

C Existing Environment

C.1 Air

Standard windrow composting is currently being undertaken in the open at the site. Bord na Mona Environmental Limited have completed an ambient odour survey during March 2004. A copy of this report “Ambient Odour Survey Undertaken at the Shannon Vermicomposting Facility, Report No. ECS0693-O”, is attached at the back of Attachment C. The survey monitoring points comprised two locations at the site perimeter (both upwind and downwind) and one at an adjacent residence. The results of the survey concluded that under the specific meteorological conditions on the day of sampling, the results recorded support the observations that the potential odorous emissions from the Shannon Vermicomposting facility did not contribute to increased odour levels downwind or at the nearest sensitive receptor. When the construction of the tunnels is complete, the composting operations will be undertaken indoors and this will further reduce any odours from the site.

C.2 Climate

The site at Rathcabbin is located 10.5 kms west-northwest of the Met Eireann weather station at Birr, Co. Offaly. The location of this station so close to the site gives very reliable and relevant information concerning the prevailing climate. The climate in the general area is a temperate climate with mild winters and moderate to warm summers. The prevailing winds are from a west to southwest direction and are moisture-laden. Most of the rain from these winds falls on the mountainous areas along the west coast and the level of rainfall decreases with distance in-land.

Data from Met Eireann indicates that at the Birr weather station the 30-year (1961-1990) mean rainfall is 804.2mm per annum and the mean temperature is 9.3⁰ C. The data for 2003 gave mean values of 595 mm of rainfall and a temperature of 10.1⁰ C, which were primarily due to the exceptionally dry spring and autumn periods plus the warm summer. The rainfall recorded in the first five months of 2004 is 72% of the 30-year mean for the same months and is down from the 84% level that was recorded in the first five months of 2003.

year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2004	80.8	28.0	57.9	23.4	29.9	49.9							
2003	49.1	24.8	33.0	48.2	100	69.8	74.1	8.3	38.3	30.3	63.9	55.9	595.
30-yr mean	76.0	53.9	60.7	52.8	61.2	55.6	58.7	78.0	70.6	84.1	74.2	78.3	804.2

Table 1: Total rainfall in millimetres for Birr

year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2004	5.5	5.1	6.7	8.8	11.4	13.4							
2003	5.1	5.5	7.8	9.8	10.9	14.0	15.7	16.4	13.6	9.1	8.2	5.5	10.1
30-yr mean	4.6	4.8	6.1	7.9	10.4	13.2	14.9	14.6	12.6	10.1	6.4	5.4	9.3

Table 2: Mean temperature in degrees C. for Birr

C.3 Cultural Heritage

An inventory of all sites of cultural significance within 5 kms of the Shannon Vermicomposting site at Coolross has been prepared. This list was prepared from the Archaeology Inventory of Tipperary and the number coded attributed to each site is retained in the inventory below. For convenience, the sites are described under the different groupings to which each belongs.

No sites of significance occur on the site or in the adjoining fields. The nearest recorded site was site Record No. 637, a ringfort located 540m west-southwest of the Shannon Vermicomposting site.

Ringforts

A ringfort, also known as a rath orlios, usually consists of a roughly circular or oval area surrounded by an earthen bank. There are 818 ringforts identified in North Tipperary. The vast majority are univallate, having just one bank. Approximately one quarter of these have been levelled, sometimes leaving just the faint outline of the former bank. Ringforts date generally to the second half of the first millennium AD. The majority of ringforts in North Tipperary are located between altitudes of 200 to 500 feet, with 67% of sites favouring slopes and 27% in upland areas, on hillocks or ridges.

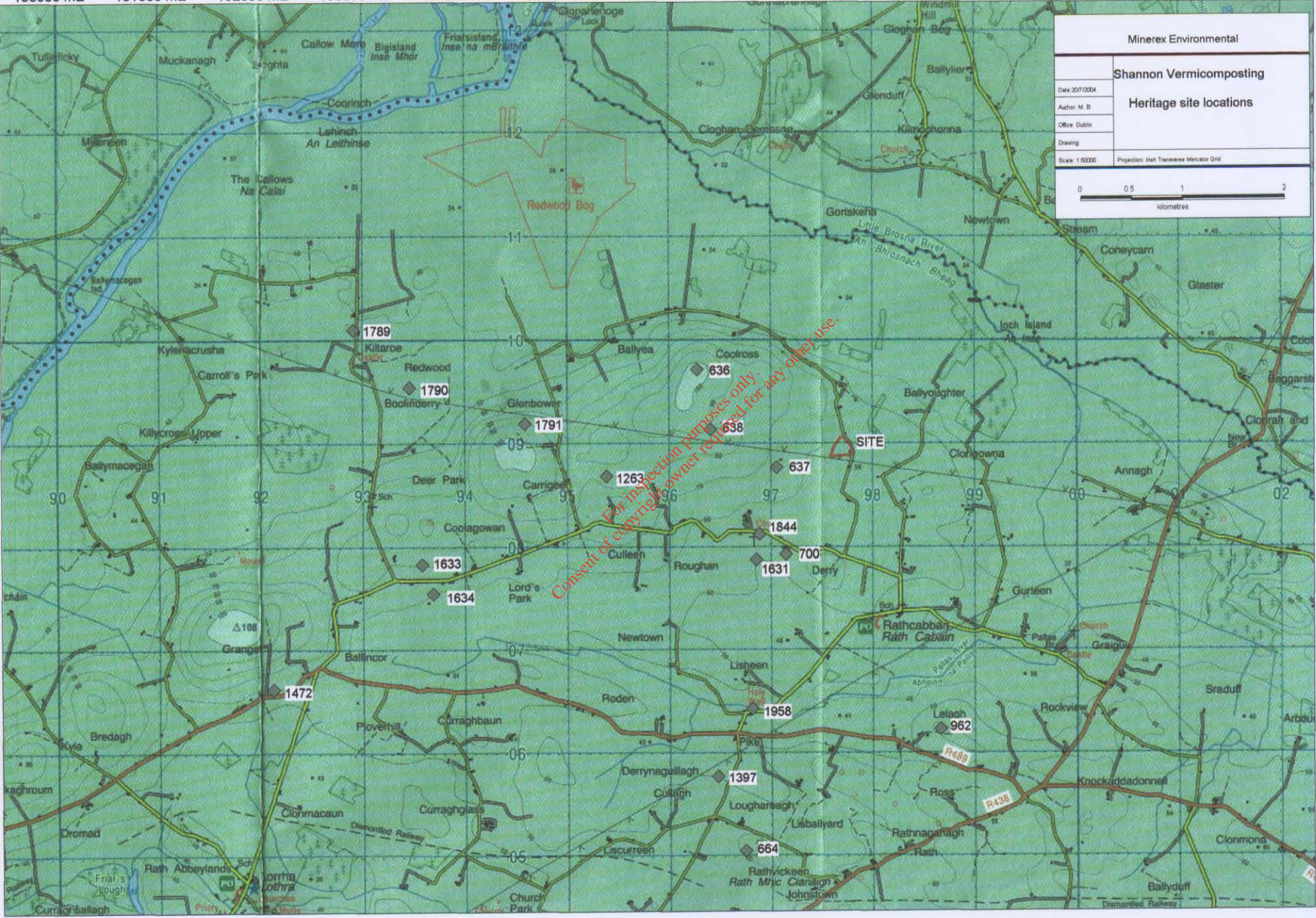
636 Coolross (Dorrha Par.)

OS 1:12:6 (853,200) "Lisheenramaher" OD 300-400 196280, 209710

Ringfort Situated on top of high ground overlooking the Little Brosna River to the north and marshland to the northwest. A well-preserved large circular area (diameter 60m E-W) enclosed by an earth and stone bank (width 3m) and outer bank visible from SE, S and W only. There is a well-

190000 mE 191000 mE 192000 mE 193000 mE 194000 mE 195000 mE 196000 mE 197000 mE 198000 mE 199000 mE 200000 mE 201000 mE 202000 mE

213000 mN
212000 mN
211000 mN
210000 mN
209000 mN
208000 mN
207000 mN
206000 mN
205000 mN



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Shannon Vermicomposting	
Date: 20/7/2004	Heritage site locations
Author: M. B.	
Office: Dublin	
Drawing	
Scale: 1:50000	Projection: Irish Transverse Mercator Grid
0 0.5 1 2 kilometres	

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mN

preserved entrance gap at the SE side. Wall-footings of a field boundary bisect the interior on a N-S axis. The site is 1500m WNW of the Shannon Vermicomposting facility.

637 Coolross (Dorrha Par.)

OS 1:13:1 (3,110) "Hachured" OD 200-300 197060, 208760

Ringfort Situated on flat pasture with good views in all directions. A slightly raised circular area (diameter 35m NW-SE) enclosed by an earth and stone bank (width 2.5m, internal height 0.7m; external height 1-1.5m) and an outer fosse (width 3m; diameter 0.5-0.7m) with a possible destroyed causeway entrance (width 10m) at the south. There is good evidence of internal and external stone revetment of the enclosing bank in the form of upright stones protruding from the top of the denuded bank. The bank and fosse are destroyed from NE to E while the bank is intersected by a field fence at the E on a NE-SW axis. The site is 540m WSW of the Shannon Vermicomposting facility.

638 Coolross (Dorrha Par.) / Derry (Dorrha Par.)

OS 1:16:3 (866,145) "Lismaloon" OD 200-300 196410, 209130

Ringfort Situated on a SE-facing slope of rising ground in an upland area. A large raised area (diameter 45m E-W, height 1m) enclosed by an earth and stone bank (width 3.5m; internal height 0.7m; external height 2m) destroyed from E to S and an internal fosse (width 3m; diameter 0.7m) with evidence of an outer bank. No entrance feature visible. The site is 1250m west of the Shannon Vermicomposting facility.

664 Cullagh

OS 4:8:6 (897,366) "Hachured" OD 200-300 196750, 205060

Ringfort Situated on top of a natural rise in an upland area with extensive views. A raised circular area (diameter 35m E-W) enclosed by an earth and stone bank (width 2m; internal height 0.4m; external height 0.7m) with a possible entrance gap (WIDTH 1.2M) at the S side. There is good evidence of stone revetment along the inner face of the bank at the W. The site is 4 km SSW of the Shannon Vermicomposting site.

700 Derry (Dorrha Par.)

OS 2:13:4 (12,32) "Lisbunaham" OD 200-300 197150, 207930

Ringfort Situated on a slight rise of ground in an elevated position with extensive views of the surrounding countryside. Depicted as “Gabunaham” on the 1st edition OS 6-inch map. Modern farm buildings appear to be situated on the site of the ringfort. The site is located 1.1km to the south-southwest of the Shannon Vermicomposting site.

962 Lelagh

OS 5:1:6 (155,477) “Hachured” OD 200-300 198670, 206230

Ringfort Situated on high ground with extensive views. A large circular area (diameter 50m N-S) enclosed by two earth banks with a wide flat-bottomed intervening fosse (width 5.6m; external height 1m) and entrance gap (width 3m) at the S side. The inner bank (width 1m; external height 1.7m) is partially destroyed at the NW side. The site is 2.8 km SSE of the Shannon Vermicomposting facility.

Enclosures

The main type of enclosures in this area are generally circular or irregular and are defined by an earth and/or stone bank, sometimes with a fosse. Most of these enclosures are probably much-degraded ringforts, although they may be the remains of other site types such as ring-barrows, henge-type monuments or even landscape features.

1263 Ballyea (Dorrha Par.)/Redwood (Dorrha Par.)

OS 1:16:1 (768, 104) Indicated OD 200-300 195390, 208680

Enclosure Situated on SW-facing slope of rising ground in an upland area. A large circular area (diameter 80m E-W) enclosed by a poorly preserved earth and stone bank (width 1.5m; internal height 0.5m, external height 0.8m) and an external fosse (width 3m) and an outer bank visible at S to SW. There is no visible entrance feature. The irregular surface of the interior is due to natural rock outcrop. The site is 4.2 km WSW of the Shannon Vermicomposting facility.

1397 Cullagh

OS 4:8:3 (872,435) Hachured OD 100-200 196480, 205780

Enclosure Situated on NE-facing slope of rising ground in low-lying undulating countryside. A circular area (diameter 35m N-S) enclosed by an earth and stone bank (width 3m, internal height 0.3m; external height 0.7m) with evidence of a stone revetment along the inner face of the

enclosing bank. Field fences radiate out from the site at E and W. The site is 3.5 km SSW of the Shannon Vermicomposting facility.

1631 Redwood (Dorrha Par.)

OS 1:15:6 (624,27) Hachured OD 200-300 193860, 207880

Enclosure Situated at the S end of a low N-S ridge in undulating countryside. A circular area (diameter 41m N-S) enclosed by an earth and stone bank (width 1.5m; internal height 0.3m; external height 0.7m) which is destroyed at S, with no evidence of an entrance feature. Locally known as the "Lios". The interior slopes from E to W with no evidence of an external fosse. The site is 4.5 km WSW of the Shannon Vermicomposting facility.

1633 Redwood (Lorrha Par.)

OS 1:15:5 (597,24) Hachured OD 200-300 193580, 207840

Enclosure Situated on a natural rise of ground in undulating countryside with enclosure sites (1630) and (1631) to the N and E, respectively. Not visible at ground level.

