 Fully Operational

Scenario 4 - Future Year 2007 – Do Nothing (No Development at Site)

Scenario 5 - Future Year 2007 – Permitted Development Implemented

Scenario 6 - Future Year 2007 – Stages 1, 2 & 3 Fully Operational

5.4 Future Year Network Traffic Flows

5.4.1 The emerging general roads network in the Ballycoolin Area has been designed to cater for the likely future needs of the surrounding Industrial type developments. Accordingly it is not expected that the impact of the traffic generated by the proposed development would have an appreciable influence or impact on the operation of the local road network beyond the immediate environs of the development site.

5.4.2 As a result the scope of future year assessments covers the operation of the Cappagh Road and the junctions located at the intersection of the Cappagah Road and the Kilshane and Ballycoolin Roads.

5.4.3 As discussed in Section 4.5 above, the levels of traffic generated at the proposed development site have been calculated for the assessment years and assigned to the proposed development based on an approximation that 50% of traffic will approach the site form the Ballycoolin Road Roundabout and an equal proportion would approach from the Kilshane Road Roundabout.

5.4.4 In the assessment of Stage 1 operation nonetheless, all traffic is assumed to arrive and depart from the Kilshane Road Roundabout.

5.4.5 Given the similarity between the traffic which would be generated by the permitted development and general Ballycollin traffic, this future potential traffic is distributed in the proportions currently manifest for both cars and HGV on the Cappagh Road, as determined in the traffic surveys. In general there is a directional split in the morning with 80% of traffic travelling southbound on the Cappagh Road, this scenario is reversed in the evening peak hour.

5.4.6 The traffic flows used in the network assessments are provided in the following Tables 5.1 through 5.4. Base network traffic flows are shown in the tables together with the forecast traffic generated by the various developments or stages thereof. The resulting Scenario traffic flows are also presented.

5.4.7 The movement (MVT) numbers used in the tables correspond to those used in the traffic surveys for the respective junctions. The traffic surveys, including movement diagrams, are provided in Appendix A.

5.4.8 The 'Do Nothing Scenario' is a scenario in which no distinct allowance is made for any specific planned or permitted developments; essentially the present scenario.

Movement	MVT 1			MVT 2			MVT 3			MVT 4			MVT 5			MVT 6		
Traffic Flow Scenario	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
2005	106	66	172	480	16	496	114	11	125	7	5	12	3	5	8	8	15	23
Base 2006	112	70	182	509	17	526	121	12	133	7	5	13	3	5	8	8	16	24
Base 2007	119	74	193	539	18	557	128	12	140	8	6	13	3	6	9	9	17	26
Stage 1 Traffic	0	0	0	5	4	9	5	3	8	0	2	2	0	1	1	0	0	0
Stage 1,2 & 3 Traffic	0	0	0	2	10	13	2	9	12	0	4	4	0	3	3	0	0	0
Permitted Dev. Traffic	0	0	0	102	20	122	5	1	6	0	0	1	1	6	7	0	0	0
Scenario 1	112	70	182	509	17	526	121	12	133	7	5	13	3	5	8	8	16	24
Scenario 2	112	70	182	611	37	648	126	12	138	8	6	13	4	12	15	8	16	24
Scenario 3	112	70	182	514	21	535	126	15	141	8	7	15	3	6	10	8	16	24
Scenario 4	119	74	193	539	18	557	128	12	140	8	6	13	3	6	9	9	17	26
Scenario 5	119	74	193	641	38	679	133	13	146	8	6	14	4	12	16	9	17	26
Scenario 6	119	74	193	542	28	570	130	22	152	8	10	18	3	9	12	9	17	26

Table 5.1 Forecast Traffic Flow Scenarios – Kilshane Road RDBT – AM Peak Hour

Movement	MVT 1			MVT 2			MVT 3			MVT 4			MVT 5			MVT 6		
Traffic Flow Scenario	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
2005	137	19	156	181	5	186	734	21	755	22	1	23	4	0	4	32	0	32
Base 2006	145	20	165	192	5	197	778	22	800	23	1	24	4	0	4	34	0	34
Base 2007	154	21	175	203	6	209	825	24	848	25	1	26	4	0	4	36	0	36
Stage 1 Traffic	0	0	0	5	5	10	5	5	10	0	0	0	0	0	0	0	0	0
Stage 1,2 & 3 Traffic	0	0	0	2	14	16	2	13	15	0	1	1	0	0	0	0	0	0
Permitted Dev. Traffic	0	0	0	16	4	20	18	4	23	1	0	1	0	0	0	0	0	0
Scenario 1	145	20	165	192	5	197	778	22	800	23	1	24	4	0	4	34	0	34
Scenario 2	145	20	165	208	9	218	796	27	823	24	1	25	5	0	5	34	0	34
Scenario 3	145	20	165	197	10	207	783	27	810	23	1	25	4	0	4	34	0	34
Scenario 4	154	21	175	203	6	209	825	24	848	25	1	26	4	0	4	36	0	36
Scenario 5	154	21	175	220	10	229	843	28	871	25	1	27	5	0	5	36	0	36
Scenario 6	154	21	175	206	19	225	827	36	864	25	2	27	5	0	5	36	0	36

