

**TIER 3**

**ENVIRONMENTAL RISK ASSESSMENT**

**APPENDIX A**

**DRAWINGS**

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NOTES



- OPEN DRAINS
- SITE BOUNDARY
- 250m RADIUS FROM THE SITE
- 500m RADIUS FROM THE SITE
- DWELLING HOUSE (RECEPTORS)
- BOG (RECEPTORS)
- MULLAGH LOUGH (RECEPTORS)
- PRIVATE WELL (RECEPTOR)

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 Web: www.traynorenvironmental.com

CLIENT  
 CAVAN COUNTY COUNCIL

PROJECT TITLE  
 SITE INVESTIGATION & RISK ASSESSMENT  
 OF EXISTING HISTORIC LANDFILL SITE AT  
 RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE  
 POTENTIAL RECEPTORS IN THE  
 VICINITY OF THE SITE

SCALE	DRAWN	CHECKED	APPROVED
1:10000	PAURIC LOUGHLIN DATE: NOVEMBER 2010	PADRAG JORDAN DATE: NOVEMBER 2010	NEVN TRAYNOR DATE: NOVEMBER 2010

DRAWING No.	REV.
10-198-001	





Site Location

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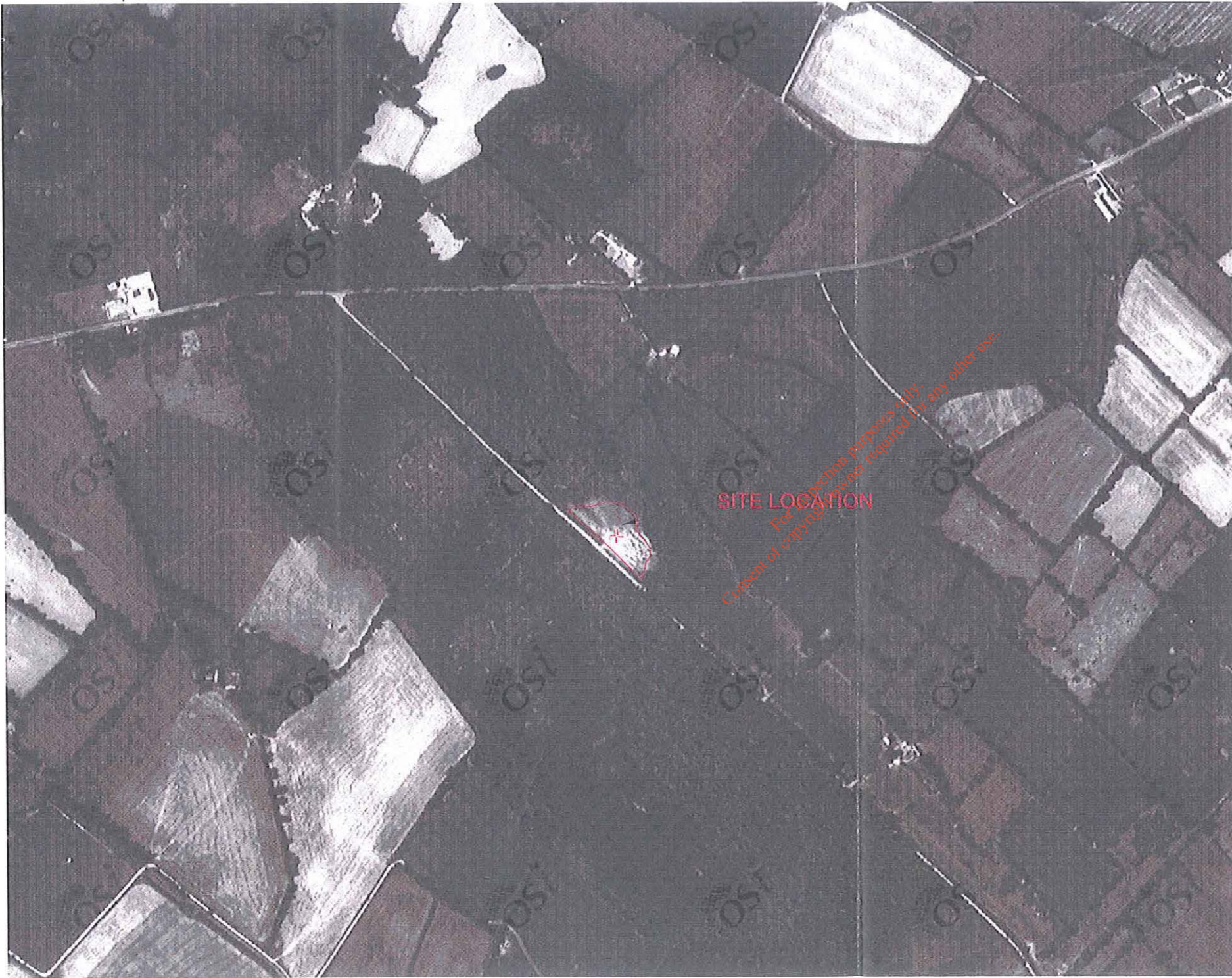
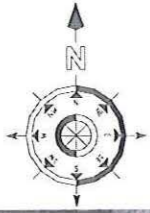
PROJECT TITLE  
 SITE INVESTIGATION & RISK ASSESSMENT  
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DRAWING TITLE  
 2000 - AERIAL MAP

