3.3. GLANOORAGH RIVER

3.3.1. Habitat Assessment

Habitat sections are shown on Map 2.

3.3.1.1. Habitat Section 3

Location	V9403 9436 to V9418 9437	
Length	c.200m	
Salmonid Habitat Quality		**Description**
Adult Habitat	Fair	Good mixture of riffle and glide (some to 40cm deep) over substrates of cobble, gravel & mud. Heavily shaded by hazel woodland.
Nursery Habitat	Good	
Spawning Habitat	Fair	

Riffle over cobble, gravel & mud

Glide to depths of 40cm.

3.3.1.2. Habitat Section 4

Location	V9418 9437 to V9463 9425	
Length	c. 500m	
Salmonid Habitat Quality		**Description**
Adult Habitat	Fair	Mixture of riffle and glide over cobble and muddy gravel with a few small pools
Nursery Habitat	Good	
Spawning Habitat	Fair - Good	

Muddy Gravel

Riffle & glide over cobble

3.3.1.3. Habitat Section 5

Location	V9463 9425 to V9582 9483	
Length	c. 1.5km	
Salmonid Habitat Quality		**Description**
Adult Habitat	Fair	Mixture of slow shallow muddy glide and poor riffle over mud and cobble. Flow and substrate diversity generally poor. Much of the section is substantially shaded by bankside trees and bushes. The upstream end of the section is turbid due to what appears to be a slurry contaminated drain at V9463 9425.
Nursery Habitat	Fair	
Spawning Habitat	Fair	

Glide over mud and cobble

Riffle over mud and cobble

3.3.1.4. Habitat Section 6

Location	V9582 9483 to V9594 9504	
Length	c. 250m	
Salmonid Habitat Quality		**Description**
Adult Habitat	Fair	Deep slow muddy glide with few poor shallow riffles. Heavily shaded.
Nursery Habitat	Poor - Fair	
Spawning Habitat	Poor	

3.3.1.5. Habitat Section 7

Location	V9594 9504 to V9591 9521	
Length	c. 150m	
Salmonid Habitat Quality		**Description**
Adult Habitat	Fair	Slow riffle and glide over muddy cobble with some larger rocks.
Nursery Habitat	Good	
Spawning Habitat	Poor	

Mixture of slow riffle & glide

3.3.1.6. Habitat Section 8

Location	V9591 9521 to V9584 9552	
Length	c. 350m	
Salmonid Habitat Quality		**Description**
Adult Habitat	Poor - Fair	Slow uniform shallow muddy glide.
Nursery Habitat	Poor - Fair	
Spawning Habitat	Poor	

Slow muddy glide

3.3.1.7. Habitat Section 9

Location	V9584 9552 to V9574 9597	
Length	c. 500m	
Salmonid Habitat Quality		**Description**
Adult Habitat	Fair	Shallow glide and riffle over gravel, small cobble and mud. A few sections of deeper glide upstream of the railway bridge.
Nursery Habitat	Fair	
Spawning Habitat	Fair - Good	

Gravel substrate

Riffle, run & glide over muddy gravel

3.3.1.8. Habitat Section 10

Location	V9574 9597 to V9578 9622	
Length	c. 250m	
Salmonid Habitat Quality		**Description**
Adult Habitat	Fair – Good	Deep glide with frequent clumps of *Callitriche* sp. and Flag Iris.
Nursery Habitat	Fair	
Spawning Habitat	None	

Deep glide

3.3.1.9. Habitat Section 11

Location	V9578 9622 to V9569 9643	
Length	c. 150	
Salmonid Habitat Quality		**Description**
Adult Habitat	Fair	Mostly uniform muddy glide, with small amount of poor riffle over muddy cobble. Heavily shaded.
Nursery Habitat	Fair	
Spawning Habitat	Poor	

Uniform muddy glide

Riffle over muddy cobble

3.3.1.10. Habitat Section 12

Location	V9569 9643 to V9567 9642		
Length	c. 30		
Salmonid Habitat Quality			**Description**
Adult Habitat	Fair		Fast glide with some riffle over large rocks, gravel and mud.
Nursery Habitat	Good		
Spawning Habitat	Poor - Fair		

Fast glide and riffle

3.3.1.11. Overview of salmonid habitat quality in the Glanooragh River

A summary of salmonid habitat quality is tabulated below. Salmonid habitat in the 4km section of the Glanooragh River assessed for this report is generally of a modest quality due to the low diversity of flow and the generally heavily silted substrate. None of the channel assessed was classified as good or better as adult or spawning habitat. 26% of the channel assessed was classified as good salmonid nursery habitat. The most significant habitat consisted of c.900m of good nursery habitat in Sections 3, 4, 7 & 12, and c.1km of fair – good spawning habitat in Sections 4 & 9. It is notable that approximately half of the fair – good spawning habitat is in Section 4, and most good nursery habitat is in Sections 3 & 4, which are immediately downstream of the confluence with the Aghacureen Drain.

Salmonid Habitat Quality	Adult	Nursery	Spawning
None / None-Poor	0%	0%	6%
Poor / Poor-Fair	10%	15%	24%
Fair / Fair-Good	90%	62%	70%
Good	0%	23%	0%
Good - Very Good	0%	0%	0%
Excellent	0%	0%	0%

3.3.2. Water Quality/ Invertebrate Fauna

3.3.2.1. Site 1

The invertebrate community recorded at this site and tabulated below merits a Q-rating of Q3 indicating moderately polluted conditions.

INDICATOR GROUP	POLLUTION SENSITIVITY/TOLERANCE	TAXON	NUMBER
A	Very Pollution Sensitive	*Ecdyonurus* sp.	1
B	Moderately Pollution Sensitive	*Leuctra sp.*	2
		Baetis muticus	2
		Goeridae	1
		Ancylus fluviatilis	5
C	Moderately Pollution Tolerant	*Potamopyrgus antipodarum*	1
		Gammarus duebeni	c.140
		Baetis rhodani	5
		Ephemerella ignita	1
		Limnephilidae	1
		Rhyacophila dorsalis	5
		Polycentropidae	4
		Elminthidae	c.80
		Hydraena	1
		Veliidae	1
		Chironomidae (excl. *Chironomus*)	10
		Tipulidae	27
D	Very Pollution Tolerant	None Recorded	
E	Most Pollution Tolerant	Tubificidae	1
-	Taxa not assigned to any Indicator Group	*Eiseniella tetraedra*	2
		Stylodrilus heringianus	5

3.3.2.2. Site 2

The invertebrate community recorded at this site and tabulated below merits a Q-rating of Q3 indicating moderately polluted conditions.

INDICATOR GROUP	POLLUTION SENSITIVITY/TOLERANCE	TAXON	NUMBER
A	Very Pollution Sensitive	None Recorded	
B	Moderately Pollution Sensitive	*Leuctra sp.*	3
		Goeridae	1
		Sericostomatidae	3
C	Moderately Pollution Tolerant	*Ancylus fluviatilis*	7
		Potamopyrgus antipodarum	10
		Gammarus duebeni	c.140
		Hydracarina	1
		Baetis rhodani	4
		Ephemerella ignita	1
		Rhyacophila dorsalis	3
		Elminthidae	45
		Dytiscidae (larva)	1
		Hydraena	1
		Veliidae	1
		Gerridae	1
		Chironomidae (excl. *Chironomus*)	36
		Simuliidae	1
		Tipulidae	24
D	Very Pollution Tolerant	Sphaeriidae	1
E	Most Pollution Tolerant	None Recorded	
-	Taxa not assigned to any Indicator Group	Nematoda	1
		Eiseniella tetraedra	3
		Lumbriculus variegatus	2
		Stylodrilus heringianus	3
		Nematomorpha	1
		Ceratopogonidae	1

3.3.2.3. SITE 3

The invertebrate community recorded at this site and tabulated below merits a Q-rating of Q2-3 indicating moderately polluted conditions.