Table 5.2 Forecast Traffic Flow Scenarios – Kilshane Road RDBT – PM Peak Hour

Movement	MVT 1			MVT 2			MVT 3			MVT 4			MVT 5			MVT 6		
Traffic Flow Scenario	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
2005	445	12	457	14	9	23	6	8	14	552	38	590	444	28	472	113	8	121
Base 2006	472	13	484	15	10	24	6	8	15	585	40	625	471	30	500	120	8	128
Base 2007	500	13	513	16	10	26	7	9	16	620	43	663	499	31	530	127	9	136
Stage 1 Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stage 1,2 & 3 Traffic	2	8	10	0	6	6	0	7	7	0	0	0	0	0	0	2	7	9
Permitted Dev. Traffic	20	3	23	1	2	3	1	3	5	0	0	0	0	0	0	24	3	28
Scenario 1	472	13	484	15	10	24	6	8	15	585	40	625	471	30	500	120	8	128
Scenario 2	492	15	507	15	12	27	8	12	19	585	40	625	471	30	500	144	12	156
Scenario 3	472	13	484	15	10	24	6	8	15	585	40	625	471	30	500	120	8	128
Scenario 4	500	13	513	16	10	26	7	9	16	620	43	663	499	31	530	127	9	136
Scenario 5	520	16	536	16	12	29	8	12	20	620	43	663	499	31	530	151	12	164
Scenario 6	502	21	524	16	16	32	7	16	23	620	43	663	499	31	530	129	16	145

Table 5.3 Forecast Traffic Flow Scenarios – Ballycoolin Road RDBT – AM Peak Hour

Movement	MVT 1			MVT 2			MVT 3			MVT 4			MVT 5			MVT 6		
Traffic Flow Scenario	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
2005	195	4	199	5	1	6	16	0	16	549	21	570	253	18	271	704	22	726
Base 2006	207	4	211	5	1	6	17	0	17	582	22	604	268	19	287	746	23	770
Base 2007	219	4	224	6	1	7	18	0	18	617	24	640	284	20	304	791	25	816
Stage 1 Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stage 1,2 & 3 Traffic	2	11	13	0	3	3	0	0	0	0	0	0	0	0	0	2	14	16
Permitted Dev. Traffic	74	15	89	2	4	6	0	0	0	0	0	0	0	0	0	4	1	5
Scenario 1	207	4	211	5	1	6	17	0	17	582	22	604	268	19	287	746	23	770
Scenario 2	281	19	300	7	5	12	17	0	17	582	22	604	268	19	287	750	24	775
Scenario 3	207	4	211	5	1	6	17	0	17	582	22	604	268	19	287	746	23	770
Scenario 4	219	4	224	6	1	7	18	0	18	617	24	640	284	20	304	791	25	816
Scenario 5	293	19	312	8	5	12	18	0	18	617	24	640	284	20	304	795	26	821
Scenario 6	222	15	237	6	4	10	18	0	18	617	24	640	284	20	304	793	38	832

Table 5.4 Forecast Traffic Flow Scenarios – Ballycoolin Road RDBT – PM Peak Hour

5.4.9 From Tables 5.1 to 5.4 above, the peak hour traffic generation of the permitted development is show as likely to have the potential to generate approximately 193 vehicles in the morning peak and 144 in the evening, 20% of which have been assumed for the purposes of this report to be HGV.

5.4.10 In comparison to the above permitted development, in Stage 1 of the proposed waste facility development is forecast to generate a total two-way traffic flow of some 10 vehicles in the peak hours and 6 in off-peak hours.

5.4.11 When operating at ultimate capacity of 250,000 the total two-way traffic generation of the proposed development is forecast for the purposes of assessment to be 32 vehicles in the peak hour periods and 17 during off-peak hours.

5.4.12 Notwithstanding the composition of the various traffic streams compared above, we believe it is clear that the likely traffic impact of the proposed waste facility will be significantly less than that of the current permitted development. This is especially so when it is considered that such waste treatment facilities typically generate a minimal number of traffic movements after approximately 16:00hrs. We have presumed for the purposes of assessment that the site would generate some 15% of daily traffic between 17:00-18:00hrs, which is unlikely.

5.5 Forecast Impact on Road Network

Cappagh Road Realignment

5.5.1 As discussed earlier, the above Tables 5.1 through 5.4 are provided in the interest of a comparative assessment only. Given the current and continuing changes in the emerging roads environment in the locality of the site, and the changing planning environment it is not expected that any detailed assessments will reflect precisely the future traffic flows to all planned and permitted developments.

5.5.2 Such an assessment would require a significant area-wide network model and an insight onto the future potential development of all lands in the vicinity of the proposed development. This type of in-depth analysis is normally reserved for master-planning by the Local Authority in the strategic planning and design of future roads improvements to cater for forecast demand.

5.5.3 The preparation of such a model is considered beyond the remit of a Traffic Impact Assessment for the proposed development, especially in light of the fact that permission has already been granted on the site for a more traffic intensive development.

5.5.4 As discussed earlier, the site currently enjoys full planning permission for an Industrial Estate type development. It has been shown in this report that the permitted development would most likely generate greater daily increases in traffic flows on the local roads network than the proposed waste facility; almost quadruple. Given the employment characteristics of the permitted development, it is considered highly likely that traffic generation during the peak hours under the permitted development would be significantly greater than that of the proposed waste facility.

5.5.5 Under the current application and taking into consideration the different composition of the traffic streams generated by the proposed and permitted developments, we consider that it is highly likely that the proposed development, when operating at ultimate capacity will have significantly less of an impact on the operation of the receiving roads environment than the current permitted development.

