

TIER 3

ENVIRONMENTAL RISK ASSESSMENT

APPENDICES

Prepared By:

Traynor Environmental Ltd
Belturbet Business Park,
Creeny
Belturbet
Co. Cavan

In Association With

Waste Management Section
Cavan County Council
Farnham Street
Cavan
Co. Cavan



TIER 3

ENVIRONMENTAL RISK ASSESSMENT

APPENDIX A

DRAWINGS 14.248.100 - 14.248.120

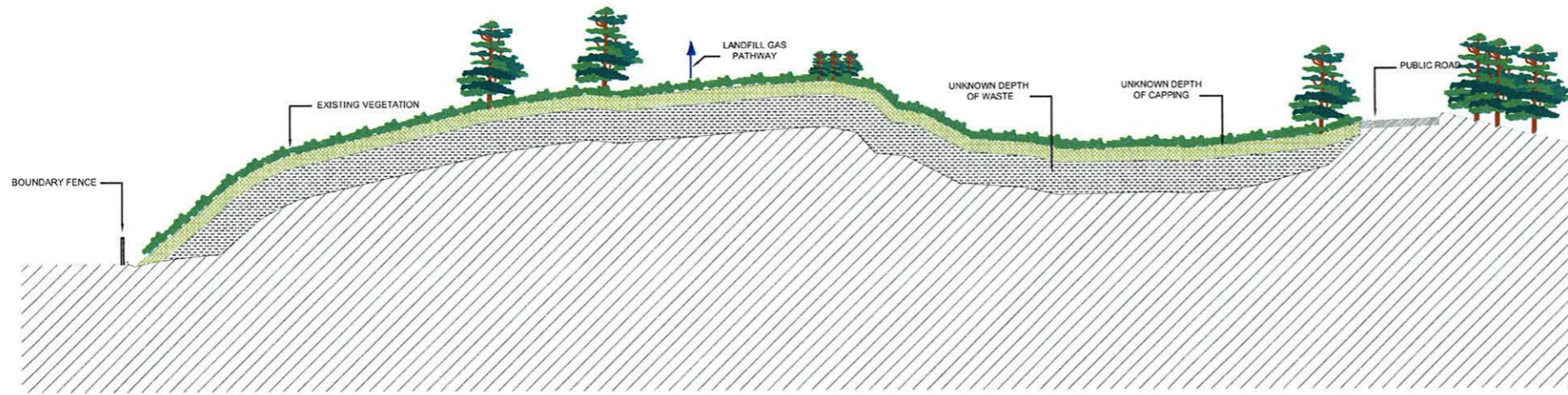
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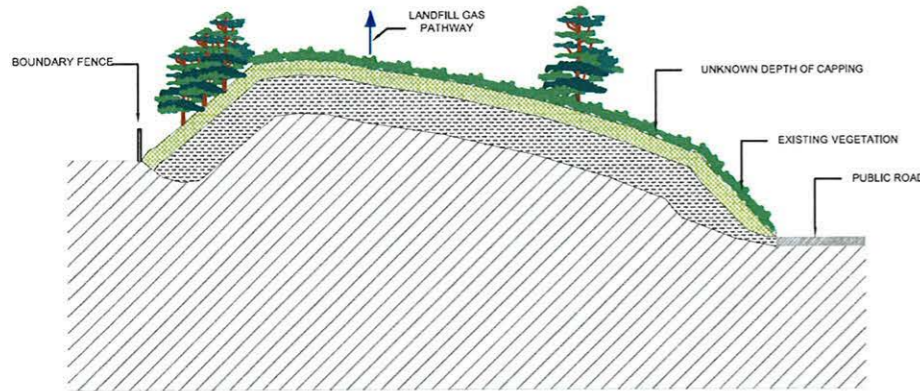
NOTES

LEGEND

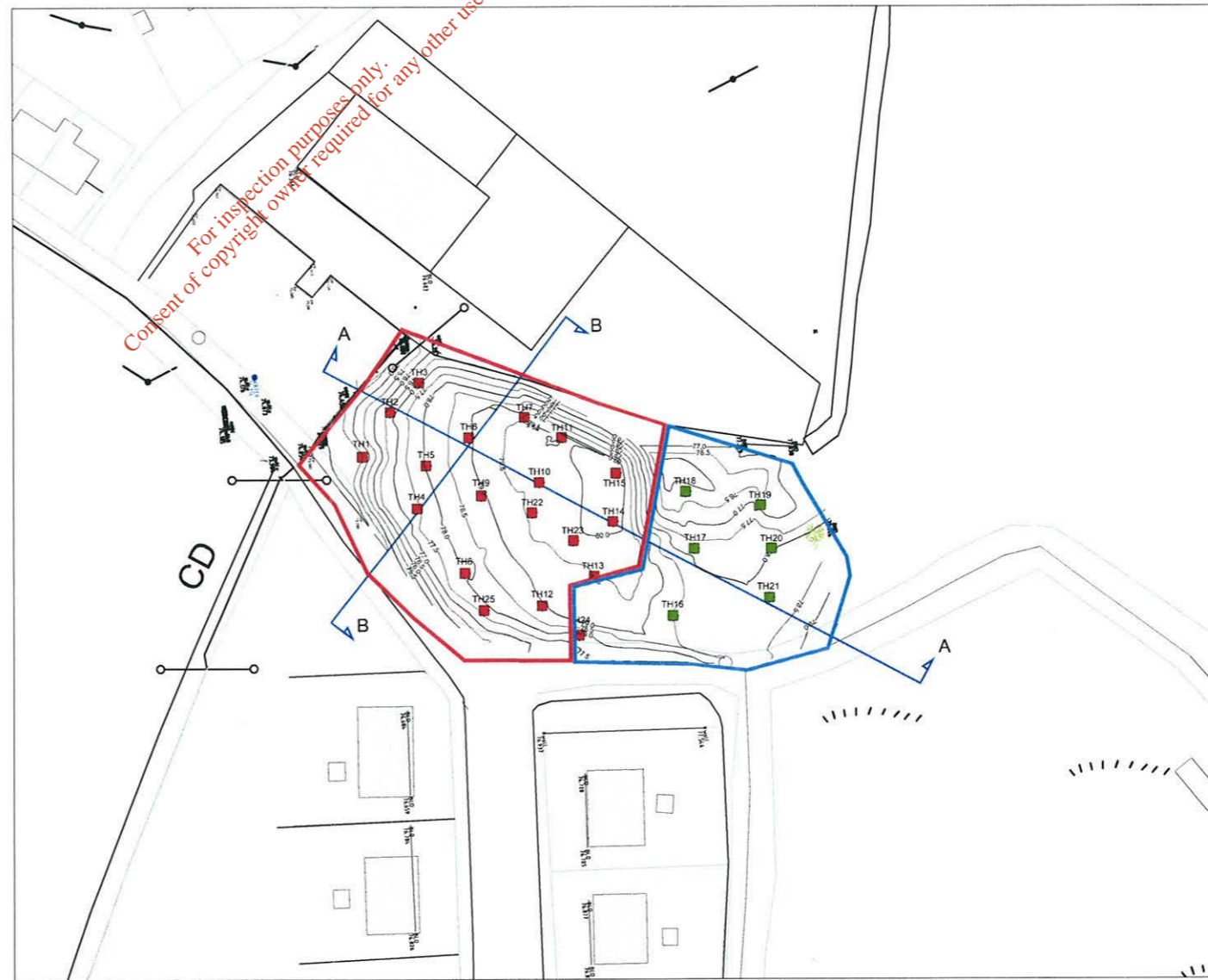
-  LANDFILL WASTE SOURCE
-  CAPPING
-  SOIL/FLY TIPPING WASTE




CONCEPT MODEL SECTION A-A
SCALE 1:200

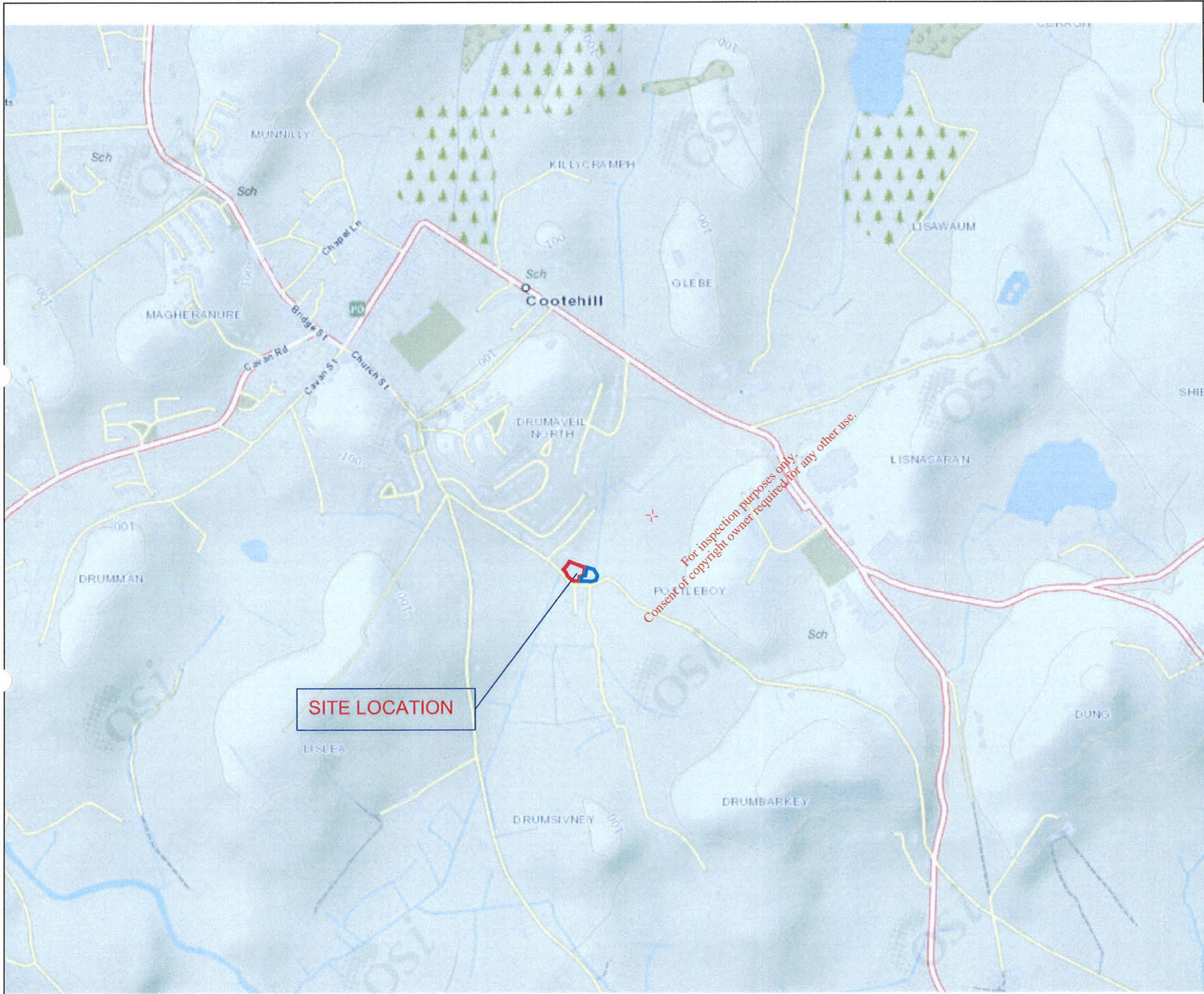


CONCEPT MODEL SECTION B-B
SCALE 1:200



SITE LAYOUT KEY
SCALE 1:500


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<p>CLIENT CAVAN COUNTY COUNCIL</p>			
<p>PROJECT TITLE SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTLEBOY COOTEHILL CO CAVAN</p>			
<p>DRAWING TITLE INITIAL CONCEPT MODELS OF WASTE DEPOSITED ON THE SITE</p>			
SCALE	DRAWN	CHECKED	APPROVED
SHOWN	DARRAGH ROWAN	ANGELA MC DERMOTT	MEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014
DRAWING No.	14.248.100		REV.