INDICATOR GROUP	POLLUTION SENSITIVITY/TOLERANCE	TAXON	NUMBER
A	Very Pollution Sensitive	None Recorded	
B	Moderately Pollution Sensitive	Sericostomatidae	1
C	Moderately Pollution Tolerant	*Ancylus* sp.	8
		Gammarus duebeni	c.38
		Baetis rhodani	2
		Polycentropidae	2
		Helophorus	1
		Chironomidae (excl. *Chironomus*)	c.150
		Tipulidae	c.80
		Simuliidae	c.130
D	Very Pollution Tolerant	*Erpobdella*	3
		Glossiphonia	3
		Helobdella stagnalis	17
E	Most Pollution Tolerant	None Recorded	
-	Taxa not assigned to any Indicator Group	*Lumbriculus variegatus*	1000s
		Muscidae	1

3.3.2.4. SITE 4

The invertebrate community recorded at this site and tabulated below merits a Q-rating of Q3 indicating moderately polluted conditions.

INDICATOR GROUP	POLLUTION SENSITIVITY/TOLERANCE	TAXON	NUMBER
A	Very Pollution Sensitive	None Recorded	
B	Moderately Pollution Sensitive	*Leuctra sp.*	4
		Sericostomatidae	4
C	Moderately Pollution Tolerant	*Ancylus fluviatilis*	1
		Planorbidae	1
		Potamopyrgus antipodarum	c.500
		Gammarus duebeni	c.70
		Baetis rhodani	8
		Ephemerella ignita	75
		Limnephilidae	3
		Hydropsyche	2
		Rhyacophila dorsalis	1
		Elminthidae	10
		Haliplidae	2
		Chironomidae (excl. *Chironomus*)	18
		Simuliidae	1
		Tipulidae	5
D	Very Pollution Tolerant	*Lymnaea peregra*	1
		Glossiphonia complanata	1
		Erpobdella	1
		Sphaeriidae	1
E	Most Pollution Tolerant	None Recorded	
-	Taxa not assigned to any Indicator Group	*Eiseniella tetraedra*	1
		Stylodrilus heringianus	4
		Nematomorpha	1
		Ceratopogonidae	3

3.3.2.5. Overview of Water Quality in Glanooragh River

The Glanooragh is moderately polluted (Q3) immediately upstream and downstream of the confluence with the Aghacureen Drain. The biological assessment data give no indication of a negative impact from the Aghacureen drain in the months preceding the survey.

Site 3, which is c. 1 km downstream of the Aghacurreen Drain, is moderately polluted (Q2-3). The deterioration in water quality between Site 2 and Site 3 is at least in part due to a significant inflow of what appears to be slurry contaminated water from a drain entering the river from the north side at Grid Ref. V9463 9425. At Site 4, which is c. 4km downstream of the Aghacureen Drain, the river is moderately polluted with a Q-rating of Q3.

3.3.3. Fish

The results of the electrofishing at the four sampling sites on the Glanooragh River are tabulated as follows, and illustrated in Fig. 3:

	Site 1	Site 2	Site 3	Site 4
Fishing Time (minutes)	14	15	15	12
C.P.U.E. Juvenile Brown Trout*	73	100	4	60
CPUE Adult Brown Trout*	0	4	0	0
Total Brown Trout C.P.U.E.	73	104	4	60
CPUE Juvenile Salmon*	0	0	4	5
Three Spined Stickleback		Present	Present	
Eel		Present		
Stone Loach			Present	

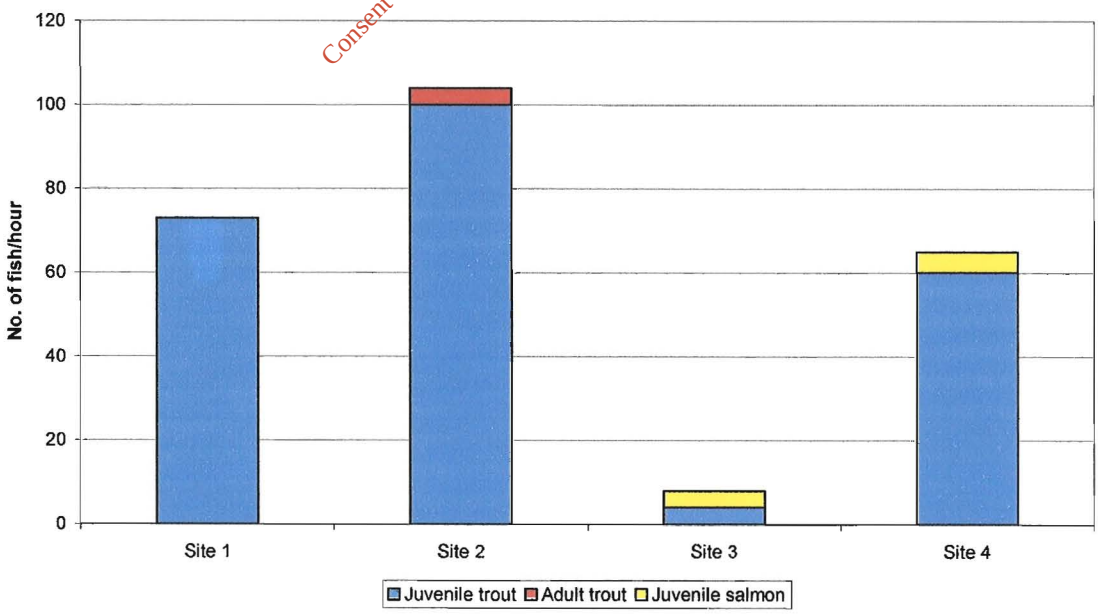
*Number of fish per hour equivalent of fishing

The survey results indicate good densities of juvenile trout both upstream and downstream of the confluence with the Aghacureen Drain (Sites 1 & 2). Whereas no salmon were recorded at these sites, their presence in this section of river at low densities cannot be ruled out, given that salmonid nursery habitat at these sites is good, and given that salmon were recorded 1km downstream at Site 3.

At Site 3 a single juvenile trout and a single juvenile salmon were recorded in 15 minutes of electrofishing, indicating a very poor density (CPUE of 4) for each of these species. Given the good potential salmonid nursery habitat at the site, these low densities are likely to be due to the poor water quality (Q2-3) and heavy siltation at the site.

At Site 4, juvenile trout were recorded at moderate density and juvenile salmon at low density. The densities probably reflect the relatively mediocre habitat quality at the site.

Fig. 3 Salmonid catch per unit effort



3.3.4. Protected Status and Protected Species

No protected species were recorded in the present survey. All three lamprey species (listed in Annex II of EU Habitats directive 92/43/EEC) are known to occur in the River Flesk catchment (Kurz and Costello, 1999). Lampreys could therefore occur in the Glanooragh river and tributaries. Salmon (listed in Annex II of EU Habitats directive 92/43/EEC) were recorded in the Glanooragh River during this survey, and have been recorded by Central Fisheries Board in the wider Gweestin system (W. Roche pers comm.)

3.3.5. Importance of Potentially Affected Freshwater Habitats.

The section of the Glanooragh River surveyed is classified as being of C Rating (High value, locally important).

4. POTENTIAL SIGNIFICANT IMPACTS OF THE DEVELOPMENT ON FRESHWATER AQUATIC FLORA, FAUNA AND HABITATS IN THE ABSENCE OF MITIGATION

The potential significant impacts of the proposed development will be:

1. Pollution of the stream with suspended solids due to runoff of soil from construction areas

2. Pollution of the stream, during construction phase, with other substances such as fuels, lubricants, waste concrete, waste water from site toilet and wash facilities, etc.

3. Pollution by effluent from the waste processing area and ancillary structures and facilities

4. Pollution by surface water draining from non process area of the site e.g. car parking, roofs, access roads, paths etc.

5. Pollution by effluent from toilet, wash facilities, canteen etc.

Potential impacts are described under two headings:

i. An assessment of the potential environmental impact on the ecology of the stream of the proposed development during the period of construction.

ii. An assessment of potential significant long-term effects of the existence of the proposed development on freshwater invertebrate fauna, flora, fish and habitats.