5.5.6 It is not unreasonable to presume that in the design of the emerging roads network, the Local Authority has accounted for the land-use zoning and potential traffic demands of the general area and that the new roads system, including the Cappagh Road Realignment, has been designed to cater for such likely future demand.

5.5.7 Given the grant of permission for the Industrial type development at the site, it is reasonable to assume that the Local Authority would have allowed for the traffic generated by that site in the design of the Cappagh Road.

5.5.8 It follows that the lesser traffic volumes generated by the proposed waste facility would equally be accommodated on the new realigned Cappagh Road. Accordingly, given the likely inaccuracies of a detailed assessment it is not proposed that the future traffic scenarios will be examined using capacity assessment models such as ARCADY or PICADY.

5.5.9 We believe it to be clear form the figures prepared in Tables 5.1 to 5.4, that traffic impact arising from the development will not be significant.

Existing Cappagh Road

5.5.10 It is not expected that the proposed Stages 2 and 3 of the waste treatment facility could be adequately served from the existing Cappagh Road. In discussions with the Local Authority some site preparation works, mainly involving earth moving have been permitted to occur under the current roads regime.

5.5.11 From discussions with the Local Authority consultants Clifton Scannell Emerson Associates that it is likely that construction may commence on the Cappagh Road Realignment sometime in mid 2006 or perhaps earlier. As we understand, the Local Authority is currently in the process of appointing consultants for the detailed design work which we assume will start soon.

5.5.12 Under the conditions of the current permission at the site, it is understood that construction of the development would be facilitated at the site prior to the opening of the Cappagh Road, indeed in the interest of limiting construction impacts it is considered rational that the development of the site could at least run along in parallel with the construction works on the Cappagh Road Realignment.

5.5.13 As can be seen from the calculations provided in this report, the traffic associated with construction is practically inconsequential to the capacity and operation of the existing road network. By the same rationale, the traffic generated by Stage 1 of the development is also considered insignificant. You will recall that the operations of Stage 1 have been forecast as likely to increase traffic flows on the Cappagh Road by as little as 1% which would essentially be imperceptible to existing road users both on the Cappagh Road and the surrounding receiving roads environment.

5.5.14 As can be appreciated the current forecast increase in traffic for Stage 1, as reported herein assumes that 50,000 tonnes of material would be handled at the facility upon opening. Clearly in practice this will not be the case, and tonnages in the early months are likely to be lower. It follows that impact on the existing Cappagh Road in the interim before the new realignment is opened are likely to be even less than the above figure of 1%.

5.5.15 Given the above. It is the aspiration of the Applicant, that construction work can be carried out and Stage 1 of the development put into operation prior to the completion of the Cappagh Road Realignment works.

6 CONCLUSION

6.1.1 The existing site enjoys full planning permission for an Industrial Estate type development.

6.1.2 It has been shown in this report that the permitted development would most likely generate greater daily increases in traffic flows on the local roads network than the proposed waste treatment facility. Indeed the permitted development is estimated as likely to generate almost four times as much traffic on a daily basis, but more significantly, as much as seven times as much traffic in the critical commuter peak hours on the roads network.

6.1.3 Given the employment characteristics of the permitted development, it is considered highly likely that traffic generation during the peak hours under the permitted development would be significantly greater than that of the proposed waste facility. Under the current application essentially more than 150 cars to or from the permitted Industrial development in the mornings and evening peak hours would be replaced by 5 cars, 4 skip lorries and 1 articulated vehicle in Stage 1, and 5 cars, 20 skip/refuse lorries and 7 articulated vehicles in Stages 2 and 3.

6.1.4 It follows therefore that it is highly likely that the proposed development, when operating at ultimate capacity will have significantly less of an impact on the operation of the receiving roads environment than the current permitted development.

6.1.5 Given the Local Authority grant of permission at the site it is not unreasonable to presume that the emerging roads network has been designed to cater for considerably more traffic that is likely to be generated by the proposed waste treatment facility.

6.1.6 Traffic generation rates associated with the construction and operation of Stage 1 of the waste treatment facility have been shown to be very low indeed. Such traffic is not thought likely to have any appreciable or indeed perceptible impact on the operation of the existing Cappagh Road. Accordingly it is expected that Stage 1 could reasonably be constructed and operable prior to the completion of the Cappagh Road Realignment.