1634 Redwood (Lorrha Par.)

OS 4:3:2 (608,603) "Hachured" OD 200-300 193690, 207556

Enclosure Situated on a S-facing slope of rising ground in undulating countryside. A circular area (diameter 35m E-W) enclosed by a poorly preserved earthen bank (width 1m) which has been reduced to a scrap in places with no evidence of an external fosse or entrance feature. The site is 4.5 km WSW of the Shannon Vermicomposting facility.

Earthworks

The term Earthworks refers to anomalous earthen structures that have no diagnostic features of any specific monument type. The lack of features such as an enclosing bank or entrance feature may be a result of disturbance thus hiding its true nature which may be revealed by future archaeological excavation.

1789 Redwood (Dorrha Par.)

OS 1:11:1 (534, 238) Not Indicated OD 100-200 192910, 210100

Enclosure Located on low-lying pasture-land in undulating countryside. A roughly circular flat-topped platform (diameter 29m N-S; external height 0.7m) defined by a scare with no evidence of an external fosse or outer bank.

1790 Redwood (Dorrha Par.)

OS 1:11:5 (586, 185) Not Indicated OD 100-200 193460, 209540

Enclosure Situated on flat poorly drained pasture with a bog nearby to the N and a tower house to the W. Not visible at ground level.

1791 Redwood (Dorrha Par.)

OS 1:16:1 (693, 151) Not Indicated OD 300-400 194590, 209190

Enclosure Situated on a north-facing slope of rising ground in undulating pasture with a bog nearby to the north. Not visible at ground level.

Ecclesiastical Site

1844 Derry (Dorrha Par.)

OS 1:16:5 (911, 50) "Bonahum Church (in ruins), Grave yard OD 200-300 196890, 208120

Church and graveyard Situated on a slight rise of ground with extensive views. An ivy-clad rectangular church (external diameter 8.2m; 15m E-W; wall 0.9m) built with rough limestone boulders located in the N sector of an irregular-shaped graveyard defined by an earthen bank from W to NW and elsewhere by a stonewall. A doorway lies off-centre to the W along the S wall, with a destroyed window at E with no other features visible due to the dense cover of ivy on the walls. An architectural fragment consisting of the head of a twin-light ogee-light headed window with decorated spandrels is located in the SE sector of the graveyard.

1958 Lisballyard/Lisheen (Dorrha Par.)

OS 4:4:6 (904, 496) "St. Kieran's Well, St. Kieran's Stone, St. Kieran's Tree"

OD 100-200 196820, 206430

Holy Well, Holy Tree Situated on flat pasture in undulating countryside. A semicircular well (diameter 1.6m; Depth 0.9m) enclosed by a low drystone wall which opens to the SW. A holy tree known as St. Kieran's Tree is located immediately to the south of the well with boulders located in

the north sector of an irregular-shaped graveyard defined by an pieces of cloth attached to its branches.

C.4 Ecology

The site is located 1.8 km west-northwest of the village of Rathcabbin, in the north of County Tipperary. The site is roughly triangular in shape and covers an area of 2.7 hectares. In the past, the site was a small farmyard and adjoining grass covered fields but it has been used as a composting facility since 2002, operating under the terms of a waste permit and planning permission issued by North Tipperary Co. Council. Since the commencement of the composting on-site, the surface of the site has been covered in parts by concrete and elsewhere by hardcore. Thus the original grass that covered the small fields behind the farmyard has been removed but the natural field hedgerow boundaries have been retained.

The area surrounding the site is largely an agricultural area, comprising of generally large fields that are used for pasture / grassland. The field boundaries generally consist of hedgerows and/or ditches with trees commonly present. The existing external field boundaries have been retained, with compost and soil berms surrounding the inside of the boundary. These berms were not substantially vegetated, with vegetation restricted to their outer edges. Species recorded include grass species and arable weeds such as nettle (*Urtica dioica*), thistle (*Cirsium vulgare*), redshank (*Polygonum persicaria*) and dock (*Rumex crispus*). Field boundaries surrounding the site comprise hedgerows systems dominated by hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), briar (*Rubus fruticosus*), with semi-mature and mature ash trees (*Fraxinus excelsior*) at intervals. The hedgerows are generally well maintained and provide screening up to 4m high.

The site is located 3.25 km to the southeast of Redwood Bog. Redwood Bog is a Nature Reserve. It is located in the lowlying area to the south of the point where the Little Brosna River joins the River Shannon. The Reserve comprises 165 hectares of raised bog.

C.5 Human Beings

The Shannon Vermicomposting site is located in a rural environment, within the townland of Coolross and is surrounded by agricultural land. The site is 1.8 kms north-northwest of the village of Rathcabbin. The population in the Rathcabbin area, based on the 2002 Census, is 222 and this is similar to the figure obtained from the 1996 Census. This indicates that there has been no increase in the population during this period.

Minerex Environmental

Shannon Vermicomposting

Date: 22/6/2004

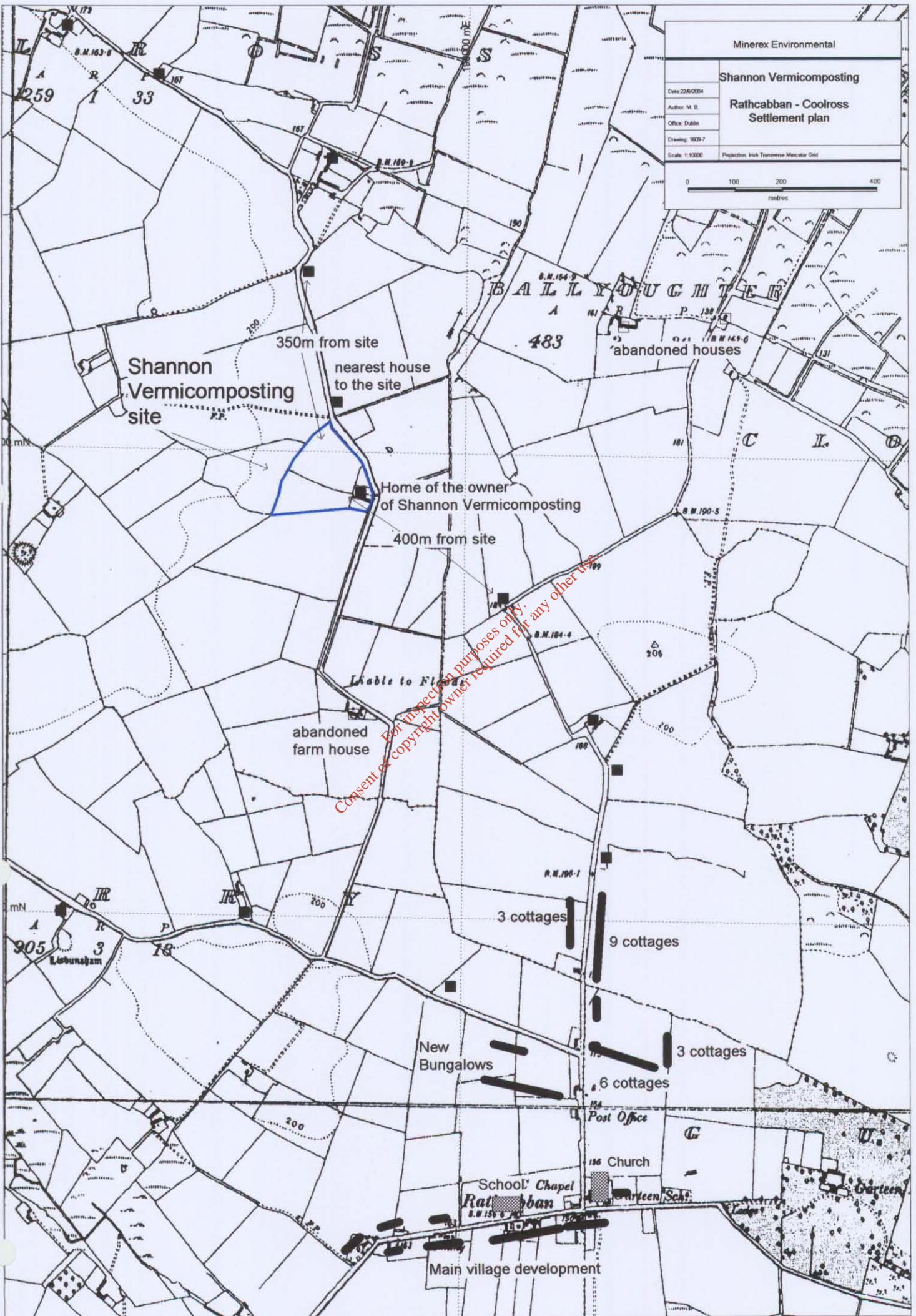
Author: M.B.

Office: Dublin

Drawing: 1009-7

Scale: 1:10000

Projection: Irish Transverse Mercator Grid



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The map titled “Rathcabbin – Coolross Settlement Plan” shows the location of occupied residential and farming buildings between the village of Rathcabbin and the site. The distribution of dwellings follows the road network in the area. The main clustering of houses occurs along the road running north from the T-junction in Rathcabbin village, along the road running westwards to Culleen and along the road in Coolross, on the northern side of Coolross Hill. There are three domestic dwellings located within a 0.5 km radius of the site. The nearest dwelling is located 70m north of the site with a second dwelling located a further 350m to the north. The third dwelling is located 400m to the south east of the site. An abandoned small farmyard is located 500m to the south of the site. Within 1 km of the site, there are a further nine dwellings and three abandoned dwellings.

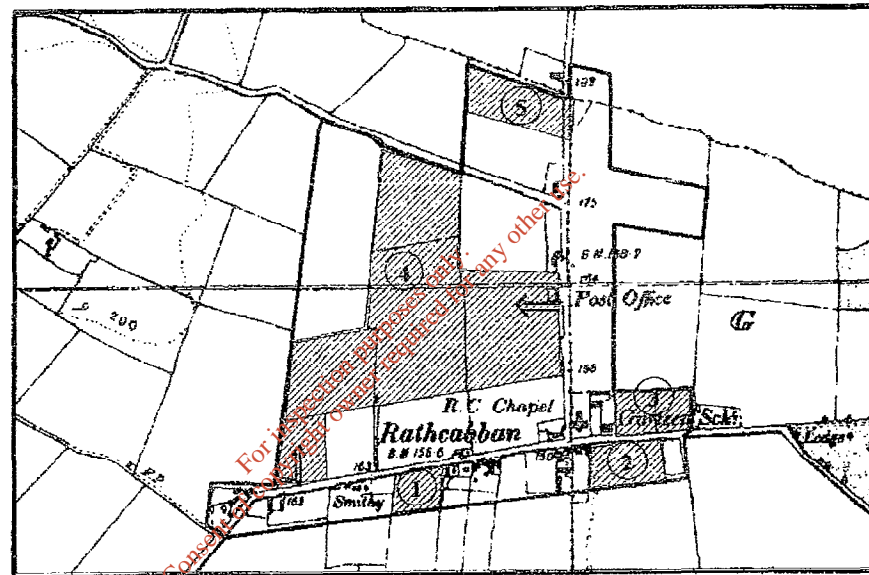
The centre of the village of Rathcabbin is 1.8 kms to the south and facilities in it comprise a national school, church, health centre, post office, 3 small shops and a sewage treatment plant. The village was recognised in the North Tipperary Draft Development Plan 2003 as a village within which there are opportunities for consolidation (see the accompanying Map 42 from the Draft Development Plan). A development of eight bungalows is currently being built in the village.

Agriculture is the main industry in the north Tipperary area and the land is largely used for grazing. There is one IPC licensed industry in the Rathcabbin area. This is IPCL No. 437, Sharragh Pig Unit and it has been licensed since 1999.

A number of concerns have been expressed by individuals from the area. These relate to: (i) the possible emissions of odours from the site, (ii) possible attraction of vermin to the site, and (iii) increases in traffic.

- (i) Currently, there is a minor agricultural type odour that is noticeable on the site and at its perimeter. This is from the outdoor, windrow composting. When the construction of the tunnels is completed and the waste reception area is enclosed within a building, all the composting will be undertaken indoors and the aeration and biofiltration system that will be part of the tunnels and waste reception building will regulate the air and eliminate odours.
- (ii) All the types of waste that will be processed will be non-hazardous, biodegradable wastes which pose no threat to humans or the environment. The wastes will be processed indoors immediately they arrive on site and no wastes will be left outdoors that could attract vermin. The site has been monitored on 11 occasions since 2003 by Rentokil and to-date no rats or evidence of rats have been found. On two occasions, some mice were found in the traps and on both occasions, pest free conditions were restored by the next survey.
- (iii) When fully operational, the facility will have the potential to treat up to 20,000t per annum. This is equivalent to approximately 400t per week or 6-8 trucks loads per day, depending on

RATHCABBIN SETTLEMENT PLAN – MAP 42



[Introduction](#) [Return to Village List](#)

Rathcabbin is a small village to the west of the Borisokane – Athlone Road, not far from the County Offaly boundary. The population is 122. The village has a range of services and sewage treatment plant. There are opportunities within the village for consolidation

Specific Objectives:

- Promote consolidation with the village at site no's 1, 2 & 3 along the main street through small scale residential development.
- Promote residential development on underused land at site 4.
- Encourage restoration / renovation of derelict sites within the village.
- Allow for future long-term residential development that should include open space at site no. 5.
- Define village boundary.
- Improve and extend footpaths and lighting.

the truck size. This therefore will not create a significant increase in the total volume of traffic passing through Rathcabbin village each day but it will mean a significant increase in the current low daily number of truck movements through the village.