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1:1000	PAUR G LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
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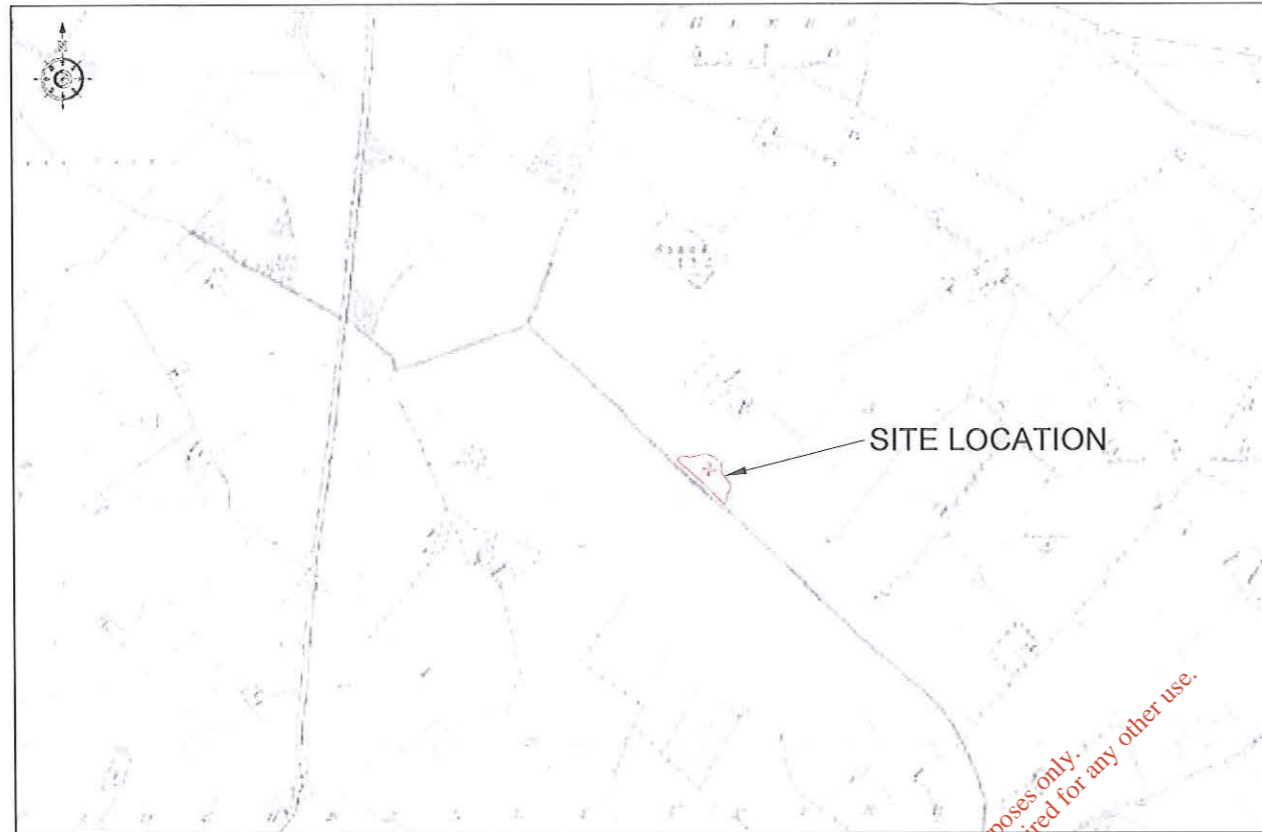
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DRAWING TITLE  
 ORTHO 1995  
 BLACK AND WHITE AERIAL PHOTOGRAPH

SCALE	DRAWN	CHECKED	APPROVED
1:20000	PAURIC LOUGHLIN	PADRAG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2010	NOVEMBER 2010	NOVEMBER 2010

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6 INCH MAPPING SERIES (1888 - 1913)  
SCALE 1:2000



25 INCH MAPPING SERIES (1837 - 1842)  
SCALE 1:2000

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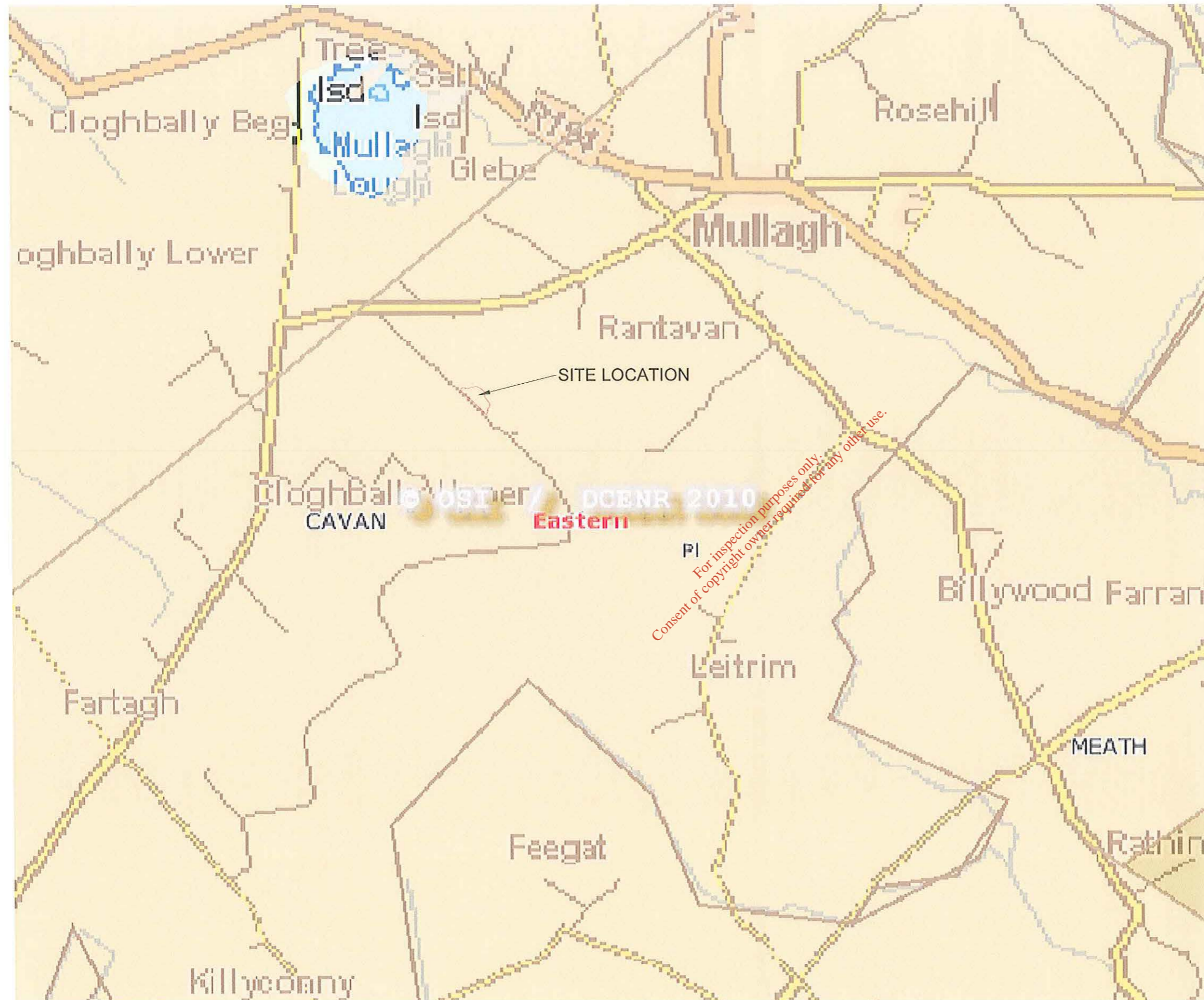
PROJECT TITLE  
 SITE INVESTIGATION & RISK ASSESSMENT  
 OF EXISTING HISTORIC LANDFILL SITE AT  
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DRAWING TITLE  
 HISTORIC MAPS

