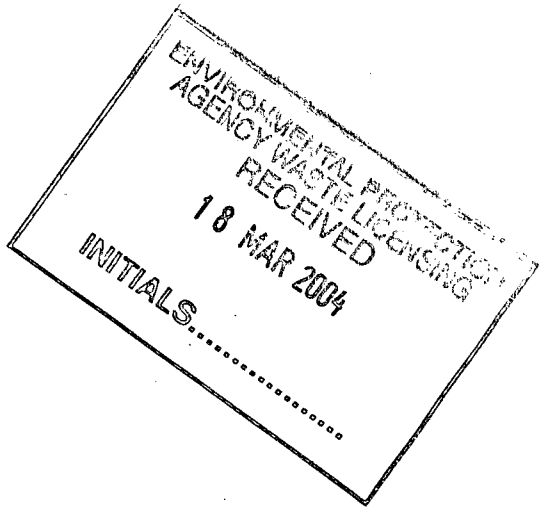


Appendix 7

Flora and Fauna

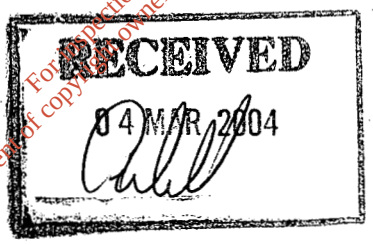
Baseline Flora and Fauna Report
Natura Environmental Consultants Ltd.
March 2004.

WHITESTOWN LOWER GRAVEL PIT

BASELINE ECOLOGICAL SURVEY

FINAL REPORT

March 2004



NATURA
ENVIRONMENTAL CONSULTANTS

Enterprise Centre, The Murrough, Wicklow
Tel: 0404 -64020 Fax: 0404-64022
e-mail: info@natura.ie

WHITESTOWN LOWER GRAVEL PIT
BASELINE ECOLOGICAL SURVEY

1. INTRODUCTION

NATURA Environmental Consultants were commissioned by Environment & Resource Management Ltd to undertake a baseline ecological survey of the Whitestown Lower gravel pit near Donard, Co Wicklow. The site is comprised primarily of a disused sand and gravel quarry which has been subjected to dumping of waste and includes an area extending to the Carrigower River. The river and its adjacent floodplain are included within the River Slaney candidate Special Area of Conservation (cSAC).

The baseline assessment included a survey of ecological habitats within the site and a zone of approximately 500m (see Figure 1), and an aquatic survey of the adjacent Carrigower River. Due to weather constraints, the aquatic survey was not undertaken until the 10th of February 2004, when the water levels and river conditions were suitable for this survey to be undertaken.

2. METHODS

Designated Conservation Areas

The National Parks and Wildlife Service (NPWS) database was consulted regarding information on designated conservation areas and boundary locations.

Terrestrial survey

The site was surveyed on the 8th of January 2004 and habitats were classified using *A Guide to Habitats in Ireland* (Fossitt, 2000). Habitats within a 500m radius of the site were mapped provisionally from aerial photography and also classified according to Fossitt (2000).

Aquatic survey

A survey of the Carrigower River between sampling location A2 and Whitestown Bridge (see Figure 1) was undertaken on the 10th of February 2004. Water levels at the time of survey were low (reading 0.3m on gauge opposite the site) with very low turbidity. An assessment of the suitability of the river for species of fauna protected under Annex II of the Habitats Directive (92/43/EEC) and Annex I of the Birds Directive (79/409/EEC) was undertaken. This included checking for tracks, spraints (dung) and other signs of otter activity along the river-bank; checking otter spraints for signs of crayfish remains (a favoured food of the otter); checking along the banks for shell fragments of freshwater pearl mussel; and identifying potential suitable nest locations for kingfisher.

A visual assessment of the suitability of the aquatic habitat as potential spawning and nursery ground for salmonids and lamprey species was also undertaken. In addition, a review of the relevant literature covering the occurrence of protected species was also carried out: Kurz & Costello (1999) for lamprey, Reynolds (1998) for white-clawed crayfish, Moorkens (1999) for freshwater pearl mussel and

O'Reilly (2002) for fisheries. Consultation was also undertaken with the Eastern Regional Fisheries Board (ERFB) for existing information on the fisheries value of the Carrigower River.

The Environmental Protection Agency (EPA) database (http://www.epa.ie/) was checked for existing information on water quality and standard sampling locations. Biological water samples were taken at three locations to determine water quality upstream and downstream of the site (see Figure 1 for sampling locations A1-A3). The methodology used follows the EPA's standard biological assessment technique (McGarrigle *et al.*, 2002). Macroinvertebrates were collected in a 2mm mesh hand-net by kick sampling in a suitable gravel-stone substrate for 2 minutes. Samples were transferred to plastic buckets and preserved in 70% alcohol. The identification of invertebrates and evaluation of water quality were undertaken by freshwater biologists at Ecological Consultancy Services Ltd (ECOSERVE) using the five-point 'Q value' system. The classification system is outlined in Appendix I and is based on the sensitivity or tolerance of various groups of invertebrates to pollution.

Ecological evaluation

Ecological evaluation of the terrestrial habitats and the Carrigower River was carried out on the basis of the criteria outlined in Appendix III.

3. RECEIVING ENVIRONMENT

Designated Conservation Areas

Part of the Whitestown gravel pit site is included within the River Slaney candidate Special Area of Conservation (cSAC)(site code 000781), which extends to cover part of the Carrigower River (see Figure 2). A significant proportion of the area occurring within 500m of the site consists of the floodplain of the Carrigower River, which is also included in the River Slaney cSAC.

The River Slaney cSAC was extended in May 2003 to include the Carrigower River on account of its importance as a salmon spawning tributary. The River Slaney was originally selected for alluvial wet woodlands (a priority habitat under the Habitats Directive), floating river vegetation, estuaries, tidal mudflats, and old oak woodlands, all habitats listed in Annex I of the directive. In addition, the River Slaney was selected for the presence of the following species listed under Annex II of the Habitats Directive: sea, river and brook lamprey (*Petromyzon marinus*, *Lampetra fluviatilis* and *L. planeri*), freshwater pearl mussel (*Margaritifera margaritifera*), twaite shad (*Alosa fallax fallax*), Atlantic salmon (*Salmo salar*) and otter (*Lutra lutra*)(NPWS, 2003).

Terrestrial habitats

Habitats within the gravel pit site

The dominant habitats occurring within the Whitestown Lower gravel pit are the categories **exposed sand and gravel (ED1)** and **recolonising bare ground (ED3).** Cliff faces vary in height up to approximately 10m. A house and barn are located on the eastern boundary of the site **(buildings and artificial surfaces BL3).**

Other habitats found in the site include small areas of **scrub (WS1).** The larger of these, which occurs along the embankment forming the eastern boundary of the quarry, is dominated by elder (*Sambucus niger*) with occasional poplar (*Populus tremula*), gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus* agr.). At the base of the embankment to the south-east, an area of alder (*Alnus glutinosa*), hazel (*Corylus avellana*) and birch (*Betula* sp.) scrub occurs, while at the north-east corner of the site, a small area of elder and bramble scrub occurs at the base of the embankment. An area dominated by ruderal species including rank grasses (e.g. cock's-foot, *Dactylis glomerata*)**(dry meadow and grassy verges, GS2)** occurs along the eastern boundary to the south of the house and barn. To the south of the area of dry meadow, the south-eastern site boundary extends below the embankment towards the east to include part of the river floodplain, which is comprised of **wet grassland (GS4)** dominated by rushes (*Juncus* spp). The riverbank at this point is fenced and comprised of a moderately steep strip of approximately 1.5m in width dominated by grasses with occasional gorse bushes, bramble and small stands of canary reed-grass (*Phalaris arundinacea*) along the water's edge. Other habitats within the site include a **stone wall (BL1)** running along the north-western boundary of the site with **scattered trees (WD5),** dominated by semi-mature oak (*Quercus* sp.) and ash (*Fraxinus excelsior*).

Habitats within 500m of the gravel pit site

The dominant habitats within 500m of the Whitestown gravel pit are: a) **improved agricultural grassland (GA1),** with **hedgerows (WL1)** frequently found along field boundaries, and b) **wet grassland (GS4)** dominated by rushes occurring in the floodplain of the Carrigower River.