NOTES

REV.	DATE	DESCRIPTION	APPROVED
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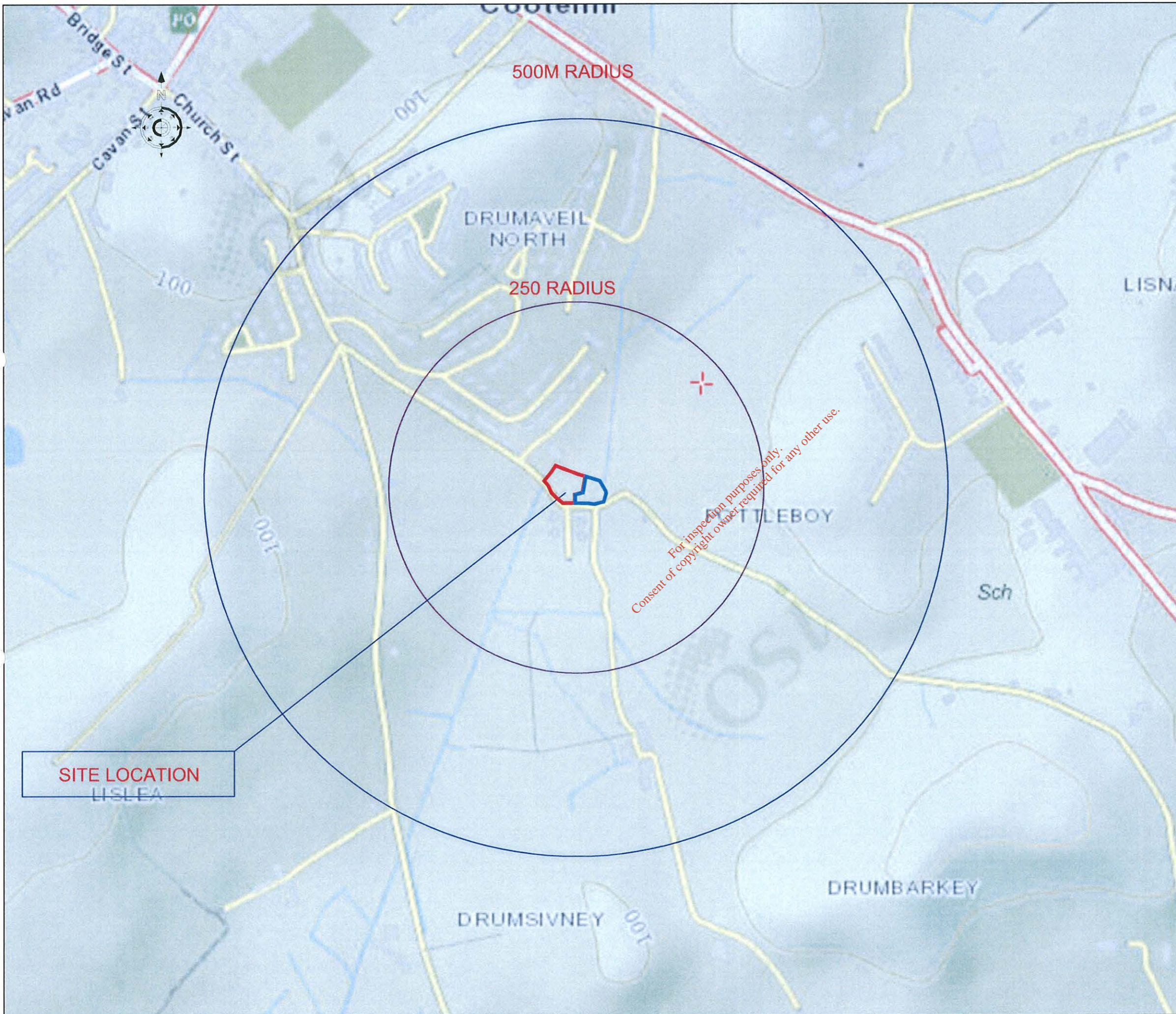
CLIENT
CAVAN COUNTY COUNCIL

PROJECT TITLE
SITE INVESTIGATION & RISK ASSESSMENT
OF EXISTING HISTORIC LANDFILL SITE AT
POTTEBOY, COOTEHILL, CO CAVAN

DRAWING TITLE
SITE LOCATION MAP

SCALE	DRAWN	CHECKED	APPROVED
1:5000	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE NOVEMBER 2014	DATE NOVEMBER 2014	DATE NOVEMBER 2014


DRAWING No.	REV.
14.248.101	



NOTES

- SITE BOUNDARY
- 250m RADIUS FROM THE SITE
- 500m RADIUS FROM THE SITE
- DWELLING HOUSE (RECEPTORS)

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PROJECT TITLE SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTEBOY, COOTEHILL, CO CAVAN			
DRAWING TITLE POTENTIAL RECEPTORS IN THE VICINITY OF THE SITE			
SCALE	DRAWN	CHECKED	APPROVED
1:5000	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014
DRAWING No.			REV.
14.248.102			


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Site Location

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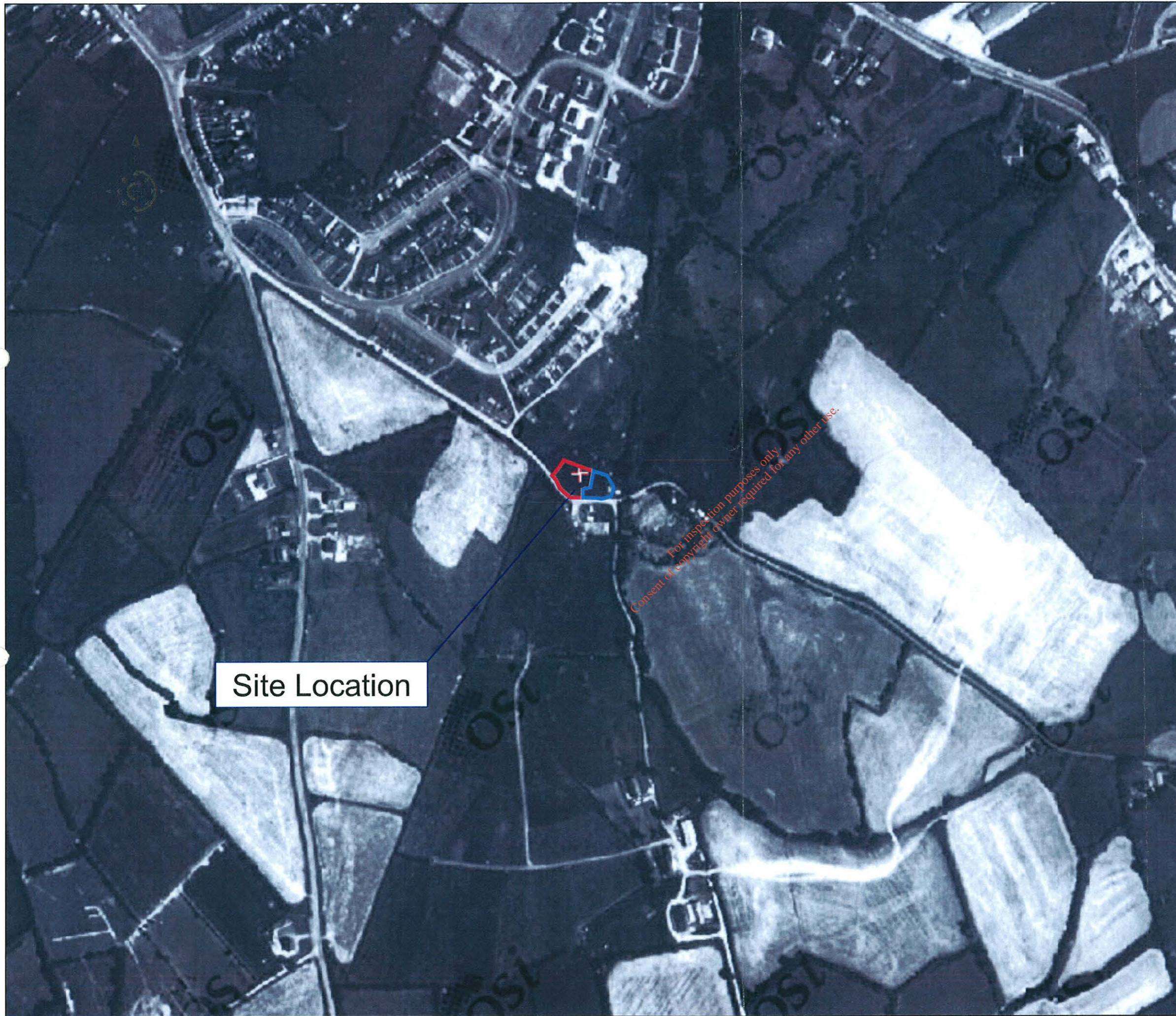
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PROJECT TITLE
 SITE INVESTIGATION & RISK ASSESSMENT
 OF EXISTING HISTORIC LANDFILL SITE AT
 POTTLEBOY, COOTEHILL, CO CAVAN

DRAWING TITLE
 2000 - AERIAL MAP


SCALE	DRAWN	CHECKED	APPROVED
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	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014

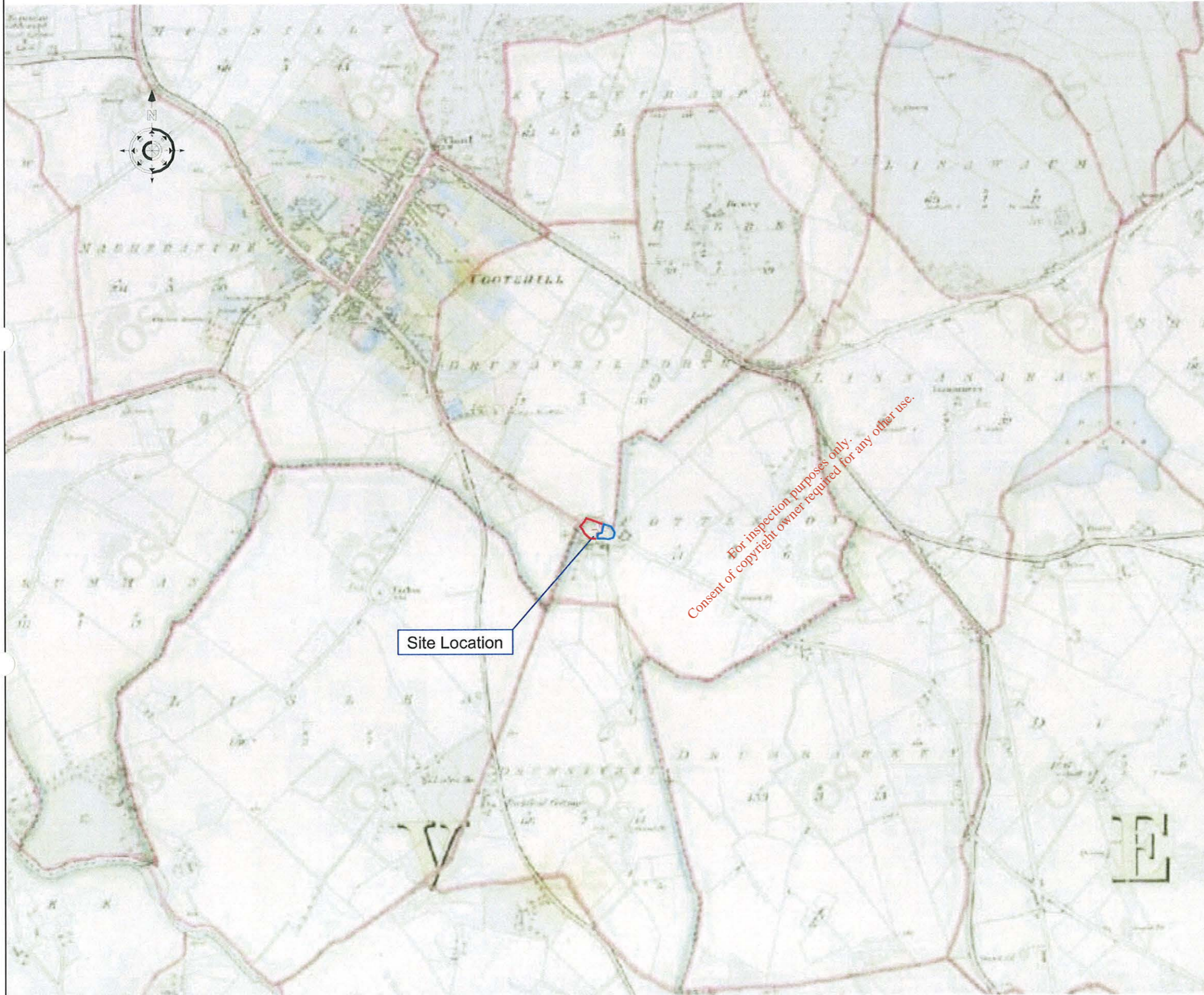
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		<p>BELTURBET BUSINESS PARK CREENY BELTURBET Co. CAVAN TEL: 049 9522236 E-MAIL: nevin@traynorenvironmental.com FAX: 049 9522808</p>	
CLIENT CAVAN COUNTY COUNCIL			
PROJECT TITLE SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTLEBOY, COOTEHILL, CO CAVAN			
DRAWING TITLE ORTHO 1995 BLACK AND WHITE AERIAL PHOTOGRAPH			
SCALE 1:5000	DRAWN ANGELA MC DERMOTT DATE NOVEMBER 2014	CHECKED ANGELA MC DERMOTT DATE NOVEMBER 2014	APPROVED NEVIN TRAYNOR DATE NOVEMBER 2014
DRAWING No. 14.248.104			REV.