4.1. AN ASSESSMENT OF THE POTENTIAL AQUATIC ENVIRONMENTAL IMPACT OF THE PROPOSED DEVELOPMENT DURING THE PERIOD OF CONSTRUCTION

4.1.1. Pollution of streams/rivers with suspended solids

Research in North America indicates that the equivalent of many decades of natural or even agricultural erosion may take place during a single year from areas cleared for construction (Wolman and Schick 1967). Suspended sediment due to runoff of soil from construction areas, or due to disturbance of fine sub-surface sediments in the course of instream construction and excavation, can have severe negative impacts on invertebrate and plant life and on all life stages of salmonid fish.

- Suspended sediment can settle on spawning areas, infill the intragravel voids and smother the eggs and alevins (newly hatched fish) in the gravel.

- Bed Load (coarse material transported along the bottom of the stream) and settled sediments can infill pools and riffles, reducing the availability and quality of rearing habitat for fish.

- Suspended sediment can reduce water clarity and visibility in the stream, impairing the ability of fish to find food items.

- Settled sediments can smother and displace aquatic organisms such as macroinvertebrates, reducing the amount of food items available to fish.

- Increased levels of sediment can displace fish out of prime habitat into less suitable areas. (Chilibeck *et al* 1992)

- Suspended solids can abrade or clog the gills of salmonid fish. It takes a high concentration of solid wastes to clog a fish gill and cause asphyxiation,

but only a little to cause abrasions and thus permit the possibility of infections. (Solbe 1988)

4.1.2. Pollution of streams/rivers with other substances associated with the construction process

The potential exists for a range of serious pollutants to enter watercourses during construction. For example any of the following will have deleterious effects on fish, plants and invertebrates if allowed to enter watercourses.

- Raw or uncured concrete and grouts
- Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks
- Fuels, lubricants and hydraulic fluids for equipment used on the development site
- Waste from on site toilet and wash facilities

4.2. AN ASSESSMENT OF POTENTIAL SIGNIFICANT LONG-TERM EFFECTS OF THE EXISTENCE AND OPERATION OF THE PROPOSED DEVELOPMENT ON AQUATIC INVERTEBRATE FAUNA, FLORA, FISH AND HABITATS.

4.2.1. Potential pollution by surface water draining from non-process area of the site e.g. car parking, roofs, access roads, paths etc.

The main pollutant of concern in the runoff from paved areas not accessed by vehicles transporting waste material would be petrol, fuel oils, lubricating oils and hydraulic fluids. In unmodified form these are liquid, virtually insoluble and lighter than water. EIFAC - The European Inland Fisheries Advisory Commission (Svobodova *et al* 1993) states that "*a sensory assessment is preferred to toxicological analysis in determining the highest admissible amounts of oil and oil products that can be present in water; on this basis the highest admissible concentrations are in the range of 0.002 to 0.025 mg per litre*".

Harmful effects include:

- The prevention of gaseous exchange at the water surface, leading to reduced dissolved oxygen in the underlying water (Solbe 1988)

- In the case of turbulent waters the oil becomes dispersed as droplets into the water. In such cases, the gills of fish can become mechanically contaminated and their respiratory capacity reduced (Svobodova *et al* 1993).

- Oil products may contain various highly toxic substances, such as benzene, toluene, naphthenic acids and xylene which are to some extent soluble in water; these penetrate into the fish and can have a direct toxic effect. It is generally agreed that the lighter oil fractions (including kerosene, petrol,

benzene, toluene and xylene) are much more toxic to fish than the heavy fractions (heavy paraffins and tars) (Svobodova *et al* 1993).

4.2.2. Potential pollution by effluent from toilet, wash facilities, canteen etc. in the absence of adequate mitigation

4.2.2.1. Organic Pollution

Following the introduction of untreated or poorly treated sewage effluent to a stream, conditions of existence for many organisms becomes substantially degraded. Increased turbidity in the water will reduce light penetration, which in turn will reduce the volume of water capable of supporting photosynthesizing plants. Particulate matter in settling will flocculate small floating plants and animals from the water. As the material settles, sludge beds may be formed on the stream bed, and many of the areas that formerly could have been inhabited by bottom dwelling organisms become covered and uninhabitable. Within the zone of active decomposition the breakdown of organic products by bacteria may consume all available dissolved oxygen, resulting in the river becoming uninhabitable by fish and many other aquatic species.

4.2.2.2. Eutrophication: Phosphorus

The most serious threat to water quality of lakes and rivers in Ireland is eutrophication, defined as the enrichment of waters, beyond natural levels, principally by the nutrient phosphorus (P). This enrichment commonly results in excessive production of cyanobacteria (formerly referred to as blue-green algae), planktonic algae and rooted plants in such waters. Eutrophication of aquatic ecosystems also results in loss of biodiversity and degradation of aquatic habitats of high ecological quality (EPA 1997).

It is now EPA policy that except in exceptional circumstances the appropriate Environmental Quality Standard to be applied to all Irish freshwaters would be for salmonid water quality (EPA 1997). This means that the long term target is to attain a Q4 rating or higher (unpolluted status/Class A) under EPA biological

quality classification system or a median Molybdate Reactive Phosphorus concentration of 0.03 mg/l.

4.2.3. Potential pollution from process area and ancillary structures and facilities in the absence of adequate mitigation

It is proposed that the facility will accept only waste classified as non-hazardous consisting of:

- Construction & demolition waste
- Mixed municipal waste
- Organic waste (kitchen and canteen waste only)
- Dry recyclable wastes (cardboard and packaging waste, paper, plastic bottles, plastic film, metals, timber, glass).

Currently the total annual intake is 16,500 tonnes; the proposed annual total intake would be 40,000 tonnes. Any hazardous waste will be placed in separate bins for disposal to an appropriate licensed facility.

Classification of waste as non-hazardous under the Waste Management Act 1996 is based largely on hazards to human health. Many substances classified as non-hazardous are potentially damaging to the aquatic environment, for instance:

- Any food stuffs or decomposable organic material
- All fats, greases & oils, whether of mineral or food origin
- Most household, garden and commercial chemicals
- Inert rubbles containing fine mineral particles
- A wide range of chemicals contained in small and large domestic and office appliances, batteries etc.

All biodegradable organic wastes such as food waste, garden waste, paper and cardboard products, animal products, treated or painted wood waste, and a

range of commercial and industrial wastes, if exposed to rain will produce runoff detrimental to the aquatic environment.

Given the wide range of potential pollutants contained in the wastes processed at the plant, the potential exists for significant contamination of surface waters from waste material exposed to rain, accidental spillages, etc. The most serious risk posed would be from accidental spillages of materials with high B.O.D. or other polluting potential.

Pollution could potentially arise from a range of sources e.g.:

- The processing area
- Storage areas for recovered waste etc. (skips and hardstanding)
- Fuel storage tanks
- Weighbridge
- Waste delivery area

4.3. SIGNIFICANCE OF POTENTIAL IMPACTS IN THE ABSENCE OF MITIGATION

In the absence of mitigation the potential impact of the proposed facility on the Glanooragh River system would be moderate during the construction phase and major during the operational phase.

5. MITIGATION MEASURES

5.1. REDUCTION AND PREVENTION OF POLLUTION DURING THE CONSTRUCTION PROCESS

i. Release of suspended solids to the stream should be kept to a minimum. The key factors in erosion and sediment control are to intercept and manage off- and on-site runoff. This limits the potential for soils to be eroded and enter the streams in runoff. Runoff and surface erosion control is more effective and less expensive than sediment control with sediment control ponds only. Sediment control ponds should be designed for a minimum retention time of 15 hours.

ii. To prevent damage to spawning and early juvenile fish, activities with a high risk of suspended solids pollution to surface waters should not be carried out between the end of September and the end of April without prior consultation with the South Western Regional Fisheries Board.

iii. Raw or uncured waste concrete should be disposed of by removal from the site or by burial on the site in a location and in a manner that will not impact on the watercourse.

iv. Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks should be trapped on-site to allow sediment to settle out and reach neutral pH before clarified water is released to the stream or drain system or allowed to percolate into the ground.

v. Fuels, lubricants and hydraulic fluids for equipment used on the construction site should be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to codes of practice.

vi. Fuelling and lubrication of equipment should not be carried out close to the watercourse.

vii. Any spillage of fuels, lubricants of hydraulic oils should be immediately contained and the contaminated soil removed from the site and properly disposed of.

viii. Waste oils and hydraulic fluids should be collected in leak-proof containers and removed from the site for disposal or re-cycling.

ix. Prior to any instream work ensure that all construction equipment is mechanically sound to avoid leaks of oil, fuel, hydraulic fluids and grease.

x. Foul drainage from site offices etc. should be removed to a suitable treatment facility or discharged to a septic tank system constructed in accordance with EPA guidelines. A septic tank is in use on site and a Puraflo system is proposed, which will be designed to cater for 12 people at 180l per person per day. This equates to a discharge quantity of 2.16 cubic metres per day to be treated by the system.