Directly south of the site is an area of rich fen-type vegetation **(rich fen and flush, PF1)** dominated by sedges (*Carex* spp) with a high percentage of moss cover (including *Calliergonella cuspidata,* a calcicole species indicator of base-rich conditions) on a peaty substrate. This area is heavily-grazed and poached by cattle. A patch of ash-hazel woodland (falling under the category **oak-ash-hazel woodland, WN2)** occurs on the eastern bank of the old riverbed of the Carrigower River and is dominated by hazel with occasional ash, birch and willow (*Salix* spp). Some of the trees are up to 10m in height, with an average height of 6-8m. The understorey is poorly developed as a result of poaching by cattle. An abundance of lichens is found on the trees and there is evidence of badger activity in the area, as indicated by the presence of feeding scrapes. **Treelines (WL2)** dominated by mature beech (*Fagus sylvatica*), **scrub (WS1)** dominated by gorse (*Ulex europaeus*), **drainage ditches (FW4), stone walls (BL1)** and the category **buildings and artificial surfaces (BL3)** also occur within 500m of the site.

Aquatic and Riparian Habitats

The Carrigower River is a lowland spate river occurring in Hydrometric Area 12 (McGarrigle et al, 2002). It rises in Hollywood Glen and is a first order tributary of the River Slaney.

In the vicinity of the proposed scheme, the Carrigower River has been dredged and canalised at some point in the past. Parts of the old riverbed, which are still visible in places, held standing water at the time of survey and may be important for amphibians and aquatic invertebrates. The main river channel ranges between 4m

and 5m in width. Glide and riffle conditions prevail along the stretch surveyed in the vicinity of the site. The substrate is dominated by gravels, cobbles and occasional small boulders, with sands occurring in areas of slack flow and along banks. Aquatic vegetation is abundant and dominated by water-crowfoot (*Ranunculus sp.*), with watercress (*Nasturtium officinale*) frequent close to the banks. The riparian habitat is chiefly comprised of wet grassland dominated by grasses and rushes (*Juncus* spp) on gentle to steep banks of approximately 1m in height. Isolated alder, gorse and small patches of bramble occur occasionally. Small stands of canary reed-grass, meadow sweet (*Filipendula ulmaria*) and willow herb (*Epilobium sp.*) occur close to the water's edge.

Water quality

Results of the 1998 river water quality investigation at Whitestown Bridge by the EPA showed that the Carrigower River was unpolluted (Q value of 4-5)(EPA, 2002). No more recent data published by the EPA are available at present. Biological sampling was undertaken by *NATURA* in February 2004 at three locations (Figure 1) to determine the current water quality status of the river. Descriptions of the sampling locations and the Q values obtained are presented in Table 1. The full detailed results of the evaluation of water quality are shown in Appendix II.

A Q rating of 3-4 was assigned to the Carrigower River for all three sampling locations (i.e. upstream and downstream of the proposed development), indicating a slightly polluted status.

Table 1. Biological water sampling locations and Q value results.

Sample Number	Description	Biological Q value
A1	Carrigower Bridge. Riffle d/s bridge with rock outcrop and gorse/briar scrub on banks. Water-crowfoot abundant on gravel/cobble-dominated substrate.	Q3-4
A2	Upstream of site – north-east. Riffle area adjacent to field boundary intersection with occasional bankside alder and ash. Water-crowfoot abundant on gravel/cobble-dominated substrate.	Q3-4
A3	Downstream of site (south-east) but upstream of quarry at Castleruddery Upper. Riffle area d/s of field boundary intersection with grass and briar on banks. Water-crowfoot abundant on gravel/cobble-dominated substrate.	Q3-4

Fisheries

The Carrigower River holds good stocks of brown trout (*Salmo trutta*) upstream of Whitestown Bridge (O'Reilly, 2002). The River Slaney is primarily a spring salmon fishery and is regarded as one of the top rivers in Ireland for early spring salmon fishing (O'Reilly, 2002). Additionally, the Slaney holds excellent stocks of sea trout and brown trout. According to NPWS (2003), the upper Slaney and tributary headwaters are very important for spawning for salmonids. The stretch of water surveyed from Carrigower Bridge downstream to Whitestown Bridge contains

abundant riffle habitat suitable for spawning of salmonids and lamprey species. In addition, the abundance of glide habitat and extensive cover of water-crowfoot offer very suitable nursery habitat for juvenile fish. The Eastern Regional Fisheries Board undertook a count of salmon redds (spawning sites) in the Carrigower River from Whitestown Quarry downstream to the confluence with the Slaney during the winter 2002-2003. Over 170 redds were recorded and the ERFB acknowledge the Carrigower as being one of the "more important salmon spawning and nursery tributaries in the Slaney system" (A. McGurdy, pers. comm., 2004).

Protected Fauna

There are seven aquatic species occurring in Ireland afforded protection under Annex II of the EU Habitats Directive (EEC/92/43), all of which have a widespread distribution in the country. These are the otter, the three species of lamprey (i.e. sea, river and brook lamprey), the white-clawed freshwater crayfish (*Austropotamobius pallipes*), the freshwater pearl mussel and the Atlantic salmon (see section on Fisheries). In addition, the kingfisher (*Alcedo atthis*), a species occurring in close association with watercourses, is listed as an Annex I of the EU Birds Directive (79/409/EEC).

Otter

The otter is a legally protected species under the EU Habitats Directive (listed in Annex II) and is found throughout Ireland (Hayden & Harrington, 2000). Otters tend to occupy linear territories along watercourses and are rarely found far away from water. Abundant evidence of otter was found along the stretch of the Carrigower River surveyed. Spraints were found at numerous locations including both the Carrigower and Whitestown Bridges. Extensive activity (trails, prints and numerous spraints of varying ages) was found at the riverbank on the south-eastern boundary of the site around a lone hawthorn with dense surrounding bramble. This appears to be a couch (temporary lie-up) location.

White-clawed freshwater crayfish

According to Reynolds (1998), white-clawed freshwater crayfish has not been recorded to date in the 10km square under study. The species also appears to be absent from the upper River Slaney (Reynolds, 1998), but it may occur downstream of Rathvilly as the species has been recorded from grid squares S86 and S87. Otter spraints were checked for signs of crayfish remains as these crustaceans are a favoured food item of the otter. No evidence of remains was found suggesting that the crayfish may be absent from the Carrigower River.

Lamprey

River and brook lamprey appear to be widespread in the River Slaney and in the lower reaches of some of its tributaries (Kurz & Costello, 1999). Sea lamprey has been observed in the River Slaney downstream of Enniscorthy, but the species is unlikely to extend as far upstream as the Carrigower River.

Brook lamprey is known to spawn in small streams in the Slaney catchment and in the River Slaney itself. The extensive riffle habitat present in the Carrigower River is likely to support spawning brook lamprey, and possibly also river lamprey. While areas of silty sediment suitable as nursery beds for ammocoete larvae (juvenile lamprey) were not evident during the survey, it is possible that

accumulations of silts and fines occur over the spring and summer period as the aquatic vegetation growth in the river extends and acts as a sediment trap.

Kingfisher
Kingfisher are very likely to occur on the Carrigower River as the river supports significant stocks of juvenile fish. However, the presence of the species remains undetermined as no sightings of the species were made during the field survey. The banks of the river within the stretch surveyed were not suitable as nesting habitat for the species.

Freshwater pearl mussel
Freshwater pearl mussels are known to occur in the River Slaney and some of its tributaries (NPWS, 2003). However, according to Moorkens (1999), the species does not occur in the 10km square under study. Distribution records indicate that pearl mussels occur in neighbouring grid squares (i.e. S88 and S98), and thus the nearest point to the proposed development where known populations may occur is approx. 6-7km downstream of the site.

Other species of fauna
A nesting colony of sand martins (*Riparia riparia*) occurs in a sand cliff towards the centre of the site. A total of 50 burrows were recorded.

A dipper (*Cinclus cinclus*) was observed feeding on the Carrigower River downstream of the Carrigower Bridge and an old nest was noted in a hole in the masonry under the bridge.

A disused badger (*Meles meles*) sett is located within the patch of scrub in the north-eastern corner of the site. There are at least five entrances, though some of these are partially blocked by earth. Bedding was present outside one of the entrances indicating relatively recent occupation.

