Appendix 2.
Noise and Vibration Impact Assessment Report

Noise and Vibration Impact Assessment Report

Robert Murphy Application for a Waste Recovery Facility at Grannagh, Co. Kilkenny.

October 2006

Quality Approval and Revision Record

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Title: Noise and Vibration Impact Assessment Report Waste Recovery Facility, Grannagh, Co. Kilkenny

Job Number: E0506

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Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
1	13/10/06	Noise Impact Report	Draft	SM	SM	SM
2	16/10/06	Noise Impact Assessment Report	Final	SM	SM	SM

1.0 Introduction

Robert Murphy proposes to develop a waste recovery facility within the Grannagh Quarry site at Granny, Kilmacow, Co. Kilkenny. Figure 1 illustrates the location.

Malone O' Regan was commissioned to prepare this report which discusses the existing ambient noise levels in the area, assesses the potential impacts of the proposed waste recovery operation in relation to increased noise levels at sensitive receptors and the abatement measures that may be employed to reduce / eliminate any impact that may arise.

2.0 Study Assessment and Methodology

2.1 Literature Survey – Existing Ambient Noise Levels

A literature survey was carried out in order to characterise existing ambient noise levels within the area. The following reports were reviewed:

- Dawn Meats IPCL Ref. No. 175 – Noise Report, May 2004
- Mooncoin By-pass Route Selection Studies, July 2002
- A report prepared in March 2006 by Malone O' Regan for Ascon Ltd. regarding the temporary re-opening of Grannagh Quarry for the purposes of extracting material for the construction of a section of the N25 By-Pass of Waterford City at Grannagh, Newrath and Smartcastle, Co. Kilkenny.

2.2 Prediction Modelling

Prediction modeling of noise sources has been carried out with reference to the following:

- BS 5228: Part 1: 1997, Noise and Vibration Control on Construction and Open Sites.
- ISO 9613-2 - Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation.

3.0 Receiving Environment

The location of Grannagh Quarry is shown on Figure 1. Quarry operations have taken place in the past and it is understood that Ascon Ltd. have permission to use the quarry to extract limestone for the Waterford By-pass scheme.

Figure 2 shows the outlined area (in red) of the proposed waste recovery activity within existing quarried areas with floor levels as low as 3.2mOD. The area also contains existing agricultural land at levels ranging from 15.5 to 25m OD, also indicated on Figure 2. The nearest sensitive receptors to the proposed waste recovery activity lie south between the boundary and the N24 at approximately 17.5m OD.

A review of noise monitoring surveys carried out within the area indicates that the N24 is the dominant noise source with levels ($L_{Aeq,t}$) of 65dB recorded at approximately 10m from the roadside; given the rural undulating landscape it can be expected that the existing N24 will be audible up to 300m distant. Table 1 below details where past noise monitoring has been carried out in the area. Figure 3 shows the locations. Typically road traffic noise levels ($L_{Aeq,t}$) experienced within the site would be in the region of 45 - 55 dB depending on the boundary location chosen.

Table 1: Noise Monitoring Undertaken in the General Area

Location	Literature Source	$L_{Aeq,t}$ (dB)	$L_{A10,t}$ (dB)	$L_{A90,t}$ (dB)
Entrance to Dawn Meats; approx. 10m from N24	IPCL Noise Report Prepared in May 2004	65	69	51
Road to Roadstone Quarry, New Aglish, near N24	Mooncoin Route Selection Report	67	66	49

Note: Measurement time t varied from 15 – 60 mins

The nearest noise sensitive receptors to the site are shown on Figure 2. These are located off the N24 with facades varying between 6 – 18m from the N24. Therefore the ambient noise environment is dominated by the N24 to the front of the houses. However to the rear, the buildings are likely to provide some screening, reducing traffic noise by up to 6 decibels. Accordingly the ambient noise environment ($L_{Aeq,t}$) to the rear of the houses, facing the site is likely to be in the region of 55 -60 dB during daytime hours. A fifteen minute reading taken in March 2006 (with no on site activity) some 10m from the rear boundary of one of the houses near the entrance indicated an $L_{Aeq,15min}$ of 55 dB. The report prepared in March 2006 for the re-opening of the quarry predicted a worst case scenario $L_{Aeq,t}$ of 75 dB with general levels likely to be in the region of 60 – 65 dB(A); however it is understood that quarrying activities are not currently being carried out.