C.6 Hydrogeology

Geological Information

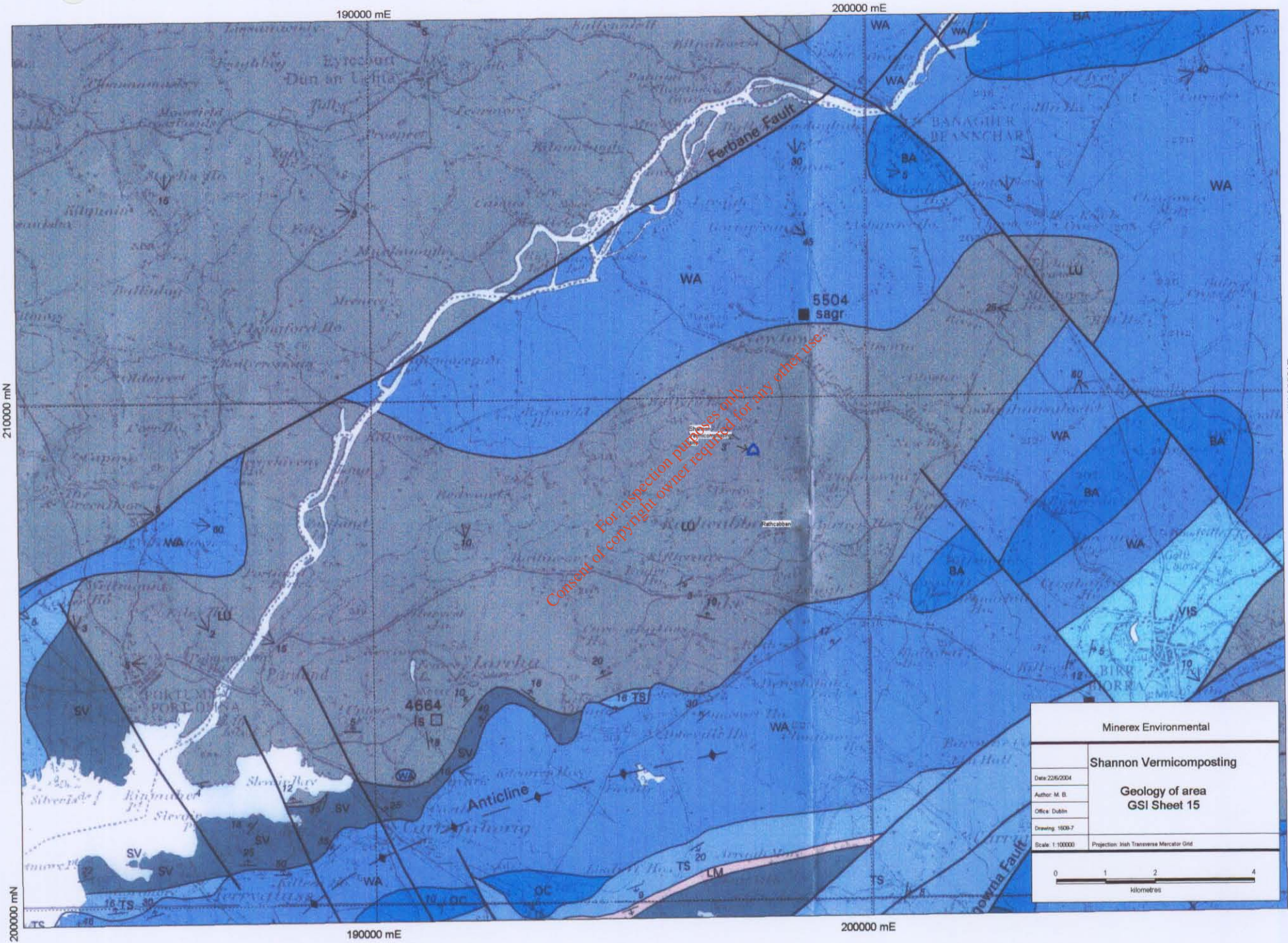
The Shannon Vermicomposting Limited site at Coolross is located within an area of subcropping Supra-Waulsortian, Upper Carboniferous limestones (see Map titled “Geology of Area “). These are Chadian to Asbian in age and are basinal limestones. The limestones are dark grey, laminated argillaceous calcisiltites and calcareous shales. The Supra-Waulsortian Limestones occur along the centre of an ENE trending syncline that overlies massive, pale grey, shallow water Waulsortian Limestones to the south and north. Bedrock dips based on recorded regional mapping and on pits excavated at the Shannon Vermicomposting site are low and generally less than 10°.

Period	Age	Formation	Description
Carboniferous (355-290 Ma)	Asbian	Lucan Formation (LU)	Laminated argillaceous calcisiltites
	Chadian	Visean Limestone (VIS)	Clean shelf limestones comprising calcarenites and calcilutites.
	Courceyan	Waulsortian Limestone (WA)	Massive, clean calcilutites
	Courceyan	Ballysteen Formation (BA)	Argillaceous bioclastic calcarenites

Table 3: The geological stratigraphy in the Coolross – Rathcabbin area.

Aquifer classification and groundwater vulnerability

The presence of basinal limestones beneath a site has major implications for the aquifer potential at that site. These are argillaceous, very fine-grained lithologies and consequently have low porosity and permeability characteristics. These are massive, competent limestones that are not susceptible to karstification or significant fracturing and thus are significantly different from clean shelf limestones that have intergranular porosity and fractures derived from the massive and brittle nature of the clean lithologies. The aquifer beneath the site is classified by the Geological Survey of Ireland as a “Poor Aquifer” and is considered to be “generally unproductive except for local zones”.



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Shannon Vermicomposting	
Date: 22/6/2004	Geology of area GSI Sheet 15
Author: M. B.	
Office: Dublin	
Drawing: 1608-7	
Scale: 1:10000	Projection: Irish Transverse Mercator Grid

The vulnerability of an aquifer to contamination is determined by the nature and thickness of the overburden material overlying it. The depth of the soil at the site is shallow and varies from between 1.5m to 2.5m in depth based on the holes that were excavated for underground tanks. The overburden comprises of tan brown, slightly sandy clay with limestone cobbles and pebbles. Subsoils less than 3m in thickness are generally classified as "extreme". The groundwater protection response of groundwater at a site depends on the different elements of risk: the vulnerability, the value of the groundwater (regionally important aquifers more valuable than locally important aquifers) and the potential contaminant loading. The groundwater protection response at this site for an on-site wastewater treatment system would be R2¹, i.e. "acceptable subject to normal good practice".

Groundwater chemistry

A sample of the water from the well was collected on the 29th April 2004 and analysed by Alcontrol Laboratories Ireland. A copy of the results are attached and are also included in the Waste Licence Application Form. The results of the analyses indicate that the water contains total coliforms of 3360 cfu/100ml plus elevated sulphate, iron and magnesium values. There are however no faecal coliforms present in the water. The water is not being used for drinking due to a smell of sulphur and the presence of coliforms. The water from the well was also analysed in February 1999 and the results indicated poor water quality. A copy of these results are attached. The results indicate that the water quality has been poor since before any composting was started on the site. The well water contains high total coliforms due to soil contamination of the well resulting from the fact that the well-head is poorly protected. Currently, the top of the well casing is below ground level and it is planned to improve the water quality by installing appropriate well-head protection, dis-infecting the well and by taking measures to reduce the sulphur smell from the water. This could be achieved by installing a splash plate in a storage tank.

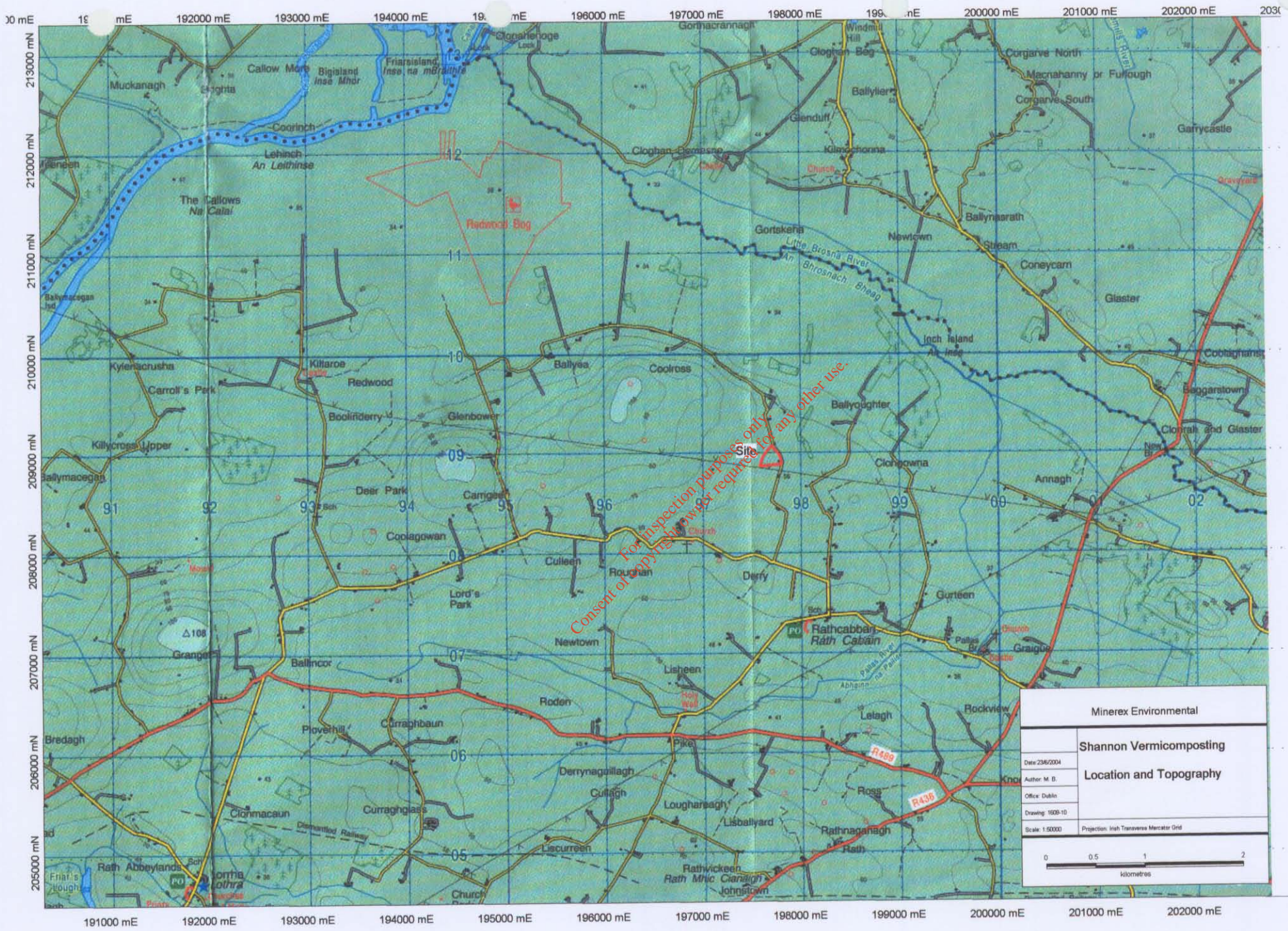
Parameter	Recorded Value	Ground water MAC limits
pH	7.39	>6.5 and <9.5
Conductivity	707 uS/cm	1500 uS/cm
Faecal Coliforms	<1 cfu/100ml	0
Total Coliforms	3360 cfu/100ml	0
Potassium	1.2 mg/l	12 mg/l
Sodium	20 mg/l	150 mg/l
Total solids	485 mg/l	1000 mg/l
Total phenols	<0.01 mg/l	0.5 ug/l

Parameter	Recorded Value	Ground water MAC limits
Magnesium	48.94 mg/l	50 mg/l
Barium	<0.05 mg/l	0.5 mg/l
Boron	0.08 mg/l	1 mg/l
Calcium	102.3 mg/l	200 mg/l
Chloride	23 mg/l	250 mg/l
Fluoride	2.1 mg/l	1 mg/l
Phosphorous	0.11 mg/l	5 mg/l
N as NO ₃	1 mg/l	50 mg/l
N as NO ₂	<0.05 mg/l	0.1 mg/l
PO ₄	0.04 mg/l	0.03 mg/l
Sulphate	71 mg/l	250 mg/l
Alkalinity	420 mg/l	no abnormal change
Total organic C	<2 mg/l	no abnormal change
Total cyanide	<0.05 mg/l	0.05 mg/l
Arsenic	2 ug/l	10 ug/l
Cadmium	<0.4 ug/l	5 ug/l
Chromium	3 ug/l	50 ug/l
Copper	<5 ug/l	2000 ug/l
Iron	150 ug/l	200 ug/l
Mercury	<0.05 ug/l	1 ug/l
Manganese	27 ug/l	50 ug/l
Nickel	<10 ug/l	20 ug/l
Lead	<5 ug/l	10 ug/l
Selenium	<2 ug/l	10 ug/l
Silver	<10 ug/l	10 ug/l
Zinc	11 ug/l	5000 ug/l

C.7 Landscape

The Rathcabbin area of north Tipperary is an undulating to flat lying rural area that is bounded by the River Shannon, 8 kms to the west of Rathcabbin, and to the north by the northwest flowing Little Brosna River.