4. EVALUATION

Terrestrial habitats

Habitats within the gravel pit site
The area of **wet grassland (GS4)** which occurs in the southern-eastern corner of the site, and the area of **dry meadow (GS2),** which is located along the eastern boundary, are included within the River Slaney cSAC and are therefore considered to be of international importance (A). However, the area of dry meadow is rather species-poor and does not form part of the floodplain of the Carrigower River, from which it is separated by an embankment and a natural field boundary of scrub. The patches of **scrub (WS1)** located along the eastern boundary of the site and the old **stone wall (BL1)** with **scattered trees (WD5)** along the north-western boundary are of moderate local ecological value (D). The habitats comprised of **exposed sand and gravel (ED1)** and **recolonising bare ground (ED3)** are considered to be of low ecological value (E).

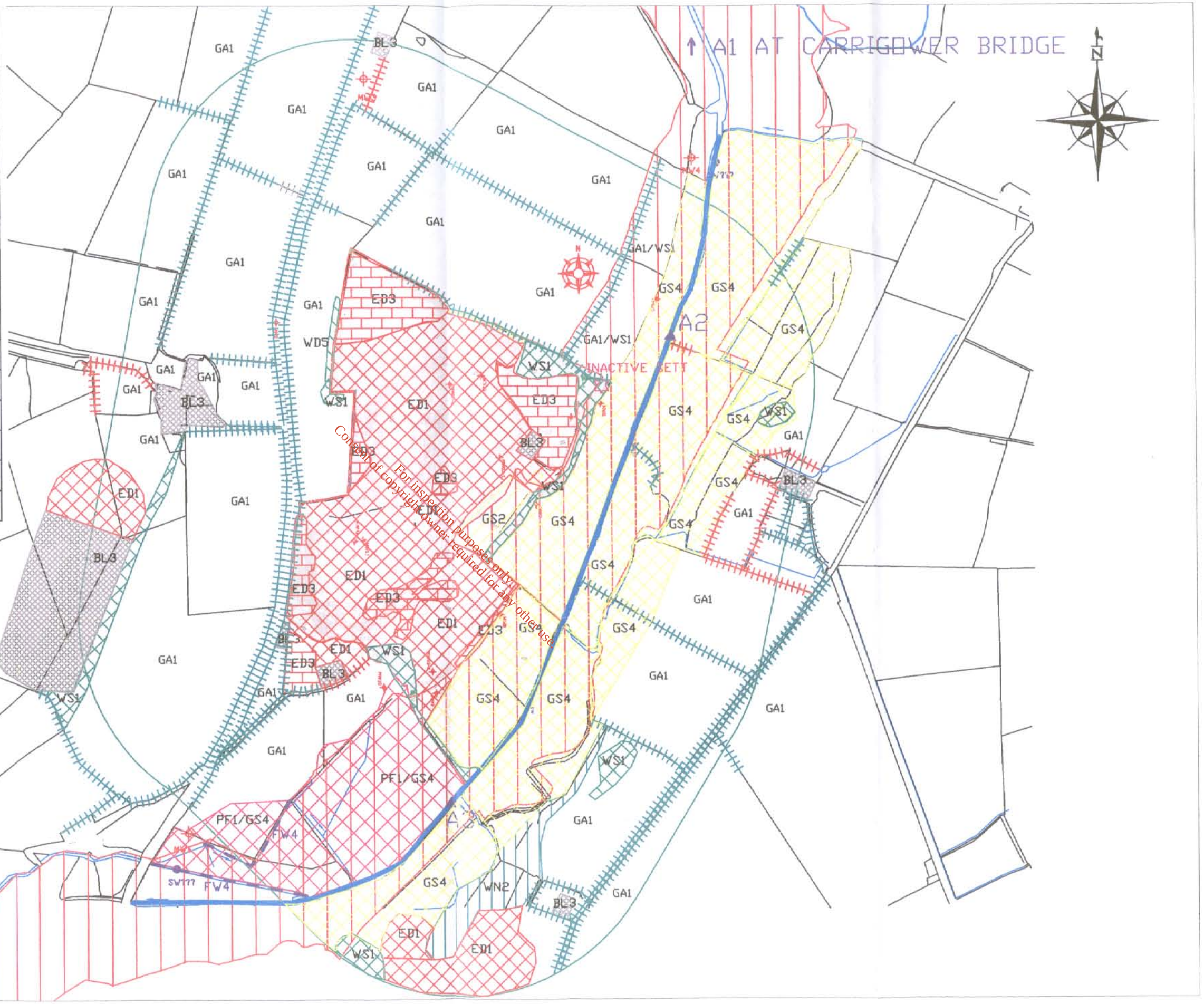
Habitats within 500m of the gravel pit site
Habitats occurring within 500m of the site and included within the River Slaney cSAC are mainly comprised of areas of **wet grassland (GS4),** with some areas of **rich fen and flush (PF1), improved agricultural grassland (GA1)** and **scrub (WS1).** These are of international importance (A). The area of **ash-hazel woodland (WN2)** is considered to be of high local ecological value (C).

Field boundaries such as **treelines (WL2)** and **hedgerows (WL1)** play an important role as ecological corridors for wildlife. Mature **treelines (WL2)** are of high local ecological value (C) and hedgerows would be considered to be of moderate to high local ecological value (D/C), depending on their maturity, species composition and associated features (e.g. ditches, banks).

Habitats such as **scrub (WS1), drainage ditches (FW4)** and **stone walls (BL1)** are considered to be of moderate local ecological value (D). Areas comprised of **improved agricultural grassland (GA1)** and **buildings and artificial surfaces (BL3)** are of low ecological value (E).

Aquatic habitats
The Carrigower River and adjacent floodplain are part of the River Slaney cSAC and are thus of international importance (A). The presence of abundant salmonids spawning habitat in the river along with extensive signs of otter activity adds to the value and importance of the site.

- Proposed Candidate Special Area of Conservation (pcSAC)
- Inactive Badger Sett
- FW2 Lowland Depositing River
- FW4 Drainage Ditch
- GA1 Improved Agricultural Grassland
- GS2 Dry Meadows and Grassy Verges
- GS4 Wet Grassland
- PF1 Rich fen and flush
- WN2 Oak-ash-hazel woodland
- WD5 Scattered trees and parkland
- WS1 Scrub
- WL1 Hedgerow
- WL2 Treeline
- ED1 Exposed Sand, Gravel or Till
- ED3 Recolonising Bare Ground
- BL1 Stone walls and other stonework
- BL3 Buildings and artificial surfaces



All mapping produced under O.S. Licence No EN 0000503

NATURA
ENVIRONMENTAL CONSULTANTS
Enterprise Centre,
The Murrough,
Wicklow, Ireland
Tel: 353 (0)404 64020
Fax: 353 (0)404 64022

Whitestown Lower Gravel Pit

Figure 1: Habitat Map

Drawn by: VS	Project no: 1111
Checked: PM	Scale: 1:5000
Sheet no: 1 of 1	Date: 03/03/2004

5. REFERENCES

Environmental Protection Agency (EPA). Website: http://www.epa.ie/

Fossitt, J.A. (2000). *A Guide to Habitats in Ireland.* The Heritage Council, Kilkenny, Ireland.

Kurz, I. and Costello, M.J. (1999). *An outline of the biology, distribution and conservation of lampreys in Ireland.* Irish Wildlife Manuals, No. 5. Dúchas, The Heritage Service, Dublin.

McGurdy, A. (ERFB). Consultation Letter to *NATURA* dated 5th February 2004.

McGarrigle, M.L., Bowman, J.J., Clabby, K.J., Lucey, J., Cunningham, P., MacCarthaig, M., Keegan, M., Cantrell, B., Lehane, M., Clenaghan, C. and Toner, P.F. (2002). *Water Quality in Ireland 1998-2000.* Environmental Protection Agency (EPA)

Moorkens, E.A. (1999). *Conservation management of the freshwater pearl mussel* Margaritifera margaritifera. *Part 1: Biology of the species and its present situation in Ireland.* Irish Wildlife Manuals, No. 8. Dúchas, The Heritage Service, Dublin.

Moorkens, E.A: (in prep). *Conservation management of the freshwater pearl mussel* Margaritifera margaritifera. *Part 3: Standard survey techniques.* Irish Wildlife Manuals. Dúchas, The Heritage Service, Dublin.

