APPENDIX A – REPORT ON POTENTIAL NOISE IMPACT

NOISE IMPACT OF PROPOSED EXPANSION of the WASTE WATER and SLUDGE TREATMENT WORKS at

CARRICKMACROSS, CO.MONAGHAN

Report for

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13 November, 2004

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Receiving Environment

1.1 The site is an established Waste Water and Sludge Treatment Works for a considerable number of years. It is bounded to the South, and to the North, by agricultural land with no nearby housing. To the East the site is closely bounded by the Proules River. To the West is the Ardee Road, a Filling Station, and some houses elevated above both the Ardee Road and the WWTW site. .
The proposed Treatment Works would be located adjacent to, and North of, the existing Waste Water Treatment Works (WWTW) in Carrickmacross.

1.2 The nearest residences, to the proposed Treatment Works, are (a) west of the existing WWTW at c.125 metres, and (b) North-east of the existing WWTW at c. 400 metres.
Both groups of houses are on elevated ground. To the West there is significant noise screening from the existing treatment works due to intervening structures on the WWTW site. However the houses to the North-east have no significant screening from the WWTW plant.

1.3 The housing to the west of the proposed works extension have the highest ambient noise levels, due to the nearby busy Ardee Road, that is the traffic travelling on it. The housing to the North-east has the lowest ambient noise levels as it is well removed from any busy road.

Measurements and Equipment

1.4 Measurements of source noise levels were made on 5th and 6th August 2004, and on 8th and 9th November 2004 with the new Blowers in place, and relatively calm weather.

1.5 Readings taken at the Western site perimeter (location 1), behind the filling station, and near the Stores are shown in Table 1. There was a noise contribution at location 1, from the activity at the filling station, as well as from passing traffic on Ardee Road.

1.6 Readings (taken in the North-east corner c.3m from the Eastern boundary) (location 2) are shown in Table 2. These latter readings show the relatively steady nature of the noise levels at the existing works. A similar pattern is expected from the proposed new works.

1.7 Night-time readings taken near the elevated houses on the Ardee Road (location 3) and at c.200 metres to the North-east of the site) (location 4), are shown in Tables 3 and 4. There are new houses in line with location 4 at c.400 metres from the centre of the existing WWTW site. Corresponding WWTW noise levels at these houses are estimated at c. 6 dBA lower than at location 4. Readings were taken with a microphone height of c.1.5 to 3 metres above ground.
A small noise contribution was noticed at location 4, from the passing traffic on Ardee Road.

1.8 Equipment used on-site included Larson-Davis Sound Level Meters Type 820, a Bruel & Kjaer Sound Level Meter Type 2260 and associated equipment. Calibration was done using a Bruel & Kjaer Sound Level Calibrator Type 4230.

1.9 The methodology of International Standard ISO 1996 "Acoustics - Description and measurement of environmental noise", adapted to the site, was used.

Results

1.10 The noise levels quoted in this report are given in A-weighted decibels, dBA, and are the average (equivalent continuous) levels, L(A)eq, over each measurement period.

1.11 Also shown are the A-weighted noise levels exceeded for 1%, 10%, 50% and 90% of the measurement periods, namely LA1, LA10, LA50 and LA90.

1.12 The weather was generally dry during the measurements. On 5/8/2004 and 6/8/2004 a light to gentle breeze was blowing, from a Southeasterly or Southwesterly direction. There was a gentle Northwesterly breeze on 8th November, while it was virtually calm or a light Southwesterly breeze during measurements on 9th November. (Wind descriptions are based on data from Clones Meteorological Station).

Characteristics of the Proposal

2.1 The proposed Works sources likely to emit noise include (a) Blowers Building (Enclosed) (b) Proposed Inlet Works (Housed in), and (c) a proposed new Oxidation Ditch.

2.2 The existing layout drawings are taken as indicative only as the proposal is to be a design and build contract which allows tenderers to put forward their own design for meeting the specified emission and discharge standards.

2.3 The proposed treatment works would operate 24 hours/day and 7 days per week

The daytime activities will include transport of sludge in and out of the site, along with the continuously running plant items. An estimated average c.1 Tanker/day, and c.10-12 cars, could enter and exit the site. The noise from these sources is unlikely to cause nuisance at any house. The recommended criterion for traffic at any residence is 55 $LAeq_{1hour}$.