25 INCH MAPPING SERIES (1837 - 1842)
SCALE 1:10000

NOTES

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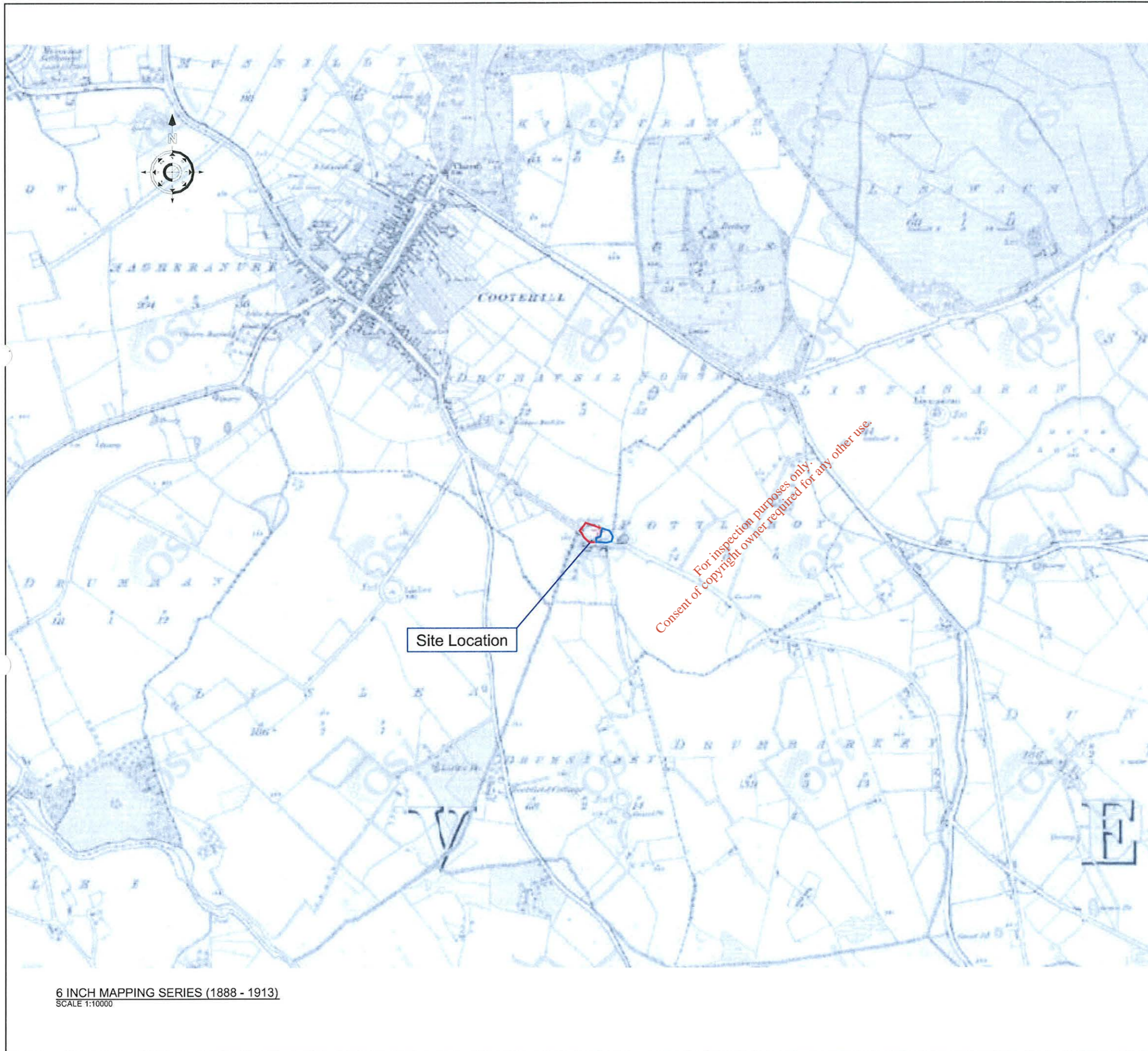
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PROJECT TITLE
 SITE INVESTIGATION & RISK ASSESSMENT
 OF EXISTING HISTORIC LANDFILL SITE AT
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DRAWING TITLE
 HISTORIC MAPS
 (1837 - 1842)

SCALE	DRAWN	CHECKED	APPROVED
1:10000	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE NOVEMBER 2014	DATE NOVEMBER 2014	DATE NOVEMBER 2014

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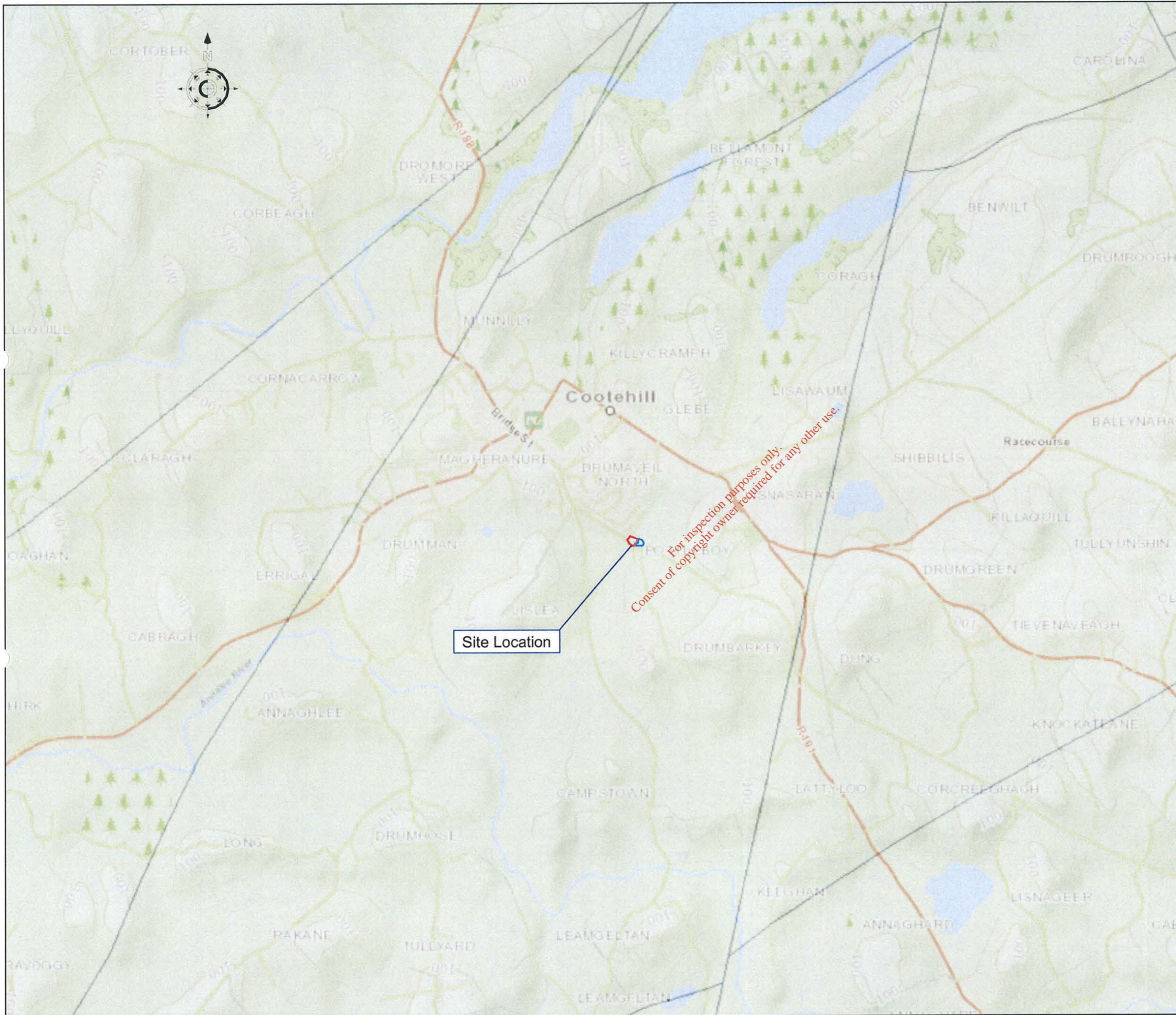
PROJECT TITLE
SITE INVESTIGATION & RISK ASSESSMENT
OF EXISTING HISTORIC LANDFILL SITE AT
POTTEBOY, COOTEHILL, CO CAVAN

DRAWING TITLE
HISTORIC MAPS
(1888 - 1913)

SCALE	DRAWN	CHECKED	APPROVED
1:10000	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014

DRAWING No.	REV.
14.248.105B	

6 INCH MAPPING SERIES (1888 - 1913)
SCALE 1:10000



NOTES

National Draft Bedrock Aquifer Map

- Rf - Regionally Important Aquifer - Fissured bedrock
- Rk - Regionally Important Aquifer - Karstified
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Unclassified

National Draft Gravel Aquifer Map

- Rg - Regionally important, extensive sand/gravels aquifers
- Lg - Locally important, sand/gravel aquifers
- No gravels present
- Not Mapped

- Bedrock Faults 100k
- RBD Boundaries
- County Boundaries
- Watermark

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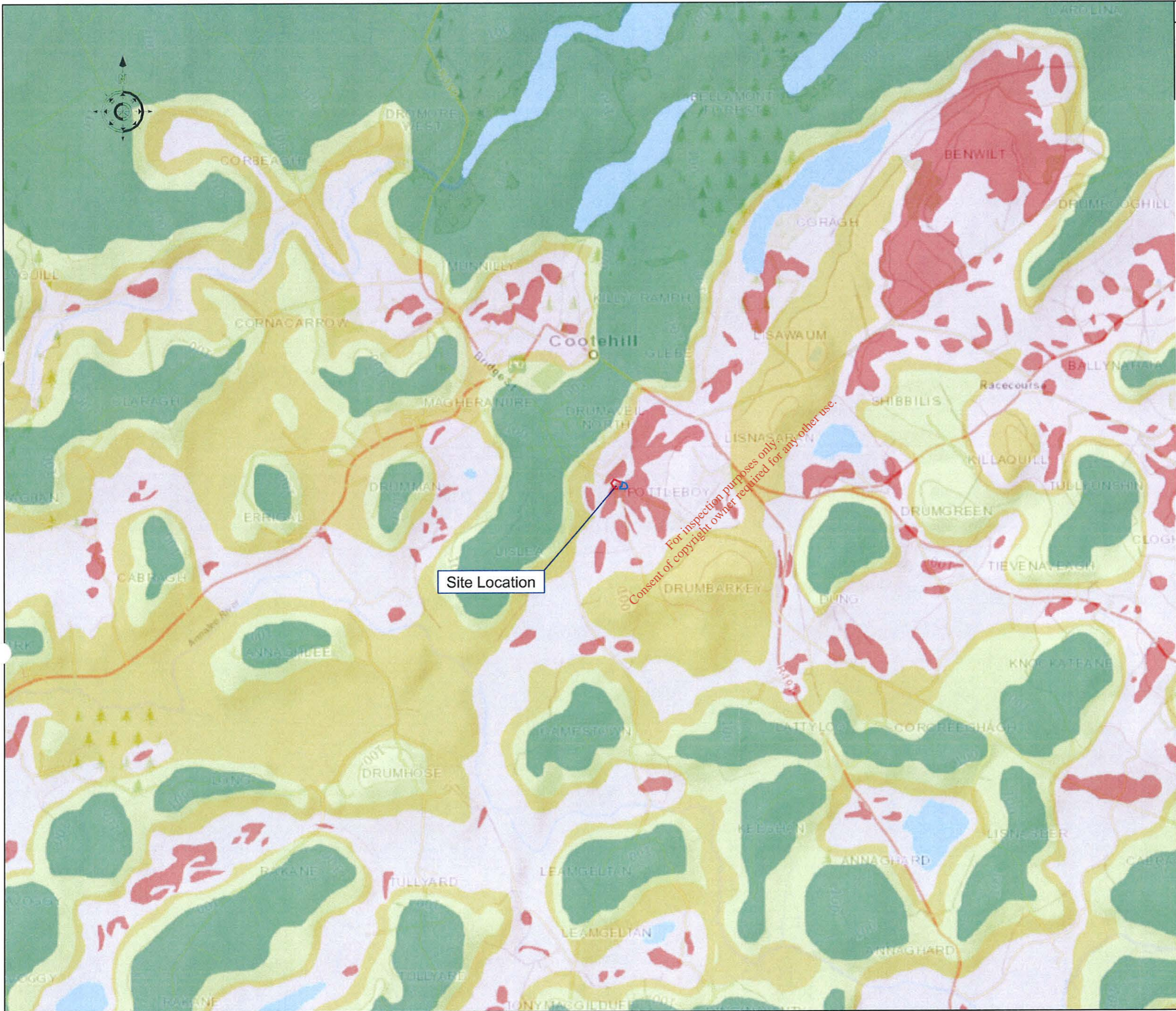
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DRAWING TITLE
GROUNDWATER MAP

SCALE	DRAWN	CHECKED	APPROVED
1:20000	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014

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14.248.106	



NOTES

- Interim Vulnerability**
- E (Rock near Surface or Karst)
- E - Extreme
- H - High
- M - Moderate
- L - Low
- HL - High to Low. Only an interim study took place.
- Water
- RBD Boundaries
- County Boundaries
- Watermark

