



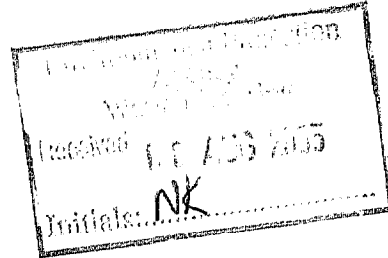
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8th August 2005



Ms. Noeleen Keavey
Office of Licensing & Guidance
Environmental Protection Agency
PO Box 3000
Johnstown Castle Estate
Co. Wexford

Dear Ms. Keavey

Re: Roadstone Dublin Ltd. – Waste Licence Application for Remediation of Unauthorised Landfill Sites at Blessington, Co. Wicklow (Licence Ref. No. 213-1)

Objection / Submission on the Proposed Decision dated 12th July 2005

We refer to your letter dated 12th July 2005 informing us of the Agency's proposed decision in relation to the above waste licence application.

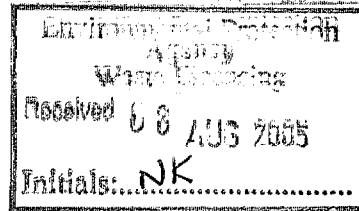
Roadstone Dublin Ltd. wish to object to the proposed decision and a copy of our submission describing the grounds of this objection is enclosed. A cheque for the required fee of €500 is also enclosed.

Yours Sincerely,
For Roadstone Dublin Ltd.

Mark Prendergast
Pits & Quarries
Roadstone Dublin Limited

Enc. Copy of Objection Submission
Cheque for Fee - €500

Cc. Mr. D. Luby (John Barnett & Associates Ltd.)



ROADSTONE DUBLIN LIMITED

**SUBMISSION ON PROPOSED DECISION OF
THE ENVIRONMENTAL PROTECTION AGENCY
TO REFUSE A WASTE LICENCE FOR
REMEDICATION OF UNAUTHORISED LANDFILL SITES
AT BLESSINGTON, CO. WICKLOW**

WASTE LICENCE APPLICATION No. 213-1

8 AUGUST 2005

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1 INTRODUCTION

This submission is made on behalf of Roadstone Dublin Ltd. (the 'Applicant') in response to the proposed decision of the Environmental Protection Agency (the 'Agency') to refuse a Waste Licence Application for remediation of unauthorised landfill sites at Blessington, Co. Wicklow (Ref. No. 213-1).

It is clear from the proposed decision of the Agency dated 12 July 2005 ("the Proposed Decision") and from comments of the Director General at a meeting of the Oireachtas Joint Committee on Environment and Local Government on Tuesday 19 July 2005 that the Applicant and the Agency have a common objective in relation to dealing with the unauthorised landfill sites on the Applicant's lands at Blessington, that objective being the removal of the waste at the earliest possible opportunity. This waste was placed on the lands by third parties and not the Applicant itself, who has proposed to remediate the situation through waste recovery, treatment and disposal.

Both the Applicant and the Agency recognise the need for:

- Carrying out the remediation works as soon as possible
- Excavation and removal of waste material from the three unauthorised landfill sites
- Processing of the waste materials (separation, sorting and treatment) to maximise re-use and recovery
- Removal of hazardous waste (if any) to a licensed facility off-site.
- The disposal of residual waste at a licensed landfill facility. The volume of residual waste is likely to be considerably less than the worst case scenario outlined in the application.

Since the conclusion of the Wicklow County Council environmental investigation in March 2003, the Applicant has moved as quickly as possible to further investigate the environmental risks and progress the Best Environmental Solution using its own resources and the best available local and international consultants.

Where the Applicant and the Agency differ is whether the Best Environmental Solution is to dispose of the residual waste at an engineered landfill facility on the Applicant's lands or at an off-site landfill facility. In relation to this issue the Applicant would wish the Agency to recognise that between February 2003 and June 2004, the Applicant had a series of meetings with the Environment Section of Wicklow County Council and the Agency with a view to determining the Best Environmental Solution. The Applicant prepared and submitted its application for a Waste Licence pursuant to the order from Wicklow County Council under Section 55 of the Waste Management Acts 1996-2003, a copy of which is reproduced in Appendix A. The Applicant further understood that the remediation scheme proposed by it was accepted and agreed by Wicklow County Council and by the Agency as the Best Environmental Solution for this site.

If that understanding was incorrect, and if the Agency has an alternative solution which it now considers to be the Best Environmental Solution, the Applicant confirms that it will be prepared to comply with the reasonable requirements of the Agency.

It would appear that the Inspector's Report recommends a refusal of the Waste Licence applied for by the Applicant on the basis that the creation of a "lined landfill cell" was the principal activity applied for in the application. However, the Applicant would maintain that the fundamental objective was to excavate and remediate the unauthorised landfill sites.

The Applicant and the Agency (as reflected in the Inspector's Report) are both agreed that time is of the essence and that remedial action must be taken as quickly as possible. The Applicant respectfully submits that this can best be achieved by granting a Waste Licence in respect of the current application with conditions considered appropriate by the Agency.

Having stated the above, the Applicant in Sections 2 and 3 of the attached submission responds to some of the arguments used in the Inspector's Report which directly affect the recommendation to the Agency's Board. In doing so the Applicant explains and clarifies relevant parts of its application, the objective of which is to achieve the Best Environmental Solution.

Submission on Proposed Decision of the EPA to Refuse Waste Licence Application for
Remediation of Unauthorised Landfill Sites at Blessington, Co. Wicklow (Ref 213-1)

This submission also addresses key concerns outlined in the Inspector's Report relating, amongst other things, to groundwater contamination, waste quantities and the current availability of alternative landfill capacity.

Licensing of the proposed landfill facility will not cause environmental pollution and will therefore satisfy the requirements of Section 40(4)(b) of the Waste Management Acts 1996-2003. The Applicant would maintain that it is open to the Agency to condition additional measures to further enhance the design of the engineered lining system and/or to limit the landfill capacity.

In summary, the Applicant considers that time is of the essence and that remedial action must be taken as quickly as possible. The Applicant respectfully submits that this can best be achieved by granting a Waste Licence in respect of the current application which should provide for:

- Carrying out the remediation works as soon as possible
- Excavation and removal of waste material from the three unauthorised landfill sites
- Processing of the waste materials (separation, sorting and treatment) at a safe location on the Applicant's lands at Blessington, to maximise re-use and recovery
- Removal of hazardous waste (if any) to a licensed facility off-site.
- The disposal of residual waste at a licensed landfill facility, whether at the Applicant's proposed facility or elsewhere.

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2 RESPONSE TO STATED REASONS FOR REFUSAL OF WASTE LICENCE

In issuing its proposed decision to refuse a waste licence for the proposed remediation of unauthorised landfill sites at Blessington, Co. Wicklow, the Agency has stated four reasons for the proposed decision:

1. *The siting of the proposed landfill facility on the locally important unconfined aquifer in proximity to the Wicklow County Council Blessington wellfield would constitute an unacceptable risk of environmental pollution. The zone of contribution of the Blessington wellfield lies directly in the path of and down/cross gradient of the proposed landfill cells.*
2. *The Applicant has not demonstrated to the satisfaction of the Agency the requirement to dispose of all of the quantity of waste as proposed in the licence application.*
3. *The Applicant has not demonstrated to the satisfaction of the Agency that it is not practicable to identify or establish a landfill disposal site in a lower risk area, and particularly at a suitably licensed facility elsewhere.*
4. *The measures proposed for excavation of waste at Area 6 are not sufficient to adequately ensure that odour nuisance and groundwater contamination will not arise thus causing environmental pollution.*

The reasons for refusal are considered below.