4.0 Characteristics of the Proposal and Assessment

4.1 Proposal Description

The activity comprises deposition works within the existing quarry site in accordance with the requirements and conditions attached to Waste Permit WMP 22/2003.

It is understood that initially the existing entrance on the Kilmacow Road will be used for Phase 1 of the deposition works within the quarry site.

A proposed new entrance as shown on Figure 2 and permitted by planning permission P06/246 will be used for Phase 2 of the activity which will commence in 2009 when the by-pass is complete.

It is also understood that prior to commencement of filling works on the site all waste on the site not qualifying as inert construction and demolition waste will be removed from the site and disposed of at an authorised waste facility. All foliage will be removed to an authorised waste facility.

Also, a 500mm thick layer of low permeability soil will be placed and compacted on the quarry floor prior to commencement. Thereafter the inert waste will be placed in 500mm thick layers. Only one working face will exist at any one time for the deposition of the waste material.

All inert construction and demolition waste will be delivered to the site in covered trucks. The material will be deposited by tipping and distributed on the site by caterpillar D5 dozer, Komatsu 210 excavator and Volvo front loaders. A Valmet tractor and trailer and water dowser will also be available on the site. All equipment will be mobile. The dozer, excavator and loaders will work at varying levels 2-18 mOD as the quarry is filled.

The operating times are from 8.00 – 17.00 Mon – Fri and 8.00 – 14.00 on Sat.

Traffic Generation

Phase 1

The Waterford Bypass is not due for completion until the end of 2009 and in the interim access to the quarry will be via the existing access to the quarry from the Kilmacow Road. However traffic volumes in the period until the completion of the N25 Waterford Bypass will remain very low – less than 10 trucks per day. Such low volumes will not have any significant noise impact and thus Phase 1 truck movements will not be assessed further.

Phase 2

In the long term, the proposal will generate up to 50-60 truck movements per day with estimated peak volumes of 10 movements per hour. These volumes are extremely low compared to the existing traffic flows on the road at present (c9,000 AADT). These flows will be very substantially reduced on the existing road once the by-pass is complete however not to the extent that 50-60 truck movements per day at the proposed new entrance will represent a perceptible noise impact. Therefore Phase 2 truck movements on the N24 will not be assessed further.

4.2 Potential Noise Impact Assessment

4.2.1 Operational Phase

Receptor 1 (as shown on Figure 2) is some 10m from the boundary. The proposed compound area containing welfare cabins, office, weighbridge and bunded diesel storage area lie between the receptor and the internal access/haul road. The main body of the existing site therefore lies 30m from Receptor 1 although Receptor 2 as shown on Figure 2 lies approximately 12m from the boundary. Figure 2 shows the general direction of filling at the end of the internal access road; this is 120m from Receptor 1.

Table 2 details the equipment likely to be used and contains predictions for the worst case scenario.

Table 2 Likely Noise Levels Arising from the Waste Recovery Operation and Predicted to the Nearest Sensitive Receptor

Activity	Activity equivalent continuous sound pressure level L_{Aeq} @ 10m	Distance (m)	Predicted LAeq,t @ Receptor 1
General Waste Deposit Activities			
Dozer	84	120	62
Tracked Excavator	81	120	59
Front Loader	76	120	54
Total			**64**

The above calculations consider the situation where source levels chosen are typically the "loudest" likely, all sources are in operation at any given time, sources are in operation constantly and where waste recovery is carried out at the same OD level as receptors and at 120m from the nearest receptor. In reality much of the work will occur on lower OD levels and the existing quarry walls will also provide a screening effect. Accordingly, taking all factors into account, waste recovery activities are generally likely to give rise to lower noise levels ($L_{Aeq,t}$) between 55 – 60 dB at the nearest noise sensitive receptor. However, it should be noted that as waste recovery activities move closer to the receptors then it will be necessary to implement mitigation measures to reduce noise as the waste permit has specified the following limits in Condition 7.2:

"Noise levels (measured from the closest residence) shall not exceed 55 dB(A) L_{Aeq} (30 minutes), during the day and 45 dB(A) L_{Aeq} (30 minutes), during the night."