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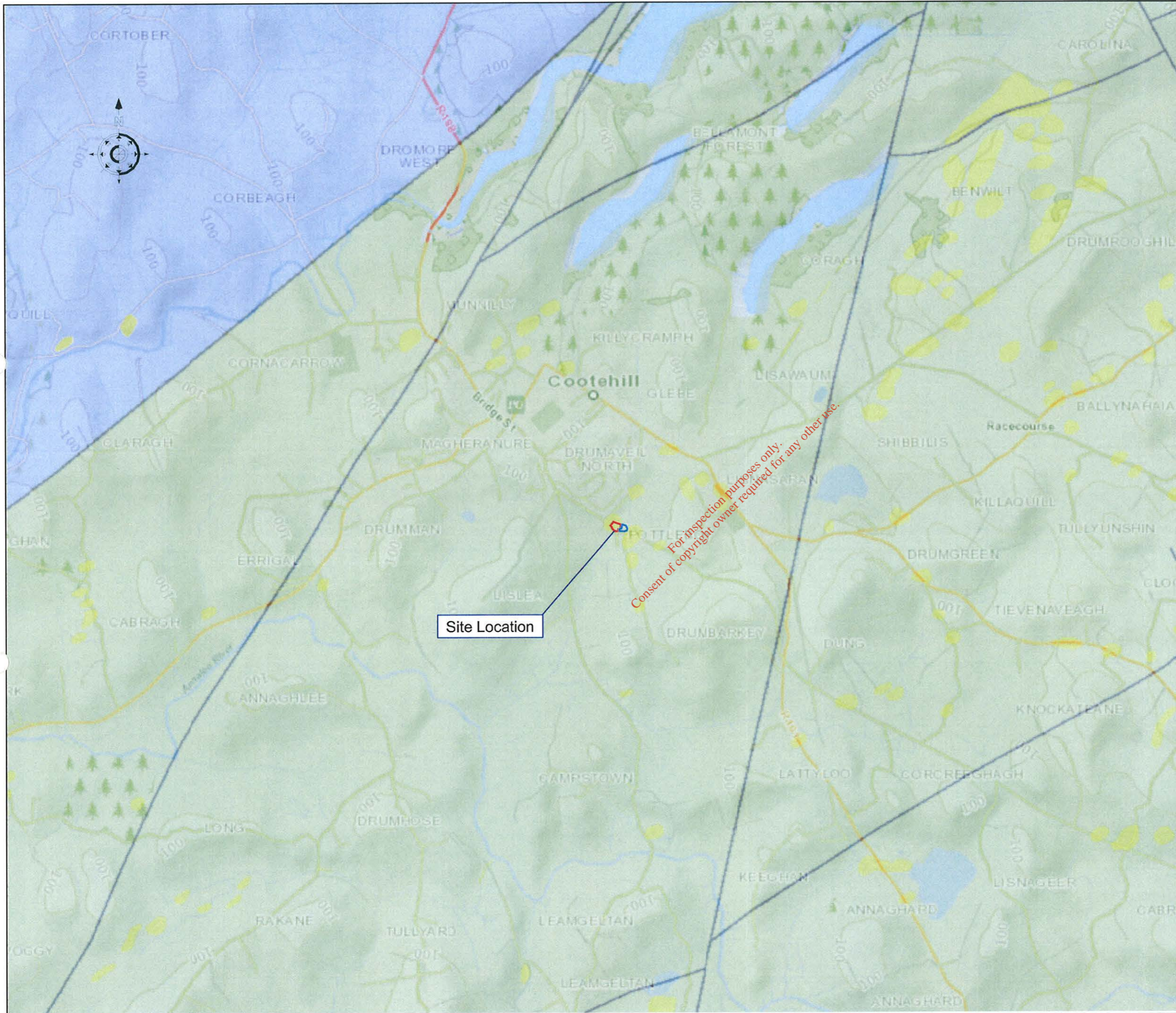
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VUNERABILITY MAP

SCALE	DRAWN	CHECKED	APPROVED
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	DATE NOVEMBER 2014	DATE NOVEMBER 2014	DATE NOVEMBER 2014

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Site Location



NOTES

Bedrock Faults 100k
National Draft Generalised Bedrock Map

- BV - Basalts and other Volcanic rocks
- CM - Cambrian Metasediments
- DDL - Dinantian Dolomitised Limestones
- DESSL - Dinantian early Sandstones, Shales and Limestones
- DKS - Devonian Kiltorcan type Sandstones
- DLIL - Dinantian Lower Impure Limestones
- DMSC - Dinantian Mudstones and Sandstones Cork Group
- MSSL - Dinantian Mixed Sandstones, Shales and Limestones
- DORS - Devonian Old Red Sandstones
- DPBL - Dinantian Pure Bedded Limestones
- DPUL - Dinantian Pure Unbedded Limestones
- DS - Dinantian Sandstones
- DSL - Dinantian Shales and Limestones
- DUIL - Dinantian Upper Impure Limestones
- GII - Granites and other Igneous Intrusive rocks
- NSA - Namurian Sandstones
- NSH - Namurian Shales
- NU - Namurian Undifferentiated
- OM - Ordovician Metasediments
- OV - Ordovician Volcanics
- PM - Precambrian Marble
- POGS - Precambrian Quartzites, Gneisses and Schists
- PTMG - Permo Triassic Mudstones and Gypsum
- PTS - Permo Triassic Sandstones
- SMV - Silurian Metasediments and Volcanics
- WSA - Westphalian Sandstones
- WSH - Westphalian Shales

- RBD Boundaries
- County Boundaries
- Watermark

REV.	DATE	DESCRIPTION	APPROVED
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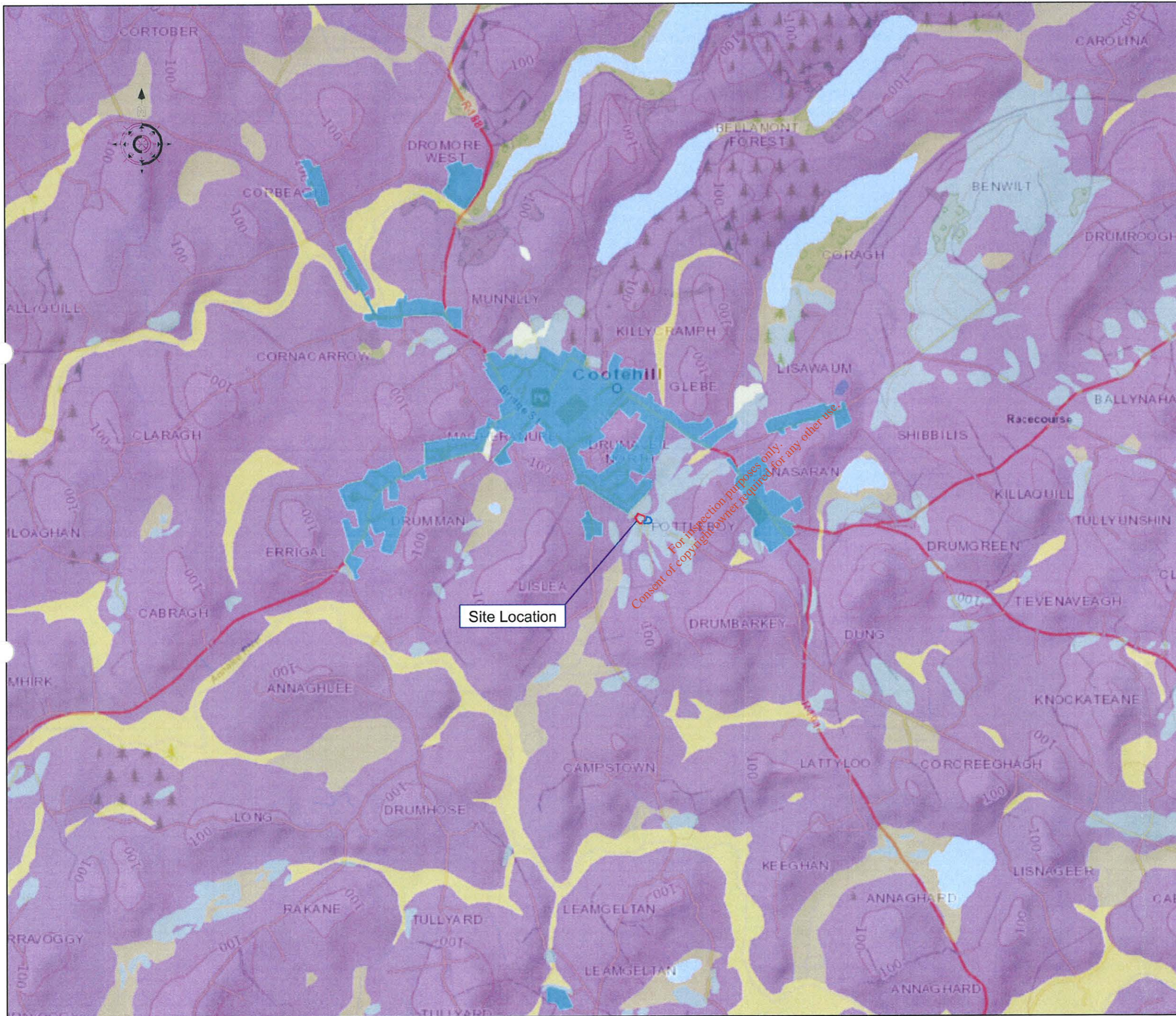
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SITE INVESTIGATION & RISK ASSESSMENT
OF EXISTING HISTORIC LANDFILL SITE AT
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DRAWING TITLE
BEDROCK MAP

SCALE	DRAWN	CHECKED	APPROVED
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	DATE NOVEMBER 2014	DATE NOVEMBER 2014	DATE NOVEMBER 2014

DRAWING No.	REV.
14.248.108	



NOTES

RBD Subsoils

- Alluvium
- Beach sands and gravels
- Bedrock outcrop and subcrop
- Esker sands and gravels
- Glaciofluvial sands and gravels
- Lake sediments
- Made ground
- Marine/estuarine silts and clays
- Marsh
- Peat
- Scree
- Till derived chiefly from Devonian sandstones
- Till derived chiefly from Lower Palaeozoic rocks
- Till derived chiefly from Namurian rocks
- Till derived chiefly from granite
- Till derived chiefly from limestone
- Till derived chiefly from metamorphic rocks
- Till derived from metamorphic rocks
- Till derived from mixed Devonian and Carboniferous rocks
- Water
- Windblown sands

RBD Boundaries
County Boundaries
Watermark

REV.	DATE	DESCRIPTION	APPROVED

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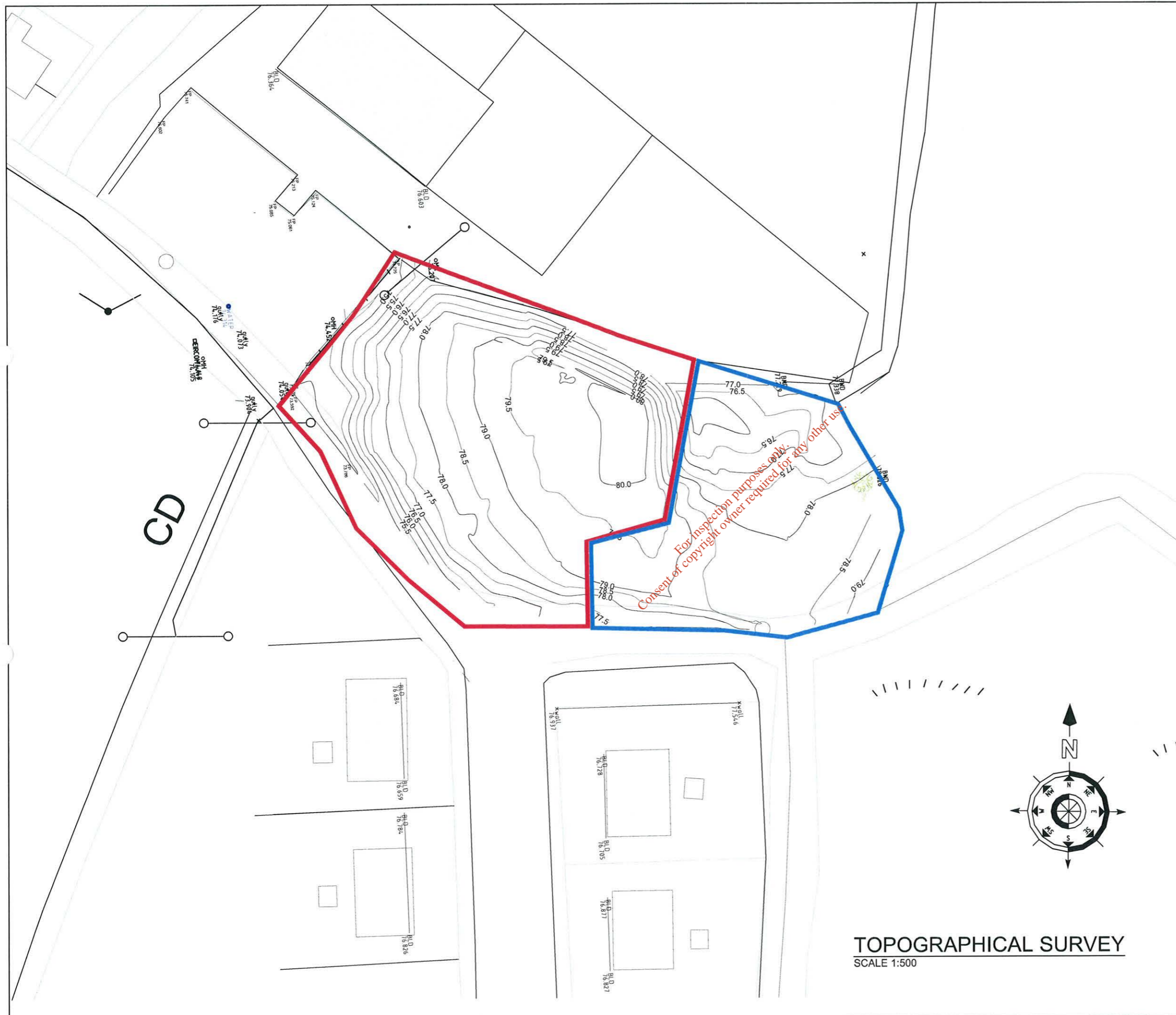
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SITE INVESTIGATION & RISK ASSESSMENT
OF EXISTING HISTORIC LANDFILL SITE AT
POTTLEBOY, COOTEHILL, CO CAVAN

DRAWING TITLE
SUBSOIL MAP

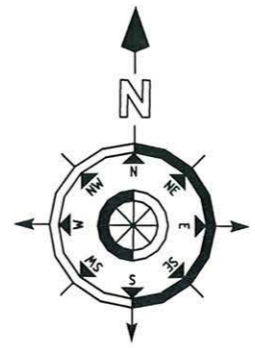
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	DATE NOVEMBER 2014	DATE NOVEMBER 2014	DATE NOVEMBER 2014

DRAWING No. 14.248.109

REV.