2.1 ***"The siting of the proposed landfill facility on the locally important unconfined aquifer in proximity to the Wicklow County Council Blessington wellfield would constitute an unacceptable risk of environmental pollution. The zone of contribution of the Blessington wellfield lies directly in the path of and down/cross gradient of the proposed landfill cells."***

The Applicant suggests that this reason for the proposed decision to refuse should be reconsidered, as:

- A. There is no "unacceptable risk of environmental pollution" :
- LandSim modelling clearly demonstrates that the proposed landfill facility will not constitute an unacceptable risk of environmental pollution to groundwater and the Blessington wellfield. Refer to Section 6.4 and Appendix 6M of the Environmental Impact Statement (EIS) accompanying the Waste Licence Application.
 - Additional LandSim modelling undertaken in response to the Agency's Article 14 notice dated 30th March 2005 assessed the potential long-term impacts on groundwater in a number of worst-case scenarios e.g. overtopping of the landfill within 250 years and loss of institutional control. This modelling also indicated that, provided a number of mitigation measures are implemented, the landfill facility presents no unacceptable risk of environmental pollution. Refer to the Mouchel Parkman addendum report submitted in response to the Agency's Article 14 notice dated 30 March 2005.
 - The input parameters for the LandSim model are consistent with the parameters adopted for the Quantitative Risk Assessment (QRA) in respect of the three existing unauthorised landfill sites. These parameters were agreed with Wicklow County Council, its technical advisors, and the Agency, as part of the Section 55 process.
 - In response to concerns raised in the Inspector's Report, further LandSim modelling was undertaken in July 2005 using the more conservative hydrogeological parameters indicated in the Inspector's Report. The Mouchel Parkman report on the additional LandSim modelling (August 2005), reproduced in Appendix B, indicates that, even if more conservative parameters are modelled, the proposed landfill facility has no significant impact on the groundwater beneath the proposed landfill facility or in the wider area.
 - The LandSim modelling for the proposed landfill facility is robust and demonstrably conservative.
 - The proposed location of the landfill facility within the Applicant's lands is optimised to achieve a maximum thickness of unsaturated zone beneath the landfill (over 20 metres),

a maximum distance to existing groundwater supply wells (1.8km from the Blessington wellfield) and to residential properties.

- The proposed landfill design incorporates, at the Agency's behest, a triple layer engineered lining system that exceeds the requirements of the EU Landfill Directive and the Agency's Landfill Design Manual for non-hazardous landfill facilities.
 - In addressing the risk of groundwater contamination, the Inspector's Report (Section 2.2 – *Development of New Landfill Cells on the Blessington Aquifer*) appears to focus solely on the QRA pertaining to the existing unauthorised landfill sites. It does not appear to consider the LandSim modelling undertaken in respect of the proposed landfill facility.
 - The Applicant considers that in assessing the impacts of the proposed landfill facility on groundwater, the Inspector's Report should have had regard to the LandSim modelling.
 - The Applicant does not accept the statement in the Inspector's Report that the QRA is "flawed". This is addressed in further detail in Section 3.1.3 of this submission. However, as noted above, the QRA relates solely to the three unauthorised landfill areas and not the proposed landfill facility.
- B. The proposed landfill facility is not located within the "zone of contribution of the Blessington wellfield" :
- The zone of contribution for the Blessington Wellfield (ie. the likely boundary of the body of water that will ultimately flow into the wells), as defined by the Geological Survey of Ireland (GSI), at its closest point lies approximately 0.9km from the proposed landfill facility, refer to Figure 1.
 - On this basis, there is no realistic risk that groundwater from beneath the proposed landfill facility could reach and contaminate the Blessington Wellfield. Refer to the Mouchel Parkman report (August 2005) reproduced in Appendix B.
 - The proposed landfill facility is located within a GSI/DoELG/EPA R3¹ groundwater protection response zone. This classification is consistent with that previously assessed by the GSI Groundwater Section for the area. This response zone designation permits siting of a non-hazardous landfill facility.
 - Wicklow County Council intends to replace the current public groundwater supply at Blessington with a mains water supply from Ballymore Eustace waterworks within 18 months time approximately.

In light of the above, there is no reasonable hydrogeological or scientific basis for the Agency to refuse the application on grounds of groundwater protection.

The Applicant suggests that the perceived '*unacceptable risk of environmental pollution*' could be addressed by granting a Waste Licence subject to conditions which might include additional mitigation measures, such as:

- Controls on the residual waste to be accepted at the proposed landfill facility
- Limiting the landfill size / volume
- Further enhancing the engineered liner (i.e. increase thickness of compacted clay liner)
- Raising the landfill base to further increase the thickness of the unsaturated zone.

2.2 "The Applicant has not demonstrated to the satisfaction of the Agency the requirement to dispose of all of the quantity of waste as proposed in the licence application".

The Applicant suggests that this reason for the proposed decision to refuse should be reconsidered, as:

- The Applicant's *best estimate*, in light of the 2003 environmental investigations, is that 52,300 tonnes of biodegrading domestic, commercial and industrial (DCI) waste is buried at the three unauthorised landfill sites on its lands at Blessington.
- In consultation with WCC and at the behest of the Agency, it was agreed on a precautionary basis to provide for the disposal, in a worst case scenario, of 180,000 tonnes of waste and surrounding / intermixed soil. In its response to the Agency's Article 14 notice dated 30 March 2005, the Applicant clarified that this upper bound estimate of waste tonnage / volume comprises:

- 52,300 tonnes (69,750m³) of biodegrading DCI waste
 - 41,850 tonnes (23,250m³) of potentially contaminated soil mixed through the DCI waste
 - 59,850 tonnes (33,250m³) of soil surrounding unauthorised landfills (0.5m thickness)
 - 11,000 tonnes (5,500 m³) of non-recoverable, residual C&D waste
 - A contingency allowance of just under 10%.
- The Section 55 Notice is explicit in its requirement to: "*segregate the excavated materials into designated fractions*" and to "*remove recoverable and recyclable materials off site for reuse and / or to appropriate recoverable activities*".
 - The Applicant will make every effort to maximise the recovery of soil as suggested in the Inspector's Report. This will minimise the volume sent for disposal at the proposed landfill facility.
 - The proposed landfill construction method offers the Applicant a significant degree of flexibility in respect of the residual waste volume / tonnage to be disposed of, on site.
 - The Agency will appreciate that it is in the Applicant's interest to limit the scale of landfilling on its lands.

The Applicant suggests that concerns regarding the quantities of waste to be disposed of can be further addressed by granting a Waste Licence subject to conditions which might include:

- Maximisation of recovery / recycling activities
- Controls on the residual waste to be accepted at the proposed landfill facility
- Limiting the landfill size / volume
- Instructing all hazardous materials to be disposed off-site
- Requiring, insofar as is possible and practical, contaminated soil in contact with the waste to be recovered by other treatment, to minimise volumes disposed to landfill

2.3 "The Applicant has not demonstrated to the satisfaction of the Agency that it is not practicable to identify or establish a landfill disposal site in a lower risk area, and particularly at a suitably licensed facility elsewhere."

The Applicant considers that there is a need to establish a landfill facility at the proposed site as part of the overall remediation scheme, because:

- On the basis of recent experience by others, the procurement of an alternative site for a new landfill facility, and the associated planning / licensing consents would take at least 5 years. This timescale conflicts with the requirement to carry out the remediation works as soon as possible.
- The Section 55 Notice directs the Applicant to construct an engineered facility within the Blessington site that will environmentally isolate and contain the residual waste fraction.
- Extensive ground investigation indicates that the proposed landfill facility is located at the lowest risk area within the Applicant's landholding at Blessington. The proposed location maximises the thickness of the unsaturated zone beneath the landfill (over 20 metres) and the distance to the Blessington wellfield.
- A recent survey of suitably licensed landfill facilities in the Wicklow and Leinster region confirms that 55,000 tonnes of landfill capacity is potentially available at the present time (up to the end of 2005). It is considered likely that capacity of this order will be available in 2006. However the Applicant has not obtained any commitment that such capacity will be available.
- The potential available capacity of 55,000 tonnes (to the end of 2005) comprises:
 - 15,000 tonnes at Kyletalesha Landfill, Portlaoise, Co Laois (69 km from the site)
 - 15,000 tonnes at Derryclure Landfill, Tullamore, Co. Offaly (83 km from the site)
 - 10,000 tonnes at Dunmore Landfill, Co. Kilkenny (95 km from the site)
 - 15,000 tonnes at Ballydonagh Landfill, Athlone, Co Westmeath (122 km from the site)
- Assuming a best case scenario where 100% of soil in contact with the waste is inert or can be recovered, rather than sent for disposal, there appears to be sufficient landfill capacity (up to the end of 2005) for the estimated 52,300 of biodegradable DCI waste.

