

Code of Practice Environmental Risk Assessment for Unregulated Waste Disposal Sites

Tier 1 Study

Conceptual Site Model, Risk Screening & Prioritisation

For

Landfill Site: Velvetstown
Site Reference: 16/N
Division: North Cork
Area Office: Charleville

TIER 1 RISK RATING

MODERATE

Report by: Kieran Coffey
Environment Directorate
Cork County Council
December 2007

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Geology:

This landfill is situated in a “*Sandstone Till*” region. There is an *Alluvium area* within 50m. As this was a quarry it is assumed that there is rock close to the surface although this is not apparent from the subsoil maps. This landfill is situated over a “*Regionally Important Karstified Aquifer*” which is dominated by diffuse flow. It is also situated in a High/Low groundwater vulnerability area. This site has been identified as having a 44% risk rating for leachate migration to the regionally important aquifer.

Risk Rating: MODERATE

Recommendations:

Proceed to Tier 2 – site investigation and testing. Confirm if there remains a risk of leachate migration to the Regionally Important Aquifer.

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Site Photos



Locations from which photos were taken



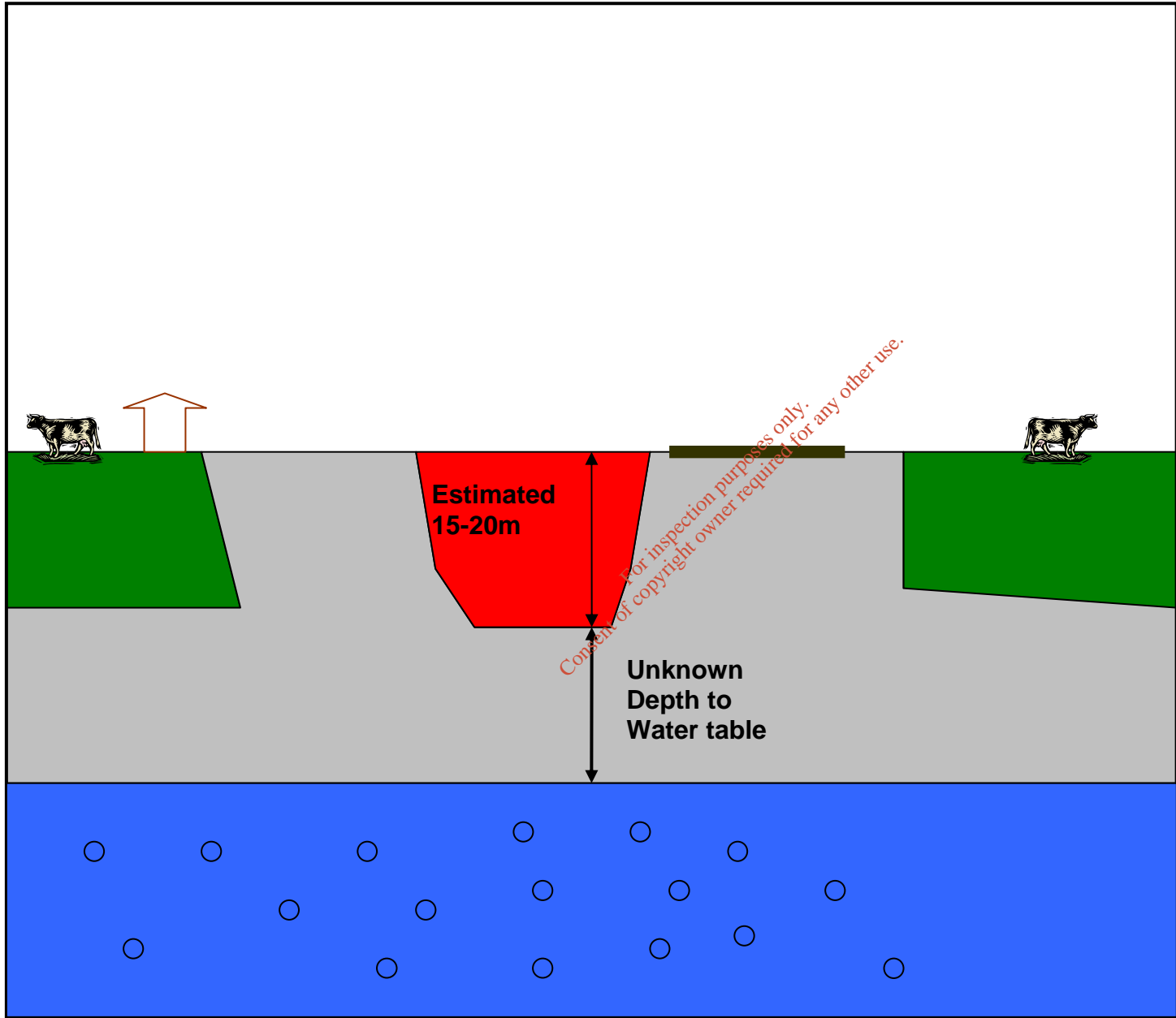
1. View of site facing South



2. Photo of site facing west



3.



Conceptual Site Model

Landfill: Velvetstown
Site Ref: 16/N
Division: North Cork
Area: Charleville

Sources:

Waste Body



Receptors:

Groundwater



Private Dwelling



Grazing Land



Main Road



Private Drinking Water supplies



Geology:

Rock



Sandstone till





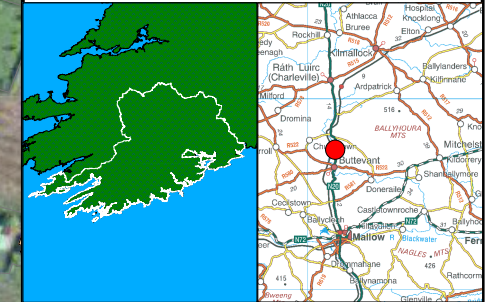
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Environmental Risk Assessment for Unregulated Waste disposal Sites
Tier 1 Investigation

Drawing Description
CSM Plan

Landfill Name & Ref No:
Velvetstown - 16/N

Division:
North Cork

Area Office:
Charleville