TOPOGRAPHICAL SURVEY
SCALE 1:500



NOTES

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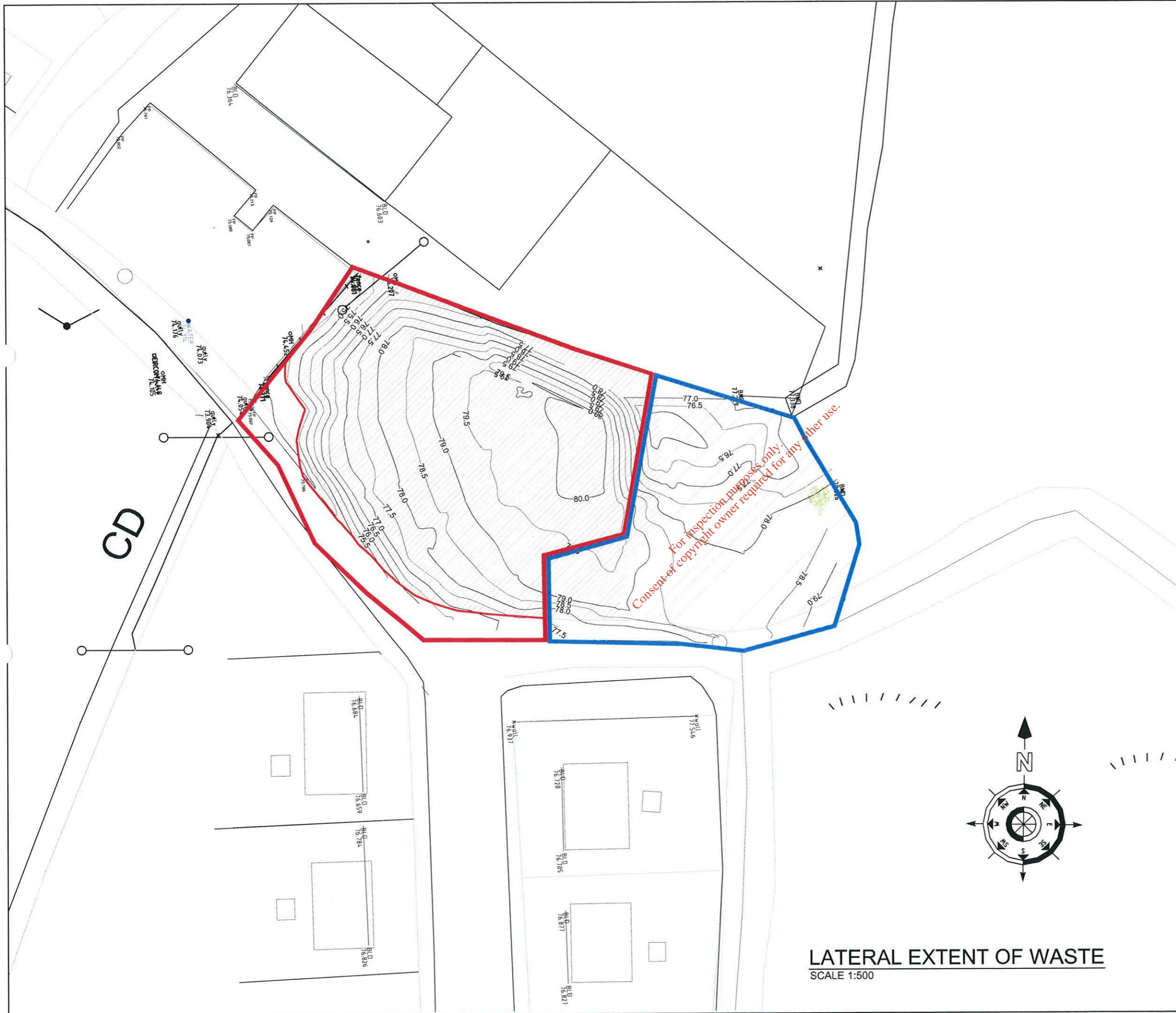
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 OF EXISTING HISTORIC LANDFILL SITE AT
 POTTLEBOY COOTEHILL CO CAVAN

DRAWING TITLE
 TOPOGRAPHICAL SURVEY

SCALE	DRAWN	CHECKED	APPROVED
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	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014

DRAWING No.	REV.
14.248.110	



LATERAL EXTENT OF WASTE
SCALE 1:500

NOTES

-  WASTE
 -  NO WASTE
 -  COUNCIL SITE BOUNDARY IN RED
 -  SITE BOUNDARY OF ADJOINING LAND OWNER IN BLUE
- 1700m² SUSPECTED AREA OF WASTE

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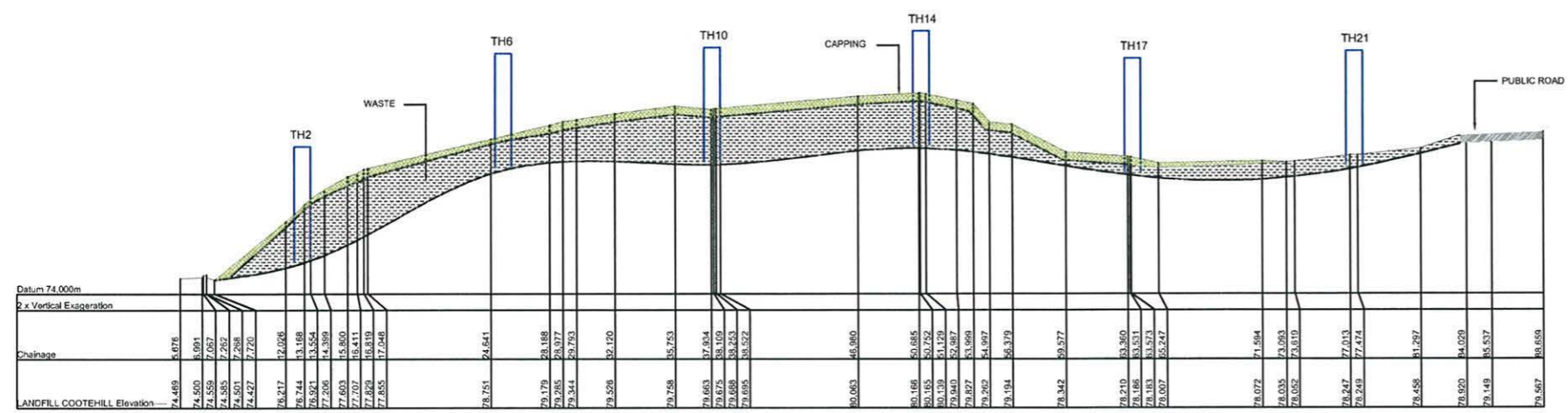
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SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTLEBOY COOTEHILL CO CAVAN

DRAWING TITLE
LATERAL EXTEND OF WASTE DEPOSITED ON THE SITE

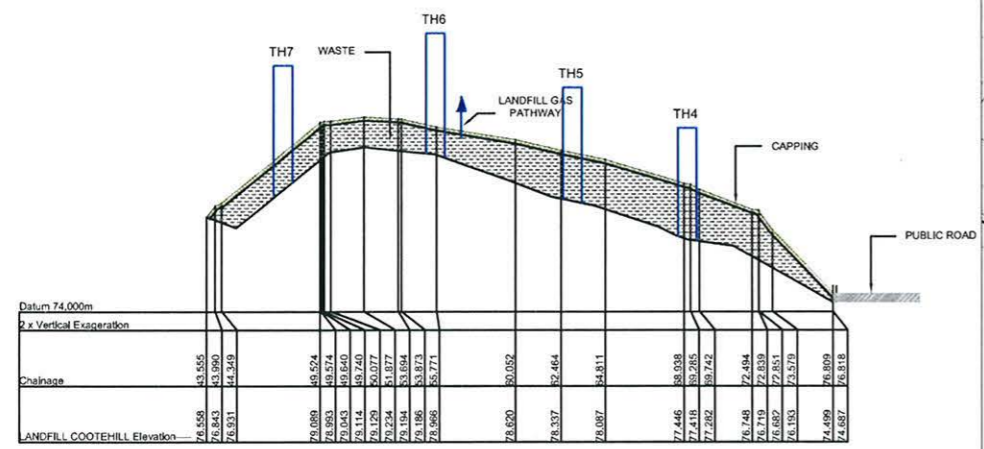
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	DATE NOVEMBER 2014	DATE NOVEMBER 2014	DATE NOVEMBER 2014