- However, if the precautionary principle is invoked, and the volume of DCI waste is greater than estimated or a proportion of the surrounding soil material requires disposal, then it would appear that there is currently insufficient licensed landfill capacity available in the Wicklow and Leinster region.
- The long haulage distances associated with the off-site disposal of the residual waste to the above licensed landfill facilities outside the Wicklow Waste Management region would appear to contravene the 'proximity principle'.
- The proposed remediation scheme conforms with the polluter pays principle, the precautionary principle; the proximity principle; and maximising recovery / recycling elements as stated in the Waste Management Acts 1996-2003, and the Minister of the Environment's Section 60 Policy Guidance (May 2005). This is addressed in more detail in Sections 3.3, 3.4 and 3.7 of this submission.

The Applicant suggests that concerns regarding the justification for the remediation scheme can be addressed by granting a Waste Licence subject to conditions which might include

- Maximising the recovery / recycling activities
- Controlling the type and volume of residual waste to be accepted at the proposed landfill facility
- Limiting the landfill size / volume.

2.4 "The measures proposed for excavation of waste at Area 6 are not sufficient to adequately ensure that odour nuisance and groundwater contamination will not arise thus causing environmental pollution."

The WLA and accompanying EIS contains proposals and mitigation measures to address the odour nuisance and groundwater contamination.

- The proposed remediation scheme provides for odour abatement measures during the excavation and removal of waste in Area 6 to a temporary safe location on site for recovery. These measures are described in Section 7.4.1 and Table 7.36 of the EIS and include prior installation of passive gas vents (installed in December 2003), removal of leachate, temporary cover of open faces, capping of waste and use of mist scrubbing systems.
- The proposed remediation scheme provides for prior removal of perched water within the waste bodies. These measures are described in Sections 2.1, 2.4.4, and 6.4.1 of the EIS. This is addressed in more detail in Section 3.1.1 of this submission.
- Irrespective of this reason for refusal, any remediation options for Area 6 must entail excavation and removal of the buried waste.

The Applicant considers that concerns regarding the risk of odour nuisance and groundwater contamination from excavation works at Area 6 can be addressed by granting a Waste Licence subject to conditions which might include

- Full implementation of the proposals included in the EIS to mitigate the odour nuisance.
- Implementation of additional odour mitigation measures considered necessary by the Agency, including use of odour neutralisers, use of a polymer landfill cover system (as opposed to the proposed soil cover), and provision of a vertical barrier at the site boundary to deflect residual emissions upwards and enhance dilution.
- Control and management of the working methods (i.e. issues such as favourable / unfavourable weather conditions)
- Implementation of the proposed mitigation measures included in the EIS to extract the perched water within the waste body
- Continuation of the ongoing groundwater monitoring programme.

3 DETAILED RESPONSE TO ISSUES RAISED IN INSPECTORS REPORT

The Inspector's Report on the Waste Licence Application raised a number of issues which it considered constituted grounds for refusal of a Waste Licence for the proposed remediation of the unauthorised landfill sites on the Applicant's lands at Blessington. A detailed response to each of the points made in the Inspector's Report is provided below.

3.1 Existing Illegal Waste Areas

The Applicant notes at the outset, that in addressing the groundwater protection response and risk of groundwater contamination, Section 2.1 of the Inspector's Report, '*Existing Illegal Areas and Applicant's Calculations*', focuses entirely on the existing situation at the three unauthorised landfill sites, rather than that which will exist after the waste has been removed to the proposed on-site landfill facility.

In the discussion which follows, the Agency should recognise that the

- **Quantitative Risk Assessment (QRA)** addresses the risk of environmental pollution to groundwater arising from the *existing* unauthorised landfill sites at Area 1, 4 and 6, while
- **LandSim** modelling addresses the longer-term risk of environmental pollution to groundwater associated with the proposed landfill facility.

3.1.1 Removal of Perched Water

Section 2.1 (Page 4) of the Inspector's Report states that '*without the removal of perched water, I am concerned that on waste excavation there may be a release of sudden plug(s) of contaminated perched water, which may impact or 'shock' the underlying groundwater quality, and have unknown consequence on the aquifer water resources*'.

The concerns identified by the Inspector's Report have been recognised by the Applicant and it has provided in the proposed remediation scheme for:

- (i) prior removal of leachate from boreholes intercepting the buried waste at unauthorised landfill sites and transport off-site to a wastewater treatment plant
- (ii) construction of sumps at each unauthorised landfill site in advance of the excavation works to facilitate collection and extraction of any residual leachate.

Details of these provisions were discussed at pre-consultation meetings with the Agency, detailed in the EIS consultation document submitted to the Agency in October 2004 and are regularly referred to within the Environmental Impact Statement (EIS) which accompanies the Waste Licence Application (refer to Section 3.1 of the Non-Technical Summary and Section 2.1, Section 2.4.4 and Section 6.4.1 of the Main Report).

3.1.2 Modelling of Existing Wells

Section 2.1 (Page 4) of the Inspector's Report states that '*only after Agency intervention did the Applicant assess the impacts the existing waste bodies are having / will have on the numerous supply wells in Blessington village, even once the waste is removed*'. The Applicant considers this statement to be unfair. At consultation meetings in 2003, the Agency was advised that the Applicant had made repeated requests to Wicklow County Council for details on the location of existing groundwater supply wells in the Blessington area, as well as information on their operational and hydrogeological characteristics, but to no avail.

In the absence of such information, and given the requirement to prepare a Quantitative Risk Assessment (QRA) within a limited time period, as required by a Section 55 notice issued by Wicklow County Council, the Applicant and its technical advisors agreed with both the Agency and Wicklow County that the QRA should be progressed by modelling the impact of the existing waste bodies on a theoretical well located just 100m south and down-gradient of the existing unauthorised landfill at Area 6.

Given that the nearest groundwater supply well is located 0.75km south of and across / down-gradient of Area 6 and that the Local Authority supply wells are located 1.15km south of and

across / down-gradient of Area 6, the Agency will no doubt appreciate that the model adopted for QRA purposes is significantly more conservative and onerous than is actually the case in reality. A full copy of the original QRA published in August 2003, and an addendum thereto produced in December 2003, are provided in Appendix 6A of the EIS accompanying the Waste Licence Application.

It was only in response to the Agency's Article 14 notice dated 30 March 2005 in respect of this Waste Licence Application that Wicklow County Council provided the required information on existing groundwater supply wells in the Blessington area. The information provided by Wicklow County Council was subsequently used to re-run the QRA and LandSim models to specifically assess the impact of both the existing unauthorised landfills and the proposed engineered landfill on existing groundwater supply wells, as required by the Agency in its Article 14 notice. The revised QRA confirms that the existing waste bodies have no significant impact on *existing* groundwater wells.

3.1.3 *Input Parameters to QRA*

Section 2.1 (Page 7) of the Inspector's Report states that the QRA submitted by Applicant is 'flawed' and for this reason suggests that the Applicant's assertions that existing groundwater wells are not at risk from the existing unauthorised landfill sites cannot be accepted. Specifically, the Inspector's Report cites three input parameters which it suggests have been incorrectly modelled in the QRA :

- (i) permeability (k) value
- (ii) storage value / Specific Yield
- (iii) infiltration values.

(i) Permeability

Regarding the permeability value, the Inspector's report suggests a value of 7m/day should be modelled in the QRA. However this represents a worst case scenario and was derived from an area known to be unusually permeable. The sand and gravel deposits around Blessington are highly variable and do not comprise a uniform, single size gravel deposit. Visual inspection of the exposed quarry faces within Roadstone Dublin's landholding reveals sands and gravel deposits which are highly variable both laterally and vertically, with the absence of any continuous beds over long distances. This inherent variability is due to the very dynamic environment in which these sediments were deposited. Further details on the regional geomorphology and quaternary geology of the Blessington area are presented in Sections 5.2.2 and 5.2.3 of the EIS which accompanies the Waste Licence Application.

It is considered highly unlikely that a permeability of 7m/day is representative of the aquifer body between the Applicant's landholding and the active groundwater abstraction wells. As an illustration of the variability of these deposits, the GSI Report on the Blessington Gravel Aquifer dated November 2001, reports that one of three wells drilled by Wicklow County Council in 1995 was abandoned at 33.5m depth, as no water was encountered. Another report on test wells for the Cookehill development to the south of the Applicant's lands, prepared by KT Cullen and Co. in October 2001 (and reproduced in Appendix 6E of the EIS) reported that no water bearing gravels were encountered in one 25m deep well. The figure of 0.864 m/day modelled by Mouchel Parkman in the QRA was the highest calculated permeability from on-site measurements and is considered to be conservative.

