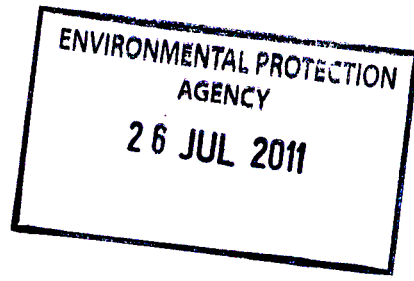


SUB No 24.



Hands Lane  
Rush  
Co Dublin  
24<sup>th</sup> July 2011

Mr Brian Meaney  
EPA Waste Licensing Dept  
PO Box 3000  
Johnstown Castle Estate  
County Wexford

Your ref. WO129-03

Application for a Waste License for a Hazardous Waste Landfill, at Nags Head, Naul, County Dublin by Murphy Environmental Hollywood Ltd

Dear Sir,

1. I refer to my previous submission to you (Submission no.10) on the above matter on behalf of the Nevitt Lusk Action Group (NLAG), on the matter of the landfilling of bottom ash and note the new drawings submitted by the applicant, which I have not yet studied in detail. However I have noted the proposal by the applicant and comments by an Bord Pleanala Inspector's report for a system employing a layering technique for the ash disposal and would be in broad agreement provided the following were implemented

- Layers would extend over the entire cell surface be no more than 250 mm deep and remain exposed to the atmosphere for up to 10 weeks to allow for curing/carbonation/ pH lowering to occur naturally.
- The top layer would be kept continuously moist by the installation of an effective water spraying system in order to promote curing and preclude wind blown dry ash.
- The proposed mineral layers between ash layers should be permeable and set at such a gradient and connected vertically to allow for water drainage/cooling/gas escape .
- The installation of a network of temperature monitoring sensors throughout the ash.
- Sumps containing gravel and connected to recirculation pumps through heavy duty plastic pipework be installed to allow for

recirculation/cooling of the entire ash mass in the event of emergency cooling of deep seated ash being required.

## 2. Hydrogeological Risk Assessment.

I have since been asked by the NLAG to prepare a further submission to the EPA on the subject of the site and local area hydrogeology. I propose to use a format based on the universally accepted **Source- Pathway- Receptor** risk assessment methodology, based principally on information provided in the applicants EIS, GSI maps and GSI Study of the Bog of Ring Public Water Supply, TES report on same, the Nevitt Municipal Waste Landfill EIA. and a selection of the nearest three Bord Bia monitored commercial horticultural wells.

**SOURCE** : As a former Army Explosives Expert and Ammunition Technical Officer with 26 years experience in bomb disposal and the storage and handling of explosive and incendiary materiel, it is my considered opinion that the greatest hazard presented by the proposed facility is the inadvertent or accidental mixing of chemically incompatible substances in the hazardous waste cells, leading to either fire, explosion, the release of toxic gasses to the atmosphere, the release of toxic chemicals to groundwater or a combination of any of the above. Such a scenario could occur without warning due to either human error or breakdown of chemical containment.

The second most dangerous scenario might not be sudden or cataclysmic but occur slowly and gradually over a long period due to containment breakdown between incompatible chemical substances.

**PATHWAY** : *In general terms the applicant identifies hydraulic boundaries surrounding the site which would presumably limit the length of pathway in any direction and in all formations, but no actual data is presented proving the effectiveness of any of these geological features as actual barriers to groundwater movement. In other words the hydraulic boundaries suggested by the applicant are not scientifically proven. This is particularly true in the most important down-gradient direction-“The aquifer probably discharges to a tributary of the small stream---“(This stream was checked today by the NLAG and is dry!)*

***This is a very serious flaw in the applicant's argument and can only be corrected by further extensive fieldwork. However the existence of three major adjacent down gradient commercial horticultural wells and a network of existing boreholes associated with the Bog of Ring water supply and the Nevitt Landfill EIS are available for this purpose. In other words pumping tests and Schafer analysis on all three commercial wells and a selection of appropriate boreholes would establish for the EPA a scientific basis for the effects of all hydraulic barriers on groundwater flow and the presence or otherwise of hydraulic boundaries.***