Legend

- Roads
- Buildings
- Landfill Area

Issue Details

Drawn: KC	File Ref.	
Checked: -	04-N CSM Plan	
Approved:		
Scale:	Drawing No.	Rev.
Date: 11th Dec 07	16/N_CSM	0

Notes

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4. Risk Screening & Prioritisation Calculations

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Risk Screening/ Prioritisation

Table 1a LEACHATE: SOURC/HAZARD SCORING MATRIX			
WASTE TYPE	Waste FOOTPRINT (ha)		
	≤ 1ha	> 1 ≤ 5 ha	> 5ha
C&D	0.5	1	1.5
Municipal	5	7	10
Industrial	5	7	10
Pre 1977 sites	1	2	3

1a = 5

Table 1b LANDFILL GAS: SOURC/HAZARD SCORING MATRIX			
WASTE TYPE	Waste FOOTPRINT (ha)		
	≤ 1ha	> 1 ≤ 5 ha	> 5ha
C&D	0.5	0.75	1
Municipal	5	7	10
Industrial	3	5	7
Pre 1977 sites	0.5	0.75	1

1b = 5

Table 2a : LEACHATE MIGRATION: PATHWAYS	
GROUNDWATER VULNERABILITY (Vertical Pathway)	Points
Extreme Vulnerability	3
High Vulnerability	2
Moderate Vulnerability	1
Low Vulnerability	0.5
High - Low Vulnerability (use where vulnerability not on GIS)	2

2a = 2

Table 2b : LEACHATE MIGRATION: PATHWAYS	
GROUNDWATER FLOW REGIME (Horizontal Pathway)	Points
Karstified Groundwater Bodies (Rk)	5
Productive Fissured Bedrock Groundwater Bodies (Rf & Lm)	3
Gravel Groundwater Bodies (Rg and Lg)	2
Poorly Productive Bedrock Groundwater Bodies (LI, PI, Pu)	1

2b = 5

Risk Screening/ Prioritisation

Table 2c : LEACHATE MIGRATION: PATHWAYS	
	Points
SURFACE WATER DRAINAGE (Surface water pathway)	
Is there a direct connection between drainage ditches associated with the waste body and adjacent surface water body? Yes	2
If no direct connection	0

2c =	0
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Table 2d : LANDFILL GAS: PATHWAY	
	Points
LANDFILL GAS LATERAL MIGRATION POTENTIAL	
Sand and Gravel, Made ground, urban, karst	3
Bedrock	2
All other Tills (including limestone, sandstone etc - moderate permabi	1.5
All Namurian or Irish Sea Tills (low permability)	1
Clay, Alluvium, Peat	1