(ii) Storage / Specific Yield

Regarding Storage / Specific Yield, the Inspector's report suggests a specific yield of between 10% and 20% should be modelled in the QRA. An effective porosity of 18.2% was used in modelling, which is approximately equivalent to specific yield in an unconfined aquifer, such as that which exists at this site. The modelled parameter is therefore consistent with the range of values suggested in the Inspector's Report.

(iii) Infiltration

Regarding the infiltration rate, the Inspector's Report suggests that there is no justification for the modelled rate of 100mm/year modelled in the QRA. The report indicates that the rate which

should have been modelled was 370mm/year which is provided by the GSI Report on the Blessington Gravel Aquifer.

The Applicant considers that the infiltration rate of 370mm/year provided in the GSI report is more representative of a 'greenfield' site situation. This rate is considered to be inappropriate for the unauthorised landfill sites, since it takes no account of the low permeability silt placed over each waste body, which effectively acts as a capping layer, shedding water away from the waste and therefore significantly reducing infiltration into waste areas. The report on 2003 investigations reproduced in Appendix 6B of the EIS accompanying the Waste Licence Application provides further details about the existing unauthorised landfill sites.

The Agency was consulted at the time the original QRA was prepared in August 2003, at a time when all parties (the Applicant and statutory bodies) were anxious to fully assess the impact of the buried waste on existing groundwater supply wells. A number of concerns expressed by Wicklow County Council and its technical advisors in respect of the hydrogeological parameters adopted for the QRA were addressed by a supplementary QRA issued in December 2003. A copy of the supplementary QRA report and the addendum thereto are included in Appendix 6A of the EIS accompanying the Waste Licence Application.

Notwithstanding the extremely conservative nature of the hydrogeological parameters suggested by the Inspector's Report, the QRA was re-run again in July 2005 using the suggested parameters to assess the impact of the *existing* unauthorised landfills on the Local Authority's groundwater supply wells. The re-run of the QRA found that the same chemicals of concern (CoC) observed in the groundwater reaching the receptors as were predicted in the original QRA (with the exception of fluoride from Area 4, which is no longer considered to reach the receptor). The CoC were:

- Area 1 – fluoride, sulphide and lead
- Area 4 – sulphide
- Area 6 – sulphide

Lead (Pb) took nearly one million years to reach the receptor from Area 1 using this new model, and in reality would precipitate out before reaching the receptor. Fluoride and sulphide do travel faster to the receptor, in less than 5 years. Fluoride is predicted to be found at levels commonly added to drinking water supplies for prevention of tooth decay. Sulphide will either react with iron to form insoluble sulphide rather than travel, or oxidise to sulphates in oxygenated water, a likely scenario, and in any event is not regarded as any risk to human health at the levels predicted in the model. A copy of the Mouchel Parkman report on this latest re-run of the QRA (August 2005) is reproduced as Appendix C.

Waste was deposited in Areas 1, 4 and 6 at Blessington between 1992 and 2001. Monitoring of drinking water boreholes does not show any impact from buried waste deposits at Blessington (refer to Section 6 of the EIS accompanying the Waste Licence Application).

The existing situation notwithstanding, the Applicant's fundamental objective in preparing and submitting this application is to obtain a Waste Licence to remediate the unauthorised landfill sites and thereby eliminate entirely the potential risk of environmental pollution.

3.2 Development of New Landfill Facility on Blessington Aquifer

3.2.1 Groundwater Table

Section 2.2 (Page 7) of the Inspector's report discusses the management of surface water at sand and gravel quarries, and states that '*all recharge and run-off percolates.....vertically to the groundwater table which lies at a depth of 8.5m in the sand and gravel aquifer*'.

The Agency should note that the situation at the three unauthorised landfill sites at Areas 1, 4 and 6 is somewhat different to that portrayed in the Inspector's report. The unauthorised landfills are all located in worked out quarries, from which sand and gravel was previously extracted. In restoring these quarries, the Applicant backfills the resultant voids / depressions to former ground level with low permeability silt arising from the sand washing and processing activities at the site

(i.e. materials which are already on site). Investigations conducted on the site indicate that the buried domestic, commercial and industrial waste was generally buried within backfilled arisings at worked out sand and gravel pits.

In view of the relatively low permeability of the silt arisings above, around and beneath the buried waste, surface water falling over the unauthorised landfill sites percolates neither directly nor rapidly to the underlying groundwater aquifer. At the time of the 2003 environmental investigations, it was notable that much of the silt surrounding the waste at the unauthorised landfill sites was dry, with little or no moisture present. This suggests that the fine-grained silt is effectively acting as capping and basal /side liner to the buried waste at the present time (refer to report on 2003 investigations reproduced in Appendix 6B of the EIS).

It is important to note that the depth to groundwater actually varies quite significantly across the site. Groundwater level lies approximately 1m below the base of the buried waste in Area 4, approximately 8.5m below that at Area 6 and approximately 15m below that at Area 1. Significantly, the depth to groundwater at the site of the proposed engineered landfill lies in excess of 20m below the base of the basal liner system.

Best practice for landfill design should endeavour to maximise the depth of unsaturated soil between the base of the engineered landfill and the groundwater table, so that in the event of a leak in the landfill liner system, the unsaturated soil will facilitate breakdown of contaminants and afford some protection to underlying water-bearing granular strata. At this site, the available thickness of unsaturated soil beneath the base of the liner system is greater than 20 metres and this was a key factor influencing the selection of the site for the proposed engineered landfill (refer to Section 1.7.2 of the EIS accompanying the Waste Licence Application).

3.2.2 Control of Emissions to Groundwater at Landfill Site

Section 2.2 (Page 7) of the Inspector's report states that *'the priority for landfills at gravel sites is to protect groundwater by controlling direct and indirect emissions to groundwater'* and then discusses the various means of doing this, depending on the sensitivity of the groundwater, aquifer extent and public usage of the groundwater reserves.

Although not noted in the Inspector's Report, the design of the basal liner system for the proposed engineered landfill exceeds the requirements of the EU Landfill Directive (Council Directive 1999/31/EC on the landfill of waste) and its own Landfill Design Manual for a residual non-hazardous landfill. This was done at the behest of the Agency, following a pre-consultation meeting with it in March 2004.

The proposed basal lining system comprises the following layers :

- a geotextile separator (immediately beneath waste),
- a leachate drainage blanket
- a geotextile protection layer
- a 2mm thick HDPE geomembrane
- a geosynthetic clay liner (GCL) and
- 1m thick clay liner of maximum permeability (k) 1×10^{-9} m/s (at base).

Full details of the proposed basal and side liner system are provided in 2.3.11 of the EIS which accompanies the Waste Licence Application.

Neither the Landfill Directive nor the Agency's Landfill Design Manual require a geosynthetic clay liner to be included in the design of the lining system for a residual non-hazardous landfill. The inclusion of such a liner, a factory manufactured composite comprising a 6mm thick layer of bentonite between two layers of geotextile, significantly enhances the degree of protection afforded to the underlying aquifer.

In further recognition of the sensitivity of the groundwater, the Applicant has also provided for construction of the landfill to be subject to a process of construction quality assurance (CQA) by

an external independent consultant, in line with internationally accepted best practice for construction of engineered landfills.

The Applicant considers that the proposed engineered liner system, coupled with the thickness of the unsaturated soil zone beneath it more than adequately addresses concerns about the sensitivity of the groundwater to the proposed engineered landfill development. In addition, extensive LandSim modelling carried out in respect of the proposed landfill facility demonstrates there is no significant risk of an impact on the underlying groundwater (refer to Section 3.2.4 of this submission).

Licensing of the proposed landfill facility will not cause environmental pollution and will therefore satisfy the requirements of Section 40(4)(b) of the Waste Management Acts 1996-2003. It is however open to the Agency to condition additional measures to further enhance the design of the engineered lining system and/or to limit the landfill capacity.

3.2.3 *Increased Distance of Waste From Supply Wells*

Section 2.2 (Pages 7 and 8) of the Inspector's Report also discusses the appropriate groundwater protection response for the application site. However, this discussion appears to focus principally on the *existing* situation at Area 6, where buried waste is within 30m of the recently constructed *Woodleigh* estate. The only salient fact mentioned in this discussion is that Area 6 lies 1.16km from the existing Local Authority groundwater supply wells.