***This analysis must therefore proceed on the assumption that no such boundaries exist in a down-gradient direction and that groundwater will flow east or southeast eventually reaching Rogerstown Estuary as either surface or groundwater.***

The pathway for Hazardous pollutant would initially be through the Namurian deposits which lie above the more permeable Loughshinny formation. This of course assumes a homogeneous Namurian deposit, free from fissures and faulting, which is not the case. In fact the Namurian borehole data indicates groundwater flow in a NNE direction towards the Bog of the Ring.

The small stream immediately adjacent to and on the northern boundary has a vulnerability of "extreme". Whether this would result in a discharge to the stream of all or some of an escaping plume is not established in the EIS.

Mr Shane Herlihey of RPS representing Final County Council at the ABP oral hearing was of the opinion that this groundwater would turn down-gradient in an easterly direction either discharging into the stream, or entering the Loughshinny formation aquifer. In such an event it could pose a threat, he said, to the Bog of Ring water supply. He also agreed that it would also pose a threat to Thorne's well.

***A number of geological features in this area may have an important function***

***a. The Donore and Balrickard formations form a syncline beneath the Walshestown formation and connect with the Bog of Ring zone of contribution.***

***b. Two NNE trending faults east of the MEHL are shown on the GSI geological map. Their effects on groundwater flow is not known.***

***c. A hitherto unknown large gravel deposit lies beneath the Nevitt landfill site and the Ballough River valley and is continuous with the known Bog of Ring gravel deposits (EPA Nevitt oral hearing). It lies below the water table and is hydraulically connected to the bedrock aquifer and the NS trending fault along the MI motorway. The GSI has identified this area as a future potential location for a public water supply, but it is already in use as a source of water for the horticultural industry, and is monitored monthly by an Bord Bia. At the ABP oral hearing Mr Eugene Daly, hydrologist for the applicant, conceded that this resource would be lost should the Nevitt landfill proceed. The unanswered question now is will it be lost if the MEHL project proceeds?***

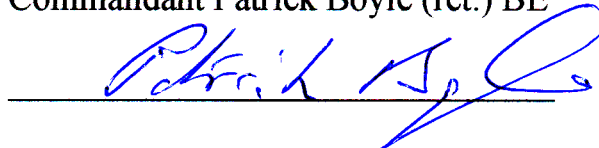
**RECEPTORS:** Since the saturated gravel deposits are so extensive down-gradient of the MEHL site all groundwater sources and the resource itself must be considered receptors unless proven otherwise. These are

- Horticultural wells at T. Kerrigan (1ML/d), J. Thorne (3/4ML/d), T. Moore (3/4ML/d) and the Bog of Ring public water supply.
- The Ballough River.
- Rogerstown Estuary SAC.