ABACUS TRANSPORTATION SURVEYS

BALLYCOOLIN TRAFFIC COUNTS **JULY 2005**
MANUAL CLASSIFIED JUNCTION COUNTS **ATH/05/158**

SITE: 01 DATE: 5th July 2005

LOCATION: Cappagh Road Northern Roundabout DAY: Tuesday

	MVT 1			MVT 2			MVT 3		
TIME	LV	HV	TOT	LV	HV	TOT	LV	HV	TOT
07:00	38	7	45	115	1	116	11	0	11
07:15	22	14	36	125	3	128	6	0	6
07:30	26	11	37	117	8	125	18	2	20
07:45	18	17	35	122	2	124	27	3	30
H/TOT	104	49	153	479	14	493	62	5	67
08:00	36	21	57	115	2	117	27	2	29
08:15	26	17	43	126	4	130	42	4	46
08:30	17	12	29	88	3	91	29	1	30
08:45	18	15	33	116	6	122	25	3	28
H/TOT	97	65	162	445	15	460	123	10	133
09:00	19	8	27	81	3	84	25	6	31
09:15	20	15	35	79	6	85	8	1	9
09:30	17	10	27	49	7	56	28	4	32
09:45	10	19	29	38	4	42	19	2	21
H/TOT	66	52	118	247	20	267	80	13	93
10:00	14	5	19	30	1	31	25	5	30
10:15	17	9	26	33	5	38	10	0	10
10:30	18	11	29	21	1	22	20	1	21
10:45	24	14	38	35	3	38	11	1	12
H/TOT	73	39	112	119	10	129	66	7	73
11:00	15	8	23	28	1	29	15	0	15
11:15	18	13	31	23	1	24	18	5	23
11:30	26	15	41	33	4	37	22	1	23
11:45	20	8	28	17	2	19	14	3	17
H/TOT	79	44	123	101	8	109	69	9	78
12:00	25	15	40	27	0	27	22	3	25
12:15	14	10	24	24	5	29	21	2	23
12:30	20	12	32	22	3	25	25	3	28
12:45	17	10	27	25	1	26	27	0	27
H/TOT	76	47	123	98	9	107	95	8	103

ABACUS TRANSPORTATION SURVEYS

BALLYCOOLIN TRAFFIC COUNTS **JULY 2005**
MANUAL CLASSIFIED JUNCTION COUNTS **ATH/05/158**

SITE: 01 DATE: 5th July 2005

LOCATION: Cappagh Road Northern Roundabout DAY: Tuesday

	MVT 1			MVT 2			MVT 3		
TIME	LV	HV	TOT	LV	HV	TOT	LV	HV	TOT
13:00	16	14	30	27	5	32	27	0	27
13:15	16	11	27	27	2	29	19	2	21
13:30	26	8	34	25	4	29	20	2	22
13:45	17	11	28	31	3	34	33	2	35
H/TOT	75	44	119	110	14	124	99	6	105
14:00	17	6	23	27	6	33	27	2	29
14:15	20	14	34	30	3	33	27	1	28
14:30	25	12	37	27	4	31	31	9	40
14:45	21	6	27	30	1	31	33	5	38
H/TOT	83	38	121	114	14	128	118	17	135
15:00	18	10	28	30	2	32	30	0	30
15:15	14	13	27	26	0	26	36	2	38
15:30	22	8	30	22	4	26	32	5	37
15:45	18	7	25	24	2	26	48	5	53
H/TOT	72	38	110	102	8	110	146	12	158
16:00	15	5	20	32	4	36	61	5	66
16:15	22	9	31	17	3	20	76	4	80
16:30	26	8	34	33	3	36	126	5	131
16:45	26	8	34	35	2	37	143	4	147
H/TOT	89	30	119	117	12	129	406	18	424
17:00	41	8	49	47	1	48	162	4	166
17:15	25	3	28	47	2	49	190	6	196
17:30	34	4	38	45	1	46	183	6	189
17:45	37	4	41	42	1	43	199	5	204
H/TOT	137	19	156	181	5	186	734	21	755
18:00	38	1	39	34	0	34	154	1	155
18:15	37	4	41	23	0	23	147	3	150
18:30	30	7	37	19	4	23	97	1	98
18:45	29	4	33	18	1	19	50	0	50
H/TOT	134	16	150	94	5	99	448	5	453
P/TOT	1085	481	1566	2207	134	2341	2446	131	2577

ABACUS TRANSPORTATION SURVEYS

BALLYCOOLIN TRAFFIC COUNTS **JULY 2005**
MANUAL CLASSIFIED JUNCTION COUNTS **ATH/05/158**

SITE: 01 DATE: 5th July 2005

LOCATION: Cappagh Road Northern Roundabout DAY: Tuesday

	MVT 4			MVT 5			MVT 6		
TIME	LV	HV	TOT	LV	HV	TOT	LV	HV	TOT
07:00	0	1	1	1	0	1	0	1	1
07:15	2	0	2	1	0	1	0	2	2
07:30	1	1	2	0	1	1	2	0	2
07:45	2	1	3	2	2	4	1	1	2
H/TOT	5	3	8	4	3	7	3	4	7
08:00	1	1	2	0	1	1	2	8	10
08:15	3	2	5	1	1	2	3	6	9
08:30	0	2	2	0	0	0	0	2	2
08:45	1	2	3	1	2	3	3	3	6
H/TOT	5	7	12	2	4	6	8	19	27
09:00	1	1	2	1	1	2	2	8	10
09:15	3	3	6	1	1	2	1	4	5
09:30	0	1	1	1	1	2	0	8	8
09:45	0	0	0	0	0	0	1	2	3
H/TOT	4	5	9	3	3	6	4	22	26
10:00	4	1	5	0	1	1	1	2	3
10:15	9	0	9	1	1	2	1	2	3
10:30	3	2	5	1	2	3	5	6	11
10:45	4	1	5	2	0	2	1	4	5
H/TOT	20	4	24	4	4	8	8	14	22
11:00	2	2	4	3	2	5	2	3	5
11:15	2	2	4	1	2	3	0	1	1
11:30	3	5	8	1	3	4	1	4	5
11:45	4	2	6	0	0	0	1	3	4
H/TOT	11	11	22	5	7	12	4	11	15
12:00	5	2	7	1	0	1	1	4	5
12:15	4	0	4	1	1	2	1	1	2
12:30	0	0	0	0	0	0	3	2	5
12:45	0	0	0	2	0	2	7	4	11
H/TOT	9	2	11	4	1	5	12	11	23