Truck Movements on Internal Access Road

Approximately 50 -60 truck movements are expected per day with a maximum of 10 per hour when the activity is operating at peak level. The internal route is shown on Figure 2. Therefore the route will pass within approximately 25m from Receptor 1.

In order to assess the noise emissions from these trucks passing by receptors on the internal haul road, the maximum single event level (SEL) will be used for each truck. The overall level will be determined for a typical 30 minute period[1] for Receptor 1. The maximum SEL for a single passing truck is 87 dB(A). The following equation was used to determine the resulting 30 min L_{Aeq}:

$$LAeq(30\ min) = 10\log\{\Sigma\ (n_i \times 10^{SEL_i/10})/T\}$$

where T is in seconds, and n_i is the total number of events.
SEL is the single event level value in dB.

[1] Permit specifies 30 minute period.

Accordingly, within a 30 minute period the $L_{Aeq(30\ min)}$ predicted value for truck noise at the side of the internal haul road is 61 dB. This level would decrease to well below 55 dB given the intervening distance from the haul road to Receptor 1. Accordingly, it is not considered that haul trucks will impact or significantly contribute to the overall cumulative impact of the proposed activity.

Compound Area

Other than truck movements as described above, this area is not likely to significantly contribute to ambient noise levels.

Cumulative Impact

The actual movement of plant equipment on site is the most significant factor in determining the cumulative impact of the overall activity. As shown above, the potential exists to breach the daytime limit set in the waste permit. Activities will not occur during night time hours (generally considered 22.00 – 08.00 hrs) therefore the night time limit will not be breached.

4.2.2 Construction Phase

The construction of the compound area, proposed entrance and internal haul road will result in temporary elevated noise levels; however this will be temporary in nature and Table 3 below specifies typical noise limits applicable to construction noise:

Table 3 Maximum Permissible Noise Levels at the Façade of Dwellings During Construction

Days & Times	$L_{Aeq\ (1hr)}$ dB	L_{Amax} dB
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60[2]	65
Saturday 08:00 to 16:30hrs	65	75
Sundays and Bank Holidays 08:00 to 16:30hrs	60	65

5.0 Mitigation Measures and/or Factors

Noise

In order to achieve the limits set in the waste permit, the following should be carried out:

[2] Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority

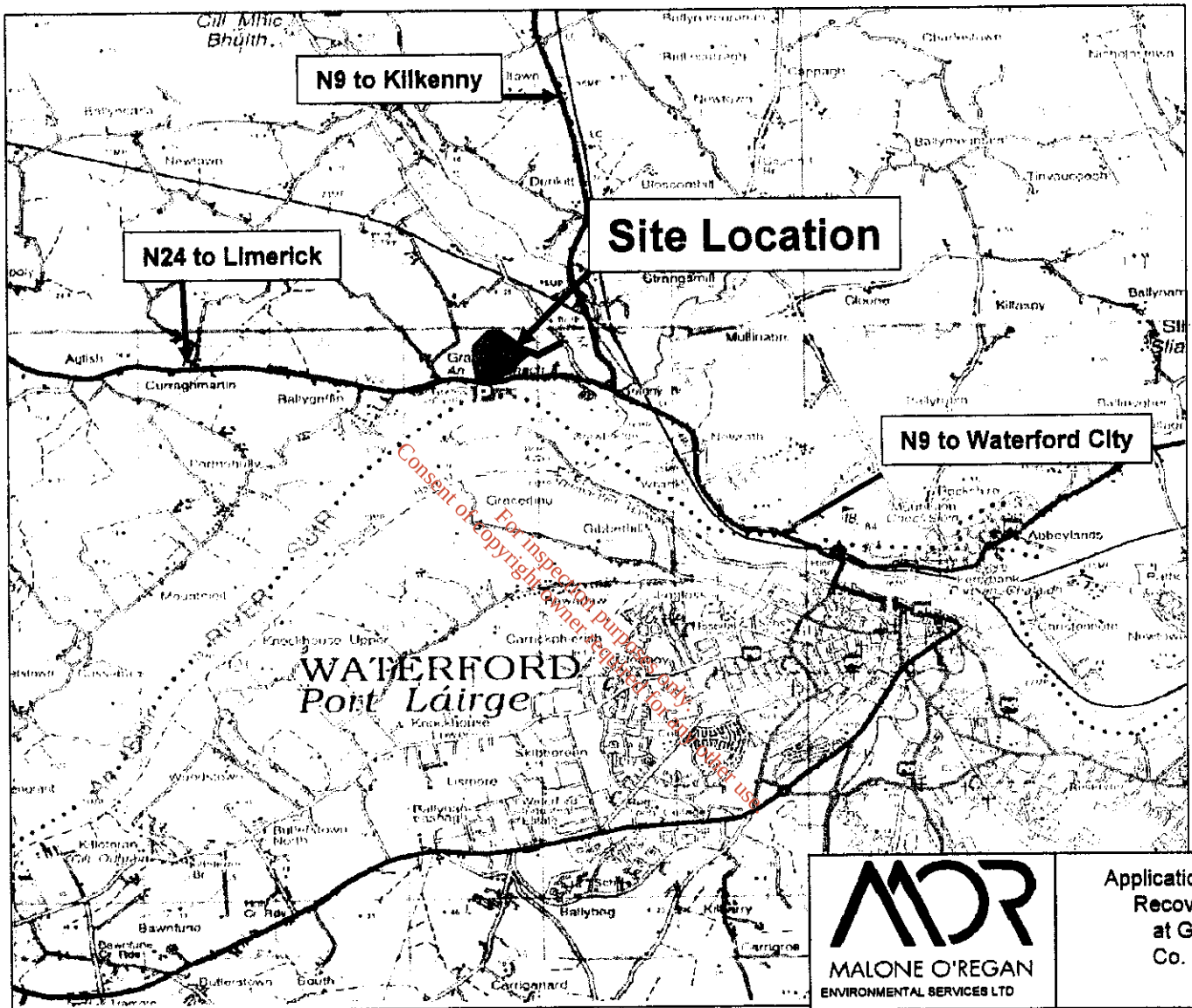
- *Periodic monitoring at the boundary with sensitive receptors should be carried* out to ensure that the limits set within the waste permit will be adhered to. Where the potential for exceedance is identified through monitoring then mitigation measures such as fitting of silencers and management of operating times for equipment should be investigated and implemented.
- Proper maintenance of all vehicles and equipment is essential. The efficiency of *silencers should be checked regularly and all ball-bearings kept lubricated.*
- Equipment used should comply with regulations regarding maximum admissible noise levels e.g. CE-marking.
- All HGVs and earthmoving equipment should comply with the EU Directives regarding the permissible sound power levels from construction plant and equipment (SI No. 320 of 1988). Account should also be taken of BS 5228: Part *1: 1997 - Noise Control on Construction and Open Sites.*
- Any complaints received should be thoroughly investigated with suitable mitigation measures taken at the time such as restricting the use of noisy equipment during certain hours. With these measures, noise impact should be kept to a minimum and within acceptable levels to noise sensitive receptors.