Within a kilometre of the site the land use is predominantly agricultural with the land primarily devoted to pasture. The area contains a low-density of one-off houses and small farm yards. The



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Shannon Vermicomposting	
Date: 23/6/2004	Author: M. B.
Location and Topography	
Office: Dublin	Drawing: 1008-10
Scale: 1:50000	Projection: Irish Transverse Mercator Grid



Photograph 1. Entrance to the site at Coolross



Photograph 2. View of the site from 100m to the east.

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Photograph 3. View towards the site from the south



Photograph 4. View towards the site from the west.

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Photograph 5. View towards the site from the road in front of the nearest house,
70m north of the site



Photograph 6. View towards the site from the road to the north of the site.

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houses are distributed at intervals along the country roads in the area. The Little Brosna River is located 2 kms to the north of the site and this lies in a flat, northwest trending, low-lying area. The land use in this area is divided between poor quality pastureland, bogland and forestry. The village of Rathcabbin is located 1.8 kms to the SSE of the site. This contains a clustering of houses with a national school, church and range of services. The village is identified in the County Development Plan 2003, as a village where there are opportunities for consolidation and a number of areas adjacent to the village have been identified as sites for residential development. None of these areas are within a 1.5km of the Shannon Vermicomposting facility.

An examination of the topographic characteristics of the landscape in the environs of the facility indicates that there is a small area of elevated ground, running in a NE direction from Grange to Coolross (See Map titled "Location and Topography"). This feature rises to a height of 102m O.D. at Coolross relative to a general level of 50m O.D. for the surrounding area. The elevation of the Shannon Vermicomposting site is approximately 56m O.D. The Shannon Vermicomposting Ltd site is located on the eastern margin of this feature, 1.6 kms to the southeast of the high point at Coolross, where the land slopes gently at 5-10° to the east.

The Shannon Vermicomposting site is located adjacent to a Third Class road, 1 km north of a >4m wide Third Class road that leads to Rathcabbin village. Access to Rathcabbin is by a Third Class road, either 2km WNW of the R439 or 2 km NE of the R489 at the Pike crossroads.

The character of the landscape in the Rathcabbin area is dominated by the flat lying nature of the land and the abundance of hedgerows and trees. The Shannon Vermicomposting facility comprises a series of low profile tunnels (3m high) and a concrete based/metal clad building (8.9m high), similar to a typical agricultural building. The facility therefore has a very low visual impact on the surrounding landscape. The site is not visible from any public road, other than from the public road at the access gate to the site. The attached photographs illustrate the view from north, south, east and west of the site plus views from the nearest houses to the site.

C.8 Noise

The Shannon Vermicomposting site in Coolross is situated in a rural agricultural setting, adjacent to a public road. A noise survey was commissioned to determine the noise levels from the composting operation at the perimeter of the property and at the nearest dwelling, i.e. noise sensitive location, to the site. All the major plant machinery that will be used in the vermicomposting is currently operating at the site. The survey was completed by Biospheric

Engineering Limited on the 26 June 2004 and a report on the study, entitled “Shannon Vermicomposting – Report on Noise Levels. Report Ref:- 491/2004” is attached.

The report concludes that the noise levels at the site boundary do not exceed EPA guidance values and that the noise levels at the nearest house, the nearest noise sensitive location, are determined by the road traffic noise on the local road rather than any noise arising from the vermicomposting facility. Thus the noise levels from the facility are in compliance with the EPA guidance levels.

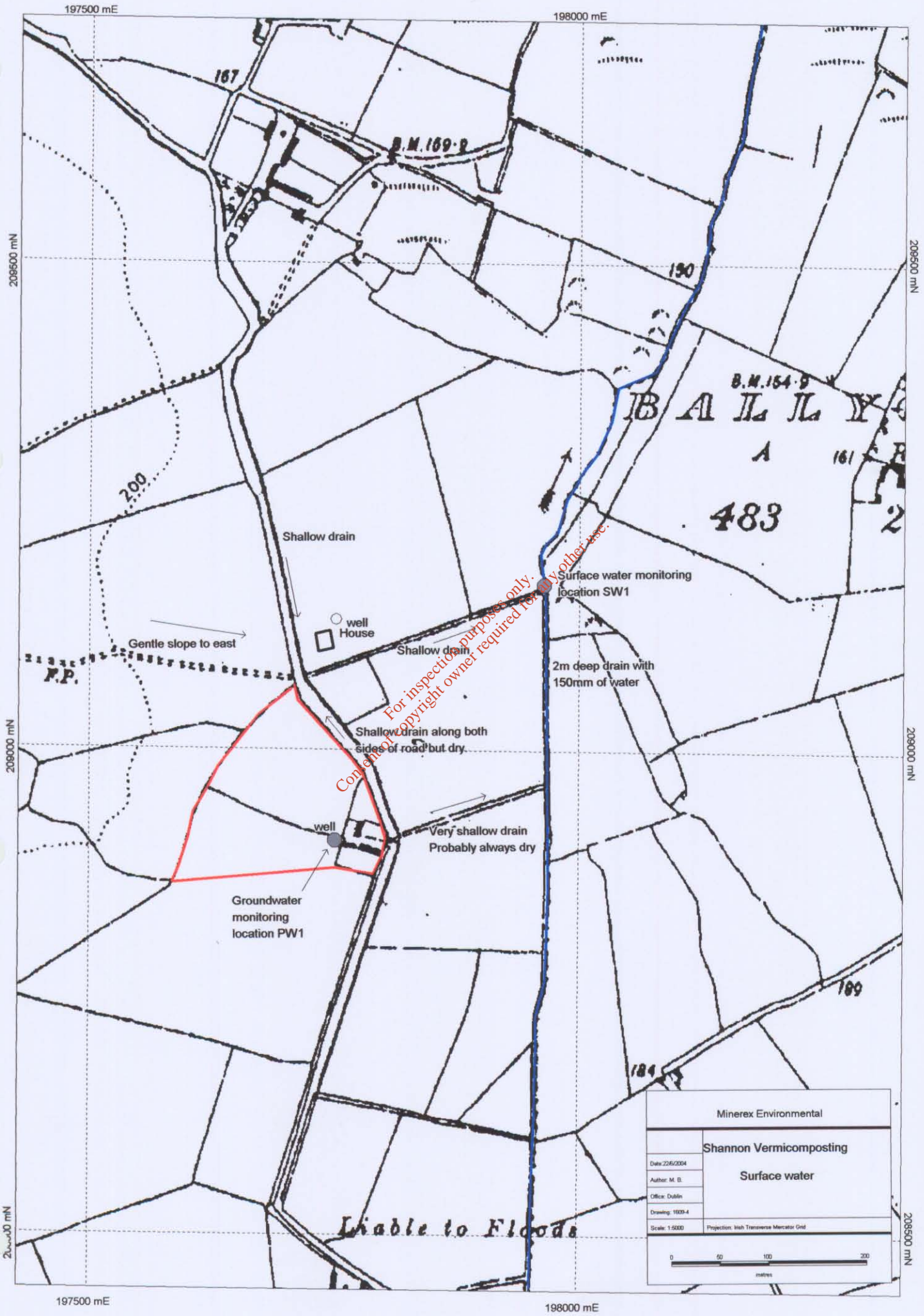
C.9 Surface Water

The Shannon Vermicomposting site is situated on a gentle, 2-5⁰, east trending slope. The area drains to the northeast to the Little Brosna River, located 2kms to the northeast and which flows in a northwest to westerly direction, past Redwood Bog Nature Reserve, to the River Shannon. The site is 3 km from the nature reserve. The Pallas River, which is a tributary of the Little Brosna flows in an easterly direction to the south of Rathcabbin before flowing north to the Little Brosna. At its nearest point, this river is located 2.25 km to the east of the site.

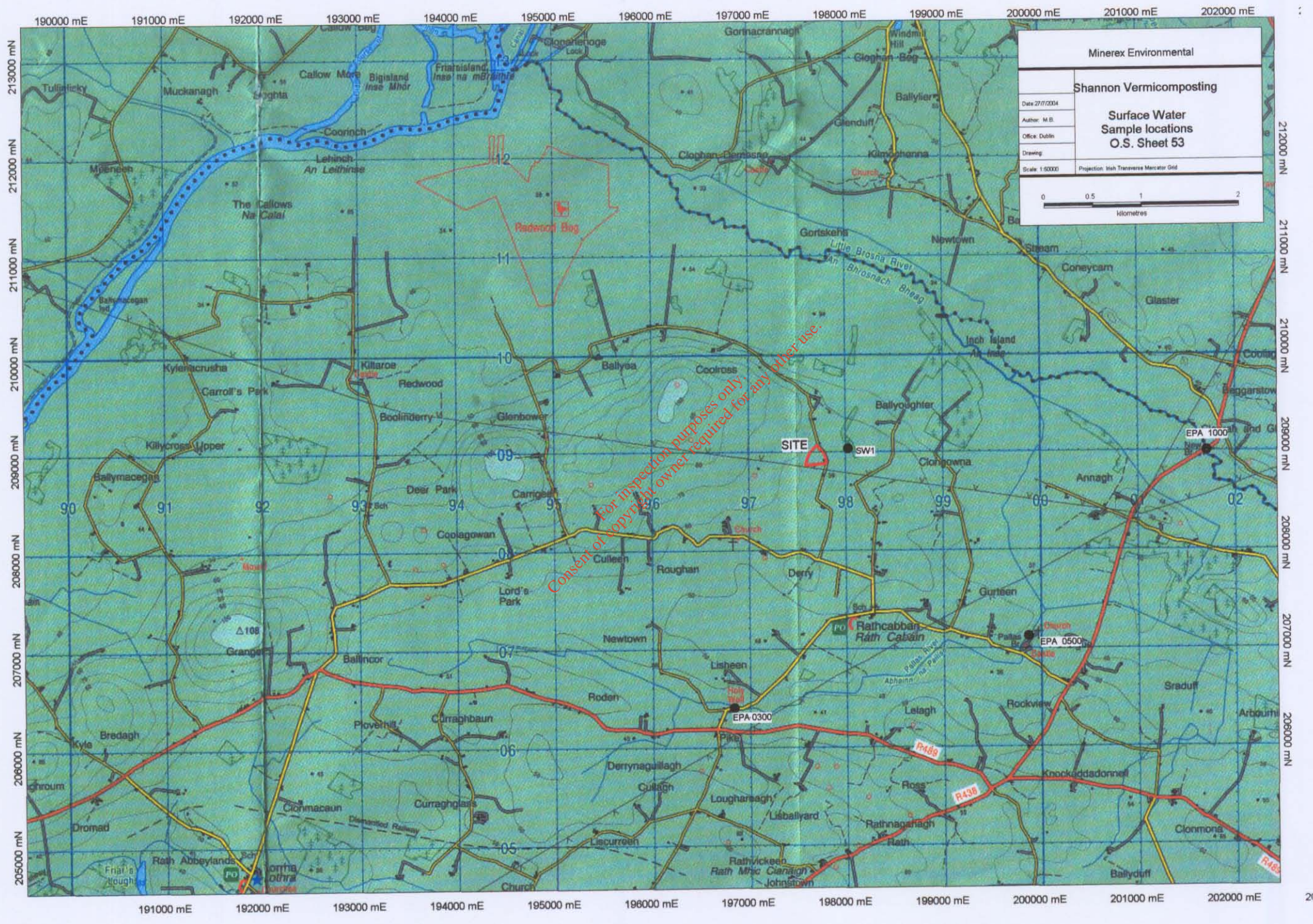
The nearest surface water to the site is a drain that is located 200m to the east of the site and which flows in a northerly direction to the Little Brosna River. The drain is located between the two north trending roads to the north of Rathcabbin village. The source of the water in the drain is a low-lying wet area that is marked as “liable to flood” on the 1:10560 Ordnance Survey map. This is located 400m to the south of the Shannon Vermicomposting site. To the east of the site, the water in this drain is 1 to 1.5m wide and 100 to 150mm deep. The base of the drain is approximately 2m below the surface level of the adjoining fields. The drain is accessed by cattle for watering in places along its length.

Shallow drains and ditches occur along the north trending road adjoining the site with shallow drains running eastwards along field boundaries to the north flowing drain. There was no water present in these drains during the period of this study. There are no streams flowing across the site or across the fields to the south or northwest of the site.