ABACUS TRANSPORTATION SURVEYS

BALLYCOOLIN TRAFFIC COUNTS **JULY 2005**
MANUAL CLASSIFIED JUNCTION COUNTS **ATH/05/158**

SITE: 01 DATE: 5th July 2005

LOCATION: Cappagh Road Northern Roundabout DAY: Tuesday

	MVT 4			MVT 5			MVT 6		
TIME	LV	HV	TOT	LV	HV	TOT	LV	HV	TOT
13:00	4	0	4	1	5	6	0	1	1
13:15	4	1	5	2	4	6	1	0	1
13:30	4	0	4	1	3	4	0	0	0
13:45	1	2	3	3	1	4	1	2	3
H/TOT	13	3	16	7	13	20	2	3	5
14:00	7	0	7	0	0	0	1	0	1
14:15	6	0	6	2	3	5	1	1	2
14:30	5	1	6	1	0	1	3	5	8
14:45	2	0	2	3	0	3	8	3	11
H/TOT	20	1	21	6	3	9	13	9	22
15:00	6	0	6	3	0	3	3	3	6
15:15	4	0	4	1	0	1	2	1	3
15:30	2	1	3	1	0	1	9	5	14
15:45	4	0	4	2	0	2	5	3	8
H/TOT	16	1	17	7	0	7	19	12	31
16:00	4	0	4	1	0	1	2	5	7
16:15	5	1	6	0	0	0	4	2	6
16:30	6	0	6	1	0	1	4	4	8
16:45	4	0	4	1	0	1	5	2	7
H/TOT	19	1	20	3	0	3	15	13	28
17:00	6	0	6	2	0	2	15	0	15
17:15	5	0	5	1	0	1	7	0	7
17:30	6	1	7	1	0	1	6	0	6
17:45	5	0	5	0	0	0	4	0	4
H/TOT	22	1	23	4	0	4	32	0	32
18:00	2	0	2	1	0	1	8	0	8
18:15	9	0	9	2	0	2	8	0	8
18:30	4	1	5	2	0	2	2	0	2
18:45	3	0	3	3	0	3	3	0	3
H/TOT	18	1	19	8	0	8	21	0	21
P/TOT	162	40	202	57	38	95	141	118	259

ABACUS TRANSPORTATION SURVEYS

BALLYCOOLIN TRAFFIC COUNTS **JULY 2005**
MANUAL CLASSIFIED JUNCTION COUNTS **ATH/05/158**

SITE: 02 DATE: 5th July 2005

LOCATION: Cappagh Road Southern Roundabout DAY: Tuesday

	MVT 1			MVT 2			MVT 3		
TIME	LV	HV	TOT	LV	HV	TOT	LV	HV	TOT
07:00	114	1	115	2	0	2	0	0	0
07:15	119	2	121	1	1	2	1	0	1
07:30	108	5	113	2	4	6	1	1	2
07:45	110	2	112	4	2	6	2	1	3
H/TOT	451	10	461	9	7	16	4	2	6
08:00	109	2	111	4	1	5	3	3	6
08:15	118	3	121	4	2	6	0	3	3
08:30	82	2	84	5	1	6	0	2	2
08:45	109	6	115	2	2	4	0	1	1
H/TOT	418	13	431	15	6	21	3	9	12
09:00	75	2	77	7	2	9	0	2	2
09:15	71	5	76	5	2	7	2	1	3
09:30	44	6	50	1	2	3	0	1	1
09:45	33	4	37	1	0	1	2	0	2
H/TOT	223	17	240	14	6	20	4	4	8
10:00	28	2	30	6	0	6	3	0	3
10:15	29	4	33	1	2	3	5	0	5
10:30	20	3	23	4	0	4	4	3	7
10:45	28	2	30	5	1	6	1	2	3
H/TOT	105	11	116	16	3	19	13	5	18
11:00	29	3	32	2	0	2	3	0	3
11:15	16	3	19	4	0	4	7	2	9
11:30	28	5	33	6	2	8	4	1	5
11:45	17	2	19	4	0	4	3	2	5
H/TOT	90	13	103	16	2	18	17	5	22
12:00	23	0	23	4	0	4	4	2	6
12:15	23	4	27	4	2	6	3	0	3
12:30	21	2	23	1	1	2	4	0	4
12:45	20	1	21	2	0	2	4	0	4
H/TOT	87	7	94	11	3	14	15	2	17