6.0 Conclusions and Recommendations

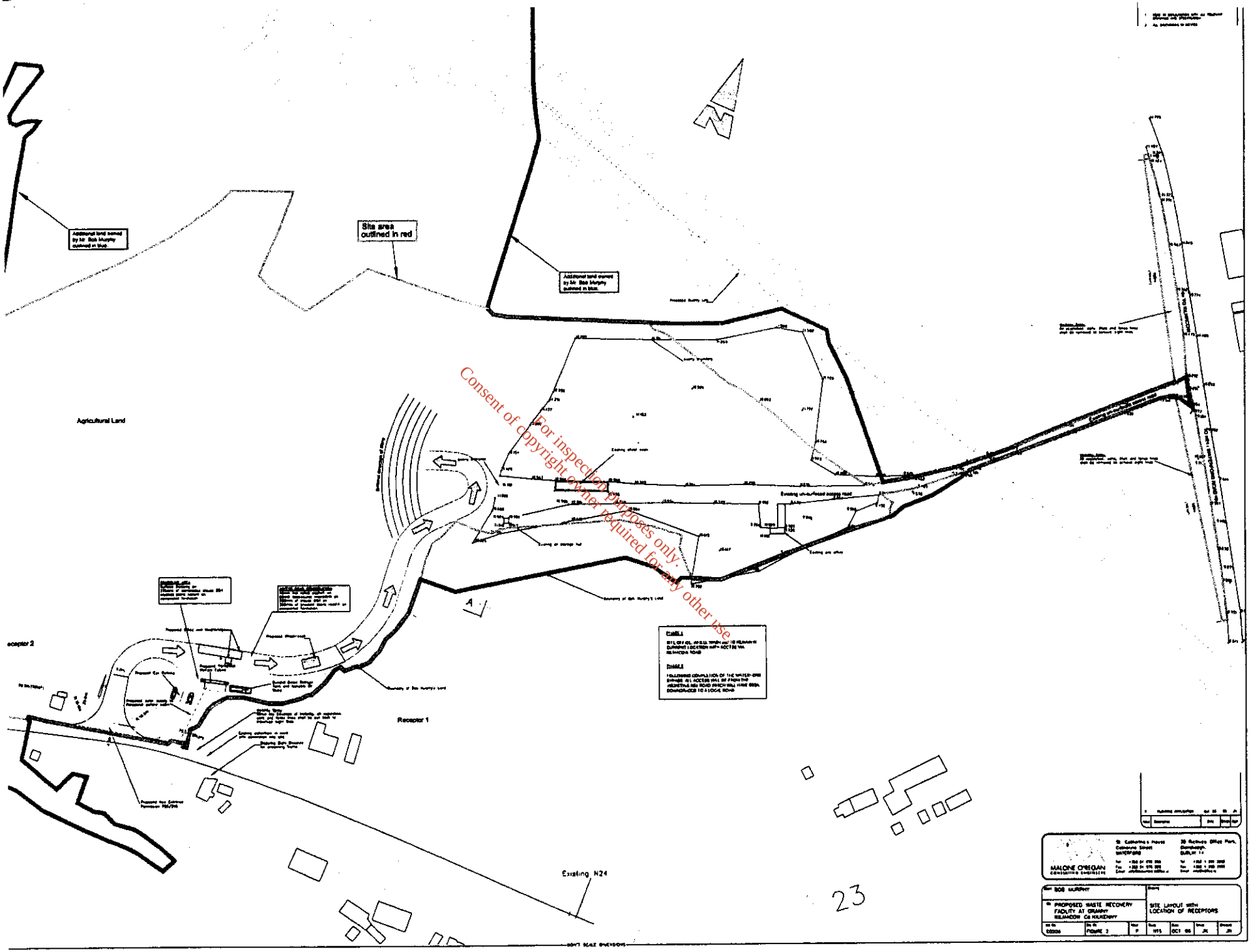
Provided the conditions of the waste permit are adhered to, then the impact of the waste recovery activity on the nearest sensitive receptors will not be significant.