SCALE	DRAWN	CHECKED	APPROVED
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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
- Li - 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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 SITE INVESTIGATION & RISK ASSESSMENT  
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DRAWING TITLE  
 GROUNDWATER MAP

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	DATE	DATE	DATE
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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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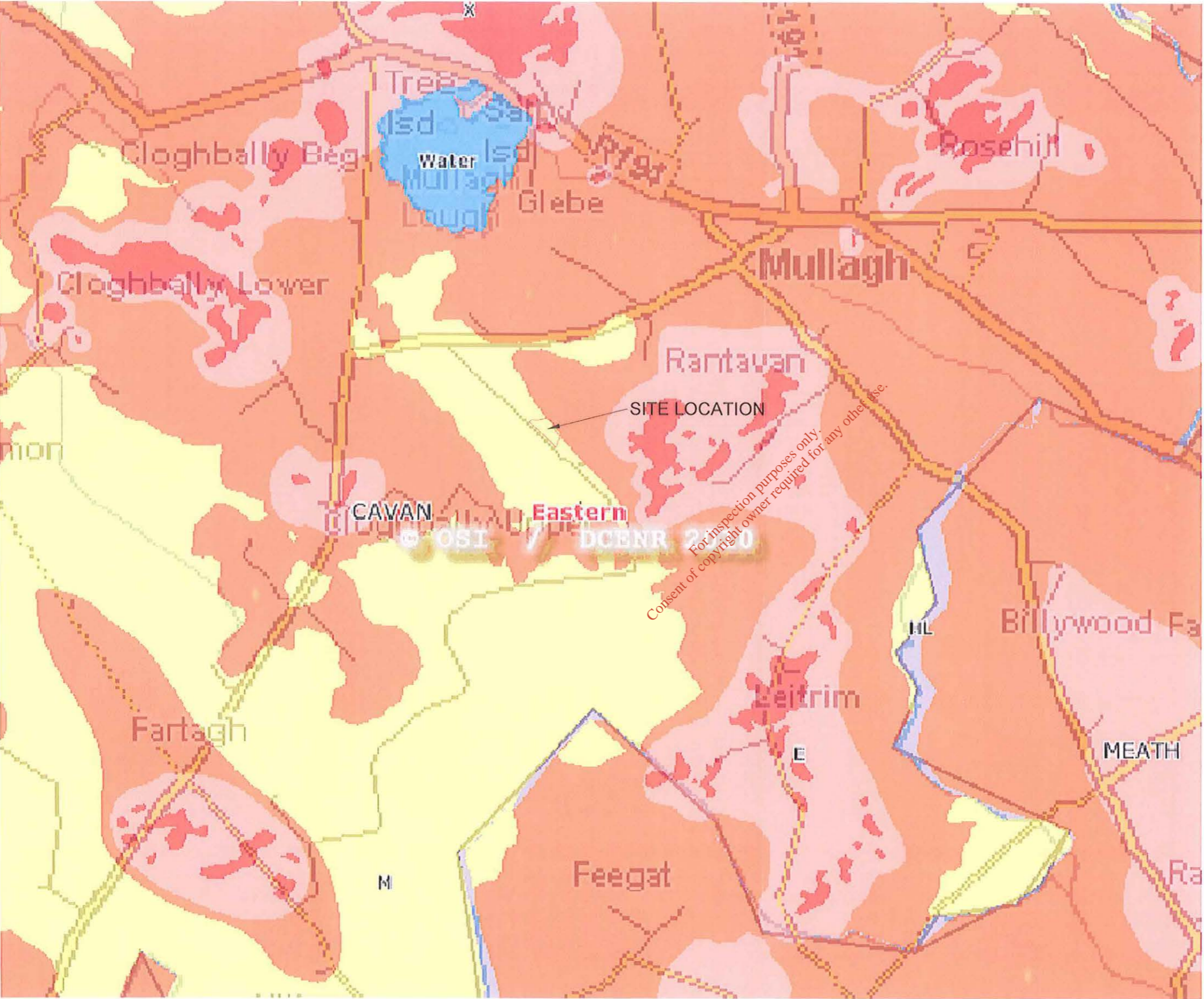
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PROJECT TITLE  
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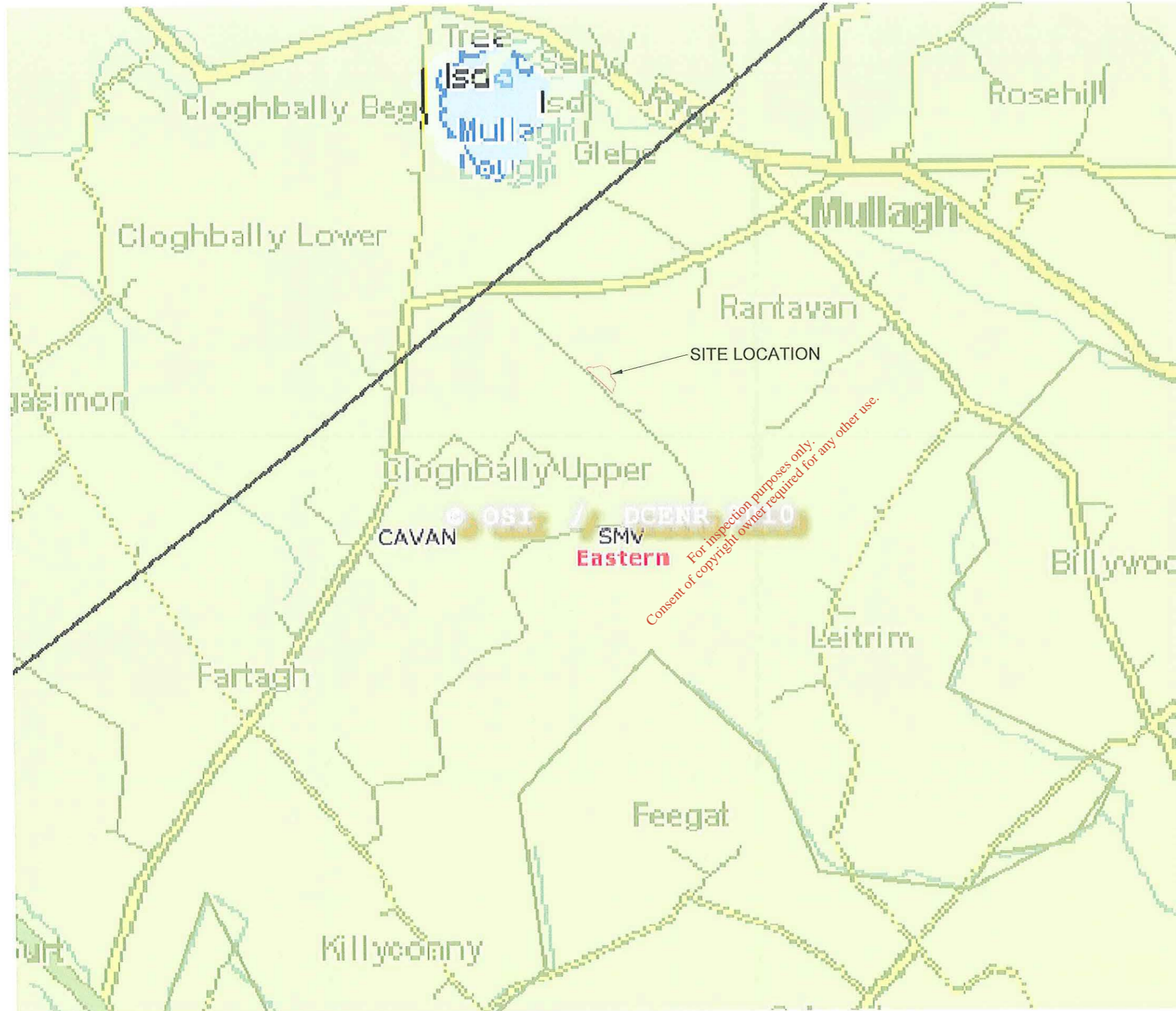
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**VUNERABILITY MAP**