National Parks and Wildlife Service, NPWS (2003). *Slaney River Valley (Site No: 000781): Site Synopsis.* http://www.duchas.ie/

O'Reilly, P. (2002). *Rivers of Ireland: A Flyfisher's Guide.* (5th ed.) Merlin Unwin Books, Shropshire, U.K.

Reynolds, J.D. (1998). *Conservation management of the white-clawed crayfish* Austropotamobius pallipes. Irish Wildlife Manuals No. 1. Dúchas, the Heritage Service, Dublin.

APPENDIX I: THE BIOLOGICAL RIVER QUALITY CLASSIFICATION SYSTEM (Q VALUES)

Q value*	Community diversity	Water quality	Condition	Quality status
Q5	High	Good	Satisfactory	Unpolluted
Q4	Reduced	Fair	Satisfactory	Unpolluted
Q3	Much reduced	Doubtful	Unsatisfactory	Moderately polluted
Q2	Low	Poor	Unsatisfactory	Seriously polluted
Q1	Very low	Bad	Unsatisfactory	Seriously polluted

*** Classification system after McGarrigle *et al.* (2002)**

APPENDIX II: ECOSERVE BIOLOGICAL EVALUATION OF THE CARRIGOWER RIVER

Macroinvertebrate species recorded from samples A1–A3. Numbers shown are numbers of individuals per sample. Q indices calculated as follows. 1 or 2 individuals = Present, <1% = Scarce/Few, <5% = Small numbers, 5-10% = Fair numbers, 10-20% = Common, 25-50% = Numerous, 50-75% = Dominant, >75% = Excessive. The EPA faunal indicator groups of sensitivity to pollution are A (sensitive), B (less sensitive), C (tolerant), D (very tolerant) and E (most tolerant).

Species/Taxa	A1	A2	A3	EPA
ANNELIDA				
Hirudinea (Leeches)				
Glossiphonia complanata	1	-	-	D
Oligochaeta (worms)				
Oligochaeta indet.	3	-	-	-
Lumbricidae indet.	2	6	1	-
AMPHIPODA				
Gammarus sp.	38	25	21	C
Asellus aquaticus	-	2	-	D
MOLLUSCA				
Gastropoda (snails)				
Ancylus fluviatilis	4	1	-	C
Lymnaea peregra	-	-	1	C
Lymnaea glabra	1	-	-	C
ARTHROPODA – INSECTA				
Ephemeroptera (mayflies)				
Ecdyonurus venosus	2	9	-	A
Rhithrogena semicolorata	12	10	6	A
Ephemerella ignita	-	1	-	B
Baetis rhodani	11	12	2	C
Plecoptera (stoneflies)				
Isoperla grammatica	2	6	1	A
Protonemura meyeri	3	-	-	A
Trichoptera (caddis flies)				
Silo pallipes	6	8	1	B
Limnephilidae indet.	-	1	1	B
Rhyacophilidae indet.	4	3	2	C
Hydropsychidae indet.	5	35	1	C
Hydroptilidae indet.	5	-	-	B

Species/Taxa	A1	A2	A3	EPA
Diptera (true flies)				
Chironomidae indet.	-	-	1	C
Simulidae indet.	62	10	-	C
Ptychopteridae indet.	9	12	7	C
Muscidae indet.	3	-	-	C
Tipulidae indet.	-	-	1	C
Coleoptera (beetles)				
Elmis aenea adult	10	-	-	C
Elmis aenea larvae	14	47	18	C
Limnius volckmari adult	11	-	-	C
Limnius volckmari larvae	25	7	12	C
No. of organisms	233	195	76	
No. of species or taxa	22	17	15	
Q-index	**Q3-4**	**Q3-4**	**Q3-4**	

RESULTS AND DISCUSSION – INTERPRETATION OF Q VALUES

Samples were taken in February 2004. The EPA biological Q-index is intended for use during the summer months when the macroinvertebrate fauna of rivers are theoretically under the greatest ecological pressure from pollution, due to reduced flows and higher temperatures (McGarrigle *et al*, 2002).

A1

The kick sample from site A1 contained 233 individual macroinvertebrates, representing 22 species/higher taxa. The most abundant family recorded was the Group C Black-fly larvae (Simuliidae indet.). Freshwater shrimps (*Gammarus* sp. - Group C) were abundant as were members of the riffle beetle group (Group C). Group A species were present in moderate numbers comprising two species of stonefly (*Isoperla grammatica* and *Protonemura meyeri*) and two species of Heptageniidae mayfly *Ecdyonurus venosus and Rhithrogena semicolorata.* Group A species represented approximately 8.3% of the total sample. Group B represented approximately 4.8% of the sample and comprised two cased caddis families - *Silo pallipes* and Hydroptilidae indet. Specimens recorded from Group C included the mayfly *Baetis rhodani,* the uncased caddis families Rhyacophilidae, and Hydropsychidae, the riffle beetles (*Elmis aenea* and *Limnius volckmari*), the gastropods *Ancylus fluviatilis* and *Lymnaea glabra* and members of the Chironomidae. One Group D specimen (very tolerant to organic pollution) was recorded at the site – the leech *Glossiphonia complanata.* The richness and abundance of species considered sensitive to organic pollution were moderate at this site. Macroinvertebrate community characteristics were consistent with a slightly polluted status. As a result a Q3-4 value was assigned indicating slightly polluted, Class B water.

A2

The kick sample from site A2 contained 195 individual macroinvertebrates, representing 17 species/higher taxa. The Group C riffle beetle larvae (*Elmis aenea*) were the most abundant organisms present in this sample. Group A was represented by the stonefly species *Isoperla grammatica* in addition to two species of Heptageniidae mayfly *Ecdyonurus venosus* and *Rhithrogena semicolorata.* Group A organisms represented approximately 13.2% of the total

sample. Group B species were recorded in smaller numbers (5.3% of the sample) and included the mayfly *Ephemerella ignita*, and cased caddis species from the family Goeridae (*Silo pallipes*) and Limnephilidae. Group C specimens recorded were the snail *Ancylus fluviatilis*, the mayfly *Baetis rhodani*, uncased caddis larvae from the families *Rhyacophilidae* and *Hydropsychidae*, members of the Simuliidae and Ptychopteridae indet (Cranefly species) and the riffle beetles *Elmis aenea* and *Limnius volckmari*. Species very tolerant to organic pollution (Group D) were again recorded in very low numbers (two specimens of *Asellus aquaticus*).
The richness and abundance of species considered sensitive to organic pollution was again moderate at this site. A Q3-4 value was assigned to site M2 indicating slightly polluted, Class B water.

A3
The kick sample from site A3 contained 76 individual macroinvertebrates, representing 15 species/higher taxa. The freshwater shrimp *Gammarus* sp. was most abundant at this site. This sample included two Group A members – the stonefly *Isoperla grammatica* and the mayfly *Rhithrogena semicolorata*. Group A specimens were categorised as present in 'fair numbers' according to EPA criteria. Group B was represented by cased caddis specimens from the families Limnephilidae and Goeridae. Specimens recorded from Group C included the snail *Lymnaea peregra*, the uncased caddis families *Rhyacophilidae* and *Hydropsychidae*, *Gammarus* sp., Chironomidae, Ptychopteridae, *Tipulidae* and the riffle beetles *Elmis aenea* and *Limnius volckmari*. Species very tolerant to organic pollution (Group D) were not recorded at the site. The richness and abundance of species considered sensitive to organic pollution were moderate to low at this site. The presence of Group A and B species in fair numbers and the classification of Group C as 'excessive' resulted in a Q3-4 value classification at site A3 indicating slightly polluted, Class B water.

APPENDIX III: NATURA SITE EVALUATION SCHEME

Rating	*Qualifying Criteria*
A	**Internationally important** Sites designated (or qualifying for designation) as SAC* or SPA* under the EU Habitats or Birds Directives. Undesignated sites containing good examples of Annex I priority habitats under the EU Habitats Directive. Major salmon river fisheries. Major salmonid (salmon, trout or char) lake fisheries.
B	**Nationally important** Sites or waters designated or proposed as an NHA* or statutory Nature Reserves. Undesignated sites containing good examples of Annex I habitats (under EU Habitats Directive). Undesignated sites containing significant numbers of resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000. Major trout river fisheries. Water bodies with major amenity fishery value. Commercially important coarse fisheries.
C	**High value, locally important** Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or significant populations of locally rare species. Small water bodies with known salmonid populations or with good potential salmonid habitat. Sites containing any resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive. Large water bodies with some coarse fisheries value.
D	**Moderate value, locally important** Sites containing some semi-natural habitat or locally important for wildlife. Small water bodies with some coarse fisheries value or some potential salmonid habitat. Any water body with unpolluted water (Q-value rating 4-5).
E	**Low value, locally important** Artificial or highly modified habitats with low species diversity and low wildlife value. Water bodies with no current fisheries value and no significant potential fisheries value.