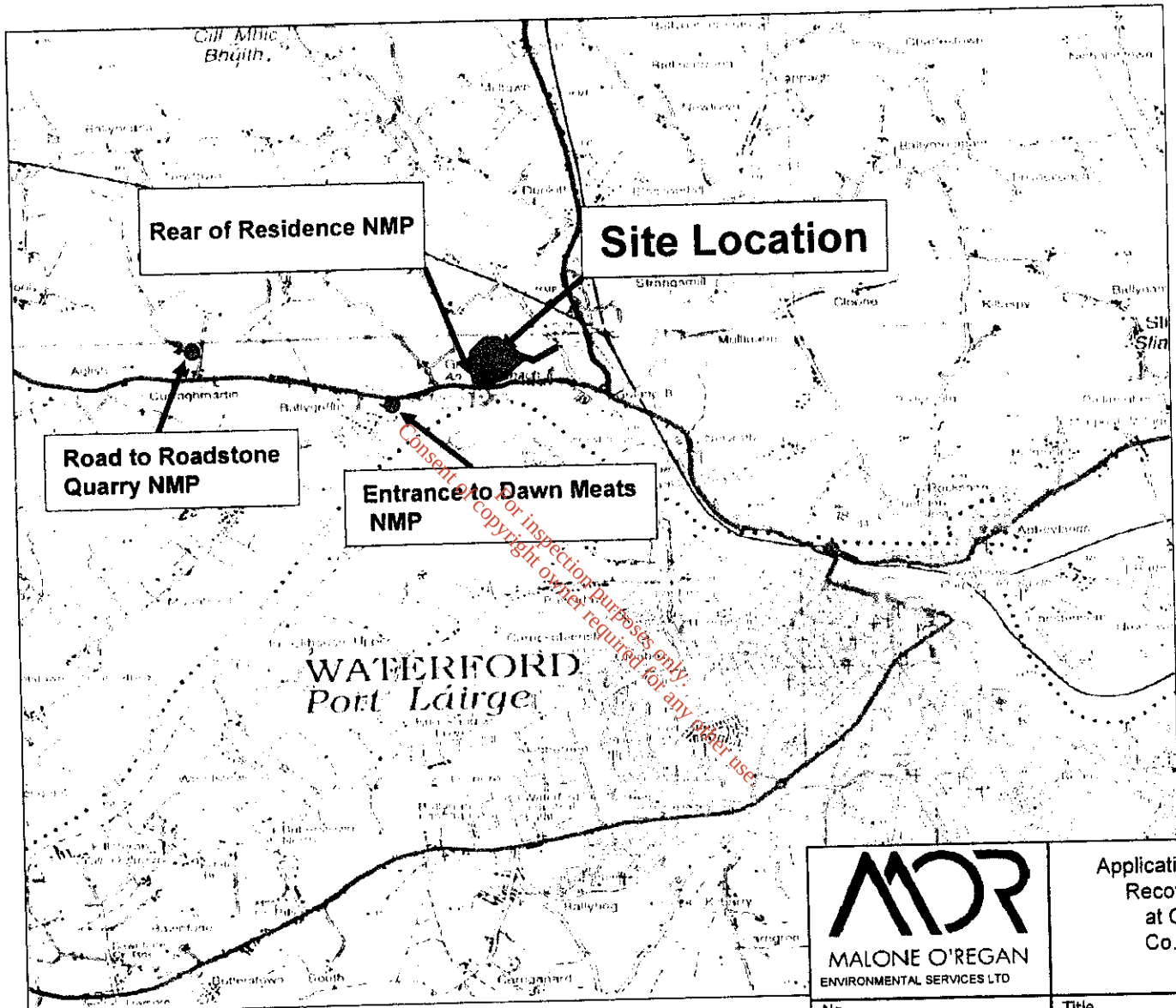
The limits specified in Table 3 will be adhered to where possible during the construction of ancillary elements of the proposed development.

Figures



MALONE O'REGAN ENVIRONMENTAL SERVICES LTD				Application for a Waste Recovery Facility at Grannagh, Co. Kilkenny.
No. Figure 1				Title. Regional Location
Job No. E0506	Scale. NTS	Issue. 01	Chk. MCK	Date. Oct '06





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No: Figure 3				Title: Past Noise Monitoring Locations
Job No.: E0506	Scale.: NTS	Issue.: 01	Chk.: MCK	Date.: Oct '06