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10-198-006	







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 Killorcan 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 Marbles
- 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

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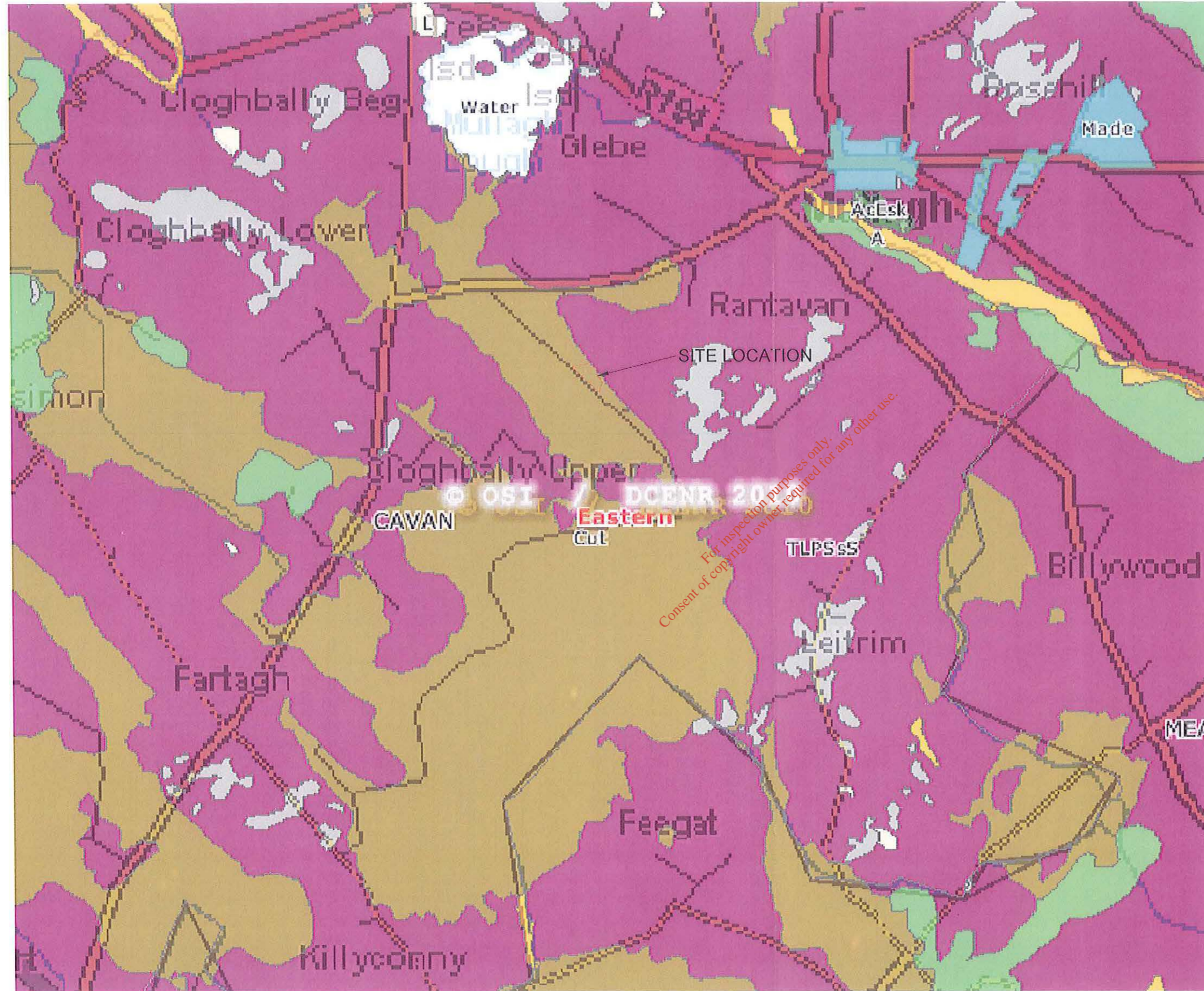
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SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE  
BEDROCK MAP