*SAC = *Special Area of Conservation*
SPA= *Special Protection Area*
NHA= *Natural Heritage Area*

Environmental Impact Assessment
Flora and Fauna Report
Roger Goodwillie and Associates
March 2004.

Integrated Waste Management Facility at Whitestown Lower, Co Wicklow

Environmental Impact Assessment

- Flora and Fauna

Report prepared for Environment & Resource Management Ltd

March 2004

Roger Goodwillie & Associates, Lavistown House, Kilkenny. Tel. 056-7765145

1. INTRODUCTION

Roger Goodwillie and Associates was retained by Environment and Resource Management Ltd. (ERML) to undertake an ecological impact assessment of the Whitestown Lower proposed integrated waste management facility. Details of the proposed development are included in Section 2 of the EIS.

This impact assessment is based on the following:

- Field Observations undertaken by Roger Goodwillie
- Natura Baseline Report (2 March 2004)
- Data supplied by ERML (March 2004)

The Whitestown Lower site is a worked out sand and gravel pit on the west bank of the Carrigower River about 1.9km above its confluence with the main Slaney. It has the form of two pits, a small deep one in the south-west corner and a larger oval one taking up much of the northern half (See Figure 1.1)

It has been described in the Natura 2004 report as being predominantly of loose soils with some grassland and scrub. It was further examined in March 2004 by Roger Goodwillie & Associates . to determine likely ecological effects of the proposed project and discuss its overall impact.

2. FIELD OBSERVATIONS

The gravel deposit is of mixed glacial origin and contains a significant fine fraction in which sand martins have established small colonies. It consists of limestone and granitic material as well as shales from east Kildare. The flora that has established contains a range of plants, most of them reflecting calcareous conditions, e.g. mullein *Verbascum thapsus*, sandwort *Arenaria serpyllifolia*, dyer's rocket *Reseda luteola*, and some, such as pepper cress *Lepidium heterophyllum*, more acidic ones. There is no evidence of scarce species such as blue fleabane *Erigeron acer* which has an old record in the vicinity (Waterloo Bridge, Stratford). The existing flora in fact appears relatively uninteresting.

Standing water occurs in a few places both as perched puddles (some with breeding frogs) and seepage groundwater. The main movement in the deposit seems to be from higher ground to the west. This flows through the material both above and below ground before accumulating in the deepest parts and percolating to the main watertable in the valley. No springs occur in the wet grassland of the river floodplain, which is in fact rather dry and firm.

The outer edge of the sand and gravel pit has been pushed out onto the floodplain in the past and lies at a greater angle than the natural valley side to the north. It is of

broken ground containing gravel, previously deposited wastes etc and is lightly covered by scrub, especially elder and aspen. A considerable extension was made in the south-eastern corner where there is low fill, partly vegetated.

The cSAC boundary follows the edges of the pit for the most part though it takes in a central area of grassland located immediately south of the existing buildings on site (See Figure 3.4.1). . This has no inherent interest as far as can be seen: it is secondary and species-poor. The wet grassland within the floodplain is also of little botanical interest itself and it is included in the designation so as to create a buffer for the Carrigower River.

3. CURRENT IMPACT OF LANDFILL

The waste currently on site has no visible impact on the ecology of the river or floodplain. There is no appreciable run-off and the vegetation at the base of the outer slope is not enriched by nutrients or other material. The alder thicket at the southern point is in a position to be affected by any such material but it contains a natural flora of tufted hairgrass *Deschampsia cespitosa*, red fescue *Festuca rubra*, glaucous sedge *Carex flacca* and spotted orchid *Dactylorhiza fuchsii* without any of the eutrophic species that might be expected. Nowhere else along the periphery of the sand and gravel pit or in the floodplain is there any sign of enrichment. A bank and double drain (drainage channel) leaves the southern corner of the site and runs towards the river (forming the property boundary – see Figure 3.10.2. The drainage channel on the pit side (DC-4) has great willowherb *Epilobium hirsutum*, meadowsweet *Filipendula ulmaria* and sweet grass *Glyceria fluitans* while that to the south (DC-5) has mainly the last species. This seems to be the effect of grazing rather than enrichment as the field to the south of this channel is grazed by cattle.

Nutrients coming from decomposing waste are likely to be entering the watertable below the sand and gravel pit and therefore the Carrigower River, though the clay fraction in the floodplain will arrest their movement to the river. The river appears slightly polluted at present, both from visual features - the abundance of water crowfoot *Ranunculus penicillatus* and general appearance - and from results quoted in the Natura March 2004 Report. No difference between the upper and lower sections of the river was found so that current input from the site must be negligible.

However, the water quality of the River Carrigower may deteriorate in time as further decay of the organic material in the previously deposited wastes occurs, and concentrations build up in the groundwater and possibly the surface water environment.

4. IMPLICATIONS OF DEVELOPMENT

The proposals would result in excavating the waste currently in the sand and gravel pit and replacing it in a properly lined cell. Additional waste would also be accepted so that a landfill would operate for a restricted period. Leachate would be collected and taken to a water treatment works by tanker. Waste cells would be capped with impervious material as soon as filled and this would restrict leachate production to a minimum. All operations would be controlled under an EPA licence and the site would be monitored by them also.

If all operations are carried out in accordance with best practice the site would be less of a threat to the river than it is at present. There are many landfills operating in gravel quarries at the edges of river valleys where modern methods have reduced or eliminated inputs to the river (e.g. Wexford, Kilkenny).

5. LIKELY SIGNIFICANT IMPACTS

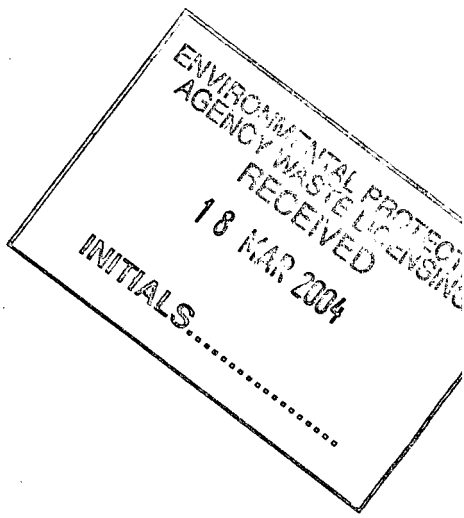
The most likely scenario is for the development to operate properly and cause no significant impact on the river or the Slaney cSAC. However as long as the waste material is breaking down there is always a risk of leachate escape and migration into the river catchment. Engineering methods are available to recover such leachate but they are not always totally satisfactory. There is thus the possibility of a temporary negative impact on the river and the cSAC, which would continue for 10 years or so after the completion of the landfill.

The worst case is for the river to be polluted over an extended period by ammoniacal nitrate which is harmful to fish and causes eutrophication. The material is also produced by farm wastes so that the Carrigower is likely to have had previous incidents of inflow. The egg and juvenile phase are the most sensitive stages of salmonid fish. Mature fish resist much higher concentrations which they experience in the lower estuaries. The downstream effects of eutrophication could also affect the pearl mussel *Margaritifera* which is sensitive to increased algal growth. Dilution from the rest of the Slaney headwaters would however greatly decrease this impact.

None of other of the Annex I species would appear to be affected significantly though the ecology of lamprey species is not well known.

A sensible precaution would be to establish a natural willow wood on the floodplain fields below the site. Movement of leachate if any would occur on the surface layer of the watertable and would be therefore be available to tree roots. Willow beds are currently being planted for waste-water treatment and are becoming accepted in Ireland. Without grazing they would also be a natural part of all river floodplains. In these situations they act as a filtration and nutrient extraction system, converting nutrient ions into biomass and reducing loading on surface waters. A wood using

native species would be totally compatible with the cSAC status of the valley and would in fact enhance its ecological value.