2.5 At night only quiet (or enclosed) plant will be running, suitably attenuated to meet the given noise limit of 35 LAeq. This would not be expected to cause any complaints.

2.6 Site preparation and construction will take place over a number of months. This phase will generate some moderately high noise levels for short periods. Initially it is expected that a bank or Berm for noise containment will be constructed. There will be no construction work at night.

Potential Impact of the Proposal

Criteria - Industrial Noise - Community Response

3.1 A noise is liable to disturb people and provoke complaints when its level exceeds the pre-existing ambient level by a certain margin, or when the level attains a particular absolute value. People's reactions to noise may be influenced by a number of factors such as : (a) Noise level (b) Noise Character (c) Habituation (d) Degree of control over the source (e) Personal sensitivity to noise (f) Attitude to the source

(g) Activity engaged in (h) Time of day or night (j) Character of area
(k) Visibility or otherwise of the noise source, and (l) Seasonality of the operation.
3.2 The International Organisation for Standardisation has published a three-part Standard on "Acoustics – Description, measurement and assessment of environmental noise ". These parts are: (i) ISO 1996/1(2003) Basic Quantities and Assessment Procedures (ii) ISO 1996/2 (1987) Acquisition of data pertinent to land use;
(iii) ISO 1996/3 (1987) Application to noise limits.

3.3 This Standard replaced the ISO Recommendation R1996-1971. This had a Table "Estimated community response to noise". This table (here labelled Table 5) is useful in assessing the likelihood of complaints due to noise. This table simply gives some structure to the statement 'The higher the noise level, the more likely it is that people will react adversely to it'. Thus Table 5 stands on its own merits.

3.4 The basic quantity to be measured is the A-weighted equivalent continuous level (average) over an appropriate period of time, T. This is denoted as $L(A)eq_T$.
The period of measurement should be sufficiently long that the result obtained is representative of the level, and the character of the noise, and its temporal variation.
If the noise in question has tonal character such as a buzz, hum ,hiss or whine, which draws added attention to it a correction term is added to the measured level, to take account of this. This correction may be from 2 to 6 dB.

3.5 If the noise in question has an impulsive character a correction of 5 dB, or more, may be added to the measured level for assessment purposes.
The corrected noise level is known as the Rating Sound Level, LA_r. Only one correction is added to any measured level (LAeq) in practice.

3.6 The Criterion is the desirable target level, set by appropriate authorities. Excesses of the Rating Sound Level over the Criterion, of 5 dB, are marginal. For excesses of 10 dB or more complaints may be expected.

3.7 The night-time environment in the area of this site is assessed as quiet urban to roadside suburban or rural. Therefore , since the proposed works would operate continuously, a potential impact is that the noise emissions might significantly exceed 35 LAeq, and could adversely affect, at night, some local residence by causing sleep disturbance. It is unlikely that adverse daytime intrusion of works noise would occur.

3.8 The estimated traffic is c.1 Tankers/day, and c.10-12 employee/visitor vehicles, entering and exiting the site. The noise from these sources is unlikely to cause a nuisance at any house. The recommended criterion for WWTW traffic noise at any residence is 55 $LAeq_{1hour}$.

3.9 At night there will be no traffic to or from the site. Only quiet (or enclosed) plant will be running, suitably attenuated to meet the given limit of 35 LAeq. This would not be expected to cause any complaints (noise-related).

3.10 The operations of the Proposed WWTW are expected to be generally in the range up to 35 (at night), and up to 45 $LAeq_{1hour}$ (daytime) at any house.

3.11 External noise levels of 35 $LAeq_{15min}$ at night and 45 $LAeq_{1hour}$ by day are unlikely to disturb anybody. Therefore no interference with normal family or domestic activities are likely and, consequently, no noise-related complaints are considered likely.

Mitigation Measures

4.1 Adoption of noise limits of 50 $LAeq_{1hour}$, by day, and 35 $LAeq_{15minute}$ at night, at the nearest and any house is the overriding control measure. Appropriate attenuation measures will be used to achieve these limits.

4.2 The existing Rotor in Oxidation Tank No.1 which is emitting excess noise, and a strong Tonal component, will be serviced or replaced to eliminate this problem. Similarly all plant will be monitored to detect and rectify, as soon as possible, any other excessively noisy plant which develops in the course of use. This facility could be part of the proposed supervisory control and data acquisition (SCADA) system.