ABACUS TRANSPORTATION SURVEYS

BALLYCOOLIN TRAFFIC COUNTS **JULY 2005**
MANUAL CLASSIFIED JUNCTION COUNTS **ATH/05/158**

SITE: 02 DATE: 5th July 2005

LOCATION: Cappagh Road Southern Roundabout DAY: Tuesday

	MVT 1			MVT 2			MVT 3		
TIME	LV	HV	TOT	LV	HV	TOT	LV	HV	TOT
13:00	21	8	29	7	2	9	2	0	2
13:15	19	5	24	3	1	4	4	1	5
13:30	22	6	28	3	1	4	2	0	2
13:45	26	4	30	2	0	2	2	1	3
H/TOT	88	23	111	15	4	19	10	2	12
14:00	21	5	26	5	1	6	2	0	2
14:15	25	4	29	7	2	9	3	0	3
14:30	24	4	28	4	0	4	4	0	4
14:45	29	1	30	4	0	4	3	0	3
H/TOT	99	14	113	20	3	23	12	0	12
15:00	24	1	25	6	1	7	4	0	4
15:15	25	1	26	3	1	4	4	0	4
15:30	22	2	24	1	1	2	0	0	0
15:45	25	2	27	3	0	3	0	0	0
H/TOT	96	6	102	13	3	16	8	0	8
16:00	22	4	26	4	0	4	2	2	4
16:15	22	2	24	3	1	4	4	0	4
16:30	31	2	33	3	1	4	4	1	5
16:45	38	1	39	1	1	2	1	0	1
H/TOT	113	9	122	11	3	14	11	3	14
17:00	49	1	50	1	0	1	1	0	1
17:15	53	2	55	1	1	2	4	0	4
17:30	43	0	43	3	0	3	2	0	2
17:45	50	1	51	0	0	0	9	0	9
H/TOT	195	4	199	5	1	6	16	0	16
18:00	33	0	33	2	0	2	2	0	2
18:15	20	0	20	5	0	5	5	1	6
18:30	22	1	23	1	2	3	1	0	1
18:45	14	1	15	7	0	7	1	0	1
H/TOT	89	2	91	15	2	17	9	1	10
P/TOT	2054	129	2183	160	43	203	122	33	155

ABACUS TRANSPORTATION SURVEYS

BALLYCOOLIN TRAFFIC COUNTS **JULY 2005**
MANUAL CLASSIFIED JUNCTION COUNTS **ATH/05/158**

SITE: 02 DATE: 5th July 2005

LOCATION: Cappagh Road Southern Roundabout DAY: Tuesday

	MVT 4			MVT 5			MVT 6		
TIME	LV	HV	TOT	LV	HV	TOT	LV	HV	TOT
07:00	111	9	120	39	6	45	12	0	12
07:15	158	10	168	67	10	77	11	0	11
07:30	139	9	148	90	4	94	18	3	21
07:45	148	10	158	117	9	126	29	2	31
H/TOT	556	38	594	313	29	342	70	5	75
08:00	137	9	146	119	7	126	24	1	25
08:15	128	10	138	118	8	126	42	2	44
08:30	121	6	127	137	5	142	33	1	34
08:45	112	5	117	140	4	144	28	4	32
H/TOT	498	30	528	514	24	538	127	8	135
09:00	95	8	103	91	8	99	29	5	34
09:15	114	16	130	83	3	86	15	4	19
09:30	73	3	76	67	9	76	23	3	26
09:45	66	10	76	56	12	68	21	2	23
H/TOT	348	37	385	297	32	329	88	14	102
10:00	73	10	83	69	7	76	24	5	29
10:15	54	9	63	60	6	66	14	0	14
10:30	64	8	72	74	5	79	20	1	21
10:45	62	8	70	57	5	62	14	0	14
H/TOT	253	35	288	260	23	283	72	6	78
11:00	60	8	68	61	7	68	15	2	17
11:15	60	6	66	56	3	59	14	5	19
11:30	63	7	70	54	2	56	22	4	26
11:45	55	4	59	63	5	68	14	3	17
H/TOT	238	25	263	234	17	251	65	14	79
12:00	56	3	59	69	3	72	22	3	25
12:15	64	6	70	62	7	69	21	2	23
12:30	65	11	76	82	8	90	24	3	27
12:45	61	7	68	85	8	93	22	0	22
H/TOT	246	27	273	298	26	324	89	8	97