SCALE	DRAWN	CHECKED	APPROVED
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	DATE	DATE	DATE
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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**

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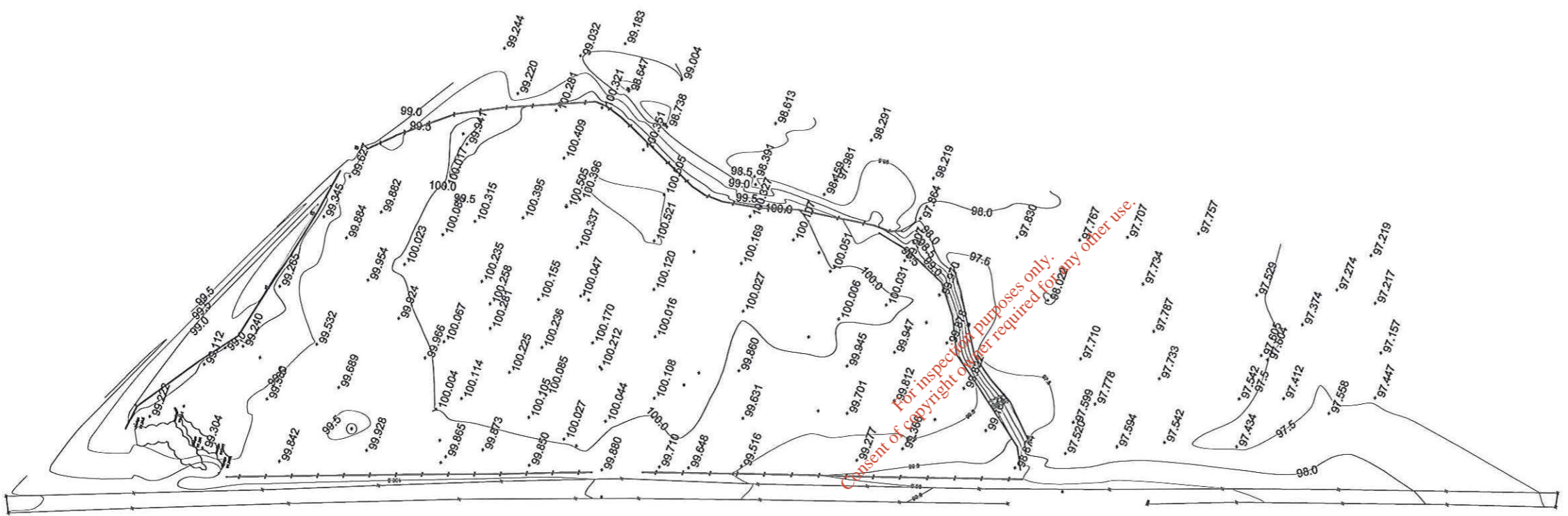
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 SUBSOIL MAP