Appendix 8

Traffic Assessment (Traffic Wise)

TRAFFIC WISE

TRAFFIC & TRANSPORTATION PLANNING

BROWNFIELD RESTORATION IRELAND LTD.
PROPOSED INTEGRATED WASTE MANAGEMENT FACILITY

Traffic Assessment

March 2004

02602/001/1203/DR/JK

Bracetown Business Park, Clonee, Co. Dublin
Tel: +353 (0)1 801 4009 - Fax: +353 (0)1 801 4035
E-mail: info@trafficwise.ie Internet: www.trafficwise.ie

CONTENTS

TABLES & FIGURES

1 GENERAL

1.1 The Master Plan for the site owned by Brownfield Restoration Ireland Ltd (BRI) at Whitestown Lower, Co. Wicklow is to remediate an existing unlined landfill and restore the site to a landform that blends into the surrounding West Wicklow countryside. This Master Plan will involve development of an Integrated Waste Management Facility that will comprise a number of elements including a Resource Recovery Building, a fully engineered lined area for disposal of residual wastes arising from waste recovery activities together with a facility reception area.

1.2 The reception area at the entrance to the site proper will include a weighbridge, administration buildings, wheel washing facility, Resource Recovery Building machinery/service shed and waste inspection area and various ancillary facilities associated with the day-to-day operation of the waste management facility.

1.3 It is proposed that primary access to the site will be by means of an improved existing access located on the N81 National Secondary Road, which forms part of the western boundary of the development site. Historically the existing access has served a sand and gravel extraction and processing operation for in excess of 20 years.

1.4 As we understand the existing entrance will be enhanced with a security gate and closed circuit television cameras (CCTV) will be located on the internal site access road, which will aid site security staff in the preventing unauthorised traffic entering the development.

1.5 The quantity of waste arriving at the proposed facility is subject to a number of factors, including the existing status of the site, and commercial influences within the waste management industry. It is understood from the design consultants, the facility is intended to have a processing capacity of 180,000 tonnes per annum. This capacity will be taken up by processing and treating wastes previously deposited at the site together with imported wastes.

1.6 To ensure a robust assessment of the potential traffic impact of the development on the local roads network in the area the consultants have advised that the rate of input of wastes should be assumed to be 180,000 tonnes per annum. The consulting engineers have also advised that the export of sand and gravel or recovered soils from the site may also be carried on at a rate of up to 20 loads per day.

2 EXISTING TRAFFIC CONDITIONS AND STUDY SCOPE

2.1 In establishing the scope of a traffic impact assessment the Institution of Highways and Transportation advises as follows;

'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'.

'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:

- *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.'

'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.'

2.2 In accordance with the above advice those locations on the local roads network considered likely to be subject to a 'potential' increase in traffic flow of 10% on the adjoining highways as a direct result of traffic generated by the proposed development have been included in the appraisal.

2.3 In general, the capacity and operation of a road network (with adequate link capacity/level of service) is dependent on the junctions within that network and it is the operation of junctions, which determine capacity and vehicle delay. In establishing the scope of the

study, it was considered that the influence of the additional traffic generated by the development is not likely to be significant beyond the junctions in the immediate vicinity of the development; specifically the site entrance.

2.4 This existing entrance was not in use in January 2004 but it is understood to have been in use until 2003. Considering that the access is dormant at present the only traffic data required in this assessment is the level of existing traffic using the N81. Rather than commissioning a single 12 hour classified count survey on the N81 it was thought more beneficial to obtain data from the NRA regarding the normal operation of the existing N81, given that this data is collected by the use of automatic traffic counters they provide a continuous stream of traffic data which is considered statistically more accurate than a single 12 hour traffic count and should therefore represent a more reflect more accurately normal daily traffic flows on the adjacent highway network.

2.5 The closest NRA automatic traffic count site to the proposed development is site reference 'Donard N81-07' located 11km north of Baltinglass. The data recorded at this counter spans 1997-2003 (inclusive, excepting 2000 and 2001). There are no significant junctions between the count site and the proposed development site, accordingly the 2003 Annual Average Daily Traffic (AADT) flow on the N81 past the site is assumed to be those reported for NRA site N81-07. The 2003 recorded AADT was 4026 (two-way daily flow). The HGV content is shown for 2003 to be 7.2% and annual growth is shown to be approximately 8.6%. Table 2.1 below provides a summary of the relevant information provided at www.nra.ie.

Year	AADT (two-way)	HGV%	Growth Rate
1997	2,561	8.3	NA
1998	2,945	8.7	15
1999	3,181	9	8
2000	NA	NA	NA
2001	NA	NA	NA
2002	3,707	8.5	NA
2003	4,026	7.2	8.6

Table 2.1 NRA Recorded Traffic Data N81 (11km North of Baltinglass)

2.6 The above Table 2.1 summaries overall combined two-way traffic volumes on the N81 for five of the past seven years. The NRA provide additional data regarding hourly directional

average flows and Figure 2.1 below provides a graphical representation of the normal daily traffic fluctuations in northbound and southbound traffic flows recorded for 2003.

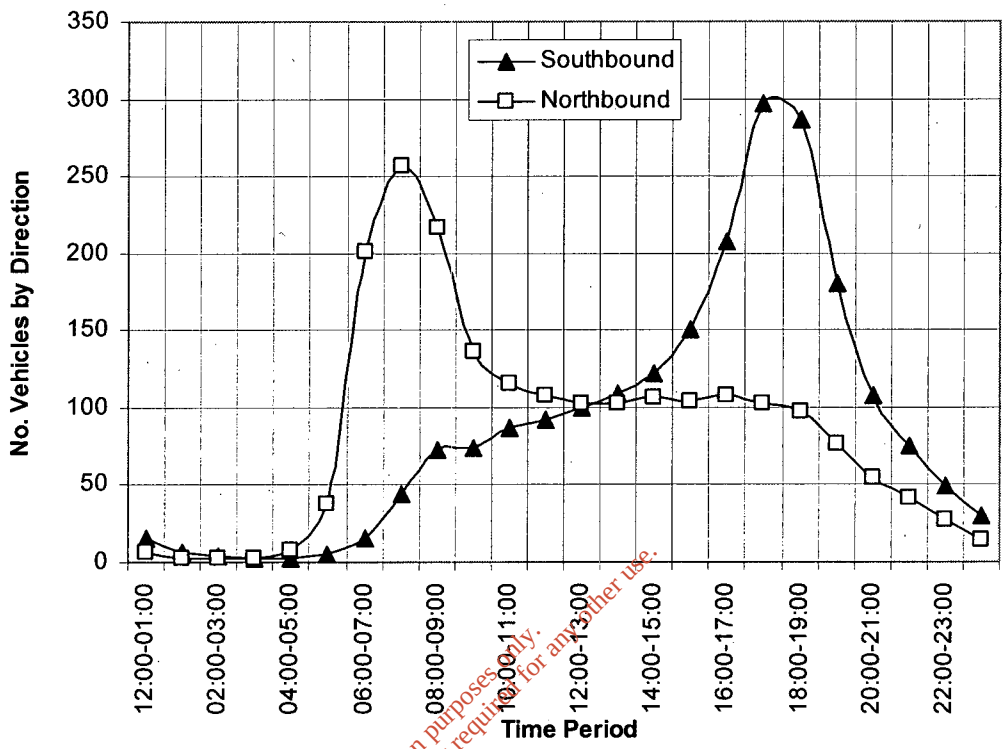


Figure 2.1 Graphical Representation of Daily Traffic Flows on N81

2.7 It can be seen from the above Figure 2.1 that traffic flows on the N81 are tidal in nature, with traffic predominantly travelling northbound in the morning peak commuter period, and the reverse occurring in the evening peak period.

2.8 The morning commuter peak hour is identified as 07:00-08:00hrs during which time 7.2% of daily two-way traffic is manifest. The current NRA records for show that on average this peak hour traffic consists of 44No. (18%HGV) southbound and 257No. (7%HGV) northbound vehicles. The equivalent evening commuter peak hour is recorded as being 17:00-18:00hrs. In the evening peak period 9.6% of the daily traffic flow on the N81 is manifest. The NRA records show that on average this peak hour traffic consists of 297No. (5%HGV) southbound and 103No. (6%HGV) northbound vehicles.