### **Conclusion.**

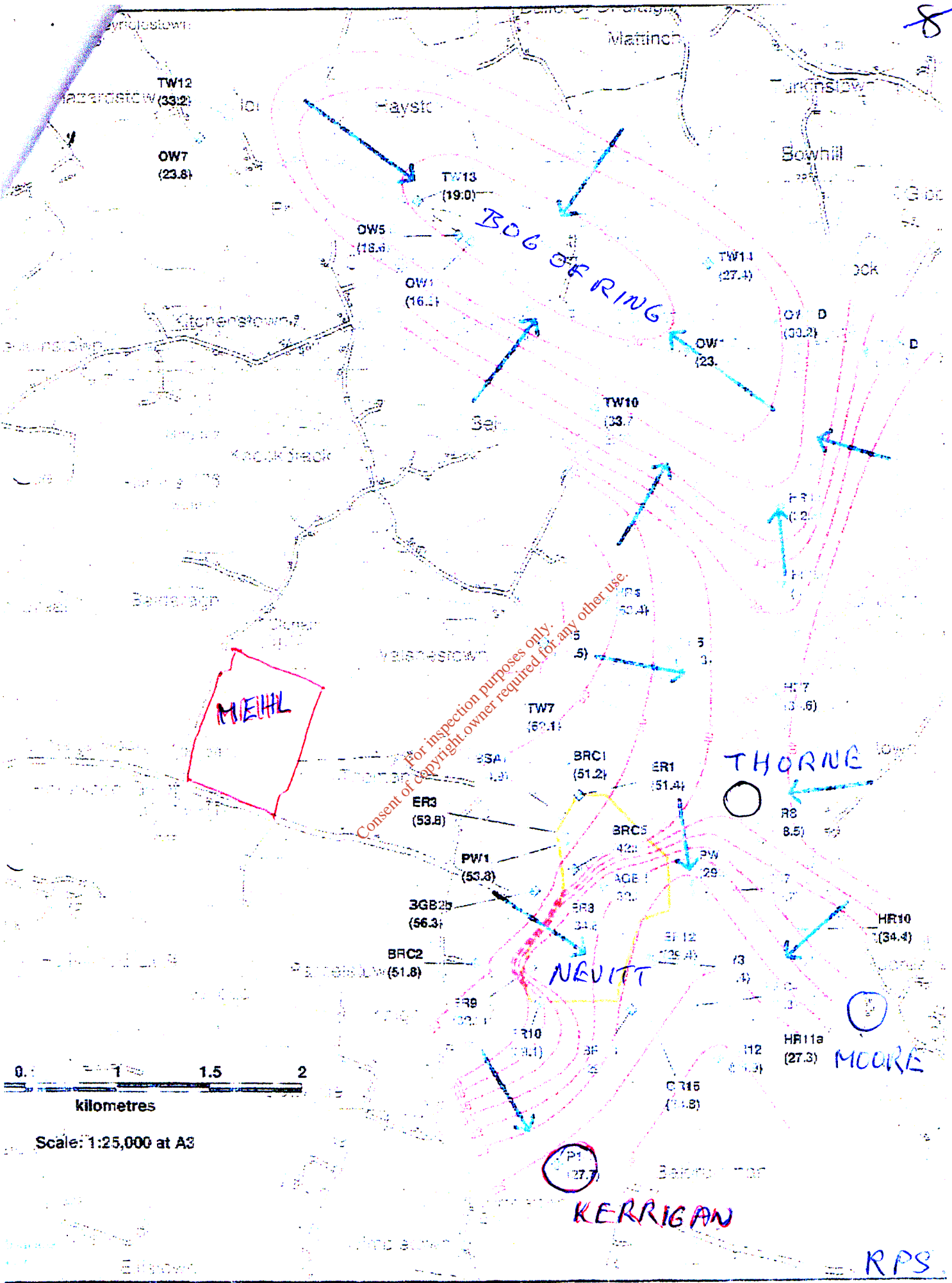
We feel that in addition to the field tests suggested above, a hydrogeological revision by the GSI Groundwater Section of the area potentially effected by the MEHL proposal, to include all new data revealed by the MEHL and Nevitt EIS is also required to assist the EPA in its deliberations.