Samples are collected from the Pallas River and the Little Brosna River by the EPA every three years as part of the “Biological Study of River Water Quality”. The Pallas River is sampled at two locations, Station 0300 at the bridge near the “Holy Well”, and Station 0500 at Pallas Bridge (see Map titled “Surface Water Sample Locations”). The assessment of the water quality is based on a



Minorex Environmental	
Shannon Vermicomposting	
Surface water	
Date: 22/6/2004	
Author: M. B.	
Office: Dublin	
Drawing: 1000-4	
Scale: 1:5000	Projection: Irish Transverse Mercator Grid



Minerex Environmental	
Shannon Vermicomposting	
Date: 27/7/2004	
Author: M.B.	
Office: Dublin	
Drawing:	
Scale: 1:50000	Projection: Irish Transverse Mercator Grid



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biological quality rating or Q Value. The Q rating ranges from Q5 to Q1; with Q5 for Good water and a satisfactory condition, Q4 for Fair quality and satisfactory condition, Q3 for Doubtful quality and unsatisfactory quality, Q2 for Poor quality and unsatisfactory quality, and Q1 for Bad quality and unsatisfactory quality. The Q ratings for the two locations in 2002 were 2-3 and 3 and the assessment from the 2002 Report states, *“This little stream remained in a distinctly unsatisfactory condition at both points surveyed in 2002. Domestic refuse was observed in the stream at Station 0300 where there was also a smell similar to human faeces while heavy usage by watering cattle was evident at the lower location”*.

The Little Brosna is sampled at a number of locations along its main channel and the nearest to the Shannon Vermicomposting site is Station 1000 which is located at “New Bridge”, approximately 4 kms to the east. The Q-Value for Station 1000 in 2002 was 3-4 and within the “2002 Report the assessment states, *“A complete absence of previously recorded sensitive macroinvertebrate species combined with luxuriant weed and algal growths and extreme substratum calcification at New Bridge (1000) pointed to a deterioration in water quality in the lowermost reaches since the previous survey”*. The EPA results indicate that the surface water quality in this general area is of doubtful quality since before composting was initiated at the site in Coolross.

A water sample, numbered 1609-A-SW1, was collected from the north-flowing drain that is located 200m to the east of the site. This sample was collected by Minerex Environmental and analysed at the ALcontrol Laboratory in Dublin. The sample was taken to establish the background surface water quality of this drain at the point where any surface run-off from the vicinity of the Shannon Vermicomposting site would enter this drain. The sample was analysed for 27 parameters and a copy of the results are attached. The sample was collected on the 17th May 2004. The water in the drain was 1.4m wide and 150mm deep. It was clear with no odour, had a pH of 7.2 and the conductivity was 650 uS/cm. The results indicate that the water contains faecal coliform values of 15 cfu/100ml, elevated nitrite and orthophosphate values plus elevated manganese values. The weather during May 2004 was dry and there was no water in the drains from beside the road in front of the vermicomposting site or in the shallow drains that flow to the water in the main north flowing drain that was sampled. The Shannon Vermicomposting site therefore had no impact on the water quality that was sampled from the drain.

Parameter	Recorded Value	Surface water MAC limits
pH	7.2	>6.5 and <9.5
Conductivity	650 uS/cm	1000 uS/cm

BOD unfiltered	17 mg/l	
Faecal Coliforms	15 cfu/100ml	0
Total Coliforms	104 cfu/100ml	0
Potassium	4.2 mg/l	12 mg/l
Sodium	12.4 mg/l	150 mg/l
Parameter	Recorded Value	Surface water MAC limits
Total solids	487 mg/l	1000 mg/l
Magnesium	9.11 mg/l	50 mg/l
Calcium	136.5 mg/l	200 mg/l
Chloride	28 mg/l	250 mg/l
Nitrate as NO ₃	4 .0 mg/l	50 mg/l
Nitrite as NO ₂	0.89 mg/l	0.2 mg/l
Ortho phosphate as PO ₄	0.29 mg/l	0.03 mg/l
Sulphate	19 mg/l	200 mg/l
Oxidised Nitrogen	0.9 mg/l	
Ammonia Nitrogen	1.3 mg/l	
COD settled	<15 mg/l	40 mg/l
Alkalinity	400 mg/l	No abnormal change
Total organic C	7 mg/l	No abnormal change
Cadmium	<0.4 ug/l	5 ug/l
Chromium	<1 ug/l	30 ug/l
Copper	<5 ug/l	30 ug/l
Iron	4 ug/l	1000 ug/l
Mercury	<0.05 ug/l	1 ug/l
Manganese	477 ug/l	300 ug/l
Nickel	<10 ug/l	50 ug/l
Lead	<5 ug/l	10 ug/l
Zinc	<5 ug/l	100 ug/l

Interim
 Validated

ALcontrol Laboratories Ireland

Table Of Results

Ref Number: 04-B01833/01

Sample Type: WATER

Client: Minerex Environmental (Dublin)

Location:

Date of Receipt: 29/04/2004

Client Contact: Leo Duffy

(of first sample)

Client Ref: 1609-135-(COC1)

Detection Method	AA	AA	CV AA	Filtration	Filtration	FLAME PHOTO	FLAME PHOTO	GRAVIMETRIC	HPLC	ICP	ICP	ICP	ICP	ICP	ICP USN		
Method Detection Limit	<2ug/l	<2ug/l	<0.05ug/l	<1cfu/100ml	<1cfu/100ml	<0.2mg/l	<0.2mg/l	<5mg/l	<0.01mg/l	<0.05mg/l	<0.05mg/l	<0.05mg/l	<0.05mg/l	<0.05mg/l	<0.4ug/l		
UKAS Accredited										✓	✓	✓	✓	✓			
Alcontrol Reference	Sample Identity	Other ID	Dissolved Arsenic Low Level	Dissolved Selenium Low Level	Dissolved Mercury Low Level	Faecal Coliforms	Total Coliforms	Potassium	Sodium	Total Solids	Total Phenols	Dissolved Barium	Dissolved Boron	Dissolved Calcium	Dissolved Magnesium	Total Phosphorous	Dissolved Cadmium Low Level
			ug/l	ug/l	ug/l	cfu/100ml	cfu/100ml	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l
04-B01833-50007	PW1	UNKNOWN	2	<2	<0.05	<1	3360	1.2	20.0	485	<0.01	<0.05	0.08	102.30	48.94	0.11	<0.4

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Notes : METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NDP = NO DETERMINATION POSSIBLE

NFP = NO FIBRES PRESENT

Checked By Dylan Halpin Dylan Halpin

Interim
 Validated

ALcontrol Laboratories Ireland

Table Of Results

Ref Number: 04-B01833/01

Client: Minerex Environmental (Dublin)

Date of Receipt: 29/04/2004
 (of first sample)

Sample Type: WATER

Location:

Client Contact: Leo Duffy

Client Ref: 1609-135-(COC1)

ALcontrol Reference	Sample Identity	Other ID	Detection Method	ICP USN	ICP USN	ICP USN	ICP USN	ICP USN	ICP USN	ICP USN	ICP USN	IR	KONE	KONE	KONE	KONE	KONE	KONE	
			Method Detection Limit	<1ug/l	<5ug/l	<1ug/l	<5ug/l	<1ug/l	<10ug/l	<10ug/l	<5ug/l	<2mg/l	<1mg/l	<0.1mg/l	<0.3mg/l	<0.05mg/l	<0.03mg/l	<0.03mg/l	<3mg/l
			UKAS Accredited																
			Dissolved Chromium Low Level	Dissolved Copper Low Level	Dissolved Iron Low Level	Dissolved Lead Low Level	Dissolved Manganese Low Level	Dissolved Nickel Low Level	Dissolved Silver Low Level	Dissolved Zinc Low Level	Total Organic Carbon	Chloride	Fluoride	Nitrate as NO3	Nitrite as NO2	ortho Phosphate as PO4	Sulphate		
			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
04-B01833-S0007	PW1	UNKNOWN	3	<5	150	<5	27	<10	<10	11	<2	23	2.1	1.0	<0.05	0.04	71		

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NDP = NO DETERMINATION POSSIBLE
NFP = NO FIBRES PRESENT

Checked By Dylan Halpin Dylan Halpin

Interim
 Validated

ALcontrol Laboratories Ireland

Table Of Results

Ref Number: 04-B01833/01

Client: Minerex Environmental (Dublin)

Date of Receipt: 29/04/2004
 (of first sample)

Sample Type: WATER

Location:

Client Contact: Leo Duffy

Client Ref: 1609-135-(COC1)

Detection Method			KONE	SPECTRO	SPECTRO	TITRATION											
Method Detection Limit			<0.3mg/l	<0.2mg/l	<0.05mg/l	<1mg/l											
UKAS Accredited			✓	✓		✓											
ALcontrol Reference	Sample Identity	Other ID	Total Oxidised Nitrogen as N	Ammoniacal Nitrogen as N	Total Cyanide	Total Alkalinity as CaCO ₃											
			mg/l	mg/l	mg/l	mg/l											
04-B01833-S0007	PW1	UNKNOWN	<0.3	<0.2	<0.05	420											

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NFP = NO FIBRES PRESENT

Checked By Dylan Halpin Dylan Halpin



1.5 GROUNDWATER QUALITY

(Sheet 1 of 2) Monitoring Point / Grid Reference: PW 1 197754 / 203910

Parameter	Results (mg/l)				Sampling method (composite etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
	29 Apr 04						
Ph	7.39				FROM TAP		field instrument
Temperature	11.3				"		field instrument
Electrical conductivity EC	707				"		field instrument
Ammoniacal nitrogen NH ₄ -N	<0.2				"	<0.2 mg/l	SPECTRO
Dissolved oxygen DO					"		
Residue on evaporation (180°C)	485				"	<5 mg/l	GRAVIMETRIC
Calcium Ca	102.3				"	<0.05 mg/l	ICP
Cadmium Cd	<0.0004				"	<0.4 µg/l	ICP USN
Chromium Cr	0.003				"	<1 µg/l	ICP USN
Chloride Cl	23				"	<1 mg/l	KONE
Copper Cu	<0.005				"	<5 µg/l	ICP USN
Cyanide Cn, total	<0.05				"	<0.05 mg/l	SPECTRO
Iron Fe	0.15				"	<1 µg/l	ICP USN
Lead Pb	<0.005				"	<5 µg/l	ICP USN
Magnesium Mg	48.94				"	<0.05 mg/l	ICP
Manganese Mn	0.027				"	<1 µg/l	ICP USN
Mercury Hg	<0.00005				"	<0.05 µg/l	CV AA
Nickel Ni	<0.01				"	<10 µg/l	ICP USN
Potassium K	1.2				"	<0.2 mg/l	FLAME PHOTO
Sodium Na	20.0				"	<0.2 mg/l	FLAME PHOTO

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GROUNDWATER QUALITY (SHEET 2 OF 2)

Parameter	Results (mg/l)				Sampling method (composite, dipper etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
Phosphate PO ₄	0.04				From TAP	<0.03 mg/l	KONE
Sulphate SO ₄	71				"	< 3 mg/l	KONE
Zinc Zn	0.011				"	< 5 µg/l	ICP USN
Total alkalinity (as CaCO ₃)	420				"	< 1 mg/l	TITRATION
Total organic carbon TOC	<2				"	< 2 mg/l	IR
Total oxidised nitrogen TON	<0.3				"	< 0.3 mg/l	KONE
Arsenic As	0.002				"	< 2 µg/l	AA
Barium Ba	<0.05				"	<0.05 mg/l	ICP
Boron B	0.08				"	<0.05 mg/l	ICP
Fluoride F	2.1				"	< 0.1 mg/l	KONE
Phenol	<0.01				"	<0.01 mg/l	HPLC
Phosphorus P	0.11				"	<0.05 mg/l	ICP
Selenium Se	<0.002				"	< 2 µg/l	AA
Silver Ag	<0.01				"	<10 µg/l	ICP USN
Nitrite NO ₂	<0.05				"	<0.05 mg/l	KONE
Nitrate NO ₃	1.0				"	< 0.3 mg/l	KONE
Faecal coliforms (/100mls)	< 1				"	<1cfu/100ml	FILTRATION
Total coliforms (/100mls)	3360				"	<1cfu/100ml	FILTRATION
Water level (m OD)					"		

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CERTIFICATE OF WATER ANALYSIS

bioserv Ltd;
Athlone Institute of
Technology,
Athlone,
Co. Westmeath, Ireland.

Tel +353 (0) 902 24572
Fax +353 (0) 902 24627



Samples Received : 01 02
Description of Samples: V
Report Sent: 04 02 99

CUSTOMER:
Jerome O'Rourke
Spring Soft Systems
Tullamore Road, Kilbeggan
Co Westmeath

Customer Details:
Ref No:
Clare Holds Vorth
Rathcabin, Roscrea, Co Tippe

JOB	Sample Results	UNITS
Chemical Results		
pH	7.29	pH
Turbidity	0.0066	FTU
Conductivity	0.672	mS
Hardness	420	mg CaCO ₃ /l
Ammonium	0.220	mg/l
Nitrite	0.300 3 x FeHl	mg/l
Nitrate	ND	mg/l
Chloride	18	mg/l
Copper	ND	µg/l
Iron	751.0 20 mg/l	µg/l
Lead	ND	µg/l
Zinc	ND	µg/l
Magnesium	62.0	µg/l
Manganese	ND	µg/l
Bacterial Results		
Total Count	23	per 100ml
Total Coliforms	>1	per 100ml Detection
Faecal Coliforms	>1	per 100ml Detection
Faecal Streps	>1 (1)	per 100ml

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Recommendations on Water Results :
MAC_s stands for Maximum Admissible Concentration (S.I. 81 1989)
as outlined in Drinking Water Regulations. ND - Not Detected
Notes: Sample very hard. Nitrite & Iron levels exceed MAC. Non-Faecal Coliforms and Faecal Streptococci detected at levels above acceptable limit. They do not meet bacteriological standards for drinking water.