2d =	2
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Table 2e : LANDFILL GAS: PATHWAY (assuming receptor located above source)	
	Points
LANDFILL GAS LATERAL MIGRATION POTENTIAL	
Sand and Gravel, Made ground, urban, karst	5
Bedrock	3
All other Tills (including limestone, standstone etc - moderate permabi	2
All Namurian or Irish Sea Tills (low permability)	1
Clay, Alluvium, Peat	1

2e =	3
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Table 3a : LEACHAGE MIGRATION: RECEPTORS	
	Points
HUMAN PRESENCE (presence of a house indicaates potential private wells)	
On or within 50m of the waste body	3
Greater than 50m but less than 250m	2
Greater than 250m but less than 1km from waste body	1
Greater than 1km of the waste body	0

3a =	2
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Risk Screening/ Prioritisation

Table 3b : LEACHAGE MIGRATION: RECEPTORS PROTECTED AREAS (SWDTE or GWDTE)		Points
Within 50m of waste body		3
Greater than 50m but less than 250m of the waste body		2
Greater than 250m but less than 1km from waste body		1
Greater than 1km of the waste body		0
Undesignated sites within 50m of waste body		1
Undesignated sites greater than 50m but less than 250m		0.5
Undesignated sites greater than 250m of the waste body		0
3b =		2

Table 3c : LEACHAGE MIGRATION: RECEPTORS	
AQUIFER CATEGORY (resource potential)	Points
Regionally Important Aquifers (Rk, Rf, Rg)	5
Locally Important Aquifers (LI, Lm, Lg)	3
Poor Aquifers (PI, Pu)	1

3c =	5
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Table 3d : LEACHAGE MIGRATION: RECEPTORS		
PUBLIC WATER SUPPLIES (Other than private wells)	Points	
Within 100m of site boundary	7	
Greater than 100m but less than 300m or with in Inner SPA for GW supplies	5	
Greater than 300m but less than 1km or within Outer SPA (SO) for GW supplies	3	
Greater than 1km (karst aquifer)	3	
Greater than 1km (no karst aquifer)	0	
3d =		3

Table 3e : LEACHAGE MIGRATION: RECEPTORS	
SURFACE WATER BODIES	Points
Within 50m of site boundary	3
Greater than 50m but less than 250m	2
Greater than 250m but less than 1km	1
Greater than 1km	0

3e =	1
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Risk Screening/ Prioritisation

HUMAN PRESENCE	Points
On site or within 50m of site boundary	5
Greater than 50m but less than 150m	3
Greater than 150m but less than 250m	1
Greater than 250m	0.5