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NOTES



SITE SURVEY

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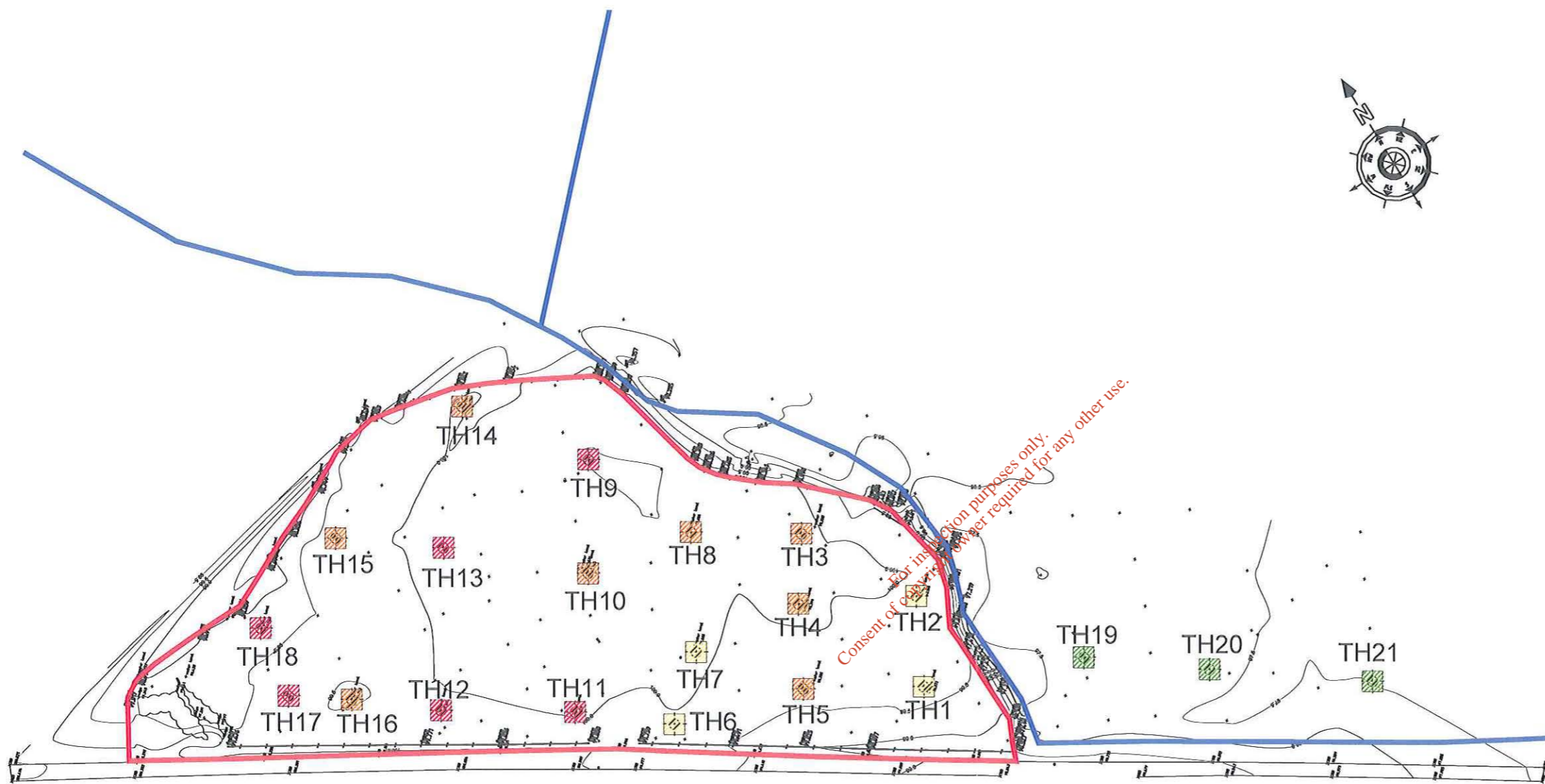
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 OF EXISTING HISTORIC LANDFILL SITE AT  
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DRAWING TITLE  
 TOPOGRAPHICAL SURVEY

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10-198-009	





TRIAL HOLE LOCATION  
SCALE 1:1000

NOTES

- ⊕ TH1 TRIAL HOLE LOCATION
- SITE BOUNDARY
- |  |  |
|--|--|
|  |  |
|  |  |

 SEVERITY RATING

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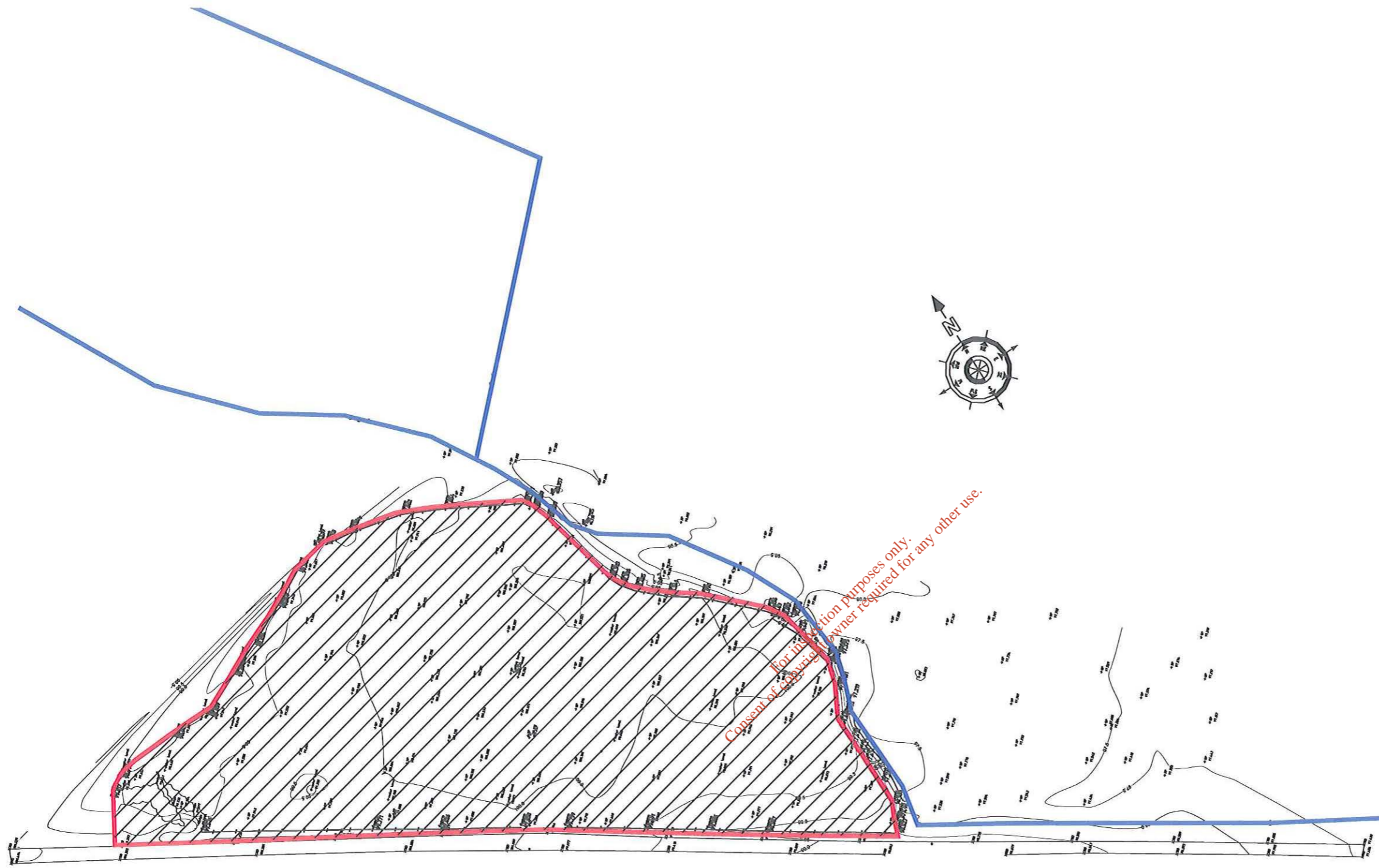
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**TRIAL HOLE LOCATION**