SIGNED Tom Keane DATE 4/2/99

Interim
 Validated

ALcontrol Laboratories Ireland

Table Of Results

Ref Number: 04-B02103/01

Client: Minerex Environmental (Dublin)

Date of Receipt: 17/05/2004
 (of first sample)

Sample Type: WATER

Location:

Client Contact: Leo Duffy

Client Ref: 1609-139-(COC1)

Detection Method			ICP USN	ICP USN	IR	KONE	KONE	KONE	KONE	KONE	KONE	SPECTRO	SPECTRO	TITRATION		
Method Detection Limit			<10ug/l	<5ug/l	<2mg/l	<1mg/l	<0.3mg/l	<0.05mg/l	<0.03mg/l	<3mg/l	<0.3mg/l	<0.2mg/l	<15mg/l	<1mg/l		
UKAS Accredited						✓	✓	✓	✓	✓	✓	✓	✓	✓		
ALcontrol Reference	Sample Identity	Other ID	Dissolved Nickel Low Level	Dissolved Zinc Low Level	Total Organic Carbon	Chloride	Nitrate as NO3	Nitrite as NO2	ortho Phosphate as PO4	Sulphate	Total Oxidised Nitrogen as N	Ammoniacal Nitrogen as N	COD Settled	Total Alkalinity as CaCO3		
			ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
04-B02103-50005	1609-A-SW-1	UNKNOWN	<10	<5	7	28	4.0	0.89	0.29	19	0.9	1.3	<15	400		

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Notes : METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL.

NDP = NO DETERMINATION POSSIBLE
 NFP = NO FIBRES PRESENT

Checked By _____ Natalie Duncan



Waste Licence Application Form- Recovery/Disposal Activities (other than Landfill)

1.12 SURFACE WATER QUALITY

(Sheet 1 of 2) Monitoring Point¹ / Grid Reference: SW1 197 963 / 209 167

Parameter	Results (mg/l)				Sampling method ² (grab, drift etc.)	Normal Analytical Range ²	Analysis method / technique
	17 MAY 04	Date	Date	Date			
pH	7.2				Grab Sample		field instrument
Temperature	10.1						field instrument
Electrical conductivity EC	650				"		field instrument
Ammoniacal nitrogen NH ₄ -N	1.3				"	< 0.2 mg/l	SPECTRO
Chemical oxygen demand	< 15				"	< 15 mg/l	SPECTRO
Biochemical oxygen demand	17				"	< 2 mg/l	5 DAY ATU
Dissolved oxygen DO					"		
Calcium Ca	136.5				"	< 0.05 mg/l	ICP IRIS
Cadmium Cd	0.0004				"	< 0.4 µg/l	ICP USN
Chromium Cr	< 0.001				"	< 1 µg/l	ICP USN
Chloride Cl	28				"	< 1 mg/l	KONE
Copper Cu	< 0.005				"	< 5 µg/l	ICP USN
Iron Fe	0.004				"	< 1 µg/l	ICP USN
Lead Pb	< 0.005				"	< 5 µg/l	ICP USN
Magnesium Mg	9.11				"	< 0.05 mg/l	ICP IRIS
Manganese Mn	0.477				"	< 1 µg/l	ICP USN
Mercury Hg	< 0.00005				"	< 0.05 µg/l	CV AA

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Surface Water Quality (Sheet 2 of 2)

Parameter ²	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
Nickel Ni	<0.01				grab sample	<10 µg/l	ICP USN
Potassium K	4.2				"	<0.2 mg/l	FLAME PHOTO
Sodium Na	12.4				"	<0.2 mg/l	FLAME PHOTO
Sulphate SO ₄	19				"	3 mg/l	KONE
Zinc Zn	<0.005				"	<5 µg/l	ICP USN
Total alkalinity (as CaCO ₃)	400				"	<1 mg/l	TITRATION
Total organic carbon TOC	7				"	<2 mg/l	IR
Total oxidised nitrogen TON	0.9				"	<0.3 mg/l	KONE
Nitrite NO ₂	0.89				"	<0.05 mg/l	KONE
Nitrate NO ₃	4				"	<0.3 mg/l	KONE
Faecal coliforms (/100mls)	15				"	<1 cfu/100ml	FILTRATION
Total coliforms (/100mls)	104				"	<1 cfu/100ml	FILTRATION
Phosphate PO ₄	0.29				"	<0.03 mg/l	KONE

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ATTACHMENT C1

ODOUR REPORT

*For inspection purposes only.
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*AMBIENT ODOUR SURVEY
UNDERTAKEN AT THE SHANNON
VERMICOMPOST FACILITY*

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For the Attention of:

Mr. Peter Ogg
Shannon Vermicompost
Cooleross
Rathcaban
Co. Tipperary

Prepared by:

Mr. Kieran Gordon
Environmental Scientist

Reviewed by:

Mr. John Conway
Air Quality Section Head

Report No:

ECS0693-O

Date:

May 2004


Executive Summary


Bord na Móna Technical Services (TS) undertook an ambient odour survey on behalf of Shannon Vermicompost at and in the vicinity of the company's facility located approximately 4 km northwest of Rathcaban, Co. Tipperary. The odour survey consisted of an Environmental Scientist conducting a subjective odour assessment at two locations at the site perimeter and at one other residential location near the facility which was designated as the nearest sensitive receptor. The two boundary locations were chosen due to the wind direction and were identified as upwind and downwind of the site. The assessment was undertaken on the 3rd March 2004.

The results obtained during the monitoring event range from 23ou_E/m³, at both the downwind boundary location and the nearest sensitive receptor, to 46ou_E/m at the upwind boundary location. The variation in concentrations obtained reflect the vagaries of ambient odour sampling which are extremely dependent on prevailing meteorological conditions and potential contributions from several local area background sources. These were noted as agricultural related odours (mainly slurry), wood pulp odours and cut grass, in addition to vegetative odour sources (hedgerows etc.). Such non-site related odorous occurrences noted during the survey were more prevalent at the upwind boundary location and also at the nearest sensitive receptor.

On site inspection of odour profiles determined that organic type odour was subjectively noted at the downwind boundary location which may be attributed to composting operations. It was subjectively determined on site that the odour influence of the facility at the nearest sensitive receptor was not significant.

Respectively submitted,


Mr. Kieran Gordon
Environmental Scientist


Mr. John Conway
Air Quality Section Head

1.0 **INTRODUCTION**

Bord na Mona Technical Services was commissioned to perform the sampling and analysis at 3 odour monitoring emission locations, representing upwind and downwind boundary locations as well as the nearest sensitive receptor. The site was visited by a Bord na Móna Environmental Scientist on 3rd of March 2004 to carry out the odour sampling on the on-site and off-site ambient locations

This report outlines the odour sampling that took place including the sampling and analytical methodologies adopted. In addition, a broad interpretation of the results obtained is included.

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2.0 METHODOLOGIES

2.1 Sampling Locations

Table 2.1 details the monitoring locations:

Sampling Station	Monitoring Location
O1	Upwind Boundary Location
O2	Downwind Boundary Location
O3	Nearest Sensitive Receptor

2.2 Weather Conditions

Intermittent rain showers with a maximum temperature of 11⁰C and a slight South Westerly wind.

2.3 Odour Sampling

Samples of gas of approximately 60 litres will be collected via Teflon tubing into Nalophane[®] gas sampling bags by means of the "lung principle" method. Using this method, the sample bag is housed in a sealed car buoy that is evacuated using a small air pump. The volume of air removed from the car buoy is replaced by sample gas entering the bag, thus avoiding contamination of sample by pumps or meters. Sampling shall be carried out in accordance with the standard I. S. EN 13725:2003 entitled 'Air Quality – Determination of Odour Concentration by Dynamic Olfactometry'.

2.4 Dynamic Olfactometry

The samples will be analysed by Dynamic Olfactometry. The instrument used will be an Olfactomat-e Olfactometer (Project Research Amsterdam) and the analytical procedures were in accordance with the I. S. EN 13725:2003 using a trained panel of 4 assessors. The odour concentration of the sample is expressed in odour units per cubic metre of gas (ou_E/m³). These values, sometimes referred to as "dilutions to threshold" are equivalent to the number of times the sample gas required dilution with odour free air to reach the panels odour threshold (i.e. the concentration at which there is a 50% probability of the panellists detecting the odour). The results are expressed in ou_E/m³.

3.0 ACCREDITED QUALITY SYSTEM

3.1 ILAB Accreditation

Bord na Móna Technical Services analytical laboratories were awarded ILAB accreditation by the National Accreditation Board (NAB) in 1997. It has always been the policy of the laboratories to achieve and maintain a high standard of quality consistent with client's requirements in all aspects of the work carried out within the laboratory.

NAB as a member of the International Laboratory Accreditation Cooperation (ILAC) and the European Co-operation for accreditation (EA) have adopted ISO 17025 as the new standard for its laboratory accreditation programme since January 2002.

This new standard contains all of the requirements that testing laboratories have to meet if they wish to demonstrate that they operate a quality system, are technically competent, and are able to generate technically valid results. ISO 17025 incorporates all those requirements of ISO 9000 that are relevant to the scope of testing services that are covered by the laboratory's quality system. Thus a laboratory that complies with ISO 17025 will therefore also operate in accordance with ISO 9000.

Bord na Móna Technical Services analytical laboratory successfully transferred to ISO 17025 on 16th of November 2001.

3.2 Interlaboratory Proficiency Schemes

To ensure the accuracy of the analytical testing we participate in several external proficiency schemes. The ongoing competence of the laboratory and its staff is assessed by participation in various inter-laboratory proficiency testing schemes, such as Aquacheck and the EPA scheme organised for environmental laboratories throughout Ireland.

3.3 EPA Quality Control Register

Bord na Móna Technical Services Analytical Laboratories performance in the EPA intercalibration scheme has insured its listing on the EPA's register of Quality Controlled Laboratories. Both accredited and non-accredited test methods are assessed by these schemes.

3.4 Quality Control Audits

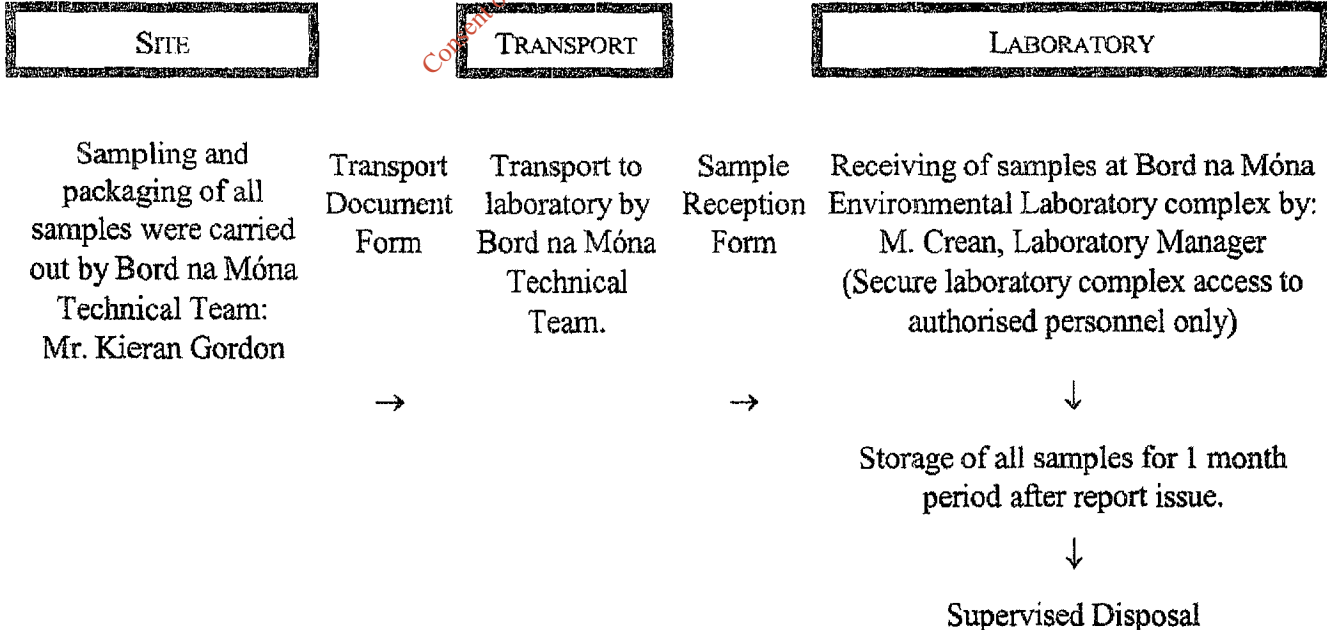
Bord na Móna Environmental Ltd. consistently strive to improve the quality of the analytical work out in its laboratories. The laboratory has a full time Quality Control Manager who assists in the organisation and execution of the extensive programme of internal Quality Audits. These quality audits examine all aspects of the laboratory's Quality System, with particular focus on auditing of test methods, and enable potential problems to be highlighted and immediate corrective action to be taken.