The Applicant is concerned that the Agency may inadvertently have formed the impression, in reading this section of the Inspector's Report, that the longer term environmental risks to groundwater resulting from the proposed remediation scheme will be similar to those *currently* presented by buried waste at Area 6. It is also concerned at the implication in the Inspector's Report that proximity of the buried waste at Area 6 to the Local Authority groundwater supply wells somehow justifies re-designation of the groundwater protection response for the proposed landfill facility from R3¹ to R4.

The Inspector's report does not highlight that the proposed remediation scheme is intended to eliminate the existing environmental risk presented by the buried waste at Area 6, by excavating and removing all buried waste currently in-situ. It is worth emphasising that the proposed remediation scheme also provides for the recovery (reuse and recycling) of buried waste, *where practicable*, and transfer of all residual domestic, commercial and industrial (DCI) waste, much of which is biodegrading at present, to an engineered landfill facility which will in fact be 1.8km from the existing Local Authority groundwater supply wells, and a further 0.6km away than the existing unauthorised landfill sites.

3.2.4 *R3¹ versus R4 Groundwater Protection Response*

Section 2.2 (Page 9) of the Inspector's report suggests that the existing GSI / DOELG / EPA landfill protection response for the aquifer beneath the proposed landfill facility should be re-designated from R3¹ to R4 (which prohibits development of a landfill facility) having regards to the precautionary principle and

- (i) the 100% dependency of Blessington on groundwater for its drinking water supplies;
- (ii) the existing high levels of abstraction;
- (iii) the large zone of contribution for the Local Authority wellfields;
- (iv) the cross-gradient flow from the proposed landfill facility to the wellfields and
- (v) the contaminant breakthrough times identified in the QRA submitted with the WLA.

Notwithstanding the fact that the Agency, or its officials, have no powers to unilaterally change the existing landfill protection response for the aquifer beneath the site from R3¹ to R4, without consultation with other stakeholders (including the Geological Survey of Ireland, the Department of Environment, Heritage and Local Government, Wicklow County Council, local landowners etc), the Applicant considers that invoking of the precautionary principle in this regard is unwarranted in this instance given that:

- The Applicant, recognising the sensitivity attaching to the aquifer underlying its lands and the site of the proposed residual landfill in particular, is proposing to install a triple layer engineered lining system at the base and sides of the landfill. The design of this lining system exceeds the requirements of EU Landfill Directive and the Agency's Landfill Design Manual
- LandSim modelling clearly demonstrates that the proposed landfill facility will not constitute an unacceptable risk of environmental pollution to groundwater, the Blessington wellfield or any other current / future abstractions in the area. Refer to Section 6.4 and Appendix 6M of the Environmental Impact Statement (EIS) accompanying the Waste Licence Application.
- Wicklow County Council has confirmed its intention to replace the current public groundwater supply at Blessington with a mains water supply from Ballymore Eustace waterworks within approximately 18 months time. Refer to letter from Wicklow County Council submitted in response to Agency's Article 14 request dated 30 March 2005.
- The zone of contribution for Local Authority wellfields, at its closest point, is in excess of 0.8km from the existing unauthorised landfill at Area 6 and in excess of 0.9km from the proposed residual engineered landfill facility sites (refer to Figure 1). **The zone of contribution does not extend beneath the unauthorised landfill sites or the proposed landfill facility.** On this basis, there is no realistic risk that groundwater from beneath the proposed landfill facility will reach and contaminate the Blessington Wellfield. Refer to the Mouchel Parkman report (August 2005) reproduced in Appendix B.
- The current GSI / DOELG / EPA landfill protection response for the aquifer beneath the Roadstone lands is based on proven scientific realities. It recognises that all groundwater and surface water within the Zone of Contribution for the wells could ultimately flow towards the wellfield, and therefore assigns the highest protection response (R4) to the zone of contribution. Adjacent areas, beyond the Zone of Contribution, which are less critical for the public groundwater supply, are assigned a less onerous R3¹ response.
- The rate of groundwater abstraction and size of the catchment zone for the County Council wells are irrelevant if a given site lies beyond the Zone of Contribution of the abstraction.
- Following a pre-consultation meeting with the Agency, and at its behest, RDL met with Mr Geoff Wright of the Groundwater Section of the GSI to confirm that the landfill protection response for the site of the proposed residual engineered landfill was in fact R3¹. A letter from the GSI confirming a R3¹ landfill protection response is provided in Appendix 1A of the EIS.
- The Agency should note that any proposed re-designation of the landfill protection response is inconsistent with the decision made by it respect of the adjacent landfill facility at JW Carnegie (Waste Licence Ref. No: 80-1). The Inspector's Report in respect of that application accepted, without reservation, that a R3¹ landfill protection response applied in respect of the Carnegie site, a site which the Inspector's Report also acknowledged to contain unauthorised biodegrading waste

The Applicant considers that the assessment of the impact of the proposed landfill facility has been undertaken on a sound hydrogeological and scientific basis and that accordingly there is no reasonable basis for the Agency to invoke the precautionary principle and to refuse this waste licence application on grounds of groundwater protection. Licensing of the proposed landfill facility will not cause environmental pollution and will therefore satisfy the requirements of Section 40(4)(b) of the Waste Management Acts 1996-2003.

3.2.5 Risk of Environmental Pollution

The Applicant disagrees with the conclusion in the Inspector's report that the proposed residual engineered landfill presents a risk to existing public groundwater supply wells and the underlying aquifer for the following reasons :

- (i) LandSim modelling clearly **demonstrates that the proposed landfill facility will not constitute an unacceptable risk of environmental pollution to groundwater, the Blessington wellfield and/or any other current / future abstraction.** Refer to Section 6.4 and Appendix 6M of the Environmental Impact Statement (EIS) accompanying the Waste Licence Application

- (ii) The LandSim modelling for the proposed landfill facility is robust and demonstrably conservative.
- (iii) The proposed landfill design incorporates, at the behest of the Agency, a triple layer engineered lining system that exceeds the requirements of the EU Landfill Directive and the Agency's Landfill Design Manual for non-hazardous landfill facilities;
- (iv) The proposed landfill location within the RDL lands is optimised to maximise the thickness of unsaturated soil between the base of the landfill facility and the aquifer (in excess of 20 metres).

The Applicant notes that, in addressing the risk of environmental pollution from the proposed landfill facility, Section 2.2 of the Inspector's Report, 'Development of New Landfill Cells on the Blessington Aquifer', does not appear to consider the LandSim modelling undertaken in respect of the proposed landfill facility.

The Applicant considers that in assessing the impacts of the proposed landfill facility on groundwater, the Inspector's Report should have had regard to the LandSim modelling presented in the Section 6.4 and Appendix 6M of the EIS and the addendum thereto submitted in response to the Agency's Article 14 notice dated 30 March 2005.

Licensing of the proposed landfill facility will not cause environmental pollution and will therefore satisfy the requirements of Section 40(4)(b) of the Waste Management Acts 1996-2003. Notwithstanding this, the Applicant suggests that the Agency's perceived '*unacceptable risk of environmental pollution*' could be addressed by granting a Waste Licence subject to conditions which might include additional mitigation measures, such as:

- (i) Controls on the residual waste to be accepted at the proposed landfill facility
- (ii) Limiting the landfill size / volume
- (iii) Further enhancing the engineered liner (i.e. increase thickness of compacted clay liner)
- (iv) Raising the landfill base to further increase the thickness of the unsaturated zone.

3.3 Waste Tonnages for Disposal

In preparing a Waste Licence Application for the remediation of the unauthorised landfill site at Blessington, the Applicant applied two basic principles which, on a superficial reading, may actually appear to in conflict with each other, but which in fact are actually complimentary.

The first, the precautionary principle, was applied in making provision for a worst-case scenario, whereby all backfilled soil in contact with the buried waste was contaminated and could not therefore be used to re-instate the site to existing ground level. This principle was applied at the behest of the Agency, following pre-consultation meetings with it. The second principle was the application of the waste management hierarchy, maximising recovery (re-use and re-cycling) and minimising disposal, insofar as practicable. This principle was applied in response to the requirements of the Section 55 notice issued by Wicklow County Council.