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14.248.111	

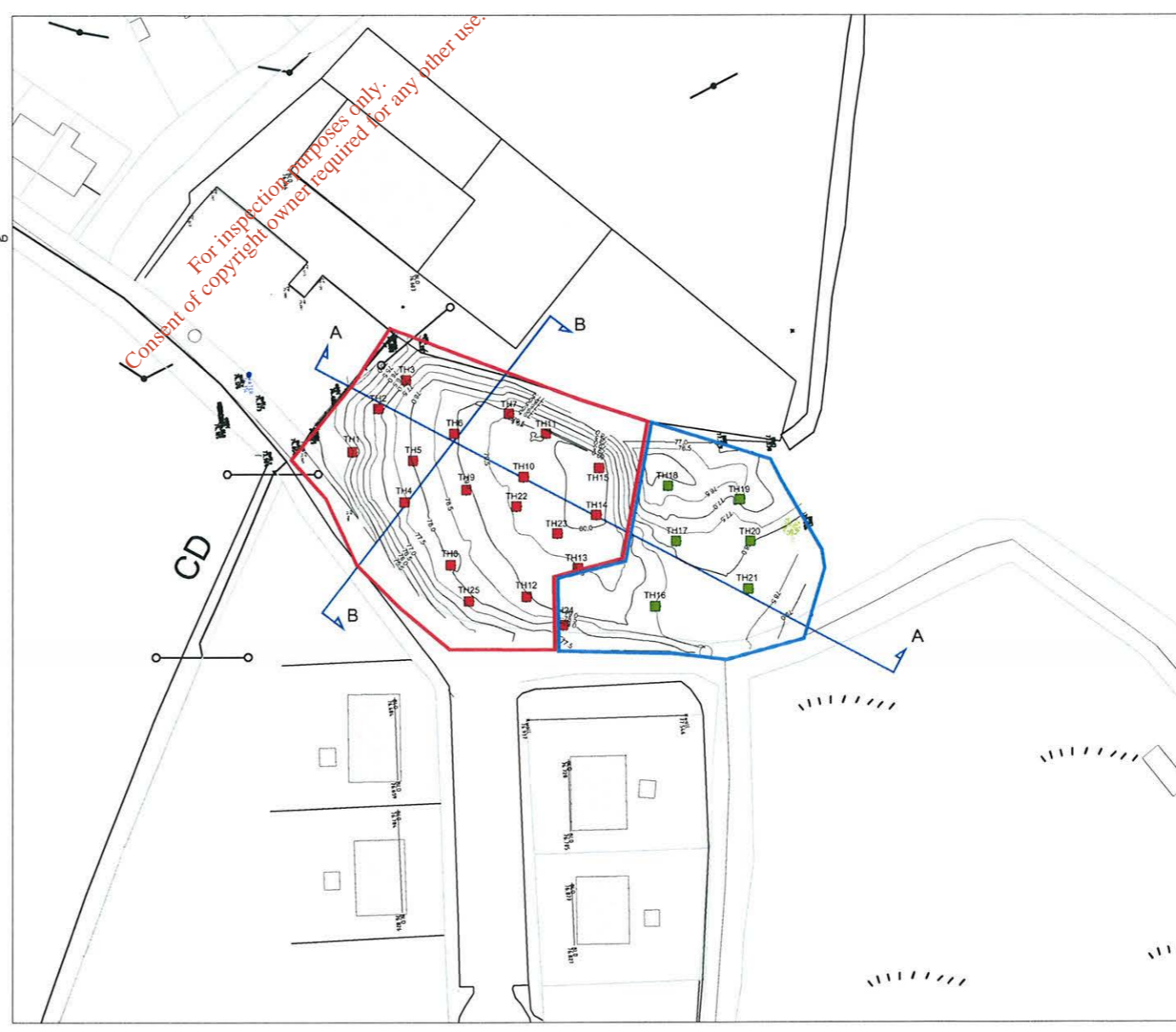
NOTES



SECTION A-A
SCALE 1:200



SECTION B-B
SCALE 1:200



SITE LAYOUT KEY
SCALE 1:500

REV.	DATE	DESCRIPTION	APPROVED

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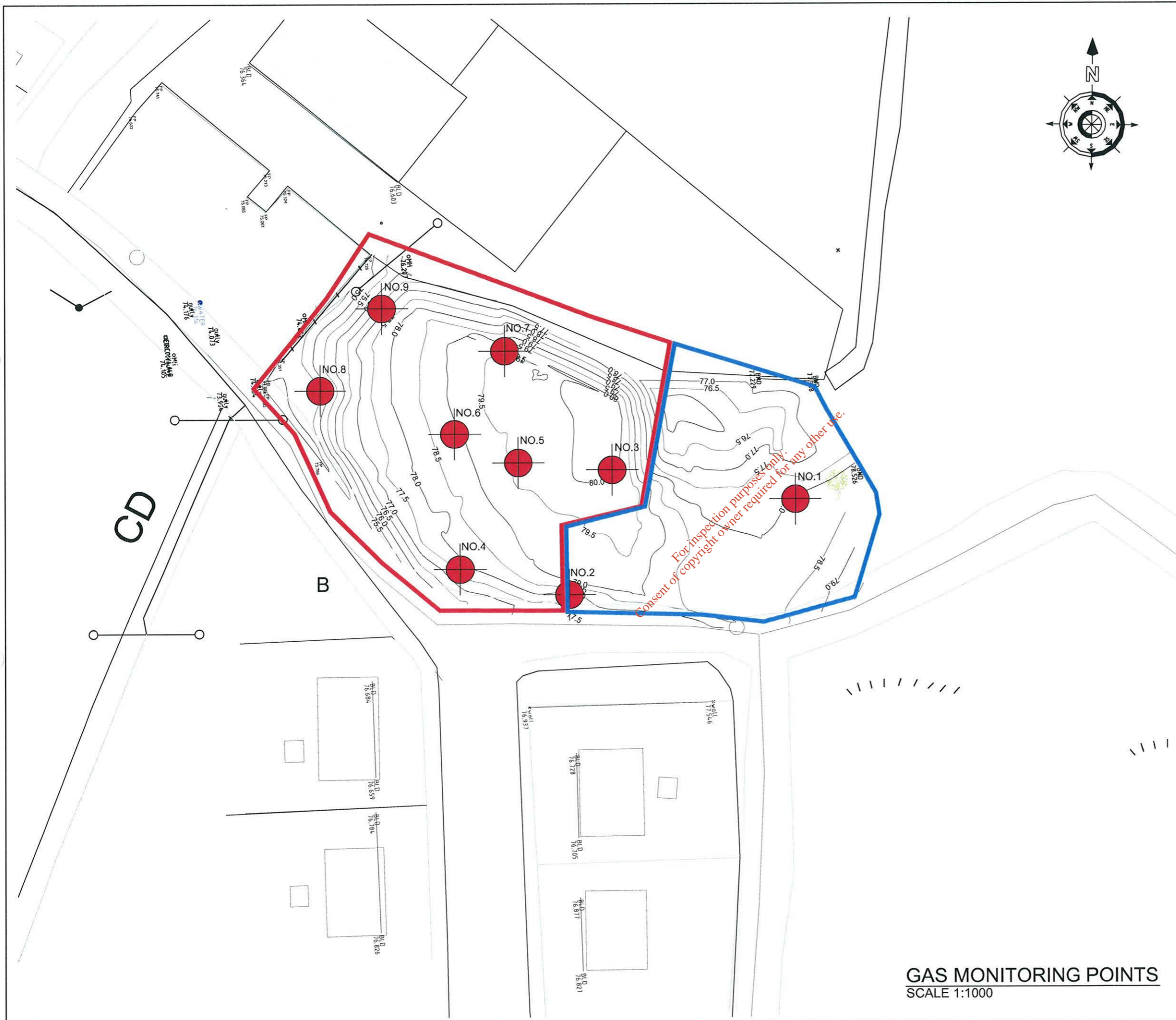
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PROJECT TITLE
SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTLEBOY COOTEHILL CO CAVAN

DRAWING TITLE
CROSS SECTIONS OF WASTE DEPOSITED ON THE SITE

SCALE	DRAWN	CHECKED	APPROVED
1:200	DARRAGH ROWAN	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014

DRAWING No. 14.248.112



NOTES


 LOCATION OF GAS MONITORING STAND PIPES

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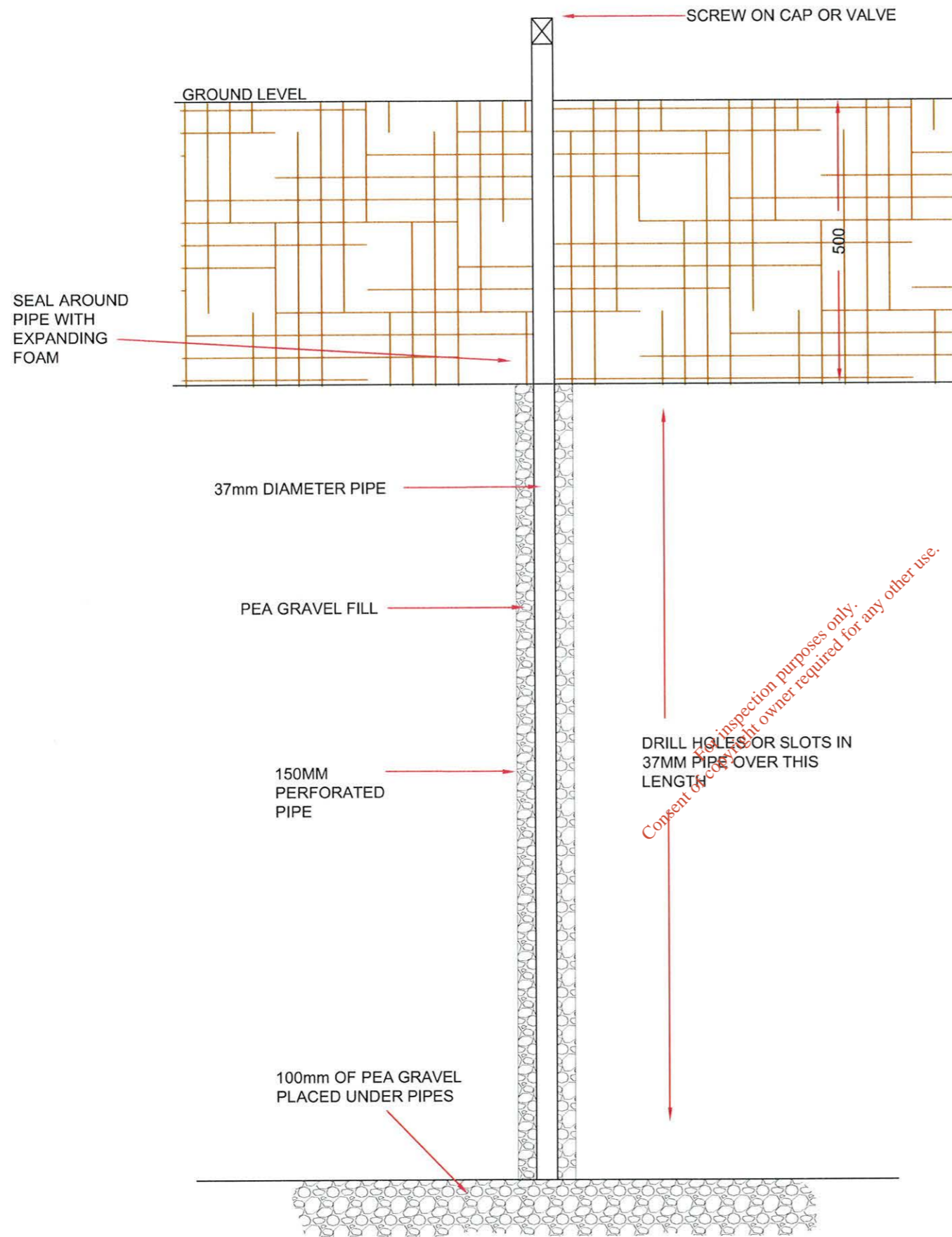
PROJECT TITLE
 SITE INVESTIGATION & RISK ASSESSMENT
 OF EXISTING HISTORIC LANDFILL SITE AT
 POTTLEBOY, COOTEHILL, CO. CAVAN

DRAWING TITLE
 GAS MONITORING LOCATIONS

SCALE	DRAWN	CHECKED	APPROVED
1:500	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014

DRAWING No. 14.248.113
 REV.

GAS MONITORING POINTS
 SCALE 1:1000



INSTALL 150MM PERFORATED PIPE IN TRIAL PIT AND BACK FILL TO WITHIN 500MM OF THE SURFACE.

STAND 37MM PIPE INTO 100MM PIPE AND FILL WITH PEA GRAVEL.

BACK FILL REMAINDER OF TRIAL PIT WITH EXTRACTED MATERIAL BACK AROUND 37MM PIPE TO FORM A SEAL

NOTES

REV.	DATE	DESCRIPTION	APPROVED
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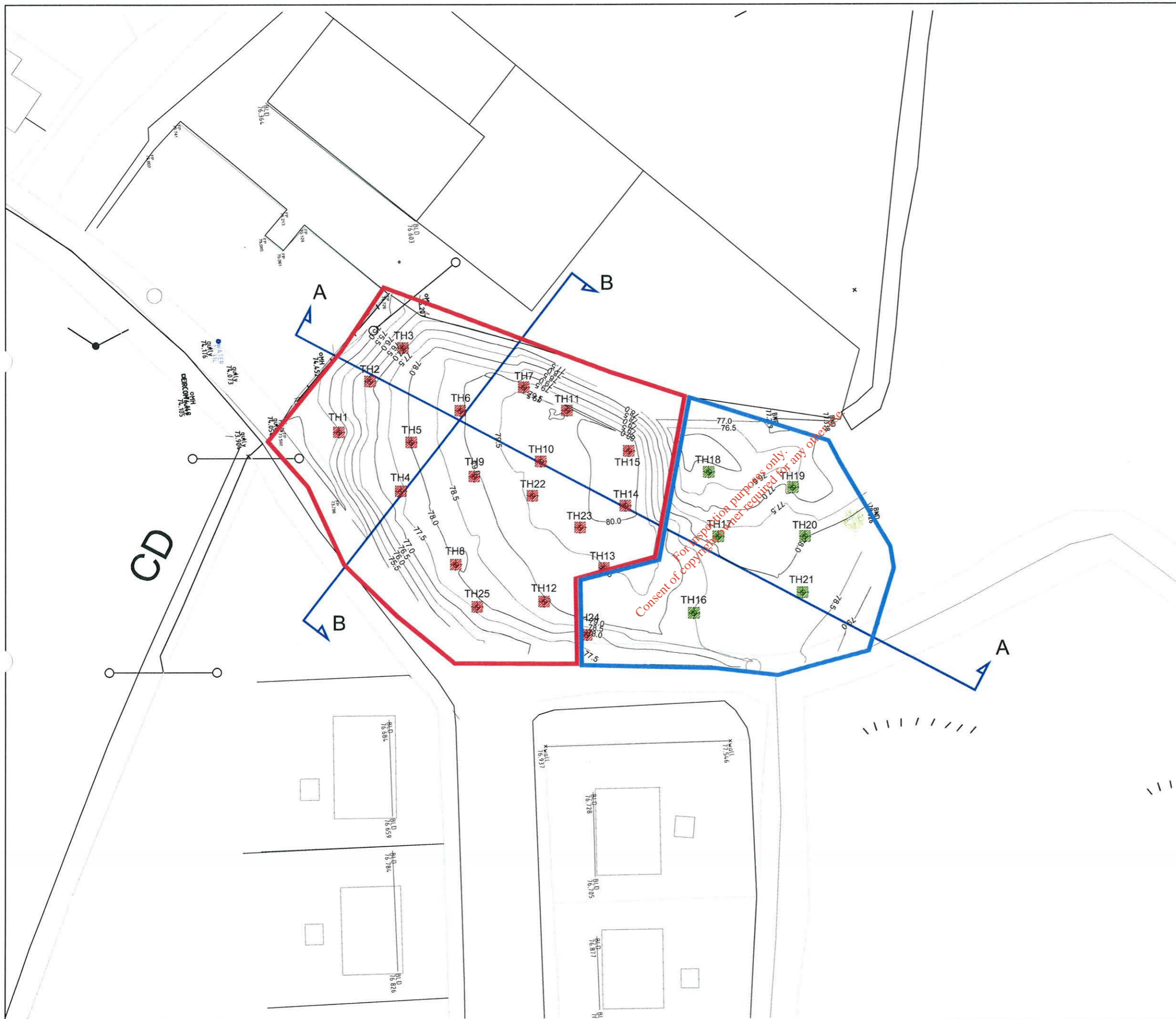
CLIENT
 CAVAN COUNTY COUNCIL