3.5 Control Chain of Custody

As part of the Quality System in place in Bord na Móna, Environmental Ltd., measures are taken to ensure controlled chain of custody. An outline of the chain of custody is given below.



CONTROLLED CHAIN OF CUSTODY



4.0 RESULTS

The results of the odour assessment carried out by Bord na Mona Environmental Limited are detailed in Table 4.1:

<i>Sampling Location</i>	<i>On-site Characterisation Comments</i>	<i>Odour Concentration O_uE/m³</i>
O1	In the vicinity of active construction works, strong agricultural smell also evident	46
O2	JCB working at this location rotating/ digging soil, organic type odour	23
O3	No apparent compost odour evident at this location. Agricultural odours again identified.	23

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5.0 COMMENT

An odour is defined as a sensation resulting from the reception of a stimulus by the olfactory sensory system. The way the human response to an odour is evaluated depends on the particular sensory property that is being measured, including the intensity, detectability, character, and hedonic tone (acceptability) of the odour. The combined effect of these properties is related to the annoyance that may be caused by the odour. Odorous air pollutants are often judged important, primarily for their nuisance value and the number of complaints they generate.

The odour concentration of the sample is expressed as multiples of one European odour unit per cubic metre of gas (ou_E/m^3). By definition therefore, $1\text{ou}_E/\text{m}^3$ is the detection threshold of 50% of a panel of trained observers working in an odour free environment. The recognition threshold is about 5 times this concentration i.e. $5\text{ou}_E/\text{m}^3$. Simply, this means that at a concentration of $1\text{ou}_E/\text{m}^3$ an odour can be detected and at $5\text{ou}_E/\text{m}^3$ the type of odour can be recognised. Moreover, it is generally accepted that odour concentrations between 5 and $10\text{ou}_E/\text{m}^3$ above the baseline concentration give rise to a faint odour and that only concentrations greater than $10\text{ou}_E/\text{m}^3$ above the baseline concentration constitute a distinct odour.

The results obtained during the monitoring event range from $23\text{ou}_E/\text{m}^3$, at both the downwind boundary location and the nearest sensitive receptor, to $46\text{ou}_E/\text{m}^3$ at the upwind boundary location. During the monitoring event, on site notes identified a large agricultural influence on the odour samples taken at both the upwind boundary location, O1, and the nearest sensitive receptor, O3. The downwind boundary location, O2, was subjectively determined on site to display an organic odour consistent with a characteristic compost odour. This essentially means that the overriding characteristic odour at locations O1 and O3 were indicative of the rural environs. However, this does not mean that this was the only odour present at this location during the sampling period and only partly contributed to the resultant odour concentration. It indicates however, that agricultural odour was the dominant source and as a result other odour types may have been masked. Other contributions can originate from other rural sources including slurry, flowers, smoke from fuel burning, odour from leaves and trees and general countryside type odour.

Furthermore, on the day of sampling, due to the higher odour levels recorded at location O1, subjectively noted to arise predominantly from agricultural activities, in comparison to that of the downwind sample at location O2, noted to have

mainly composting characteristics, the facility does not appear to have significant contributions from its composting operations either downwind or at the nearest sensitive receptor.

In summary, it may be concluded that under the specific meteorological conditions on the day of sampling, the results recorded support the observations that the potential odorous emissions from the Shannon Vermicompost facility did not contribute to increased odour levels downwind or at the nearest sensitive receptor.

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ATTACHMENT C8

NOISE REPORT

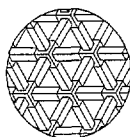
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Shannon Vermicomposting

Report on Noise levels

Report Ref: - 491/2/2004

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**Report on Noise levels at
Shannon Vermicomposting
For Waste Licence application to the EPA**

Report Ref: - 491/2/2004

Confidential Report To:

Mr. Peter Ogg
Shannon Vermicomposting
Coolross
Rathcabbin
Roscrea
Co. Tipperary

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Report submitted by:

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Issued by:

Eugene McKeown, B.E., L.L.B.
M.I.O.A., Chartered Engineer

1. INTRODUCTION

This Report was prepared by Biospheric Engineering Ltd as part of a waste licence application to the Environmental Protection Agency.

It is anticipated that the following conditions will be imposed as part of a licence:

Noise Limits

There shall be no clearly audible tonal component or impulsive component in the noise emissions from the activity at the noise sensitive locations.

Noise Emissions:

Day dB (A) L_{Aeq} (30 minutes)	Night dB(A) L_{Aeq} (15 minutes)
55	45

Monitoring Locations

Monitoring locations are generally required at each of the site boundaries and at a nearby noise sensitive location. In this case the four corners of the site were monitored and the nearest house to the Northeast corner of the site was chosen as the noise sensitive location.

Noise Monitoring

Parameter	Monitoring Frequency	Analysis Method/Technique
$L(A)_{EQ}$ [30 minutes]	Annual	Standard ^{Note 1}
$L(A)_{10}$ [30 minutes]	Annual	Standard ^{Note 1}
$L(A)_{90}$ [30 minutes]	Annual	Standard ^{Note 1}
Frequency Analysis (1/3 Octave band analysis)	Annual	Standard ^{Note 1}

Note 1: "International Standards Organisation. ISO 1996. Acoustics – description and Measurement of Environmental noise. Parts 1, 2 and 3".

2. MEASUREMENT METHODOLOGY

Measurements were taken using two Bruel & Kjaer model 2260 type 1 sound level meters with modular real-time analysis using BZ7210 noise analysis module. The instrument was calibrated using a Bruel & Kjaer model 4231 sound level calibrator. No drift in calibration was evident. Post Measurement analysis was carried out using Bruel & Kjaer Noise Explorer software. During measurement the height of the microphone was 1.3 metres above ground at the sampling location.

Weather data was compiled using Prosser model Weathertrend digital barometer, Rotronic model A1 Hygrometer and Silva digital anemometer.

Noise measurements were taken in accordance with International Standards Organisation ISO 1996 – Acoustics – Description and Measurement of environmental noise.

Noise measurements were taken at the four corners of the site as well as the nearest residence (other than that occupied by the operator of the site). Measurements were also taken close to all the noise sources operating on the site.

Some construction activity was being carried out on the site at the time of the measurements. This activity was such that it did not significantly effect the noise readings at the site perimeter and carried on during the course of the measuring periods.

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3. Weather Data

26th June, 2004	Barometric Pressure (mBar)	Temperature °C	Relative Humidity %	Wind speed & Direction
15.00 hrs	998	20.7	38	1.2 m/s SW

Weather: sunny and dry

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4. Noise Measurements

The noise measurements taken on site are reproduced on the following tables:

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NOISE EMISSIONS AT SITE BOUNDARY AND NOISE SENSITIVE LOCATIONS

Emission point reference No.	Location	Octave bands (Hz) Sound Pressure Levels dB (unweighted) per band									Impulsive or tonal qualities	Periods of Emission	Other Comments
		31.5	63	125	250	500	1K	2K	4K	8K			
N 1	Entrance Gate	61	53	48	48	45	44	40	35	27	No	Working hours	
N 2	NE Corner	63	54	45	41	39	39	37	32	25	No	Working hours	
N3	NW Corner	57	52	48	41	37	35	35	38	38	No	Working hours	
N4	SE Corner	66	61	49	42	41	38	37	35	27	No	Working hours	
NSL1	Nearby House to NE	59	51	47	46	45	45	45	38	34	No	Working hours	Local traffic

Note:**Identification of Tones**

A prominent tonal component can be identified by one-third octave band analysis, where the level of a one-third-octave band exceeds the levels of the adjacent bands by 5 dB or more.

Identification of impulsive characteristics

An impulsive characteristic can be determined by measuring the difference between the A-weighted sound pressure level, with time-weighting characteristic I, averaged over the same time interval, and $LA_{e,T}A$ value of greater than 2 dB ($LA_{Im}-LA_{eq}$) would indicate an impulsive characteristic.

NOISE EMISSIONS – ON SITE EQUIPMENT

Equipment on Site Measured Noise Levels

Emission point reference No.	Location	Octave bands (Hz) Sound Pressure Levels dB (unweighted) per band									Impulsive or tonal qualities	Periods of Emission	Other Comments
		31.5	63	125	250	500	1k	2k	4k	8k			
1	Birdscarer @ 5m	19	32	48	45	53	72	73	52	51	Tonal and impulsive features	Every 30 minutes	Operating hours only
2	Feeder Conveyor @ 2m	38	55	62	76	72	71	65	61	54	No	Intermittent	
3	Generator @ 2m	45	69	77	85	89	91	90	87	81	Slight tone	Operating hours only	
4	Hyundi Loader @ 5m	37	53	67	80	82	88	85	80	73	No	Intermittent	
5	JCB Fastrack @ 5m	42	57	64	70	75	73	72	70	70	No	Intermittent	
6	Matbro Loadall @ 5m	38	63	66	76	78	80	80	73	66	No	Intermittent	
7	John Deere Tractor @ 5m	50	57	67	69	78	78	77	73	69	No	Intermittent	
8	Perkins Generator @ 2m	29	53	68	69	73	74	71	64	58	Slight tone	Operating hours only	
9	Trommel @ 3m	35	53	61	65	69	73	72	68	62	no	Intermittent	
10													
11													

Location		National Grid Reference (6N, 6E)	Sound Pressure Levels			Comment
			L(A) _{eq}	L(A) ₁₀	L(A) ₉₀	
SITE BOUNDARY						
Location 1:	N1	197801,208886	48	47	40	All values Within EPA guidance
Location 2:	N2	197705,209050	44	47	38	
Location 3:	N3	197601,208869	44	44	40	
Location 4:	N4	197778,208988	45	46	40	
NOISE SENSITIVE LOCATIONS						
Location 5:	NSL1	197718,209074	50	50	38	Determined by traffic on local road not by licensed activity . In compliance with licence guidance

5. DISCUSSION OF RESULTS

Location N1

- site based noise level in compliance with EPA requirements

Location N2

- site based noise level in compliance with EPA requirements

Location N3

- site based noise level in compliance with EPA requirements

Location N4

- site based noise level in compliance with EPA requirements

Location NSL1

- noise sensitive location 1 – noise climate predominantly influenced by road traffic noise on local road. No tonal or impulsive components. No audible noise from licensed activities - complies with licence conditions.

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6. CONCLUSIONS

Five monitoring locations were chosen:

1. At the site entrance
2. At the Northeast corner of the site
3. At the Northwest corner of the site
4. At the Southeast corner of the site
5. At the nearest residence to the Northeast of the site.

These locations offer the best monitoring locations as the sites are easily accessible and offer a representative view of noise emissions from the site.

Noise levels at the site boundary do not exceed EPA guidance values.

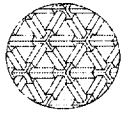
Noise levels due to licensed activities at the nearest noise sensitive location NSL1 are within the guidance limits.

The noise levels at the noise sensitive location are determined by the road traffic noise on local road rather than any noise arising from the licensed activities and so the licensed activity complies with EPA guidance for licensed activities.

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Appendix A. Detailed Monitoring Results

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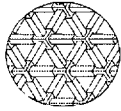
Biospheric Engineering Ltd.

Frequency Analysis Table

Client: Shannon Vermicomposting
 Site: Coolross, Rathcabbin, Roscrea, Co. Tipperary
 Location: N1 Entrance Gate
 Survey Date: 25th June 2004

Frequency Hz	$1/3$ Octave		$1/1$ Octave	
	dBA	dB lin	dBA	dB lin
25	14	58		
31.50	17	56	22	61
40	20	54		
50	20	50		
63	21	48	27	53
80	25	47		
100	24	44		
125	28	44	32	48
160	29	42		
200	32	43		
250	35	44	40	48
315	36	42		
400	37	41		
500	37	40	42	45
630	37	39		
800	39	40		
1000	39	39	44	44
1250	38	38		
1600	38	37		
2000	35	34	41	40
2500	33	32		
3150	33	32		
4000	31	30	36	35
5000	27	27		
6300	23	23		
8000	21	22	27	27
10000	23	20		
Leq Sound Level	48	62		

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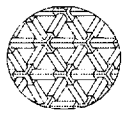


Biospheric Engineering Ltd.

Frequency Analysis Table

Client:	Shannon Vermicomposting			
Site:	Coolross, Rathcabbin, Roscrea, Co. Tipperary			
Location:	N2 NE Corner			
Survey Date:	25th June 2004			
Frequency Hz	$1/3$ Octave		$1/1$ Octave	
	dBA	dB lin	dBA	dB lin
25	16	61		
31.50	19	58	23	63
40	20	55		
50	22	52		
63	23	49	27	54
80	24	46		
100	23	42		
125	24	40	29	45
160	25	38		
200	27	38		
250	26	35	32	41
315	28	35		
400	31	35		
500	31	34	36	39
630	32	34		
800	34	35		
1000	34	34	39	39
1250	35	34		
1600	35	34		
2000	34	33	39	37
2500	32	31		
3150	30	29		
4000	27	26	33	32
5000	25	24		
6300	22	22		
8000	19	20	26	25
10000	22	20		
Leq Sound Level	44	64		

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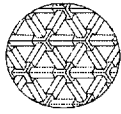


Biospheric Engineering Ltd.