5.2. REDUCTION AND PREVENTION OF POLLUTION FROM THE COMPLETED DEVELOPMENT

5.2.1. Mitigation of potential pollution of surface waters with effluent from the waste processing facility

All waste delivery, storage and processing areas should be fully roofed against rain, bunded to contain any accidental spillages, and drained on an impervious surface to a holding tank for tankering to a waste treatment facility. As leachate may arise from deliveries particularly of municipal wastes, delivery trucks should drive across the weighbridge and unload the waste into a housed delivery area which drains to the effluent storage tank.

The EPA are in the process of drawing up a groundwater protection response which will include guidelines for above ground and underground storage tanks (M.F. Rochford, EPA, pers comm.) Pending the completion of EOA guidelines, any underground effluent storage tanks should be double-skinned (that is, have an inner and outer skin) and have an interstitial monitoring device with automatic alarms. All USTs should be provided with overfill prevention. Any above ground fuel or effluent storage tanks should comply with current regulations and be bunded.

5.2.2. Mitigation of potential pollution by surface water draining from non-process area of the site e.g. car parking, roofs, access roads, paths etc.

A drainage system should be installed which can be sealed off to contain a major spillage and oil interceptors of suitable size should be placed on all discharges to surface waters. An interceptor for oil and solids separation is currently in operation; the interceptor is 13.5m^3 capacity to provide average 2 days retention time (Information supplied by RPS-MCOS). It is also proposed to direct surface drainage via a lagoon to a constructed wetland and then to a

percolation area; the lagoon, constructed wetland and percolation area are currently under construction (Information supplied by RPS-MCOS).

5.2.3. Mitigation of potential pollution by effluent from toilet, wash facilities, canteen etc.

A treatment system should be installed following the guidelines contained in the EPA wastewater treatment manual – "Treatment systems for small communities, businesses, leisure centres and hotels". A septic tank is in use on site and a Puraflo system is proposed, which will be designed to cater for 12 people at 180l per person per day. This equates to a discharge quantity of 2.16 cubic metres per day to be treated by the system (Information supplied by RPS-MCOS).

5.3. RESIDUAL IMPACTS

If all mitigation measures are fully implemented the impact of the facility would be minor or insignificant.

6. NON-TECHNICAL SUMMARY

6.1. WATERCOURSES POTENTIALLY AFFECTED BY THE PROPOSED DEVELOPMENT

The KWD Ltd. site is located on a drain which flows to one of the headwater tributaries of the Glanooragh River c. 0.5km downstream of the facility. The drain, though moderately or slightly polluted c.200m upstream of the facility, is seriously polluted at the point where it enters the site. At the time of this assessment, the drain was receiving effluent as it flowed through the site and remained seriously polluted at the downstream end of the site. The drain has no significant aquatic habitat value in the immediate vicinity of the site. However, the lowest c.450 m of the drain has some potential value as salmonid nursery habitat. At the point where it joins the Glanooragh River the drain is moderately polluted; no fish were recorded at this location.

The Glanooragh River was assessed for c.4km downstream of the drain confluence. The river is moderately polluted at all sites assessed. The biological assessment contains no evidence of an impact on the river from the Aghacureen Drain. Moderately polluted conditions and good populations of juvenile brown trout were recorded immediately upstream and downstream of the confluence with the drain. Juvenile salmon at very low densities were recorded 1km and 4km downstream of the drain confluence. Salmonid habitat is generally of a modest quality due to the low diversity of flow and the generally heavily silted substrate. None of the channel assessed was classified as good or better as adult or spawning habitat. Good salmonid nursery habitat comprised 26% of the channel assessed. The most significant habitat consisted of c.900m of good nursery habitat in Sections 3, 4, 7 & 12, and c.1km of fair – good spawning habitat in Sections 4 & 9. It is notable that approximately half of the fair – good spawning habitat is in Section 4, and most good nursery habitat is in Sections 3 & 4, which are immediately downstream of the confluence with the Aghacureen Drain.

6.2. THE PRINCIPAL POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT ON AQUATIC INVERTEBRATE FAUNA, FLORA, FISH AND HABITATS IN THE ABSENCE OF MITIGATION

1. Pollution of the stream with suspended solids due to runoff of soil from construction areas

2. Pollution of the stream, during construction phase, with other substances such as fuels, lubricants, waste concrete, waste water from site toilet and wash facilities, etc.

3. Pollution by effluent from the waste processing area and ancillary structures and facilities

4. Pollution by surface water draining from non process area of the site e.g. car parking, roofs, access roads, paths etc.

5. Pollution by effluent from toilet, wash facilities, canteen etc.

6.3. RECOMMENDED MITIGATION MEASURES

i. Rigorous measures should be implemented to minimise suspended solids and other pollutants entering surface waters during the construction.

ii. To prevent damage to spawning and early juvenile fish, activities with a high risk of suspended solids pollution to surface waters should not be carried out between the end of September and the end of April without prior consultation with the South Western Regional Fisheries Board.

iii. All waste delivery, storage and processing areas should be fully roofed against rain, bunded to contain any accidental spillages, and drained on an impervious surface to a holding tank for tankering to a waste treatment facility. As leachate may arise from deliveries particularly of municipal wastes, delivery trucks should drive across the weighbridge and unload the waste into a housed delivery area which drains to the effluent storage tank.

iv. Any underground effluent storage tanks should be double-skinned (that is, have an inner and outer skin) and have an interstitial monitoring device with automatic alarms. All USTs should be provided with overfill prevention. Any above ground fuel or effluent storage tanks should comply with current regulations and be bunded.

v. A drainage system should be installed in the non-process area of the site which can be sealed off to contain a major spillage, and oil interceptors of suitable size should be placed on all discharges to surface waters. An interceptor for oil and solids separation is currently in operation; the interceptor is 13.5m^3 capacity to provide average 2 days retention time (Information supplied by RPS-MCOS). It is also proposed to direct surface drainage via a lagoon to a constructed wetland and then to a percolation area; the lagoon, constructed wetland and percolation area are currently under construction (Information supplied by RPS-MCOS).

vi. A treatment system for effluent from toilet, wash facilities, canteen etc should be installed following the guidelines contained in the EPA wastewater treatment manual – "Treatment systems for small communities, businesses, leisure centres and hotels". A septic tank is in use on site and a Puraflo system is proposed, which will be designed to cater for 12 people at 180l per person per day. This equates to a discharge quantity of 2.16 cubic metres per day to be treated by the system (Information supplied by RPS-MCOS).