3f =	3
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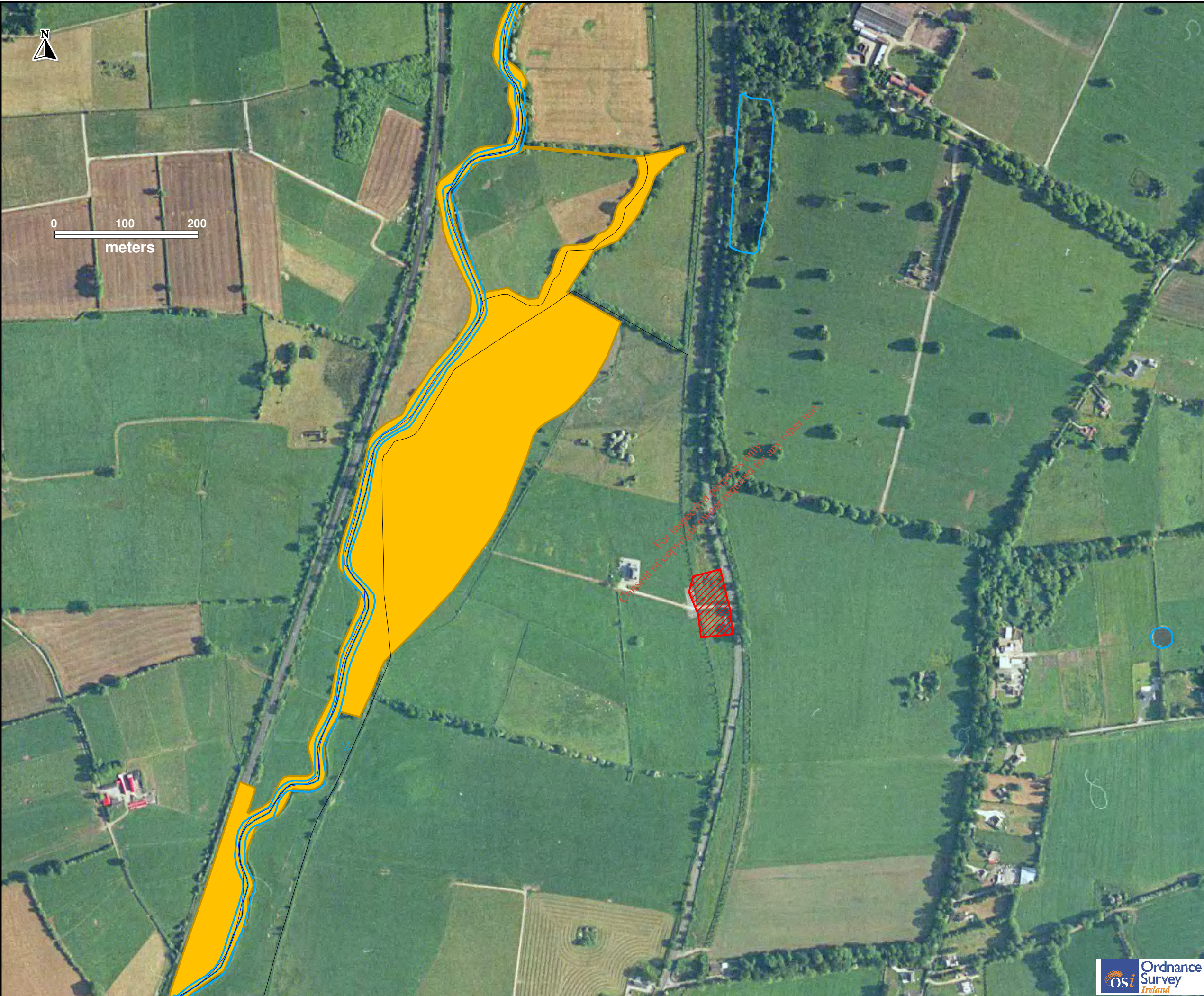
Note: The table below represents the Tier 1 risk rating for this site. SPR 1 to 9 represent the leachate risk scores. SPR 10 & 11 represent Landfill Gas risks. The migration pathways are colour coded as follows:

Groundwater & Surface Water	Groundwater only	Surface water only	Lateral & Vertical
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Calculator	SPR Values	Maximum Score	Linkages	Normalised Score
SPR 1 =	35	300	Leachate => surface water	12%
SPR 2 =	70	300	Leachate => SWDTE	23%
SPR 3 =	70	240	Leachate => human presence	29%
SPR 4 =	70	240	Leachate => GWLTE	29%
SPR 5 =	175	400	Leachate => Aquifer	44%
SPR 6 =	105	560	Leachate => Surface Water	19%
SPR 7 =	35	240	Leachate => SWDTE	15%
SPR 8 =	0	60	Leachate => Surface Water	0%
SPR 9 =	0	60	Leachate => SWDTE	0%
SPR 10 =	30	150	Landfill Gas => Human Presence	20%
SPR 11 =	45	250	Landfill Gas => Human Presence	18%

Risk Classification	Range of Risk Scores
Highest Risk (Class A)	Greater than or equal to 70% for any individual SPR linkage
Moderate Risk (Class B)	Between 40-70% for any individual SPR linkage
Lowest Risk (Class C)	Less than or equal to 40% for any individual SPR linkage

OVERALL RISK RATING	MODERATE
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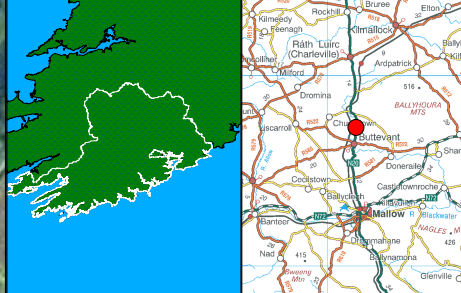