2.9 From the above NRA data, Table 2.2 below shows the current daily peak hour traffic flows on the N81 passing the site.

Traffic Stream	AM Peak Hour 07:00-08:00	PM Peak Hour 17:00-18:00
Northbound Volume	257	103
Northbound HGV	18	6
Southbound Volume	44	297
Southbound HGV	8	15
Total Two-way	301 (26No.HGV)	400 (21No. HGV)

Table 2.2 Summary of N81 Peak Hour Traffic Flows

2.10 In the interest of a comprehensive assessment of the current NRA data, we have assessed the likely seasonal fluctuations in traffic. In the following Figure 2.2 we provide a graph showing the monthly-recorded AADT for the year 2003.

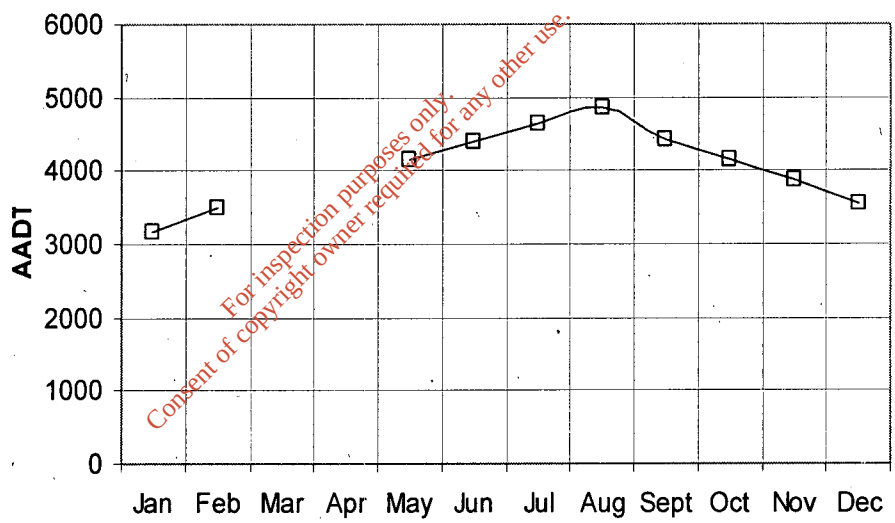


Figure 2.2 Graphical Representation of Seasonal Fluctuations
(Data not available March and April)

2.11 It can be seen from the above Figure 2.2 that the normal AADT fluctuates seasonally. The maximum monthly AADT of 4,854 is recorded in August and is most likely associated with increased tourism. The minimum AADT of 3151 was recorded in January.

2.12 The maximum is 14% greater than the average AADT of 4,200, whilst the minimum is some 24% less than the average.

3 TRAFFIC GENERATION

3.1 From our review, the general parameters affecting traffic generation on the local roads network in the vicinity of the proposed development it has been established that under Council Directive 1999/31/EC of 26 April 1999, only treated waste or bulked waste requiring treatment will arrive at the proposed landfill under the forthcoming application. Accordingly, the average payload of vehicles transporting waste will reasonably be expected to be in the region of 20 tonnes. This estimated average payload is derived from our past experience in the development of waste transfer (treatment) facilities; from which treated waste will arrive.

3.2 The opening hours of the site will be open Monday to Saturday. The site will not operate on Sundays or Bank Holidays. This constitutes approximately 272 working days per annum. Although the site will not be operational before 0800hrs it is expected that vehicles will arrive at the site from 0700-0730hrs. These vehicles will be permitted to enter the site, however they will not cross onto the weighbridge before 0800hrs. It is also assumed that all staff would arrive at the site prior to 0800hrs.

3.3 From the foregoing and an assumed importation rate of waste of 180,000 tonnes (considered robust) per annum in 20 tonne payloads, it is expected that the proposed waste management facility will generate a maximum of 33 HGV per day carrying waste materials to the Whitestown Lower site and leaving empty.

3.4 In addition, we are informed that there may be up to a maximum of 20 HGV per day exporting soils / granular materials from the site and returning empty.

4 CONSTRUCTION TRAFFIC

4.1 As outlined in the Master Plan for this proposed development, construction at the site will be undertaken on a phased basis. The initial phase will include the following construction elements:

- Installation of necessary infrastructure (resource recovery building, weighbridges, administration buildings, ancillary works etc.)
- Removal of clean materials on site to develop void space
- Preparation of lined landfill areas

4.2 The initial construction phase will last approximately 6 months. Following this lead in phase in which the site infrastructure will be constructed the development of each lined landfill area will be undertaken during 4 subsequent construction periods each of 3 months duration. For the purposes of estimating traffic volumes, it is assumed that in Phase 1 on average an additional 5 HGV and 15 cars per day will be manifest. This is to allow for sundry deliveries to site and site construction staff. In the subsequent phases these figures are estimated as likely to be 2 HGV and 10 cars per day. These are assumed averages from our experience in the construction of similar facilities and are likely to fluctuate up and down depending on the nature of construction activities.

4.3 In addition to the above materials, which includes clay, drainage stone and final capping materials will need to be imported. The design consultants have advised that the importation of clay/drainage stone will generate some 20 to 30 movements into the site over a three-month basis for each phase of the landfill base construction. Additionally, the importation of soils to cap and restore the surface may be required over the later years of the project. There may be up to 20 loads per day associated with this activity. Some of these loads may not arise if some of these restoration materials are sourced from incoming C&D wastes.

5 TIMESCALE

5.1 As discussed above, it is proposed that the waste management facility will be constructed in distinct phases throughout the lifespan of the development. This phased construction programme will not have a significant influence on the overall normal levels of traffic attraction to the landfill site, however, as outlined above there will be a resultant increase in traffic to the development during these periods of construction, and the periods over which construction materials will be stockpiled, imported or exported for each construction phase.

5.2 It is anticipated that the planning and licence applications will be submitted in early 2004. Based on this submission date, it is expected that the application would be determined and that construction work at the waste management facility would be likely to commence by 2006 or before. It is also assumed that all infrastructure and ancillary buildings etc. would be constructed before the residual waste management facility becomes operational. Based on these assumptions, we expect the waste management facility to begin receiving waste materials by 2006. The expected life of the restoration project is 10 years. Waste will be imported for up to nine years leaving the last one to two years to restore the site.

6 INCREASES IN DAILY TRAFFIC VOLUMES

6.1 As indicated, the current growth rate on the N81 is in the region of 8%, which is considered relatively high. If such growth were to continue unabated over the lifetime of the proposed waste management facility (10 years after construction) the eventual AADT on the N81 would be at least trebled. Considering the current level of investment in major infrastructure provision for north/south traffic on the east coast, with such proposals as the N9/N10 improvement, we do not believe that the above scenario will be manifest in the coming years.

6.2 As stated in the EIS for the N9/N10 improvement "*The forecast level of traffic growth has been based on the National Road Needs Study (NRNS), published in July 1998. The NRNS, which represents only a single input into the NDP, has provided a basis upon which policy decisions for the development of the National Roads Network have been made for the period to 2019. The National Roads Authority (NRA) also recommends that it should form the basis of traffic forecasts to be used in current scheme appraisals. This has led to the conclusion that growth on secondary routes within the Study Area will be higher than projected national rates and likely to be more in line with those on National Primary Routes. It has therefore been assumed that matrix growth factors for the N9/N10 corridor can be derived from National Primary Road forecasts only.*"

6.3 The growth rates assumed for the purposes of this report are those 'high' growth rates quoted in, and derived from Table 5.1 of the N9/N10 EIS. Although the growth rates, provided in the above EIS are considered both by us and the N9/N10 EIS team to be high for use on secondary roads, clearly the resulting forecast traffic flows will be significantly less than would result by assuming an 8% year on year growth over the next 10-15 years; a scenario which is highly unlikely on any secondary road in the country especially considering current economic forecasts.

6.4 In the following Table 6.1, based on the above NRA traffic data, is an estimate of the future year traffic flows on the N81 in the vicinity of the proposed development together with an estimate of the likely traffic increases on the local roads network directly attributable to the proposed development. It can be seen from the NRA data that on a daily basis the volumes of traffic travelling northbound are practically equivalent in number to those travelling southbound accordingly in the following AADT assessment we have assumed a 50/50 split north/south in site related traffic.