Commandant Patrick Boyle (ret.) BE



See: Appendix A1  
attached. A2

8



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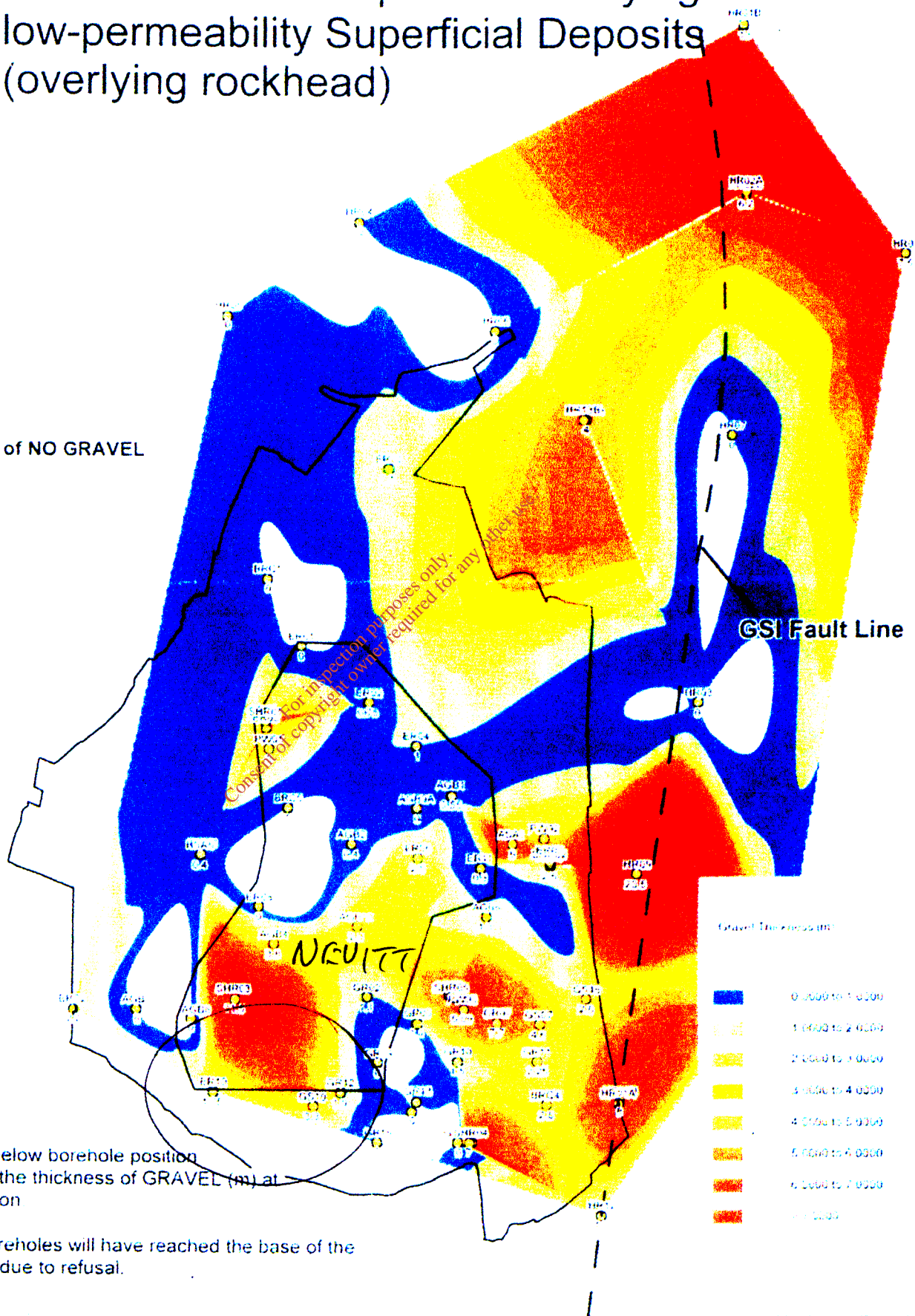
A1

P. Syle 24/7/2011

# Proposed Fingal Landfill Extent of Gravel Deposits underlying low-permeability Superficial Deposits (overlying rockhead)



Areas of NO GRAVEL



Gravel Thickness (m)

Blue	0.000 to 1.000
Light Blue	1.000 to 2.000
Yellow	2.000 to 3.000
Orange	3.000 to 4.000
Red-Orange	4.000 to 5.000
Red	5.000 to 6.000
Dark Red	6.000 to 7.000
Black	7.000

Number below borehole position  
Indicates the thickness of GRAVEL (m) at  
that location

Not all boreholes will have reached the base of the  
GRAVEL due to refusal.

*REF 14*

*R.P.S.*

*A2*

*P. Boyle 24/7/2011*