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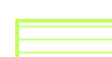



Drawing Description
Protected Areas Map

Landfill Name & Ref No:
Velvetstown - 16/N

Division:
North Cork

Area Office:
Charleville

Legend

-  Landfill Area
-  SAC
-  NHA
-  SPA
-  National Park
-  Nature Reserve
-  Rivers

Issue Details

Drawn: TJ	File Ref.
Checked: -	16-N Protected Areas Map
Approved:	
Scale: 1:2500	Drawing No.
Date: 12th Dec 2007	16/N_PA1
	Rev. 0

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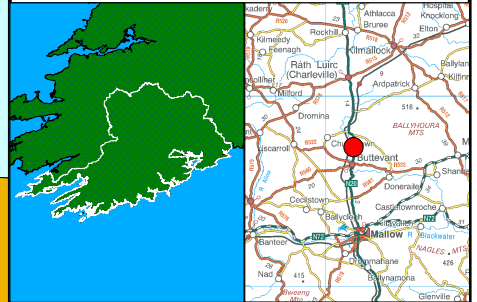


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Tier 1 Investigation

Drawing Description:
Aquifer Map

Landfill Name & Reference No:
Velvetstown - 16/N

Division:
North Cork

Area Office:
Charleville

Legend

Landfill Area

AQUIFER CATEGORY

- LI - Locally Important
- Pending Classification
- PI - Poor Bedrock Aquifers
- Pu - Poor Bedrock Aquifers
- Rf - Regionally Important Aquifer
- Rkd - Regionally Important Karstified Aquifer

Rivers

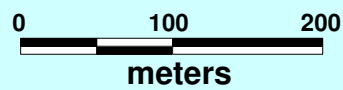
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Date: 12th Dec 2007	16N_AC_0	

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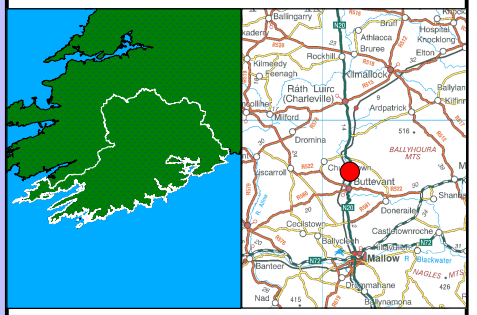


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Drawing Description:
Groundwater Vulnerability Map

Landfill Name & Ref No:
Velvetstown - 16/N








Division:
North Cork

Area Office:
Charleville

Legend

 Landfill Area

SWRBD_Groundwater Vulnerability

-  E (Rock near Surface or Karst)
-  E - Extreme
-  H - High
-  HL - High/Low
-  M - Moderate
-  L - Low
-  Water

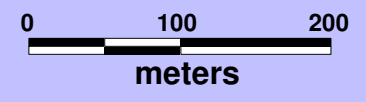
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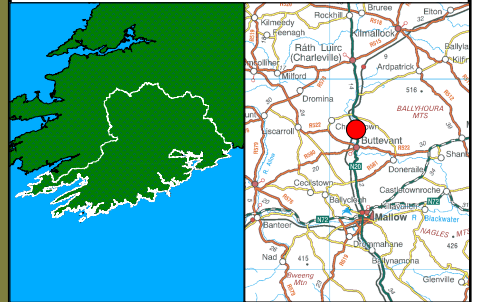
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Drawing Description:
Subsoils Map

Landfill Name & Ref No:
Velvetstown - 16/N

Division:
North Cork

Area Office:
Charleville

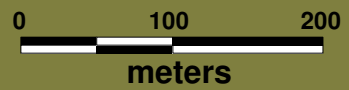
Legend

Landfill Area

Soil type

- | | |
|----------|--------|
| Alluvium | MGs |
| BktPt | Msi |
| GDSs | ROCK * |
| GLs | Scree |
| GNSSs | TDCSsS |
| IrSTDSSs | TdlMr |
| KaRck | TDSs* |
| L | TLPSSs |
| Made | TLs |
| Marsh | TNSSs |
| Mbs | Water |
| Mesc | Ws |

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Issue Details

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Approved:	
Scale:	Drawing No.
Date: 12th Dec 2007	16/N_STO
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