Frequency Analysis Table

Client:	Shannon Vermicomposting			
Site:	Coolross, Rathcabbin, Roscrea, Co. Tipperary			
Location:	N3 NW Corner			
Survey Date:	25th June 2004			
Frequency Hz	$1/3$ Octave		$1/1$ Octave	
	dBA	dB lin	dBA	dB lin
25	11	56		
31.50	10	49	17	57
40	14	48		
50	17	48		
63	22	48	26	52
80	24	46		
100	26	45		
125	28	44	32	48
160	27	40		
200	28	39		
250	28	36	32	41
315	27	34		
400	28	33		
500	29	32	34	37
630	29	31		
800	30	31		
1000	30	30	35	35
1250	31	30		
1600	32	31		
2000	32	31	36	35
2500	31	29		
3150	30	29		
4000	34	33	39	38
5000	36	35		
6300	37	37		
8000	32	33	38	38
10000	27	24		
Leq Sound Level	44	59		

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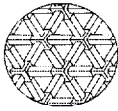


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Frequency Analysis Table

Client: Site: Location: Survey Date:	Shannon Vermicomposting Coolross, Rathcabbin, Roscrea, Co. Tipperary N4 SE Corner 25th June 2004			
Frequency Hz	$\frac{1}{3}$ Octave		$\frac{1}{1}$ Octave	
	dBA	dB lin	dBA	dB lin
25	19	63		
31.50	22	61	26	66
40	22	57		
50	29	59		
63	29	55	33	61
80	27	50		
100	26	46		
125	28	44	33	49
160	29	42		
200	28	38		
250	28	36	33	42
315	29	36		
400	32	36		
500	32	36	37	41
630	33	35		
800	34	34		
1000	34	34	38	38
1250	34	33		
1600	35	34		
2000	34	33	38	37
2500	33	31		
3150	32	31		
4000	32	31	36	35
5000	28	28		
6300	24	24		
8000	20	21	27	27
10000	21	18		
Leq Sound Level	45	67		

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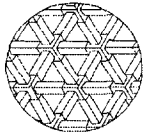
Biospheric Engineering Ltd.

Frequency Analysis Table

Client: Shannon Vermicomposting
 Site: Coolross, Rathcabbin, Roscrea, Co. Tipperary
 Location: NSL1 Nearest house to NE
 Survey Date: 25th June 2004

Frequency Hz	¹ / ₃ Octave		¹ / ₁ Octave	
	dBA	dB lin	dBA	dB lin
25	12	56		
31.50	14	53	19	59
40	16	50		
50	19	49		
63	18	44	24	51
80	21	44		
100	24	43		
125	26	43	32	47
160	29	42		
200	30	41		
250	33	41	36	46
315	34	41		
400	36	40		
500	37	41	42	45
630	39	40		
800	40	41		
1000	40	40	45	45
1250	41	40		
1600	43	42		
2000	41	40	46	45
2500	37	35		
3150	35	34		
4000	34	33	39	38
5000	33	32		
6300	30	31		
8000	28	29	34	34
10000	30	27		
Leq Sound Level	50	60		

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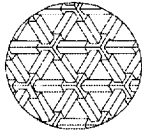
Biospheric Engineering Ltd.

Frequency Analysis Table

Client: Shannon Vermicomposting
 Site: Coolross, Rathcabbin, Roscrea, Co. Tipperary
 Location: Feeder Conveyor @ 2m
 Survey Date: 25th June 2004

Frequency Hz	$1/3$ Octave		$1/1$ Octave	
	dBA	dB lin	dBA	dB lin
25	29	73		
31.50	30	69	38	76
40	37	71		
50	46	76		
63	52	78	55	81
80	51	73		
100	51	70		
125	56	73	62	77
160	60	73		
200	66	77		
250	75	83	76	84
315	64	71		
400	57	71		
500	68	71	72	76
630	68	70		
800	68	69		
1000	65	65	71	71
1250	63	62		
1600	61	60		
2000	60	59	65	64
2500	59	58		
3150	57	56		
4000	57	56	61	60
5000	54	53		
6300	51	51		
8000	48	49	54	54
10000	49	47		
Leq Sound Level	79	87		

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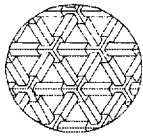
Biospheric Engineering Ltd.

Frequency Analysis Table

Client:	Shannon Vermicomposting
Site:	Coolross, Rathcabbin, Roscrea, Co. Tipperary
Location:	John Deere 3050 @ 5m
Survey Date:	25th June 2004

Frequency Hz	$\frac{1}{3}$ Octave		$\frac{1}{1}$ Octave	
	dBA	dB lin	dBA	dB lin
25	24	68		
31.50	40	79	50	86
40	50	85		
50	44	74		
63	47	74	57	81
80	56	79		
100	53	72		
125	56	72	67	82
160	67	80		
200	61	72		
250	65	73	69	77
315	65	71		
400	73	78		
500	70	73	78	81
630	75	76		
800	73	74		
1000	74	74	78	78
1250	74	73		
1600	72	71		
2000	73	71	77	76
2500	71	70		
3150	71	70		
4000	68	67	73	72
5000	65	64		
6300	65	65		
8000	64	65	69	69
10000	64	62		
Leq Sound Level	83	90		

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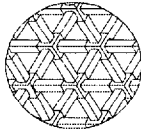


Biospheric Engineering Ltd.

Frequency Analysis Table

Client: Site: Location: Survey Date:	Shannon Vermicomposting Coolross, Rathcabbin, Roscrea, Co. Tipperary Generator @ 2m 25th June 2004			
Frequency Hz	$\frac{1}{3}$ Octave		$\frac{1}{1}$ Octave	
	dBA	dB lin	dBA	dB lin
25	40	84		
31.50	36	75	45	86
40	43	78		
50	54	85		
63	64	90	69	93
80	67	89		
100	69	88		
125	74	90	77	93
160	73	87		
200	74	85		
250	77	86	85	92
315	84	90		
400	86	90		
500	83	86	89	93
630	84	86		
800	87	87		
1000	86	86	91	91
1250	87	86		
1600	87	86		
2000	85	84	90	89
2500	84	82		
3150	84	83		
4000	82	81	87	86
5000	80	80		
6300	77	77		
8000	74	75	81	80
10000	76	73		
Leq Sound Level	96	100		

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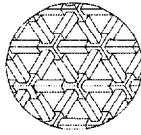


Biospheric Engineering Ltd.

Frequency Analysis Table

Client: Site: Location: Survey Date:	Shannon Vermicomposting Coolross, Rathcabbin, Roscrea, Co. Tipperary Hyundi HL 750 Loading Shovel @ 5m 25th June 2004			
Frequency Hz	$\frac{1}{3}$ Octave		$\frac{1}{1}$ Octave	
	dBA	dB lin	dBA	dB lin
25	23	67		
31.50	30	70	37	74
40	36	70		
50	41	71		
63	47	73	53	77
80	51	74		
100	59	78		
125	62	78	67	83
160	65	78		
200	71	82		
250	77	86	80	88
315	75	82		
400	79	83		
500	75	78	82	86
630	78	80		
800	78	79		
1000	84	84	88	88
1250	85	84		
1600	81	80		
2000	80	79	85	84
2500	79	77		
3150	77	76		
4000	73	72	80	79
5000	73	72		
6300	70	70		
8000	67	68	73	73
10000	67	65		
Leq Sound Level	91	94		

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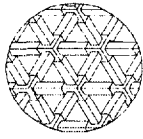


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Frequency Analysis Table

Client: Site: Location: Survey Date:	Shannon Vermicomposting Coolross, Rathcabbin, Roscrea, Co. Tipperary JCB Fastrack Turbo 1135 @ 5m 25th June 2004			
Frequency Hz	$1/3$ Octave		$1/1$ Octave	
	dBA	dB lin	dBA	dB lin
25	33	78		
31.50	37	76	42	81
40	40	74		
50	46	76		
63	46	72	57	81
80	56	79		
100	58	77		
125	58	74	64	80
160	61	74		
200	63	74		
250	63	72	70	78
315	66	75		
400	68	75		
500	69	72	75	78
630	68	70		
800	67	68		
1000	69	69	73	73
1250	68	68		
1600	68	67		
2000	67	66	72	71
2500	66	65		
3150	65	64		
4000	65	64	70	69
5000	66	66		
6300	66	66		
8000	65	66	70	70
10000	64	61		
Leq Sound Level	80	87		

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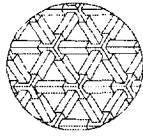


Biospheric Engineering Ltd.

Frequency Analysis Table

Client:	Shannon Vermicomposting			
Site:	Coolross, Rathcabbin, Roscrea, Co. Tipperary			
Location:	Matbro TS260 Loadall @ 5m			
Survey Date:	25th June 2004			
Frequency Hz	¹ / ₃ Octave		¹ / ₁ Octave	
	dBA	dB lin	dBA	dB lin
25	30	75		
31.50	31	70	38	77
40	36	71		
50	47	77		
63	63	89	63	89
80	52	75		
100	57	75		
125	65	81	66	83
160	60	74		
200	68	79		
250	77	80	76	84
315	74	80		
400	72	77		
500	73	77	78	81
630	74	76		
800	76	77		
1000	74	74	80	80
1250	75	74		
1600	76	75		
2000	76	75	80	79
2500	72	71		
3150	70	69		
4000	69	68	73	72
5000	66	65		
6300	64	64		
8000	60	62	66	66
10000	60	57		
Leq Sound Level	85	92		

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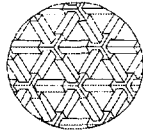
Biospheric Engineering Ltd.

Frequency Analysis Table

Client: Shannon Vermicomposting
 Site: Coolross, Rathcabbin, Roscrea, Co. Tipperary
 Location: Perkins generator @ 2m
 Survey Date: 25th June 2004

Frequency Hz	¹ / ₃ Octave		¹ / ₁ Octave	
	dBA	dB lin	dBA	dB lin
25	16	60		
31.50	18	57	29	66
40	29	63		
50	51	81		
63	41	67	53	82
80	46	69		
100	64	83		
125	59	75	68	85
160	65	78		
200	64	75		
250	63	72	69	78
315	66	72		
400	70	74		
500	67	71	73	77
630	67	69		
800	68	69		
1000	69	69	74	74
1250	70	69		
1600	68	67		
2000	65	64	71	70
2500	64	62		
3150	62	60		
4000	60	59	64	63
5000	56	55		
6300	55	55		
8000	51	52	58	57
10000	52	49		
Leq Sound Level	79	88		

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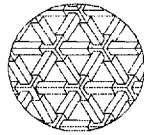


Biospheric Engineering Ltd.

Frequency Analysis Table

Client:	Shannon Vermicomposting			
Site:	Coolross, Rathcabbin, Roscrea, Co. Tipperary			
Location:	Bird Scarer @ 5m			
Survey Date:	25th June 2004			
Frequency Hz	$1/3$ Octave		$1/1$ Octave	
	dBA	dB lin	dBA	dB lin
25	11	56		
31.50	15	55	19	59
40	14	49		
50	30	60		
63	22	48	32	61
80	27	50		
100	42	61		
125	40	56	48	64
160	45	58		
200	43	54		
250	39	48	45	55
315	37	44		
400	39	43		
500	41	44	53	55
630	53	55		
800	53	53		
1000	69	69	72	72
1250	69	68		
1600	73	72		
2000	63	61	73	72
2500	54	53		
3150	49	47		
4000	47	46	52	51
5000	46	45		
6300	45	45		
8000	44	45	51	50
10000	48	45		
Leq Sound Level	76	76		

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Frequency Analysis Table

Client: Shannon Vermicomposting
 Site: Coolross, Rathcabbin, Roscrea, Co. Tipperary
 Location: Trommel @ 3m
 Survey Date: 25th June 2004

Frequency Hz	¹ / ₃ Octave		¹ / ₁ Octave	
	dBA	dB lin	dBA	dB lin
25	22	67		
31.50	26	66	35	72
40	34	69		
50	40	70		
63	47	73	53	78
80	52	75		
100	51	70		
125	55	71	61	76
160	59	72		
200	62	73		
250	58	66	65	75
315	60	67		
400	66	70		
500	62	65	69	72
630	65	67		
800	67	67		
1000	70	70	73	73
1250	68	67		
1600	68	67		
2000	68	66	72	71
2500	68	66		
3150	65	64		
4000	63	62	68	67
5000	60	59		
6300	58	58		
8000	55	56	62	61
10000	58	55		
Leq Sound Level	78	83		

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1.8 NOISE MONITORING

IN NOISE REPORT

Third Octave analysis for noise emissions should be used to determine tonal noises

Location	National Grid Reference (5N, 5E)	Sound Pressure Levels		
		L(A) _{eq}	L(A) ₁₀	L(A) ₉₀
1. SITE BOUNDARY				
Location 1:				
Location 2:				
Location 3:				
Location 4:				
Location 5:				
Location 6:				
Location 7:				
Location 8:				
2. NOISE SENSITIVE LOCATIONS				
Location 1:				
Location 2:				
Location 3:				
Location 4:				
Location 5:				
Location 6:				
Location 7:				
Location 8:				

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NOTE: All locations should be identified on accompanying drawings.