It is noted for the record, that the Applicant made provision in its Waste Licence Application for disposal of a **maximum** of 180,000 tonnes of domestic, commercial and industrial waste (DCI) waste, and surrounding / intermixed soil, at the proposed engineered landfill. It has also clearly identified this tonnage on the Application Form, and throughout the EIS to be an upper bound estimate. In its response to the Agency's Article 14 notice dated 30 March 2005, Roadstone Dublin Limited clarified that this upper bound estimate comprises:

Waste Type	Tonnage	Volume
Biodegrading DCI waste	52,300	69,750m ³
Potentially contaminated soil mixed through the DCI waste	41,850	23,250m ³
Soil surrounding the unauthorised landfills	59,850	33,250m ³
Non-recoverable, residual C& D waste	11,000	5,500 m ³
Contingency allowance (approximately 10%)	15,000	10,000 m ³
Total	180,000	141,750 m³

Contrary to the proposal made in the Inspector's report, it is not possible to recycle the approximately 101,000 tonnes of soil material intermixed with or surrounding the buried waste as **secondary aggregate** because the Applicant is satisfied that most of the material intermixed with, and surrounding, the buried waste is a fine soil, principally silt, which was removed in processing (washing) aggregate extracted at the company's adjacent quarry sites. At the present time, silt arisings from the aggregate washing process are deposited as slurry at the large silt lagoons in the centre of Applicant's lands. They are later excavated, stockpiled and dried on-site before being re-used in backfilling and restoring worked out sand and gravel pits around the site.

Notwithstanding the above, every effort will be made to ensure that the excavated soil arisings which currently surround the buried waste will be fully tested and characterised in order to maximise the amount of such material which can be classified as inert and minimise the amount ultimately sent for disposal at the proposed engineered landfill site. Any material classified as inert will be re-used in the ongoing backfilling and restoration of the worked-out sand and gravel pits on this site.

The Applicant is prepared to accept such Waste Licence conditions as the Agency considers appropriate to maximise the amount of soil recovered as part of the remediation scheme. Conditions may provide, *inter alia*, for separation, stockpiling, treating, testing and classification of soil prior to re-use in restoration of worked-out sand and gravel pits.

However, the Applicant would also highlight that, in reviewing the proposed remediation scheme, the Agency should have regard (as it has) to the implications of a high proportion of the surrounding soil having contaminant concentrations in excess of defined criteria for inert soil which would then necessitate either on-site recovery by other treatment (subject to Waste Licence condition) or its disposal at a licensed non-hazardous landfill facility.

3.4 Alternatives

Section 3.2 (Page 10) of the Inspector's report notes that the siting of a landfill is not generally acceptable on a site with a landfill protection response of R3¹ unless it can be shown that it is not practicable to find a site in a lower risk area.

In this regard, the Applicant notes that the Agency has recently issued licences for landfill facilities at a site with a R3² landfill protection response (Annaskinnan, Co. Westmeath, granted 2 June 2005 Ref 153-1) and a site with an equivalent R3¹ response (Usk, Co. Kildare, granted 8 June 2004, Ref 168-1).

The Applicant assumes that in granting these licences, the Agency implicitly accepted that it was not practicable to find alternative landfill sites in lower risk areas **and/or that it was possible to adjust the landfill protection response by engineering in protection to the proposed landfill facility** (refer to Inspector's reports). However, the Applicant suggests that in designing the proposed landfill facility on its lands, it has effectively adjusted the landfill protection response by engineering in protection in the basal liner to the proposed landfill.

The Applicant requests that the precedent set by the Agency in granting Waste Licences for much larger landfill facilities (with potentially greater environmental risk) on sites with a R3¹ or R3² landfill protection response be extended to this application for a much smaller facility on a site with a R3¹ classification. This is particularly relevant if it has already accepted, on more than one occasion and in more than one area, an argument to the effect that it is not practicable to find a site in a lower risk area.

The Agency will no doubt recognise that the procurement of a site for a new landfill facility and the associated planning / licensing consents would take a minimum of 5 years, based on recent experience of Local Authorities and Waste Management Companies. This timescale conflicts with the requirement and the desire of all parties to carry out the remediation works at the unauthorised landfill sites as soon as possible. For this reason alone, it is considered impractical to locate a relatively small non-hazardous landfill at a greenfield site in a lower risk area.

The Applicant has contacted all landfill sites in the Leinster region which are licensed to accept organic, biodegradable, non-hazardous waste and which are not expressly restricted by the planning permissions from accepting waste from the Wicklow area. As a result of these contacts, the Applicant has established that a maximum potential landfill capacity of 55,000 tonnes is currently available for waste arising from the unauthorised landfill sites, comprising

- (i) 15,000 tonnes at Kyletalesha Landfill, Portlaoise, Co Laois (69 km from the site)
- (ii) 15,000 tonnes at Derryclure Landfill, Tullamore, Co. Offaly (83 km from the site)
- (iii) 10,000 tonnes at Dunmore Landfill, Co. Kilkenny (95 km from the site)
- (iv) 15,000 tonnes at Ballybonagh Landfill, Athlone, Co Westmeath (122 km from the site)

In undertaking this survey, the Applicant was advised that there is currently no spare landfill capacity at the following licensed facilities

- (i) Rampere, Co. Wicklow
- (ii) Whiteriver, Co. Louth
- (iii) Powerstown, Co. Carlow
- (iv) Killurin, Co. Wexford (closed)

The Applicant further considers that landfill capacity at the following licensed facilities is not available to it:

- (i) Balleally, Swords, Co. Dublin (quota system for established users only)
- (ii) Knockharley, Co. Meath (planning restriction to waste generated within North-East region)
- (iii) Ballynagran, Co. Wicklow (construction yet to commence)

Assuming a best case scenario, where 100% of the soil in immediate contact with the buried waste is inert, or can be recovered rather than sent for disposal, there appears to be sufficient landfill capacity (up to the end of 2005) for the estimated 52,300 tonnes of biodegradable, non-hazardous domestic, commercial and industrial (DCI) waste at existing licensed facilities in the Wicklow / Leinster region.

However, if the precautionary principle is invoked, and the volume of DCI waste is greater than estimated or a proportion of the surrounding soil material requires disposal, then it would appear that there is currently insufficient licensed landfill capacity available in the Leinster region.

The long haulage distances associated with the off-site disposal of the residual waste to the above licensed landfill facilities, all of which lie outside the Wicklow Waste Management region, would appear to contravene the proximity principle. The Agency will no doubt recognise that the transfer of this volume of waste to the licensed landfill facilities identified above is not without environmental impact, not least of which is the traffic impact generated by HGV lorries carrying excavated waste over long distances through built-up urban environments and small villages.

3.5 Waste Licence Application Area

The Inspectors report queries the irregular shape of the proposed waste licence application area and deems it unpractical. The proposed application area was submitted to the Agency in April 2004 for review and no objections to the proposed area were received.

3.6 Existing Landfill Gas Situation at Area 6

The Applicant agrees with most of the sentiments expressed in Section 5 (Page 11) of the Inspector's report in respect of the existing landfill gas situation at Area 6 and agrees that the waste in Area 6 needs to be removed as soon as possible in the interests of the residents of the nearby *Woodleigh* estate.

The proposed remediation scheme and current waste licence application provide for the removal of the existing waste at Area 6. In view of the concerns expressed in the Inspector's report about the environmental risk to *Woodleigh* residents presented by landfill gas, it appears illogical to argue that the risk of odour and landfill gas emissions from waste extraction would constitute

environmental pollution and that for this reason a Waste Licence under Section 40 (4) (b) of the Waste Management Acts 1996-2003 should not be granted.

The Agency should recognise that all remediation options for Area 6 require the waste to be removed as soon as possible. The Applicant's view is that all environmental impacts can be satisfactorily managed and any additional measures which the Agency deems appropriate can be conditioned in issuing a Waste Licence. A greater risk applies for as long as the biodegrading waste is allowed to remain in place in Area 6.

At the risk of labouring the point, time is of the essence as regards the removal of waste from Area 6. Granting a Waste Licence now will provide for the earliest removal of waste from this area.

As regards the Inspector's Report, Section 5 (Page 11) states that "*Notwithstanding the merits of the works carried out, I am concerned about the impacts of any landfill gas arising on waste ageing or indeed after a hot summer.*" However it should be borne in mind that the waste in Area 6 was placed between 1992 and 1995, The waste is therefore unlikely to undergo any 'sudden' change after being in place between 10 and 13 years and it is already well into the ageing process.