PROJECT TITLE
 SITE INVESTIGATION & RISK ASSESSMENT
 OF EXISTING HISTORIC LANDFILL SITE AT
 POTTLEBOT, COOTEHILL, CO. CAVAN

DRAWING TITLE
 CROSS SECTION OF STAND PIPE
 FOR GAS MONITORING

SCALE	DRAWN	CHECKED	APPROVED
N.T.S.	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE NOVEMBER 2014	DATE NOVEMBER 2014	DATE NOVEMBER 2014

DRAWING No.	REV.
14.248.114	



NOTES

-  TRIAL HOLES CONTAINING WASTE
-  TRIAL HOLES CONTAINING NO WASTE
-  COUNCIL SITE BOUNDARY IN RED
-  SITE BOUNDARY OF ADJOINING LAND OWNER IN BLUE
- 1700m² SUSPECTED AREA OF WASTE

REV.	DATE	DESCRIPTION	APPROVED
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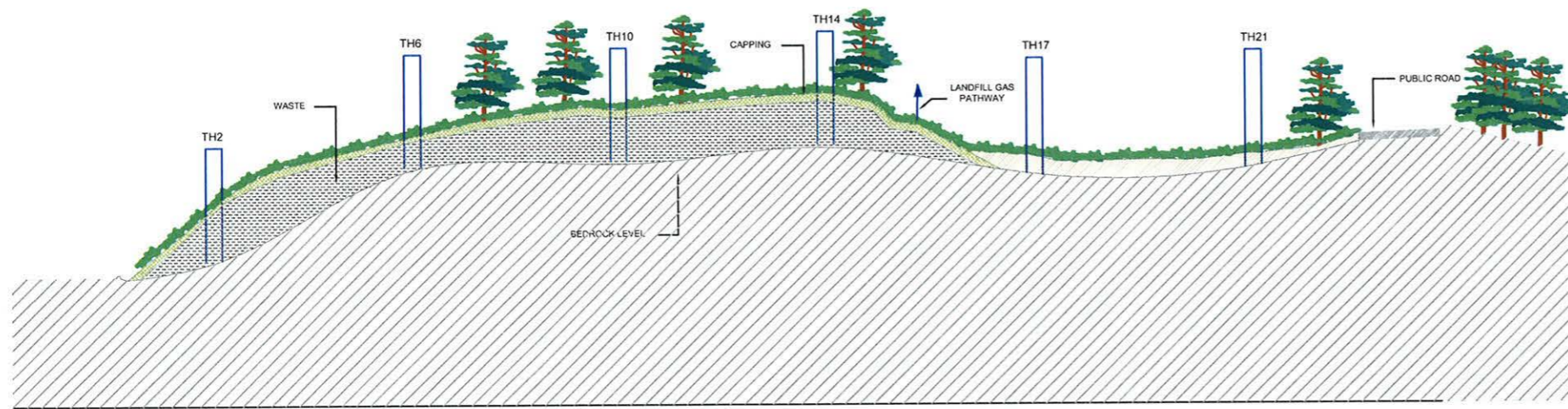
PROJECT TITLE
SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTLEBOY COOTEHILL CO CAVAN

DRAWING TITLE
TRIAL HOLE LOCATIONS

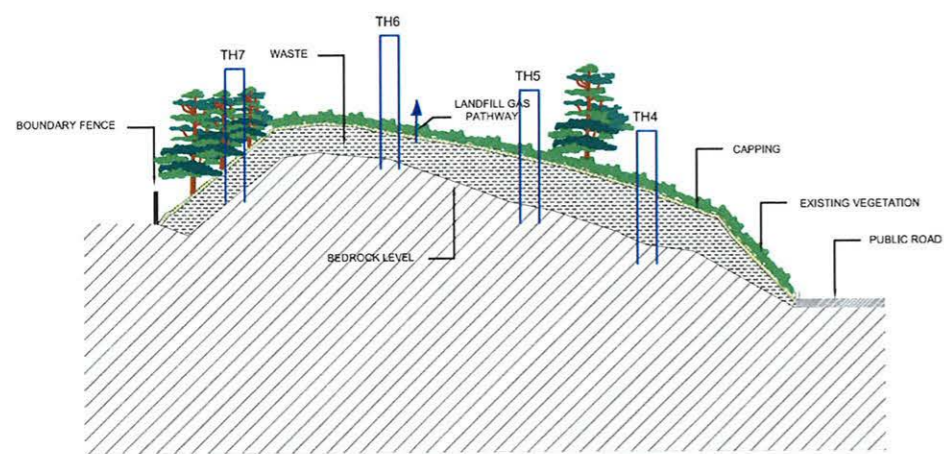
SCALE	DRAWN	CHECKED	APPROVED
1:500	DARRAGHROWAN	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014

DRAWING No.	REV.
14.248.115	

NOTES



CROSS SECTION A-A
SCALE 1:200



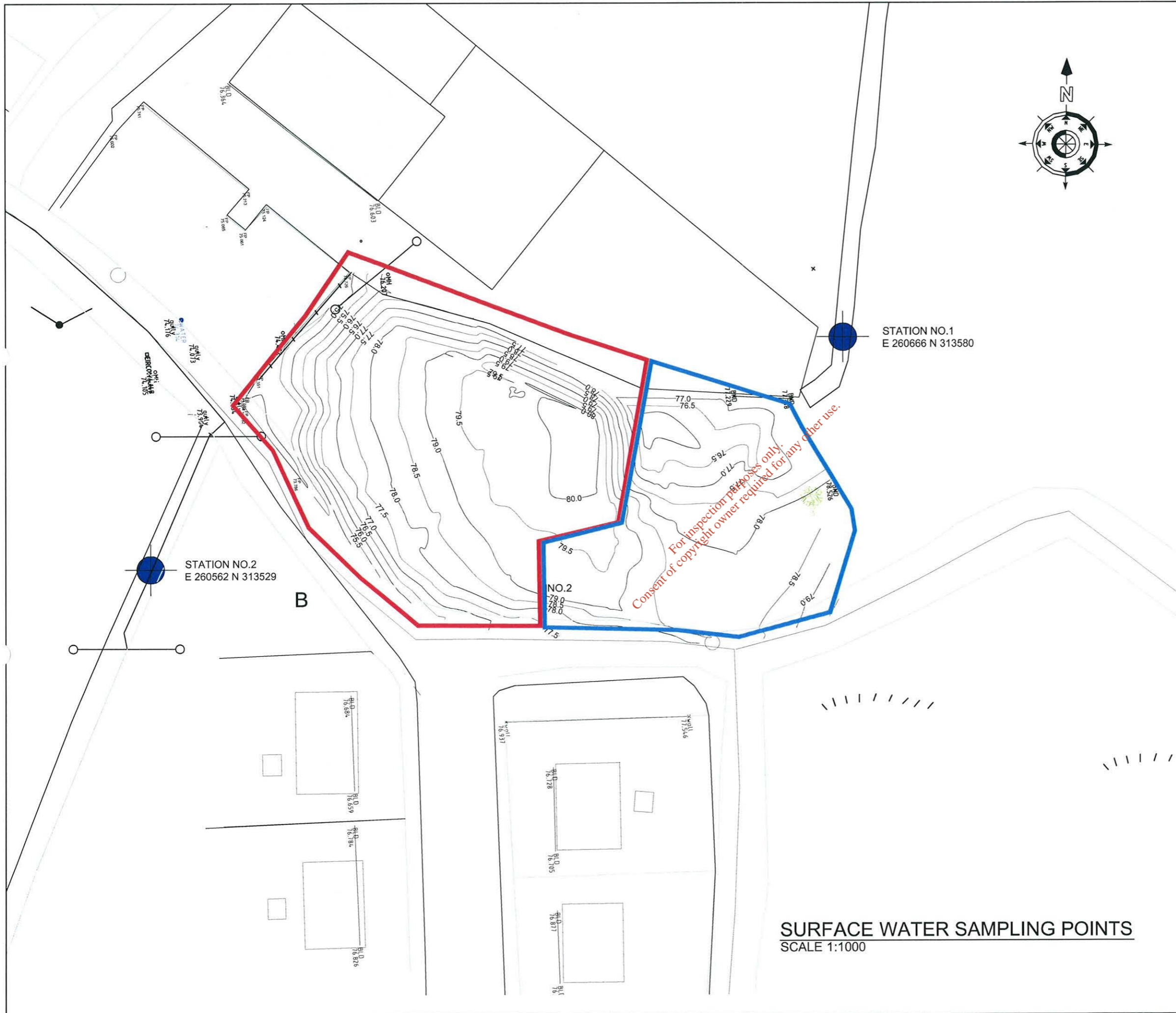
CROSS SECTION B-B
SCALE 1:200

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SITE LAYOUT KEY
SCALE 1:500

REV.	DATE	DESCRIPTION	APPROVED
<p><small>COPYRIGHT RESERVED - THIS DRAWING IS NOT TO BE USED FOR A PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN ISSUED BY TRAYNOR ENVIRONMENTAL LTD NOR IS IT TO BE COPIED OR REPRODUCED IN ANY MANNER WITHOUT WRITTEN CONSENT.</small></p>			
<p>CLIENT CAVAN COUNTY COUNCIL</p>			
<p>PROJECT TITLE SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTEBOY COOTEHILL CO CAVAN</p>			
<p>DRAWING TITLE REVISED CONCEPT MODEL OF WASTE DEPOSITED ON THE SITE</p>			
SCALE	DRAWN	CHECKED	APPROVED
1:200	DARRAGH ROWAN	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014
DRAWING No.	14.248.116		REV.



NOTES

 SURFACE WATER SAMPLE LOCATIONS

REV.	DATE	DESCRIPTION	APPROVED
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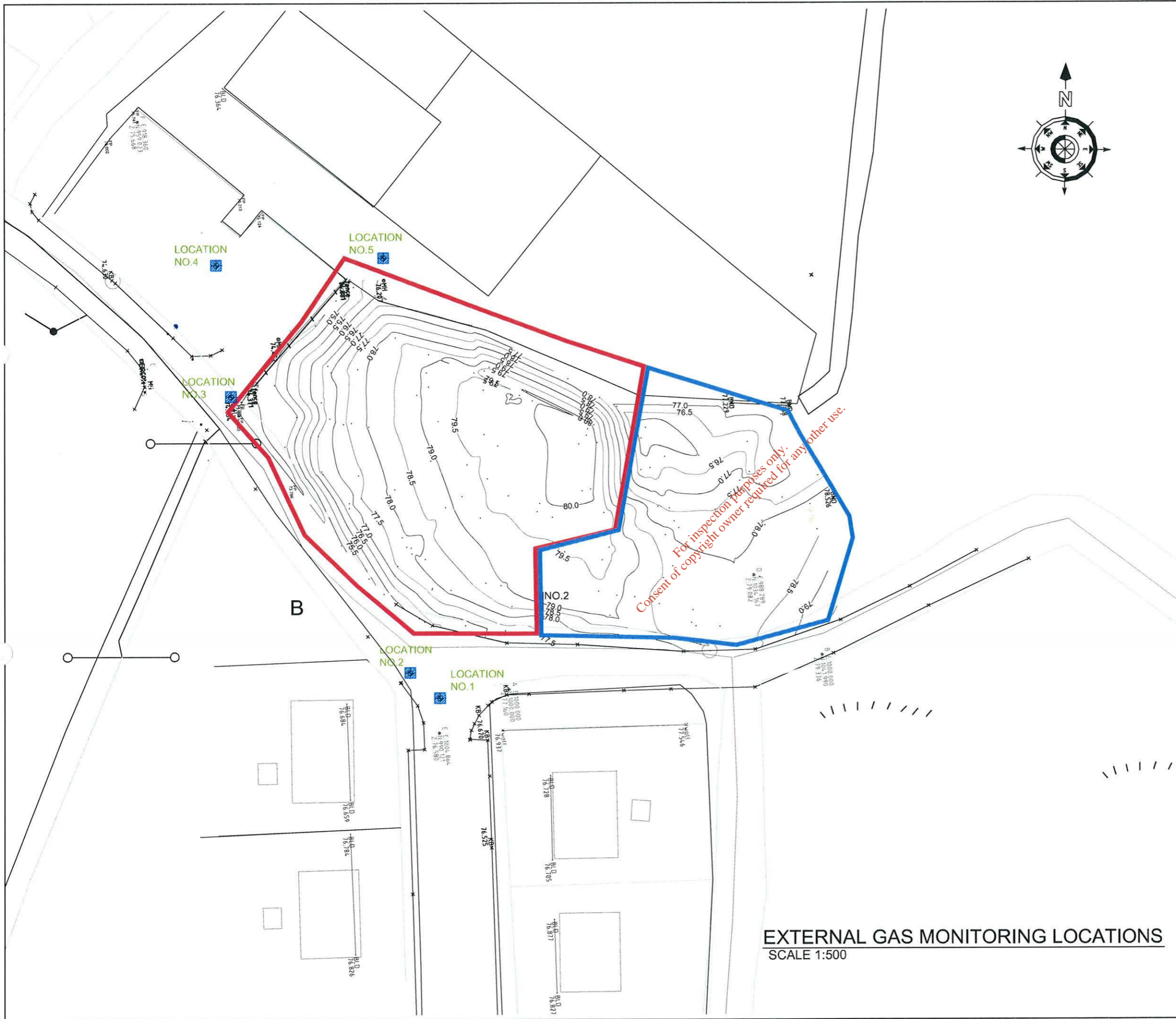
PROJECT TITLE
 SITE INVESTIGATION & RISK ASSESSMENT
 OF EXISTING HISTORIC LANDFILL SITE AT
 POTTLEBOY COOTEHILL CO CAVAN