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APPENDIX 1

HABITAT DESCRIPTION AT INVERTEBRATE/WATER QUALITY SAMPLING SITES

SITE CODE	A	B	C	D	E
DATE OF ASSESSMENT	22/07/04	22/07/04	12/07/04	12/07004	12/07/04
SITE LOCATION	c.200m upstream of facility	Just upstream of facility boundary, & upstream of v. small drain from south.	Just downstream of facility boundary and downstream of samll drain from south	Just downstream of facility and just upstream of confluence with drain flowing under road.	c.550m downstream of faciity, just upstream of confluence with Glanooragh River
River	Aghacureen Drain	Aghacureen Drain	Aghacureen Drain	Aghacureen Drain	Aghacureen Drain
Irish Grid Square Identification	V	V	V	V	V
Irish Grid Reference Eastings	9342	9357	9359	9374	9402
Irish Grid Reference Northings	9380	9384	9385	9395	9432
Width (m)	0.25	0.75	0.75	0.75	1
Depth (cm)	4	8	5	12	4
Substrate (components numbered in order of dominance)					
Bed Rock	1				
Large rocks					
Cobble	2				1
Gravel/pebble					
Sand					
Mud	3	1	1	1	2
Siltation			Heavy deposits of floculated material. Oil contamination evident.		Yes
Flow type					
% cascade					
% riffle			2		30
% glide		100	98	100	70
% pool					
% trickle	100				
Conductivity (uS)	120	280	180	500	390
Dissolved Oxygen % Saturation	89.5	8.6	17.0	56	84.3
Temperature	15.1	17.2	14.6	16.0	15.5

SITE CODE	A	B	C	D	E
Dominant bankside vegetation	Alder, rush, gorse, spruce	Grass. Gorse, rush, spruce	Elder, birch, spruce	Alder, sycamore, bramble	Hazel
Estimated summer cover of stream by bankside vegetation (High, Medium, Low, None)	High	Medium	High	Medium	Low
Fish Habitat Assessment					
Salmonid adult habitat at site	None	None	None	None	None - Poor
Salmonid nursery habitat at site	None	None	None	None	Fair
Salmonid spawning habitat at site	None	None	None	None	Fair
Instream vegetation (% cover)			None		
Agrostis stolonifera	10			40	
Glyceria fluitans		30			
Sparganium erectum		5			
Callitriche sp.				5	5
Moss					
Filamentous algae					10
Q-rating	3	1-2	1-2	1-2	3

SITE CODE	1	2	3	4
DATE OF ASSESSMENT	12/07/2004	12/07/2004	12/07/2004	12/07/2004
SITE LOCATION	Just upstream of confluence with Aghacureen Drain	Just downstream of confluence with Aghacureen Drain	Glanooragh River c.1km downstream of confluence with Aghacureen Drain	Glanooragh River c.4km downstream of confluence with Aghacureen Drain
River	Glanooragh River	Glanooragh River	Glanooragh River	Glanooragh River
Irish Grid Square Identification	V	V	V	V
Irish Grid Reference Eastings	9399	9407	9493	9569
Irish Grid Reference Northings	9436	9435	9433	9643
Width (m)	1.5	02-Mar	6	6
Depth (cm)	5 - 12	5 -10	12	20
Substrate (components numbered in order of dominance)				
Bed Rock				
Large rocks				4
Cobble	1	1	1	1
Gravel/pebble	2	2	3	3
Sand	3			
Mud	4	3	2	2
Siltation			Heavy	
Flow type				
% cascade				
% riffle	50	70	60	5
% glide	50	30	40	95
% pool				
% trickle				
Conductivity (uS)	240	290	280	240
Dissolved Oxygen % Saturation	92.7	92.8	77.5	86.3
Temperature	14.6	14.6	16.2	14.8

SITE CODE	1	2	3	4
Dominant bankside vegetation	Hazel	Hazel	Elder, alder, hawthorn	Alder
Estimated summer cover of stream by bankside vegetation (High, Medium, Low, None)	High	High	Medium	Medium
Fish Habitat Assessment				
Salmonid adult habitat at site	Poor	Fair	Fair	Fair - Good
Salmonid nursery habitat at site	Good	Good	Good	Fair - Good
Salmonid spawning habitat at site	Fair	Fair	Fair	Poor - Fair
Instream vegetation (% cover)	None		None	
Agrostis stolonifera				
Glyceria fluitans				<5
Sparganium erectum				
Callitriche sp.				<5
Moss				<5
Filamentous algae				
Q-rating	3	3	3	3

APPENDIX 2

CHEMICAL SURFACE WATER QUALITY DATA
(SUPPLIED BY RPS-MCOS)

CHEMICAL SURFACE WATER QUALITY RESULTS

Parameter	Monitoring Points		SW Standard	Dangerous Substances[4]	
	c. 70m d/s Site A*	Site D	FW Standard[2]	Hardness of water	
Sampling Date	04/08/2004	04/08/2004		≤100	> 100
Dissolved Oxygen mg/l	6.1	9.7	100% ≥7[2] (S) 100% ≥5[2] (C)		
pH	6.8	7.6	6.-9[2]		
Conductivity (µS/cm)	182	732	1,000		
Chemical Oxygen Demand mg/l	395	78	40 (A3)		
Biochemical Oxygen Demand mg/l	21.5	3	5		
Chloride mg/l Cl	24.3	35.2	250		
Sulphate mg/l	4.2	80.9	200		
Cadmium mg/l	<0.02	<0.02	0.005		
Calcium mg/l	29.7	165.5			
Chromium mg/l	<0.05	<0.05	0.05	0.005	0.03
Iron mg/l	66.07	0.76	0.2		
Lead mg/l	<0.1	<0.1	0.05	0.005	0.01
Manganese mg/l	22.77	0.56	0.05		
Magnesium mg/l	9.5	12.9			
Mercury mg/l	<1	<1	0.001		
Nickel mg/l	<0.05	<0.05		0.008	0.05
Potassium mg/l	21.7	22.5			
Sodium mg/l	17.9	25.4	200 [3]		
Total Alkalinity $CaCO_3$ mg/l	68	320			
Zinc mg/l	0.18	0.08	3	0.05	
Copper mg/l	0.04	<0.02	0.05	0.005	0.03
Ammonia mg/l N	0.29	2.22	0.2		
Visual Inspection	Stagnant and overgrown with oily substance on the surface	Stagnant and overgrown			

Surface Water Regulations 1989 A1 unless otherwise specified

[2]Freshwater Fish Directive 78/659/EEC
S= Salmonid C= Cyprinid

[3]Drinking Water Standard

[4]Water Quality (Dangerous Substances) Regulations, 2001

*No flow at Site A on date of sampling

RPS-MCOS Ltd.

AIR QUALITY

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DOCUMENT CONTROL SHEET

Client	Killarney Waste Disposal Ltd					
Project Title	Killarney Waste Disposal Waste Licence Application					
Document Title	Air Quality Assessment					
Document No.	MGE0031.Rp0003					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	13	1		

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
1	Draft	M.Doherty	P.Chadwick	W. Madden	Carnegie	07/09/04
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1	Final	M.Doherty	P.Chadwick	W. Madden	Carnegie	06/10/04

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DRAWING

1 AIR QUALITY

1.1 INTRODUCTION

RPS Group was commissioned to prepare the Air Quality Assessment report for the proposed development. This report should be read in conjunction with the site layout plans for the site and project description sections of the EIS. This assessment was prepared in accordance with the Guidelines on the information to be contained in Environmental Impact Statements (EPA 2002).

The proposed extension is to the existing waste transfer facility at Killarney Waste Disposal Ltd, Killarney, Co. Kerry. This study will identify, describe and assess the impact of the development in terms of its effect on air quality. Particular attention will be focused on sensitive receptors, such as residential areas adjacent to the site, and to the extent of the exposure of these receptors to airborne pollutants derived as a result of the development.

A baseline air quality assessment has been carried out in the area around the site of the proposed development. This survey will identify the existing pollutant trends in the area and aims to establish sufficient spatial information in order to determine compliance with relevant ambient air legislation. Additionally, comparison with longer period limit values can be used to establish trends and are important in defining baseline air quality.

1.2 RECEIVING ENVIRONMENT

1.2.1 General

The site of the proposed extension to the existing waste transfer facility is at Killarney Waste Disposal Ltd., Killarney, Co. Kerry. Killarney Waste Disposal is located to the north west of Killarney town in a rural area. The site is bordered to the east and north by residential dwellings and the main road. Wooded and agricultural lands border the western perimeter, with agricultural lands and a private access road leading to some residential dwellings located to the south of the site. This private access road meets the main road directly east of the site.

The nearest sensitive receptors are situated to the south and east and northeast along the main road and the private access road. The nearest receptors are approximately 50m from the site at either end of the private access road. The most distant receptor is on the main road approximately 400m from the site boundary.

The site is located in a rural area with no major roads nearby. There is no major industry in the vicinity of the site that may have an impact on local air quality.