ABACUS TRANSPORTATION SURVEYS

BALLYCOOLIN TRAFFIC COUNTS **JULY 2005**
MANUAL CLASSIFIED JUNCTION COUNTS **ATH/05/158**

SITE: 02 DATE: 5th July 2005

LOCATION: Cappagh Road Southern Roundabout DAY: Tuesday

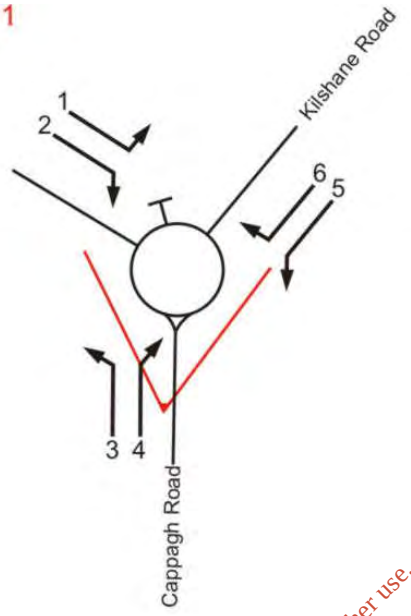
	MVT 4			MVT 5			MVT 6		
TIME	LV	HV	TOT	LV	HV	TOT	LV	HV	TOT
13:00	90	5	95	77	7	84	28	0	28
13:15	60	5	65	83	4	87	18	2	20
13:30	71	8	79	84	7	91	22	2	24
13:45	69	9	78	92	12	104	30	3	33
H/TOT	290	27	317	336	30	366	98	7	105
14:00	72	4	76	104	6	110	28	2	30
14:15	86	7	93	103	4	107	29	3	32
14:30	68	7	75	82	12	94	27	7	34
14:45	61	2	63	105	7	112	37	5	42
H/TOT	287	20	307	394	29	423	121	17	138
15:00	74	6	80	88	9	97	28	0	28
15:15	82	7	89	93	10	103	41	2	43
15:30	62	5	67	95	6	101	37	6	43
15:45	79	9	88	88	7	95	48	5	53
H/TOT	297	27	324	364	32	396	154	13	167
16:00	104	10	114	97	8	105	59	3	62
16:15	110	8	118	97	5	102	74	5	79
16:30	136	9	145	71	1	72	119	4	123
16:45	124	8	132	86	6	92	139	4	143
H/TOT	474	35	509	351	20	371	391	16	407
17:00	152	5	157	71	3	74	153	4	157
17:15	140	6	146	61	4	65	183	6	189
17:30	127	6	133	51	7	58	184	7	191
17:45	130	4	134	70	4	74	184	5	189
H/TOT	549	21	570	253	18	271	704	22	726
18:00	134	10	144	91	3	94	147	1	148
18:15	105	4	109	94	4	98	144	2	146
18:30	86	2	88	87	5	92	95	2	97
18:45	79	1	80	108	4	112	56	1	57
H/TOT	404	17	421	380	16	396	442	6	448
P/TOT	4440	339	4779	3994	296	4290	2421	136	2557

Site Locations

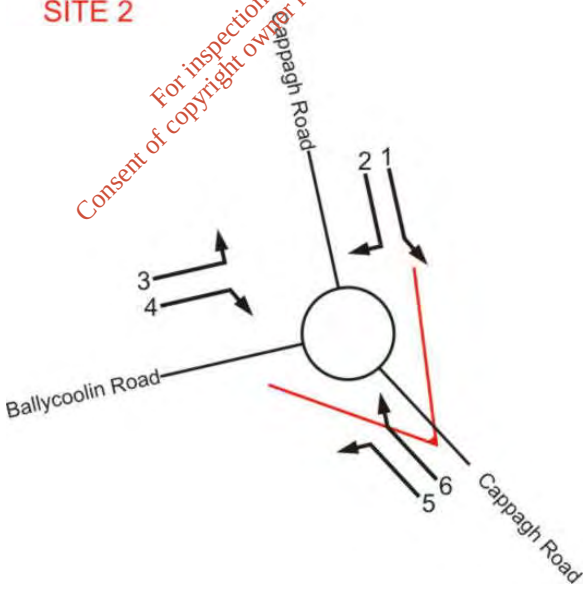
Job number: ATH/05/158	Job date: 5th July 2005	Drawing No: ATH/05/158-1	abacus Transportation Surveys
Client: TW	Job day: Tuesday	Author: ITK	

Movement Numbers & Directions

SITE 1



SITE 2



Job number: ATH/05/158	Job date: 5th July 2005	Drawing No: ATH/05/158-2	abacus Transportation Surveys
Client: TW	Job day: Tuesday	Author: ITK	

APPENDIX 8

Dublin Airport Authority Correspondence

Granary House
Rutland Street
Cork

Tel. [021] 4321521
Fax. [021] 4321522

environmental management for business

Mr. Nigel Sommerfield,
Technical Standards Manager,
Operation and Aviation Standards Department,
Cloghran House,
Dublin Airport Authority,
Dublin Airport,
Co. Dublin.

19th July 2005

RE: Proposed Waste Recycling Centre at Cappogue, County Dublin

Dear Mr. Sommerfield,

I refer to our discussion in relation to the proposal by Panda Waste Services Ltd to construct and operate a waste recycling centre at Cappogue, County Dublin. I enclose as requested a description of the proposed waste activities and a site location map.

If you have any queries or require further information, please call me.

Yours sincerely,

Michael Watson.
Michael Watson

0513801/MW/PS
Enc.
c.c. Mr. Des Crinion, Panda Waste Services

PROPOSED RECYCLING FACILITY

CAPPOGUE

COUNTY DUBLIN

Prepared For: -

Panda Waste Services,
Rathdrinagh,
Beauparc,
Navan,
Co. Meath.

Prepared By: -

O' Callaghan Moran & Associates,
Granary House,
Rutland Street,
Cork.

19th July 2005

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PAGE

1. INTRODUCTION

1.1 Introduction

PANDA Waste Services (PANDA) intends to apply to Fingal County Council for planning permission for change of use to allow a site, located in the townland of Cappogue, to be developed as a recycling centre. There is an existing planning permission for the construction of Industrial units.

PANDA also intends to apply to Fingal County Council for a Waste Permit to operate the site. As the volumes of waste handled at the site increases PANDA will apply to the Environmental Protection Agency for a Waste Licence.

1.2 Site Location

The site is located on Cappagh Road to the north of Stadium Business Park, as shown on Figure 1.1. The site encompasses approximately 2.42 hectares (ha).

1.3 Site Development

The facility will be developed in a series of Stages and when fully operational will comprise three waste processing buildings: -

- Construction and Demolition (C & D) and Commercial and Industrial (C & I) Building,
- Dry Recyclables Building,
- Municipal Solid Waste (MSW) Building.

In Stage 1 the facility will accept and recycle C & D and C & I waste. Stages 2 and 3 will involve the expansion of the recycling capacity to process Dry Recyclables and Municipal Solid Wastes (MSW).