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DRAWING No. <b>10-198-010</b>	REV.
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NOTES



- OPEN DRAINS
- SITE BOUNDARY
- / / / / LATERAL EXTENT OF WASTE

LATERAL EXTEND OF WASTE  
SCALE 1:1000

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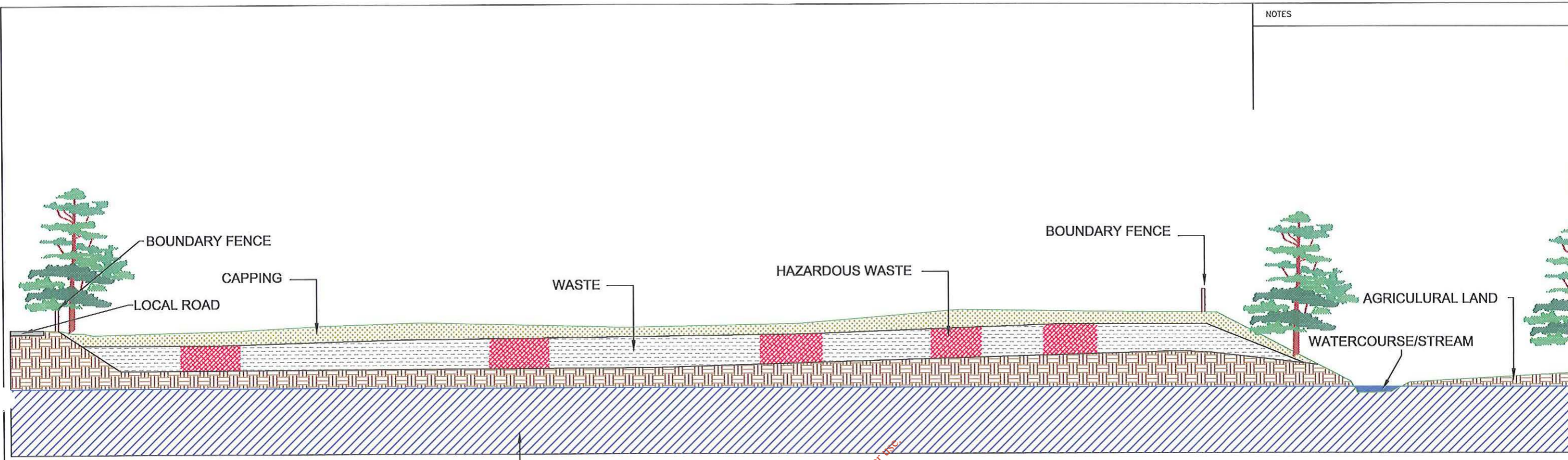
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 LATERAL EXTEND OF WASTE DEPOSITED  
 ON THE SITE

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	DATE	DATE	DATE
	NOVEMBER 2010	NOVEMBER 2010	NOVEMBER 2010

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NOTES



GROUNDWATER

CROSS SECTION OF WASTE  
SCALE 1:200

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- TRIAL HOLES WHERE HAZARDOUS WASTE WAS IDENTIFIED
- LANDFILL WASTE SOURCE
- EXISTING SUBSOIL
- GROUNDWATER
- WATERCOURSE / DRAIN
- CAPPING

REV.	DATE	DESCRIPTION	APPROVED
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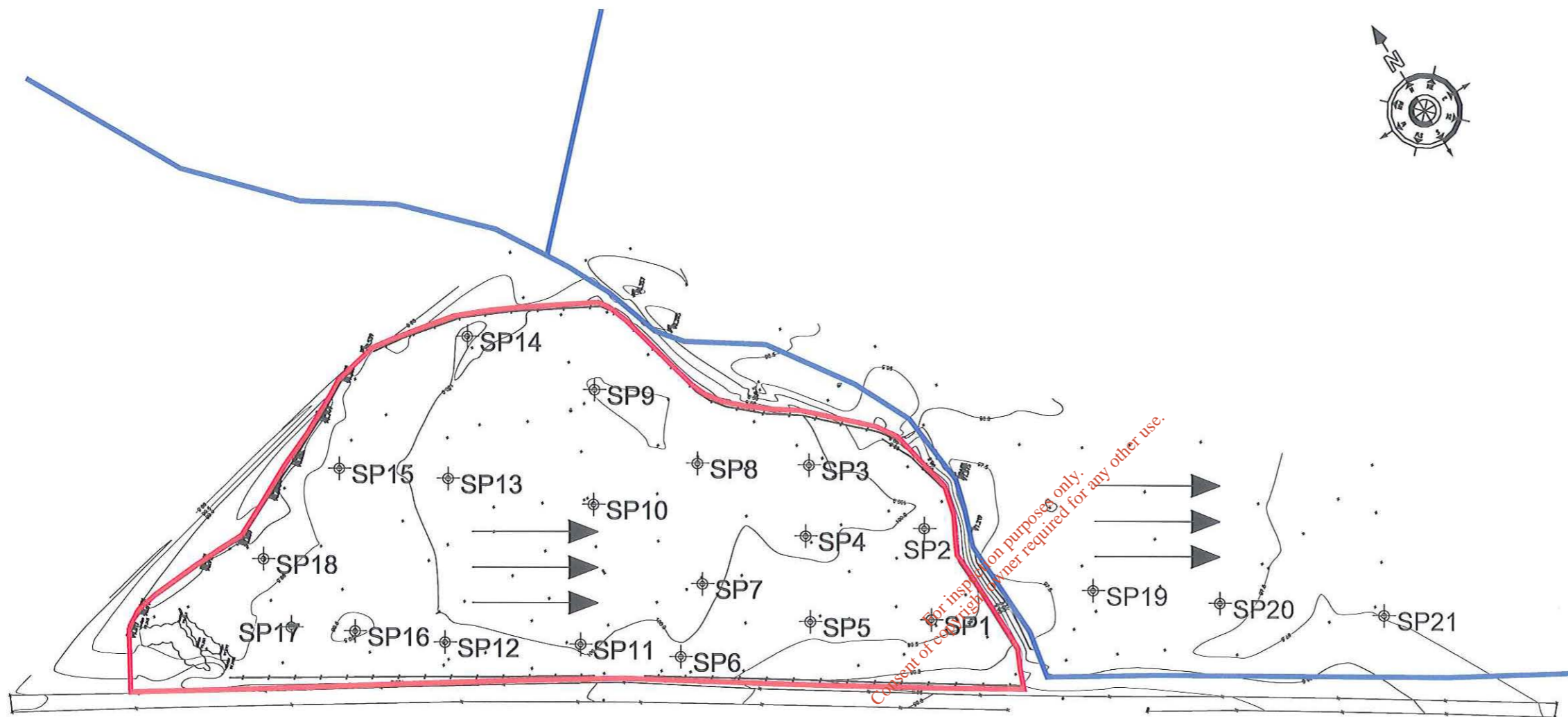
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RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE  
CROSS SECTION OF WASTE DEPOSITED  
ON THE SITE