1.2.2 Baseline Air Quality

A total of five sample locations were chosen to represent the baseline air quality in the vicinity of the proposed development. These locations are listed in ***Table 1.2.2.1*** and presented in ***Drawing DG0001-05.***

Reference	Description
A1 and D1	Western perimeter of site. Bordered by woodland
A2 and D2	At site entrance
A3 and D3	Outside House H1 to north west of site.
A4 and D4	To east of site, at junction close to House H14
A5 and D5	To south of site, close to houses H19 and H18

Table 1.2.2.1: Description of Air and Dust Monitoring Locations

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

Benzene

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 VOC from plants and animals but is also generated as a by-product of certain industries. Benzene and other aromatic compounds and 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 five sites the air was monitored for benzene, over a 30-day period, using benzene diffusion tubes. The sample tubes were analysed for benzene at a UKAS accredited laboratory (Gradko International, Winchester). The results are presented in ***Table 1.2.2.2***

Location	Sampling Period	Average Benzene (µg/m^3)
A1	23/07/04-24/08/04	0.84
A2	23/07/04-24/08/04	0.52
A3	23/07/04-24/08/04	0.45
A4	23/07/04-24/08/04	0.65
A5	23/07/04-24/08/04	0.65
Limit Value	-	5(1)

Table 1.2.2.2: Average Benzene Concentrations at each location as measured by passive diffusion tubes.

Note:(1) EU Directive 2000/69/EC

The results indicate that ambient concentrations of benzene are currently low in the area with all locations within the EU limit. The concentrations of benzene recorded at the five locations are quite similar. The lowest level of benzene recorded was at A3, which is expected as vehicles passing this

location, do so at high speed, which contributes less to the build-up of benzene in the vicinity of the sampling location. The highest level of benzene recorded was at A1. This is most likely due to the HGVs and plant equipment on site. The levels detected at the remaining locations are all similar and are typical of rural benzene concentrations. The results suggest that the greatest source of benzene in the area is from motor vehicle exhausts. All levels are well below EU limits and are typical of benzene levels in rural locations.

NO_2 (Nitrogen Dioxide)

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 heating-related emissions and 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 five sites, levels of NO_2 were measured using diffusion tubes, which were left on site for a 30-day period. The tubes were then analysed using UV spectrophotometry, at a UKAS accredited laboratory (Gradko International, Winchester), giving an average concentration over the period. The results are presented in ***Table 1.2.2.3***.

Location	Sampling Period	Average NO_2 ($\mu g/m^3$)
A1	23/07/04-24/08/04	4.90
A2	23/07/04-24/08/04	2.94
A3	23/07/04-24/08/04	2.94
A4	23/07/04-24/08/04	3.43
A5	23/07/04-24/08/04	2.45
Limit Value	-	40(1)

Table 1.2.2.3: Average NO_2 concentrations at each location as measured by passive diffusion tubes.

Note:(1) EU Ambient Air Standard (1999/30/EC) (as an annual average)

As with the benzene results, the highest level of nitrogen dioxide determined is at A1, on the KWD site. This is to be expected due to the works traffic on the site passing close to and/or stopping in the vicinity of the sampling location. The levels at the other four locations are relatively similar, with the lowest level again recorded at A5, on the private access road. Again, the results suggest that the main source of NO_2 in the area is traffic-derived. As with the benzene result, NO_2 levels at all locations are well below the EU limit.

SO_2 (Sulphur Dioxide)

Sulphur dioxide is classed as a primary pollutant principally emitted from the combustion of fossil fuels (diesel, coal, oil, etc.) SO_2 is emitted from boilers and heating units. As traffic based pollutant, SO_2 is mainly emitted from vehicles running on diesel fuel, which will include most light goods vehicles (LGVs) and heavy goods vehicles (HGVs). SO_2 emissions from domestic heating may be significant as SO_2 is a major constituent of sulphurous smog. However, in recent years the government has significantly reduced the importance of SO_2 as an air pollutant with the introduction of smokeless fuel.

In addition, future EU legislation will attempt to minimise and eliminate the sulphur content in motor fuels. Consequently, concentrations of SO_2 in major urban areas are typically low and this is likely to decrease in future years with the broadening of the ban on non-smokeless fuels and the introduction of new EU fuel directives. Sulphur Dioxide is a known contributor to respiratory illness and respiratory symptoms. People with asthma are the most susceptible in the community to elevated SO_2 levels.

At each of the five sites, the air was monitored for sulphur dioxide over a 30-day period, using SO_2 diffusion tubes. The sample tubes were analysed for SO_2 at a UKAS accredited laboratory (Gradko International, Winchester). The results are presented in ***Table 1.2.2.4***.

Location	Sampling Period	Average SO_2 ($\mu g/m^3$)
A1	23/07/04-24/08/04	0.62
A2	23/07/04-24/08/04	0.94
A3	23/07/04-24/08/04	0.46
A4	23/07/04-24/08/04	1.25
A5	23/07/04-24/08/04	0.46
Limit Value	-	20(1)

Table 1.2.2.4. Average SO_2 concentrations at each location as measured by passive diffusion tubes.

Note:(1) EU Ambient Air Standard (1999/30/EC) (as an annual average)

The levels of SO_2 recorded at the five locations are well below EU limits and are typical of rural summertime SO_2 level. Again, the higher levels are recorded on the KWD site at A1 and A2, most likely due to site traffic. The higher result recorded at A4 can be attributed to the house adjacent to the sampling location. There was renovations work taking place at the house during the survey and this may have a direct effect on SO_2 levels recorded at this location during the sampling period.

Dust

Dust is characterised as encompassing particulate matter with a particle size of between 1 and 75 microns (1-75μm). Deposition typically occurs in close proximity to each site and potential impacts occur within 500 metres of the dust generating activity as dust particles fall out of suspension in the air. Larger particles deposit closer to the generating source and deposition rates will decrease with distance from the source.

Sensitivity to dust depends on the duration of the dust deposition, the dust generating activity, and the nature of the deposit. Therefore, a higher tolerance of dust deposition is likely to be shown if only short periods of dust deposition are expected and the dust generating activity is either expected to stop or move on.

At each of the five sites, dust deposition levels over the 30-day period were recorded using Bergerhoff gauges. The results are presented in ***Table 1.2.2.5***

Location	Sampling Period	Dust Deposition Rate ($mg/m^2/day$)
D1	23/07/04-24/08/04	172.7
D2	23/07/04-24/08/04	173.8
D3	23/07/04-24/08/04	116.6
D4	23/07/04-24/08/04	90.0
D5	23/07/04-24/08/04	277.7(2)
Limit Value	-	350(1)

Table 1.2.2.5 Dust deposition levels recorded at each location using Bergerhoff gauges.

Note 1: TA Luft Technical Instructions On Air Quality Control Guidelines. The Limit Value is established to protect against considerable disadvantages or substantial impairments.
Note 2: Sample D5 contained excessive foliage and plant debris from overhanging trees.

As with benzene and NO_2, the results vary with distance from the main activities in the area. As expected, the highest levels of dust recorded are on the KWD site (D1) and at the site entrance (D2). As distance from the site increases, the dust levels decrease and the lowest levels are recorded at the most distant sampling locations (D3 and D4). It should be noted that the sample at D5 was heavily contaminated with debris from overhanging trees and is not a representative of dust levels in the area and should be discounted.

The dust levels recorded in the area are below the TA Luft Guidelines Limit Value.

1.2.3 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 1.2.3.1*** EU Council Directive 2000/69/EC defines limit values for both carbon monoxide and benzene in ambient air and is presented in ***Table 1.2.3.2***.

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 1.2.3.1: EU Ambient Air Standard 1999/30/EC.