Year	N81 Base AADT	N81 Base HGV	Waste Facility Related Vehicles & Staff	Exported Product	Const. Traffic	*Engineering Fill Materials (3 Months)	N81 Max Increase in AADT %age (Number)	N81 Forecast %HGV Total (% Inc.)
2003	4026	282 (7.0%)						
2004	4191	290 (6.9%)	No Waste Facility					
2005	4363	299 (6.9%)	No Waste Facility	0	5 HGV 15 pcu*	22 HGV	0.95% (42)	7.4 (+0.5%)
2006	4542	308 (6.8%)	33 HGV 8 pcu*	20 HGV	2 HGV 12 pcu	26 HGV	2.18% (101)	8.4 (+1.58%)
2007	4728	317 (6.7%)	33 HGV 8 pcu*	20 HGV	2 HGV 12 pcu	30 HGV	2.17% (105)	8.3 (+1.62%)
2008	4806	321 (6.7%)	33 HGV 8 pcu*	20 HGV	2 HGV 12 pcu	19 HGV	1.92% (94)	8.1 (+1.36%)
2009	4885	325 (6.7%)	33 HGV 8 pcu*	20 HGV	2 HGV 12 pcu	18 HGV	1.51% (75)	8.0 (+1.30%)
2010	4966	329 (6.6%)	33 HGV 8 pcu*	20 HGV	No Const.	0 HGV	1.57% (79)	7.6 (+1.00%)
2011	5048	333 (6.6%)	33 HGV 8 pcu*	20 HGV	No Const.	20 HGV	1.58% (81)	7.9 (+1.32%)
2012	5131	338 (6.6%)	33 HGV 8 pcu*	20 HGV	No Const	20 HGV	1.55% (81)	7.9 (+1.29%)
2013	5216	342 (6.6%)	33 HGV 8 pcu*	3 HGV	2 HGV 12 pcu	39 HGV	1.83% (97)	7.9 (+1.29%)
2014	5302	346 (6.5%)	33 HGV 8 pcu*	3 HGV	1 HGV 5 pcu	20 HGV	1.30% (70)	7.5 (+1.00%)
2015	5389	350 (6.5%)	0 HGV 0 pcu	3 HGV	1 HGV 5 pcu	20 HGV	0.54% (29)	6.9 (+0.4%)

Table 6.1 Forecast Likely Maximum Increases in Traffic Flows on N81 (Assuming the Facility is Operational in 2006)

* Preliminary estimates, provided by design consultants

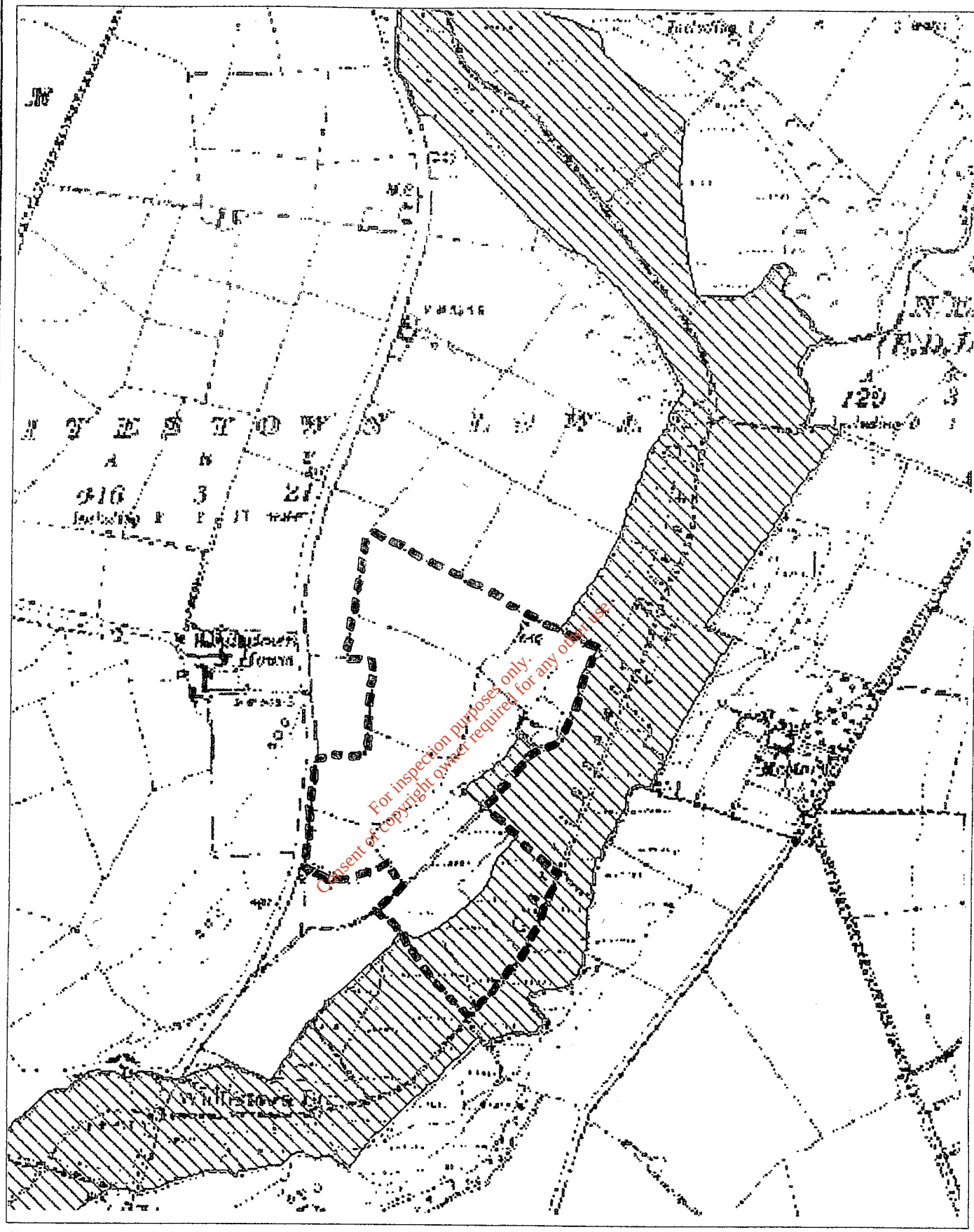
6.5 It can be seen from the above Table 6.1 that the forecast increases in traffic on the N81 as a direct result of the proposed development are likely to be less than 2.2%. Only during the early periods of construction (incl. import of materials) does the increase in traffic on the N81 exceed 2%. It is noted that this falls well below the threshold recommended by the IHT (Institution of Highways and Transportation) that would warrant detailed capacity assessment analyses to be carried out. Accordingly the increases in AADT on the N81 are not considered significant.

6.6 Similarly it can be seen from Table 6.1 that the increases in HGV content on the N81 are not likely to exceed 2.2% indeed the average increase in HGV content on the N81 over the life of the proposed scheme (including all construction periods) is shown to be marginally over 1%, which is considered insignificant. It must be noted that the above figures provided in Table 6.1 represent maximum or peak traffic generation, as recommended by the Institution of Highways and Transportation for the assessment of traffic impact. It should be appreciated that the levels of traffic normally generated by the facility are likely to be lower than shown in Table 6.1 which should be considered to represent a short term extreme 'worst case' analysis.

7 CONCLUSION

7.1 It can be seen from the above, that even under the robust assessment scenario the increases in traffic on the local roads network serving the proposed development are not likely to be significant.

7.2 In addition to the above, it is expected that some waste related traffic and indeed traffic associated with the import of building materials etc., which would avail of the proposed facility or deliver to it may already be travelling along the N81 in any case. However in the interest of a robust assessment, no account has been taken of the 'double counting' of this traffic as all traffic in the assessment has been assumed to be totally new to the local road network and the N81.



All mapping produced under O.S. Licence No EN 0000503

FIGURE 2. WHITESTOWN QUARRY: RIVER SLANEY cSAC BOUNDARY Client: ERM Ltd.

NATURA
ENVIRONMENTAL CONSULTANTS

Enterprise Centre,
The Murrough,
Wicklow, Ireland
Tel: 353 (0)404 64020
Fax: 353 (0)404 64022

Supplied by the National Parks & Wildlife Service (February 2004)

Drawn by: VS	Project no: 1111
Checked: PM	Scale: Not to scale
Sheet no: 1 of 1	Date: 12/02/2004