4.3 Plant will be selected which can be attenuated, to avoid any significant noise intrusion or disturbance at local residences. Plant will also be chosen to avoid significant low-frequency noise emission, or any Tonal emissions, at night, which increase nuisance potential.

4.4 An earthen Berm of suitable height is recommended along the Northern and Western site boundaries in order to assist in containing noise emissions effectively.

4.5 The proposed Blower house, and the Inlet works building, will each have an Acoustic insulation standard sufficient to achieve the overall recommended noise limits given in paragraph 5.1.

4.6 Any new pumps and blowers may either be submersible or be sound insulated in such a manner that the overall noise limits in paragraph 5.1 are achieved.

4.7 Noisier plant may be positioned to optimize screening by other plant.

4.8 Sound Attenuation will be fitted to any fan or opening likely to emit excess noise.

4.9 The internal walls of buildings will, if necessary, be fitted with Sound-absorbing material to minimise any noise emissions. This could be of Rockwool or Glass-wool or equivalent sound absorbent. It would be protected mechanically by a suitable frame or fixtures and wire grille or netting.

Construction Phase

4.10 The temporary nature of Construction activities accords the associated noise a higher level of acceptance by people than noise sources of a more permanent nature. It is recommended that construction Plant and equipment for use on the proposed works comply with Statutory Instrument No.632 of 2001 "European Communities (Noise Emission by Equipment for use Outdoors) Regulations, 2001, and that silencers and engine covers be kept in good and effective working order.

4.11 The methodology of British Standard B.S.5228:1997 "Noise and vibration control on Construction and open sites" Part 1, is available for use, if need be, during the construction work, to minimise emission of any noise to any residence. Construction work is not expected to occur at night.

4.12 A daytime limit of 65-70 $LAeq_{12hr}$ is often considered reasonable for construction work. This proposal is not expected to generate levels in excess of 70 $LAeq_{12hr}$, at any house, for any phase of the construction process. Furthermore construction work is only expected to take place during daytime hours.

Predicted Impact of the Proposal

5.1 In this area, the external noise level criteria considered appropriate, outside any residence, are as follows :

Operations 0700-1900 hours : Daytime 50 $LAeq_{1hr}$; **Traffic** - 55 $LAeq_{1hour}$
1900-2200 hours : Evening 45 $LAeq_{1hour}$
2200-0700 hours : Night-time 35 $LAeq_{15mins}$, with no tones or impulses.

Note - Definition of day-night times is intended as a guide. These times can vary.

5.2 The following table or guide to likely noise impacts stands on its own merits.

TABLE 5 - ESTIMATED COMMUNITY RESPONSE TO NOISE

dBA excess of Rating Sound Level over noise Criterion	Estimated Community Response Category	Description
0	None	No observed reaction
5	Little	Sporadic complaints
10	Medium	Widespread complaints
15	Strong	Threats of community action
20	Very Strong	Vigourous community action

5.3 The predicted impact of the proposal is 'None', with the Mitigation measures in place to achieve the recommended limits during Daytime – that is no significant adverse impact.
At Night - There will be no traffic, and plant emissions will be limited to 35 $LAeq_{15min}$ at any house. Furthermore the existing Noisy Rotor in Oxidation Tank No.1 will be serviced or replaced, in order to (a) reduce the noise emissions and (b) eliminate the Strong Tone centred on the 500 Hz Octave.
Thus the response is expected to be 'None'.

Monitoring

6.1 Monitoring of noise emissions will be done at any location requested by the Planning Authority, should any noise-related complaint occur.

7. Reinstatement - Not applicable.

Table 6 - Typical Noise Levels from Common Activities and Sources

Level in dBA (Decibels)	Source or Situation
140	Fireworks, Jet Takeoff at c.100m
130	Threshold of Pain
120	Night Clubs, Noisy Toys, Chainsaws, Stereos
110	Personal Stereo at high sound level
100	Video Arcades, Classical Music
90	Lawnmower, Motorbike, Crying Child
80	City or Town Traffic, Nearby Ringing Phone
70	Outside Busy Roadside House
60	Normal Conversation at c.1 metre
50-55	Normally acceptable by day, outdoors
40	Refrigerator, Quiet Living Room, Library
35-40	Normally acceptable at night, outside houses
25-30	Inside Bedrooms
20	Whisper
10	Very Quiet Countryside
0	Threshold of Hearing