Pollutant	Regulation	Limit Type	Margin of Tolerance	Value
Nitrogen Dioxide	1999/30/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	50% until 2001 reducing linearly to 0% by 2010	200 $\mu g/m^3$ NO_2
		Annual limit for protection of human health	50% until 2001 reducing linearly to 0% by 2010	40 $\mu g/m^3$ NO_2
		Annual limit for protection of vegetation	None	30 $\mu g/m^3$ NO NO_2
Lead	1999/30/EC	Annual limit for protection of human health	100% until 2001 reducing linearly to 0% by 2005	0.5 $\mu g/m^3$
Sulphur Dioxide	1999/30/EC	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	43% until 2001 reducing linearly until 0% by 2005	350 $\mu g/m^3$
		Daily limit for protection of human health - not to be exceeded more than 3 times/year	None	125 $\mu g/m^3$
		Annual & Winter limit for the protection of ecosystems	None	20 $\mu g/m^3$
Particulate Matter Stage 1	1999/30/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50% until 2001 reducing linearly to 0% by 2005	50 $\mu g/m^3$ PM_{10}
		Annual limit for protection of human health	20% until 2001 reducing linearly to 0% by 2005	40 $\mu g/m^3$ PM_{10}
Particulate Matter Stage 2	1999/30/EC	24-hour limit for protection of human health - not to be exceeded more than 7 times/year	To be derived from data and to be equivalent to Stage 1 limit value	50 $\mu g/m^3$ PM_{10}
		Annual limit for protection of human health	50% until 2005 reducing linearly to 0% by 2010	20 $\mu g/m^3$ PM_{10}

Table 1.2.3.2: EU Ambient Air Standard – 2000/69/EC.

Pollutant	Regulation	Limit Type	Margin of Tolerance	Value
Benzene	2000/69/EC	Annual limit for protection of human health	100% until 2003 reducing linearly to 0% by 2010	5 $\mu g/m^3$
Carbon Monoxide	2000/69/EC	8-hour limit (on a rolling basis) for protection of human health	50% until 2003 reducing linearly to 0% by 2005	10 mg/m^3

1.3 CHARACTERISTICS OF THE PROPOSAL

Killarney Waste Disposal Ltd (KWD) proposes to increase the total annual intake from 16,500 tonnes per annum (tpa) to 40,000 tpa. Only non-hazardous waste is accepted on site. As part of the expansion, it is proposed to build an additional shed for processing. The new shed will be built on the existing fill area on the site and will house sorting, baling and various recycling equipment. Wood shredding will continue to take place outside. It is also proposed to construct a hard surface road around the perimeter of the proposed new shed.

1.4 POTENTIAL IMPACTS OF THE PROPOSAL

1.4.1 Construction Phase

There is the potential for a number of emissions to atmosphere during the construction of the development. In particular, the construction activities may generate quantities of dust, particularly in drier weather conditions. This problem is exaggerated when vehicles transporting sands/gravels/soils etc. to and from the site have the potential to cause an environmental nuisance several kilometres from the facility. The construction vehicles, generators etc., will also give rise to petrol and diesel exhaust emissions, although this is of minor significance compared to dust.

1.4.2 Operational Phase

Scheduled Emissions

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

There may be an impact from unscheduled emissions of dust from HGV movements on the site. This impact will be directly related to the working practices on the site. If a satisfactory dust minimisation plan is implemented (i.e. wheel washes, road sweepers, etc), the potential impact of fugitive dust is expected to be minimal.

As there is no waste deposited in the site, there is no potential for the build up of methane and landfill gas. Consequently, the emissions from a landfill gas flare unit will not be generated at the proposed development.

Odours are a potential nuisance from any facility that involves waste storage or transfer. Fugitive odours (i.e. not through stacks or vents) from landfills, waste transfer stations, baling stations, etc. arise mainly from the uncontrolled anaerobic biodegradation of waste to produce unstable intermediates.

Odours are generated by a number of different components, the most significant being the sulphur containing compounds (thiols, mercaptans, hydrogen sulphide), volatile fatty acids (butyric acid, valeric acid), amines (Methylamine, Dimethylamine), phenols (4-methylphenol) and chlorinated hydrocarbons (trichloroethylene, tetrachloride).

Most of these compounds have very low odour threshold concentrations and therefore are capable of generating odours even in very low concentrations. Different concentrations and mixtures of these compounds can intensify or reduce odour threshold concentration, determined as synergism and antagonism respectively.

A series of design features, work practices and mitigation measures for the reduction of fugitive odour emissions are outlined later in this report.

The operators of the proposed development will apply to the Environmental Protection Agency for a Waste Licence for all on-site activities. Consequently the EPA will require a level of operation that will not impinge on the surrounding environment and decide on the extent and nature of any environmental monitoring (e.g. dust or odour) to be carried out.

Road Traffic

There are relatively low volumes of traffic on the adjoining roads currently in the area of the proposed development. Any traffic is free flowing and is not currently giving rise to significant air pollution. Any alterations to the existing traffic scenario, i.e. traffic volumes and/or a significant drop in vehicle speed (to gridlock speeds) may cause a variation in the pollutant concentrations. The Transportation Access and Traffic Assessment Report proposes some improvements to the existing road and access road to the facility. The proposed improvement of the road has the potential to improve traffic flow in the area and decrease the likelihood of a gridlock scenario occurring and thus mitigating against the predicted increase in traffic as a result of the proposed development.

"Do-Nothing" Scenario

The baseline survey results suggest that air quality in the vicinity of the proposed development is good and shows typical levels for a rural area with all pollutants within the relevant EU limits at all locations. 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.

1.5 REMEDIAL OR REDUCTIVE MEASURES

1.5.1 Construction Phase

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 must be regularly watered, as appropriate, during dry and/or windy conditions.

In the event of the access road and local road widening taking place, the above measures should be implemented and all reasonable dust reduction measures used during the construction process.

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.

Public roads outside the site shall be regularly inspected for cleanliness, and cleaned as necessary.

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.

1.5.2 Operational Phase

Road Traffic

The emission of pollutants from road traffic can be controlled by either controlling the number of road users or by controlling the flow of traffic. For the majority of vehicle-generated pollutants, emissions rise as speed drops. Emissions are also higher under stop-start conditions when compared with steady speed driving. The free flow of the traffic in the vicinity of the proposed development is essential in order to minimise the generation of traffic related pollutants. The proposed improvement of the local road and access road should improve the available sightlines and thus assist with the free-flow of traffic in the area.

Odours

The potential for odour emissions may be minimised by a series of design features, work practices and mitigation measures. Each of these measures is outlined briefly below:

All of the on-site operations scheduled for the site (including storage of bales) should be housed indoors in the proposed purpose built shed. All loading and unloading should be carried out in designated loading bays. All tipping should be carried out in designated tipping areas. The site layout should be maximised so as to keep any outdoor operation as far as possible from the nearest sensitive receptors.

All work surfaces and floors should be cleaned and regularly maintained to a suitable standard to prevent the build up of anaerobic bacteria. All areas where there is a potential for the generation of odour (i.e. temporary storage areas, skips, bins, etc) should be covered to reduce the potential for escape of odours. Residence time for waste, even non-odorous waste, should be kept to a minimum before transfer.

In the event that an odour nuisance is occurring from the facility, despite the building design and work practices, there are a number of odour mitigation measures that may be employed. The main mitigation measure would be the use of a masking agent, which is a chemical component in an open-air spray specifically designed to mix with the fugitive odour. These masking agents typically have pleasant odours designed to "mask" the unpleasant odour fro the facility.

Alternatively, a counteractant may be employed, by a similar process to masking agents. Counteractants are designed to "interfere" with the odour molecules by a chemical or physical reaction and reduce their odour intensity.

1.6 PREDICTED IMPACT OF THE PROPOSAL

1.6.1 Construction Phase

The effect of construction on air quality will not be significant following the implementation of the proposed mitigation measures. The main environmental nuisance associated with construction activities is dust. However, it is proposed to adhere to good working practices and dust mitigation measures to ensure that the levels of dust generated will be minimal and are unlikely to cause an environmental nuisance. A series of such good working practices and mitigation measures are outlined earlier in this chapter.

1.6.2 Operational Phase

The predicted increases in traffic volumes as a result of the development along the existing road network are expected to be relatively low. At present there are 67 normal vehicle movements per day at the facility, and 59 HGVs movements. The proposed increase to 40,000 tpa will cause the number of normal vehicle movements to increase to 71 per day and the number of HCV movements to increase to 143 per day.

The total predicted number of HGV's per day is relatively low but does represent an increase in order of magnitude, of more than two. The proposed improvements to the local road and access road as recommended in the Transportation Access and Traffic Report will lead to better sightlines for traffic in the area and thus improve traffic flow. As long as the traffic remains free flowing, the predicted increase in traffic volumes should not have an adverse effect on local air quality.