In reviewing the existing landfill gas situation at Area 6, the Inspector's report refers to a submission made by TMS Environmental on behalf of the Blessington and District Forum in which they query the rationale for not undertaking a Quantitative Risk Assessment for the landfill gas. The report further states that "*the houses at Woodleigh are too close to the Area 6 illegal waste deposit (<30m), and at a distance to which no risk assessment can be involved*"

As regards a landfill gas QRA, the Applicant's technical advisors undertook a gas risk assessment for Area 6 which found that the landfill gas currently presented no risks to nearby residents (the QRA is included in Appendix 6A of the EIS which accompanied the Waste Licence Application). The model used is generally known to be very conservative in its predictions for distances less than 1km. Notwithstanding this, it is also possible to risk assess gas dispersion for distances of less than 30m, with models using the Johnson – Ettinger approach. In light of the concerns raised in the Inspector's report, a further study was undertaken using this approach. This new study, reproduced in Appendix D, confirms that there is currently no risk to residents at Woodleigh, or elsewhere, from landfill gas from Area 6 at distances less than 30m (or indeed greater than 30m).

The current Waste Licence Application provides for the removal of waste from Area 6 to a residual landfill facility on the Applicant's lands. The proposed landfill facility presents no risks to the residents in the *Woodleigh* estate. The Applicant agrees with the statement made in the Inspector's Report to the effect that the "*link / pathway to the housing must be broken as soon as possible by specifying Area 6 waste immediately to an area of lower risk and at a distance from Woodleigh*" and would respectfully point out that this was provided for in its Waste Licence Application.

The penultimate paragraph of Section 5 of the Inspector's Report on the Waste Licence Application states, in respect of the EIS submission "*it is predicted in Section 7 of the EIS that there will be dust and odour impact of greater than 6 odour units in the vicinity of the Woodleigh during waste excavation (over a two month period). No mitigation measures for this nuisance aspect has been provided.*" The EIS does in fact include provision for mitigation measures in respect of the anticipated odour and dust impact arising during waste excavation at Area 6 and these measures are described in Sections 7.4.1 and 7.4.2 of the EIS and Table 7.36, and include provision of cover material, use of mist sprays etc..

Notwithstanding this, if the Agency considers that the existing proposals for odour mitigation are insufficient, it is at liberty to make it a licence condition that an acceptable mitigation scheme be agreed in advance of any waste excavation and removal at Area 6 in order to prevent environmental pollution. A number of possible alternatives could be considered and these are detailed below :

- i) Use a commercially available odour neutraliser, used as a mist spray, called Ecosorb. This is a non-toxic food grade odour neutraliser which uses biodegradable essential oils, collected from sustainable resources, to neutralise malodour by removing it from the air, breaking down the odour to harmless forms. The Applicant's technical consultants have successfully used this technology in recent times to eliminate strong odours during the removal of a large chemical waste landfill.
- ii) Use a landfill cover system which suppresses both odours and dust, minimises the exposed area during excavation and covers the area during non-working hours to prevent odour and dust emission. The cover system is a polymer mixture containing recycled paper which:
- prevents the emission of dust and minimises the release of gas and odours by filtering any gaseous emission through the cover
 - prevents the ingress of water
 - is weather resistant
 - does not trap gas within the landfill
 - can be used daily to cover any exposed faces left at the end of the working day and any stockpiles of waste awaiting sorting or removal
 - does not add significantly to the quantity of waste
- This system, supplied in Europe by New Waste Concepts Limited, is used in the USA for remediation projects similar to that envisaged at Blessington.
- iii) To further minimise emissions to the housing area adjacent to Area 6, it is possible to construct a scaffold supported fabric barrier up to 4m high along the boundary. This would be in addition to spray precautions and cover systems. The effect would be to deflect any residual emissions vertically upwards to aid dispersion, away from the housing area. It would also serve to further reduce any temporary noise and visual impact.
- iv) Increase the rate of removal of material from Area 6 to 28 days from the proposed two months, reducing the impact on adjacent housing.
- v) Apply controls to waste removal activity at Area 6 such as restricting waste removal activities over periods where unfavourable weather conditions (defined by or agreed with the Agency) occur.
- vi) Implement the proposed mitigation measures to extract perched water within the waste body in advance of waste removal activities.

The Applicant and the Agency (as reflected in the Inspector's Report) are both agreed that time is of the essence and that remedial action must be taken as quickly as possible, particularly in respect of the biodegrading waste at Area 6. The Applicant submits that this can best be achieved by granting a Waste Licence in respect of the current application with conditions considered appropriate by the Agency. The Applicant therefore requests that the Agency, at a minimum, consider approving such waste activities as are necessary to provide for immediate excavation and removal of waste from Area 6 to a temporary safe location on site for recovery.

The technical issues raised in the TMS Environment report submitted by the Blessington and District Forum and referred to in the Inspector's Report are addressed separately in Section 3.8 of this submission.

3.7 Ministers Policy Direction (Section 60 Waste Management Act)

The Minister of the Environment, Heritage and Local Government issued a policy guidance in respect of action against illegal waste activity on 3 May 2005 in exercise of powers conferred on him by Section 60 of the Waste Management Act 1996 (as amended).

Although this guidance was issued almost 6 months after the lodgement of the Waste Licence Application under review, the Applicant suggests that the proposed remediation scheme is totally consistent with the Minister's policy direction in that it provides, *inter alia*, for

- Disposal and recovery of waste in shortest practical time, without endangering the environment or human health and without using processes and methods which could harm the environment
- Removal (off-site) of hazardous waste;
- Removal (and on-site recovery) of recyclable material;
- Remediation of lands proximate to existing or planned residential development in the shortest time practicable;
- Implementation of monitoring and management controls to ensure that immediate and longer-term environmental impacts are assessed and addressed.

The final paragraph of Section 6 of the Inspector's Report states that given '*the proximity of the waste at Area 6 to housing at Woodleigh, I deem it not appropriate that waste at Area 6 be left in-situ. Hence by virtue of the Minister's policy, remediation at Area 6 shall require its removal in the shortest practical time*'.

The Applicant wishes to emphasise that at all times since the discovery of unauthorised landfills on its lands, its principal objective has been, and continues to be, to remediate the unauthorised landfill sites in the shortest practical time. This particularly applies in respect of the unauthorised landfill adjacent to *Woodleigh* at Area 6.

3.8 Submissions

A total of 22 submissions were received by Agency in response to the Waste Licence Application and an overview of the issues raised therein was presented in the Inspectors Report. The Applicant has responded to the technical issues raised in these submissions, below:

Surface Water

Dublin City Council, operator of the Ballymore Eustace waterworks, and others expressed concern about the impact of the proposed landfill facility on the quality of surface water and the Pollaphuca reservoir in particular. These concerns are addressed in detail in Section 6.4 of the EIS accompanying the Waste Licence Application. The Burgess Stream, which runs south-east of the Applicant's site, past Area 6, into the Pollaphuca Reservoir 3km downstream is largely fed by a groundwater source. LandSim modelling carried out in respect of the proposed landfill facility demonstrates there is no significant risk of an impact on the underlying groundwater and by extension, to the Burgess Stream. In recognition of concerns about water quality in the Burgess Stream, the Applicant has incorporated surface water monitoring at two locations along the stream in the ongoing water monitoring programme.

Groundwater

One submission makes the comment that the EIS confirms that groundwater is contaminated by the illegal waste activities. It should be noted that contamination is confined to perched water in contact with the waste bodies, with intermittent exceedences above screening levels in the groundwater immediately underlying the unauthorised landfill sites (Refer to Section 6.2.4 of the EIS)

TMS Environment Ltd. in its report on behalf of Blessington and District Forum questioned whether results for perched water were used in the Quantitative Risk Assessment (QRA). This is addressed by Section 4.1.5 of the QRA which states that '*for each contaminant the highest measured value at each site has been taken as representative for the soil, leachate or groundwater and has been used to generate the risk assessment*'.

Dust

Concerns were raised by TMS Environment Ltd. in a report, submitted on behalf of Blessington and District Forum, about the fact that no baseline PM₁₀ monitoring was undertaken and the validity of the emission modelling undertaken, particularly in respect of the proposed waste excavation and handling activities at Area 6 (adjacent to *Woodleigh* residents). PM₁₀ monitoring is only undertaken on a long term basis. In preparing an EIS therefore, it is not practicable to obtain meaningful results based on short term measurements. Notwithstanding the concerns expressed about modelling of dust emissions from waste excavation and handling at Area 6, it should be noted that the more significant dust impact (by orders of magnitude) arises as a result

of haulage along unpaved roads. This factor accounts for most of the dust impact predicted by the dust modelling presented in the EIS.