DRAWING TITLE
 SURFACE WATER SAMPLING LOCATIONS

SCALE	DRAWN	CHECKED	APPROVED
1:500	DARRAGHROWAN	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2014	NOVEMBER 2014	NOVEMBER 2014

DRAWING No.	REV.
14.248.117	

SURFACE WATER SAMPLING POINTS
 SCALE 1:1000



NOTES

 External Gas Monitoring Location

REV.	DATE	DESCRIPTION	APPROVED
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PROJECT TITLE
 SITE INVESTIGATION & RISK ASSESSMENT
 OF EXISTING HISTORIC LANDFILL SITE AT
 POTTLEBOY, COOTEHILL, CO. CAVAN

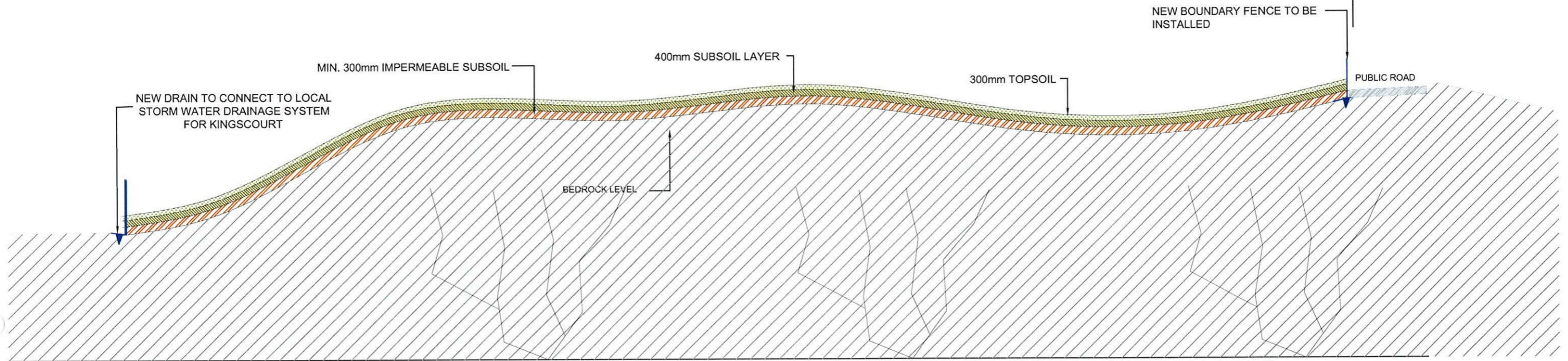
DRAWING TITLE
 EXTERNAL GAS MONIROTING LOCATIONS

SCALE	DRAWN	CHECKED	APPROVED
1:500	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	DECEMBER 2014	DECEMBER 2014	DECEMBER 2014

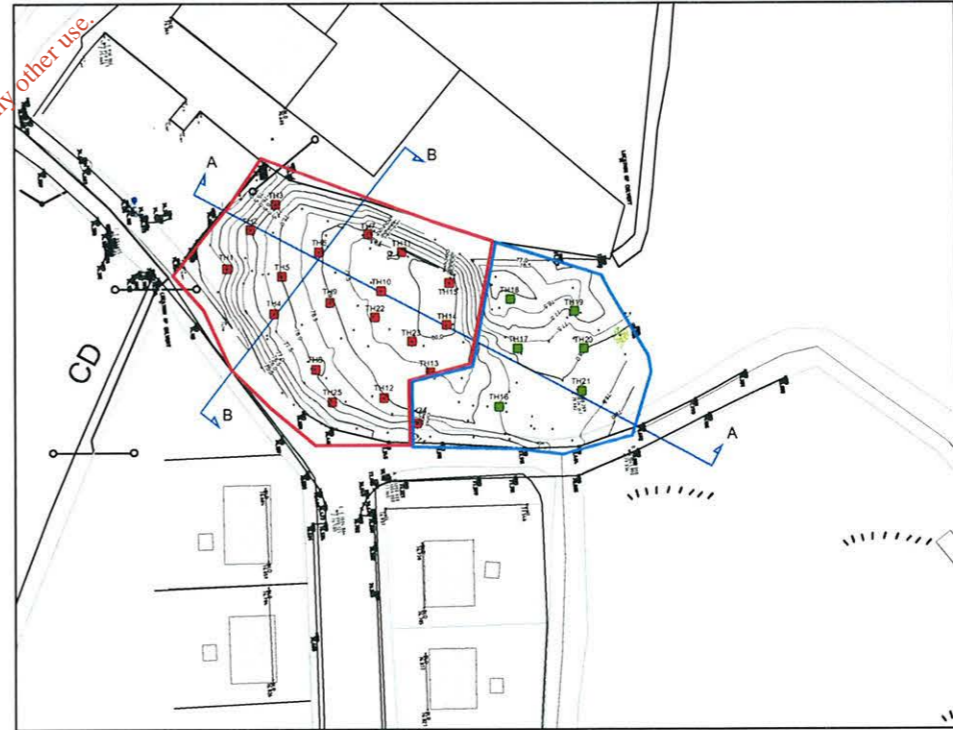
DRAWING No.	REV.
14.248.118	

EXTERNAL GAS MONIROTING LOCATIONS
 SCALE 1:500

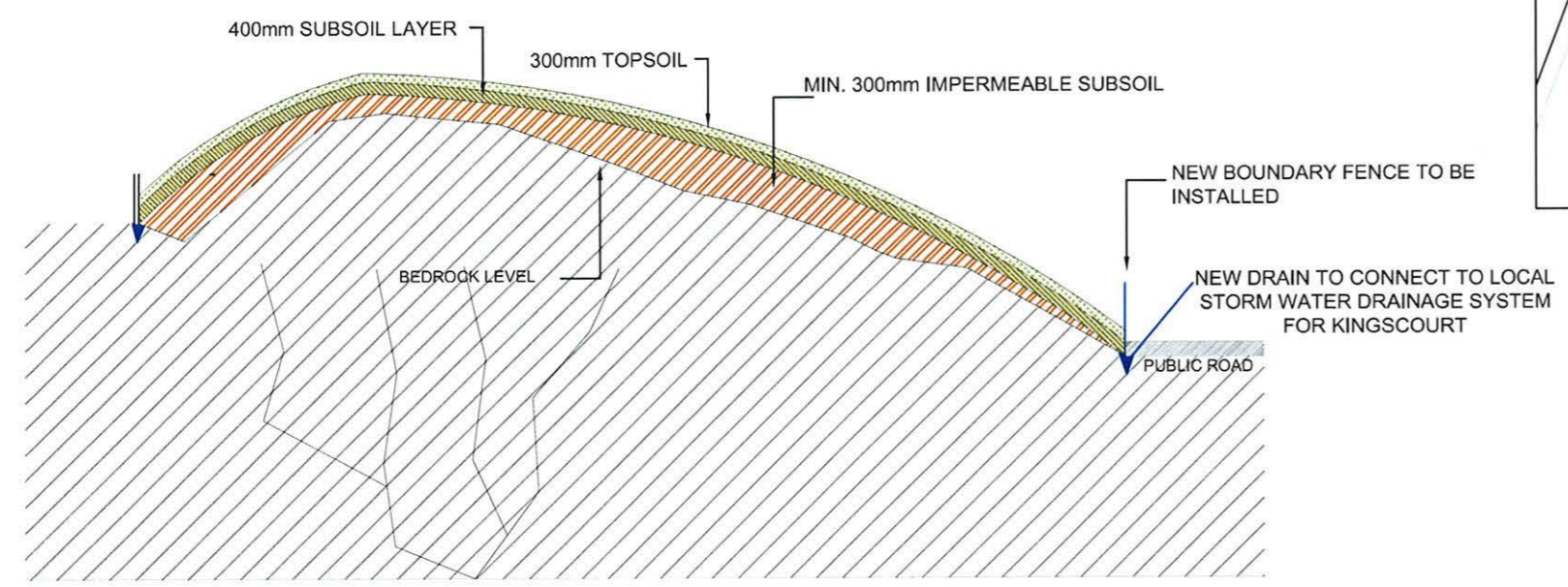
NOTES



CROSS SECTION A-A
SCALE 1:200



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CROSS SECTION B-B
SCALE 1:200

- LANDFILL WASTE SOURCE
- CAPPING
- SUBSOIL
- IMPERMEABLE SUBSOIL
- BEDROCK

REV.	DATE	DESCRIPTION	APPROVED
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PROJECT TITLE
SITE INVESTIGATION & RISK ASSESMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTLEBOY, COOTEHILL, CO. CAVAN

DRAWING TITLE
CAPPING CROSS SECTION FOR THE COOTEHILL HISTORIC LANDFILL

SCALE	DRAWN	CHECKED	APPROVED
1:200	ANGELA MC DERMOTT	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE DECEMBER 2014	DATE DECEMBER 2014	DATE DECEMBER 2014

DRAWING No.	REV.
14.248.119	

NOTES ON PLANTING

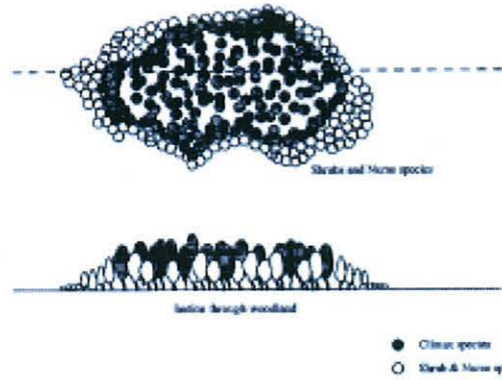
Trees should be planted when they are dormant, usually between late autumn and early spring (before the end of March). Autumn planting is preferred for broadleaves and some conifers. Care should be taken to avoid damage by frost during planting operations in mid-winter. Planting and subsequent maintenance must be carried out by competent experienced staff

- All trees listed 1-8 should be planted in a staggered pattern to create a natural effect this will also encourage biodiversity and form a natural screening belt. See picture below of desired effect

- Small trees marked 5-8 should be inter planted among the larger trees marked 1-4

- Trees in the central area to be planted in a staggered fashion away from drains and inspection or sampling points.

All trees to be spaced as per EPA Landfill Manuals



Tall/Medium trees to be planted on site as part of the landscaping scheme

No.	Species	Height at year 20(m)	Remarks
1	Silver birch * <i>Betula pendula</i>	9	Fast growing, useful nurse crop, tolerates low fertility
2	Common alder * <i>Alnus glutinosa</i>	8	Nitrogen fixing, grows well in damp areas, good for wildlife
3	Sycamore <i>Acer pseudoplatanus</i>	8	Tolerant to exposure and air pollution, good for wildlife
4	Scots pine * <i>Pinus sylvestris</i> (native)	7	Visually attractive tree, grows well in poor exposed sites

Small trees to be planted on site as part of the landscaping scheme

No.	Species	Height at year 20(m)	Remarks
5	Holly * <i>Ilex aquifolium</i>	3	Good for wildlife and screening
6	Hawthorn * <i>Crataegus monogyna</i>	4	Commonly found in hedgerows, attractive tree with white blooms in the spring and deep red haws in autumn
7	Rosin * (mountain ash) <i>Sorbus aucuparia</i>	6	Hardy tree suitable for exposed site, good for wildlife
8	Giant willow <i>Salix caprea</i>	4	Associated with damp conditions

Trees suitable for central area of the Landfill site (* indicates native species)

PLANTING LEGEND



NOTES



All tree and shrub planting to be carried out, in accordance with EPA Manuals for Landfill Restoration and Aftercare.

REV.	DATE	DESCRIPTION	APPROVED
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CLIENT	CAVAN COUNTY COUNCIL
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PROJECT TITLE	SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT POTTLEBOY, COOTEHILL, CO CAVAN
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DRAWING TITLE	PROPOSED LANDSCAPE PLAN FOR COOTEHILL HISTORIC LANDFILL
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SCALE	DRAWN	CHECKED	APPROVED
1:500	LIAM MC ELGUIN	ANGELA MC DERMOTT	NEVIN TRAYNOR
	DATE	DATE	DATE
	SEPTEMBER 2013	SEPTEMBER 2013	SEPTEMBER 2013

DRAWING No.	14.248.120	REV.	
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LANDSCAPE PLAN
SCALE 1:500