In addition, the proposed new shed will be located in the yard where the surface currently consists of large aggregate stone fill. The creation of an enclosed shed and a hard surface road in place of the current surface has the potential to reduce local dust levels.

1.7 MONITORING

1.7.1 Construction Phase

It the event that dust from the proposed development is creating an environmental nuisance during the construction phase of the development, an ambient dust deposition survey is recommended. This survey should be carried out by qualified consultants using EPA approved Bergerhoff gauges. Typically these surveys require four gauges on the site (one at each corner) and possibly one at the nearest sensitive receptor.

The TA Luft (German Government "Technical Instructions on Air Quality") states a guideline of 350 $mg/m^2/day$ for the deposition of non-hazardous dusts. This value should be used to determine the impact of construction dust as an environmental nuisance should the need arise.

1.8 CONCLUSION

The result of the baseline air quality survey show that air quality in the vicinity of Killarney Waste Disposal Ltd., is typical of rural air quality and can be categorised as Zone D (explain) in relation to the EU Air Framework Directive and EPA Air Quality Zones *.

Providing that all reasonable mitigation measures are undertaken during the construction and operations phases of the proposed development of facilities at Killarney Waste Disposal Ltd., no significant negative impacts on local air quality are predicted.

* The EU Air Framework Directive deals with each EU Member State in terms of Zones and Agglomerations. For Ireland, four zones, A, B, C and D are defined in the Air Quality Regulations (2002)

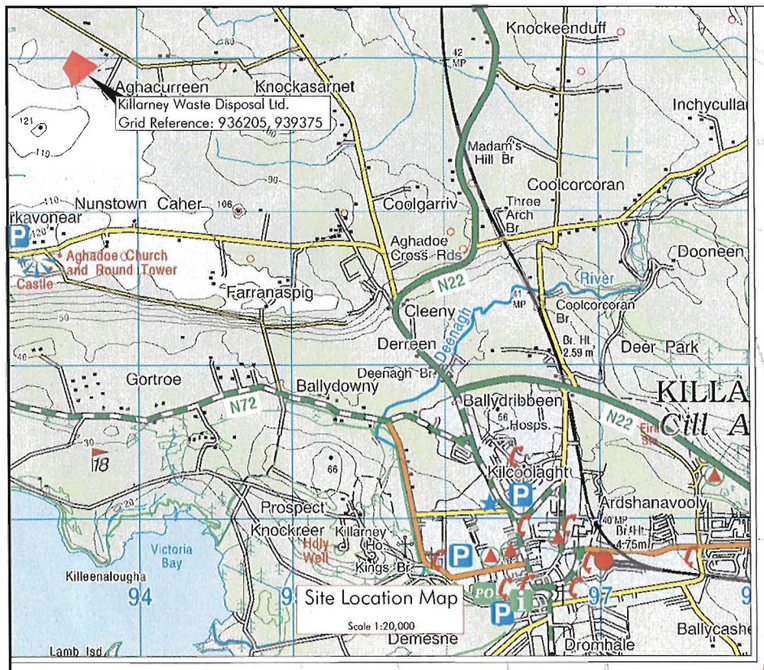
The main areas defined in each zone are:

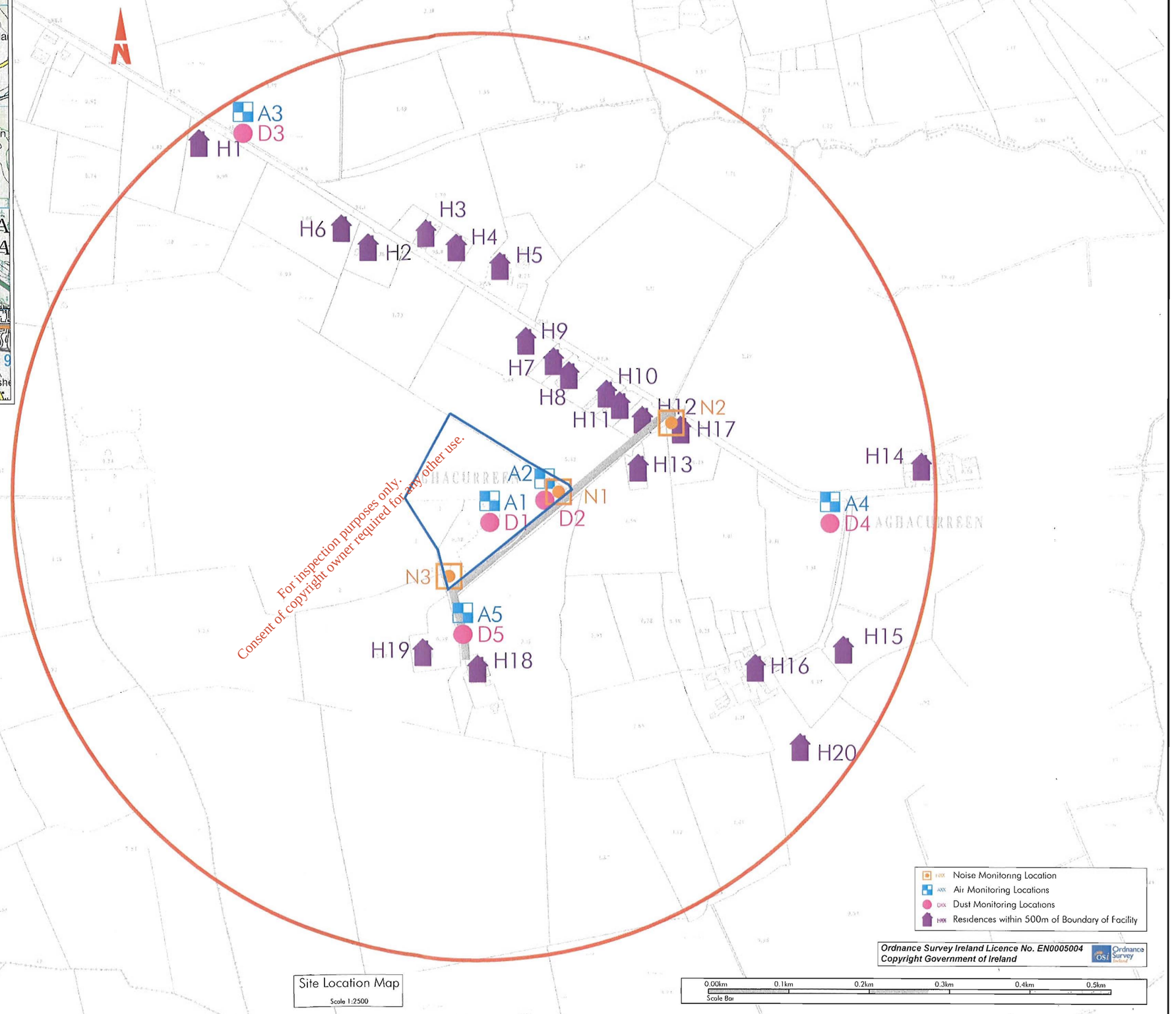
Zone A: Dublin Conurbation

Zone B: Cork Conurbation

Zone C: Other Cities and Large Towns comprising Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee and Dundalk

Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.





KWD RECYCLING

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NOTES

1 This drawing is the property of RPS-MCOS Ltd., it is a confidential document and must not be copied, used, or its content divulged without prior written consent
2 All Levels refer to Ordnance Survey Datum, Malin Head.
3 DO NOT SCALE, use figured dimensions only, if in doubt ask.

No.	Date	Ch'k'd	Amendment / Issue	App.
F02	07/01/05	C.N. / S.A.	Final Issue	W.M.
F01	17/09/04	C.N. / S.A.	Final Issue	W.M.

Killarney Waste Disposal LTD.

Waste Licence Application

Title: Monitoring Locations Dust, Air & Noise

Drawn by	C.N.	Job No	MGE0031
Checked by	S.A.	File No	MGE0031DG0001
Approved by	W.M	Drg No	DG0001-05
Scale	1:2500 @ A1	Rev	F02
Date.	Jun.'04		