Odour

Concerns were also raised by TMS Environment Ltd. in its report on behalf of Blessington and District Forum that the proposed odour limit values (of 3 Ou/m³ to 6 Ou/m³) used in the impact assessment did not comply with relevant guidance documents. The impact criterion of 3Ou/m³ used in the odour impact assessment has previously been accepted by the EPA, has been validated by international research and is generally accepted for landfill sites. The rationale for using higher odour limit values was that the odour levels at Area 6 would only arise for a two month period whereas a landfill might generate odours on a continuous basis for 20 years.

Impact on Wildlife

The National Parks and Wildlife Service (NPWS), expressed concern about the impact of the proposed remediation scheme on peregrine falcons (*falco peregrines*) known to nest in the area. The Applicant confirms it is willing to comply with any mitigation measures, such as construction of a nest platform, which either NPWS or the Agency deems necessary to minimise the impact of the proposed scheme on this protected species.

Miscellaneous

In response to various other comments, the Applicant confirms

- It intends to only dispose of residual waste arising from excavation of the unauthorised landfill sites at the proposed landfill facility. No waste from external sites will be accepted at the facility;
- All 'illegal' waste will be removed to a licensed facility;
- Disposal of waste at the proposed Ballynagran landfill is not currently an option available to it as construction of the landfill facility has yet to commence;
- Extensive investigations by Wicklow County Council failed to reveal any other unauthorised landfill site other than the three which are the subject of this Waste Licence Application;
- Additional landfill gas monitoring data was submitted to the Agency in response to its Article 14 notice dated 30 March 2005;
- It recognises and shares the concerns about the environmental risks associated with delays in removing the buried waste and transferring it to a licensed landfill facility.

All other technical issues raised in third party submissions have largely been addressed by the Waste Licence Application and this submission.

4.0 CONCLUSION

In conclusion, the Applicant considers that:

- (i) The design of the proposed landfill facility exceeds the requirements of the EU Landfill directive and the Agency's Landfill Design Manual. LandSim modelling undertaken in respect of the proposed landfill facility demonstrates that it will have no significant impact on groundwater and that it does not constitute an unacceptable risk of environmental pollution. Licensing of the proposed landfill facility will not cause environmental pollution and will therefore satisfy the requirements of Section 40(4)(b) of the Waste Management Acts 1996-2003. Notwithstanding this, it is open to the Agency to condition additional measures to further enhance the design of the engineered lining system and/or to limit the landfill capacity.
- (ii) Time is of the essence and that remedial action must be taken as quickly as possible. The Applicant respectfully submits that this can best be achieved by granting a Waste Licence in respect of the current application which should provide for:
 - Excavation and removal of waste material from the three unauthorised landfill sites
 - Processing of the waste materials (separation, sorting and treatment) to maximise re-use and recovery at a safe location on the Applicant's lands at Blessington.
 - Removal of hazardous waste (if any) to a licensed facility off-site.
 - The disposal of residual waste at a licensed landfill facility whether at the Applicant's proposed facility or elsewhere.

In light of this submission, the Applicant respectfully submits that the Agency should review, revise and reverse its proposed decision and GRANT a Waste Licence, duly conditioned, for the remediation of the unauthorised landfill sites at the Applicant's landholding in Blessington, Co. Wicklow.

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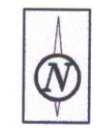
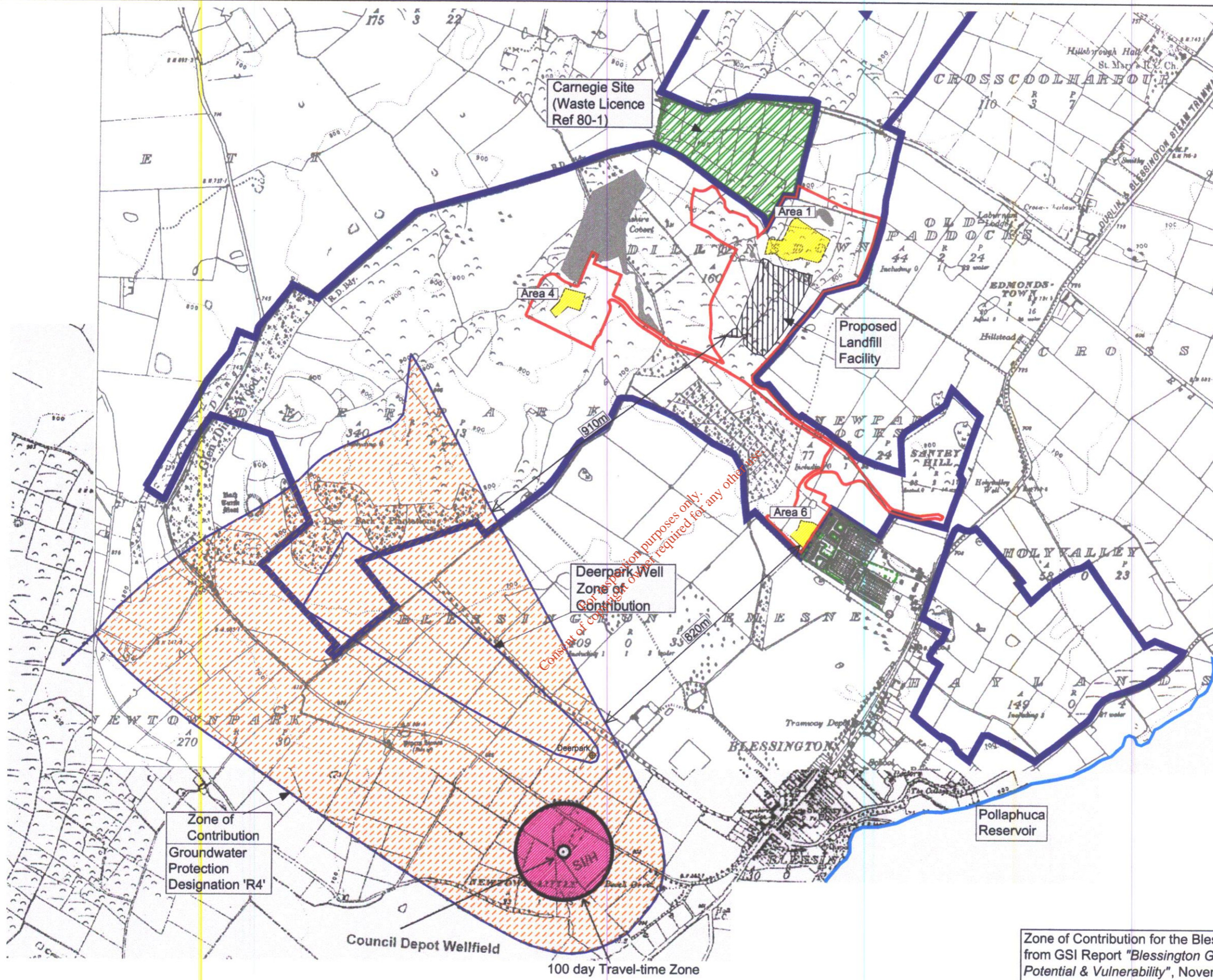
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Submission on Proposed Decision of the EPA to Refuse Waste Licence Application for
Remediation of Unauthorised Landfill Sites at Blessington, Co. Wicklow (Ref 213-1)

FIGURES

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Zone of Contribution for the Blessington Wellfield reproduced from GSI Report "Blessington Gravel Aquifer: Groundwater Potential & Vulnerability", November 2001.

roadstone
 ROADSTONE DUBLIN LTD.
 FORTUNESTOWN
 TALLAGHT
 DUBLIN 24

JBA
 JOHN BARNETT & ASSOCIATES
 7 DUNDRUM BUSINESS PARK
 WINDY ARBOUR
 DUBLIN 14

Legend

- Land Ownership (c. 267ha)
- Application Area (c. 27.6ha)
- Unauthorised Landfill Sites

Ordnance Survey Ireland Licence No. SU 0000705 (c) Government of Ireland

Rev.	Date	By	Description
0	Aug 05	PMC	

Site:	Lands at Blessington, Co. Wicklow
Project:	Remediation of Unauthorised Landfill Sites
Title:	Landfill Impact on Groundwater Wells
Drawn:	PMC
Scale:	1:12,500
Job. No.:	2901/10
Date:	Aug 2005

FIGURE 1