O' Callaghan Moran & Associates. Granary House, Rutland Street, Cork Ireland. Tel. (021) 4321521 Fax. (021) 4321522 email : ocm@indigo.ie	CLIENT Panda Waste Ltd	Details O.S. Licence Agreement Number AR 0038702 Ordnance Survey Ireland. Government of Ireland.	Figure 1
	TITLE Site Location		Scale NTS Rev. A

1.4 Waste Handling

All wastes accepted at the site will be off-loaded and processed internally. Wastes containing food stuffs or putrescible matter, which are potentially attractive to birds, will not be processed or stored externally, but will at all times be handled inside the buildings. All waste materials delivered to the facility will be removed off-site following processing and wastes will not be disposed of at the site. A description of how each waste type will be handled is presented below.

1.4.1 C &D Waste

The C&D waste (bricks, concrete, timber, tar, etc) which will not contain any foodstuff, will be delivered in covered skips. All waste delivered to the facility will be inspected to determine if it is suitable for recycling activities. The wastes will be off-loaded inside the C & D Recycling Building. All waste will be unloaded, processed and stored inside the buildings. The processing will involve shredding and crushing. The processed materials will be removed off-site in articulated trucks for use in construction projects.

1.4.2 Commercial & Industrial Waste

The C&I wastes will include pre-segregated (e.g. paper, plastic, cardboard etc) and mixed wastes generated by commercial and industrial activities. The waste will be delivered to the facility in compactors, rear end loaders and covered skips. The wastes will be off-loaded inside the Building.

The mixed waste, which will contain small amounts of foodstuffs, will be subject to mechanical and manual sorting and mechanical screening inside the building to separate the wastes into the different component parts (paper, plastic, timber, metals and organic residue). Paper, plastic and metal cans will be baled. The organic residue will be stored inside the building pending removal off-site. All of the recovered materials will be removed off-site in fully enclosed vehicles.

1.4.3 MSW

MSW comprising mixed and pre segregated materials will be delivered to the facility in refuse collection vehicles. The waste will be delivered in fully enclosed refuse collection vehicles. Pre-segregated waste e.g. (paper, plastic, drinks cans) will be off-loaded inside the Dry Recyclables Building. Mixed MSW will be off-loaded inside the MSW building.

Mixed MSW, which will contain foodstuffs, will be off-loaded inside the MSW Building. The mixed wastes will be subject to mechanical and manual sorting and mechanical screening inside the building to recover recyclable materials including metals, paper, plastics and compostable materials. The recovered metals, paper and plastic will be stored on-site pending removal to off-site recovery/recycling facilities using curtain side trailers/containers. The compostable materials will be stored inside the building pending removal off-site for composting at a licensed facility. All of the recovered materials will be removed off-site in fully enclosed vehicles.

APPENDIX 9

Emergency Response Plan

Master copy (in red)	Panda An Animal for Recycling	SOP No.:01-008C-EMP	
		Revision:	1
		Page:	1 of 3
		Issued:	14 Mar 07
		By:	DN
Title:	**Emergency Response Procedure for Cappagh**		

Prepared by: _____ **Date:** _____
Print Name Sign Name

Approved by: _____ **Date:** _____
Print Name Sign Name

1.0 Purpose:

The purpose of this SOP is to provide an emergency response method for dealing with emergencies

2.0 Responsibilities

The general manager has overall responsibility for this procedure.

The environmental department are responsible for ensuring that all relevant personnel are adequately trained in this procedure.

Employees trained in this procedure are responsible for complying with the requirements of the SOP and are responsible for ensuring that they can adequately respond to any emergency that may arise.

All managers and drivers are responsible for ensuring that vehicles and trailers/skips are maintained in a roadworthy condition at all times.

3.0 Definitions

3.1 SOP: Standard Operating Procedure

3.2 Emergency: For the purposes of this procedure an emergency shall constitute
- Spillage
- Fire/explosion
- Anything that might result in environmental pollution

4.0 Procedure

4.1 *Waste spill*

1. If it is a liquid spillage use the spill kit provided to contain the spill if it is safe to do so.
2. Contact Panda Waste Services offices (Ph. No. 1850 65 65 65), with details of the spill including estimated quantity of waste
3. Clean-up will be arranged at the company offices. All relevant authorities will be notified from the company offices.
4. Do not leave the area until the supervisor has arrived.

4.2 *Fire/explosion*

1. Contact the fire services.
2. Contact Panda Waste Services offices (Ph. No. 1850 65 65 65). The office will arrange for a supervisor to go to the site immediately.
3. Use appropriate fire extinguisher if it is safe to do so.
4. Do not leave the area until PWS supervisor has arrived.

4.3 Anything that might result in environmental pollution

If it is suspected that environmental pollution is being caused as a result of waste transportation

1. Stop what is being done immediately and
2. Notify the environmental Officer at Panda Waste Services (Ph. No. 1850 65 65 65).
3. The environmental officer will notify the relevant regulatory authorities if necessary.

5.0 Useful numbers

Brian M^{c}Cabe (Panda Waste Services)	087-9978422
Peter Waters (Panda Waste Services)	086-8386979
Andrew Cullen (Panda Waste Services)	086-2676500
David Naughton	086-6045905
Dublin City Council	01-2224300
EPA	053-9160600
EPA Dublin	01-2680100
Emergency Services	***999***