SCALE	DRAWN	CHECKED	APPROVED
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	DATE	DATE	DATE
	NOVEMBER 2010	NOVEMBER 2010	NOVEMBER 2010

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10-198-012	





GROUND WATER SAMPLING POINTS  
SCALE 1:1000

NOTES

- OPEN DRAINS
- SITE BOUNDARY
- ⊕ SP1 GROUND WATER SAMPLING POINT
- GROUND WATER FLOW DIRECTION

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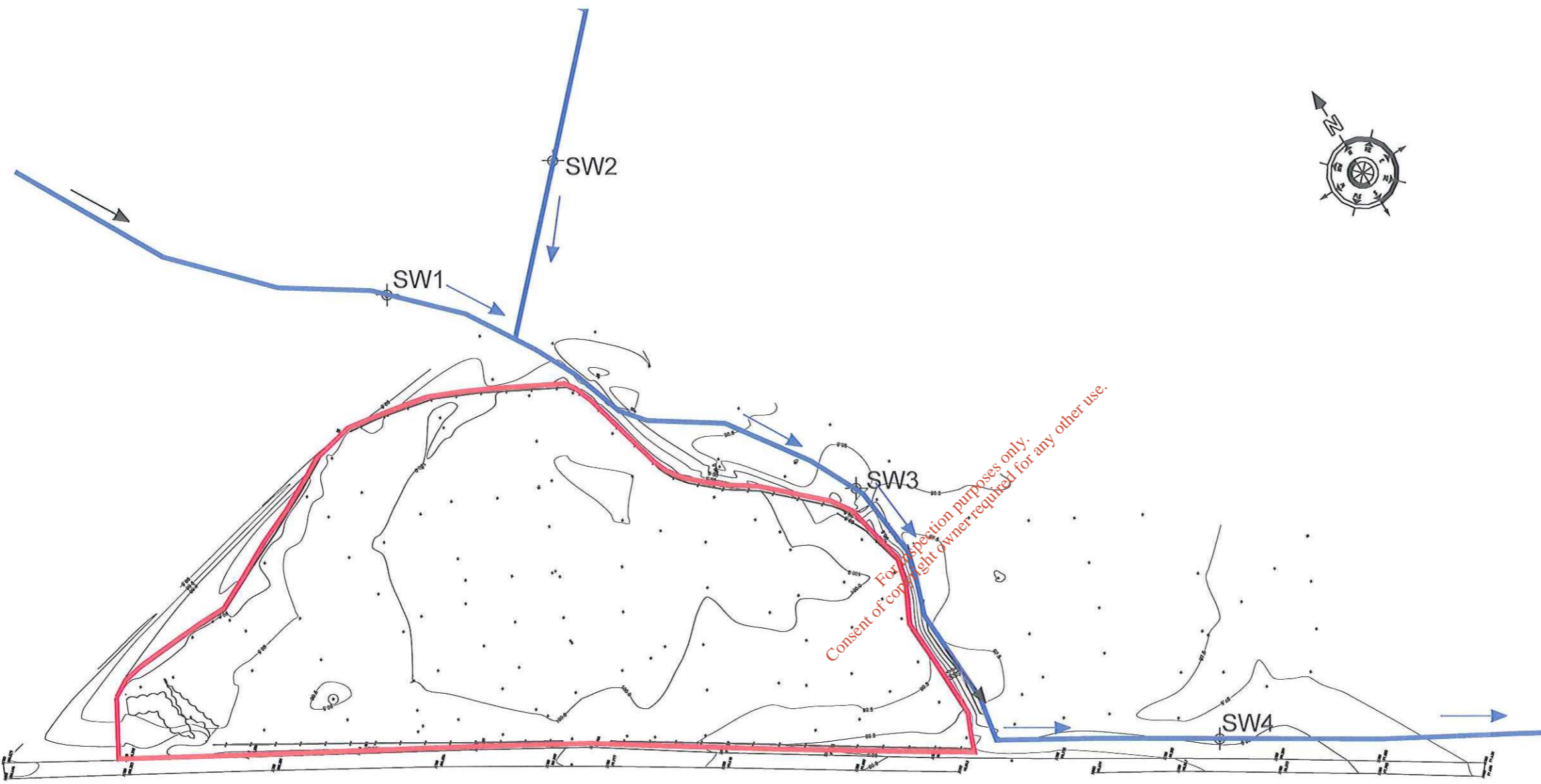
DRAWING TITLE  
 GROUNDWATER MONITORING LOCATIONS

SCALE	DRAWN	CHECKED	APPROVED
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10-198-013	



NOTES



- OPEN DRAINS
- SITE BOUNDARY
- ⊙ SW1 SURFACE WATER MONITORING POINT
- SURFACE WATER FLOW DIRECTION

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**SURFACE WATER MONITORING POINTS**  
SCALE 1:1000

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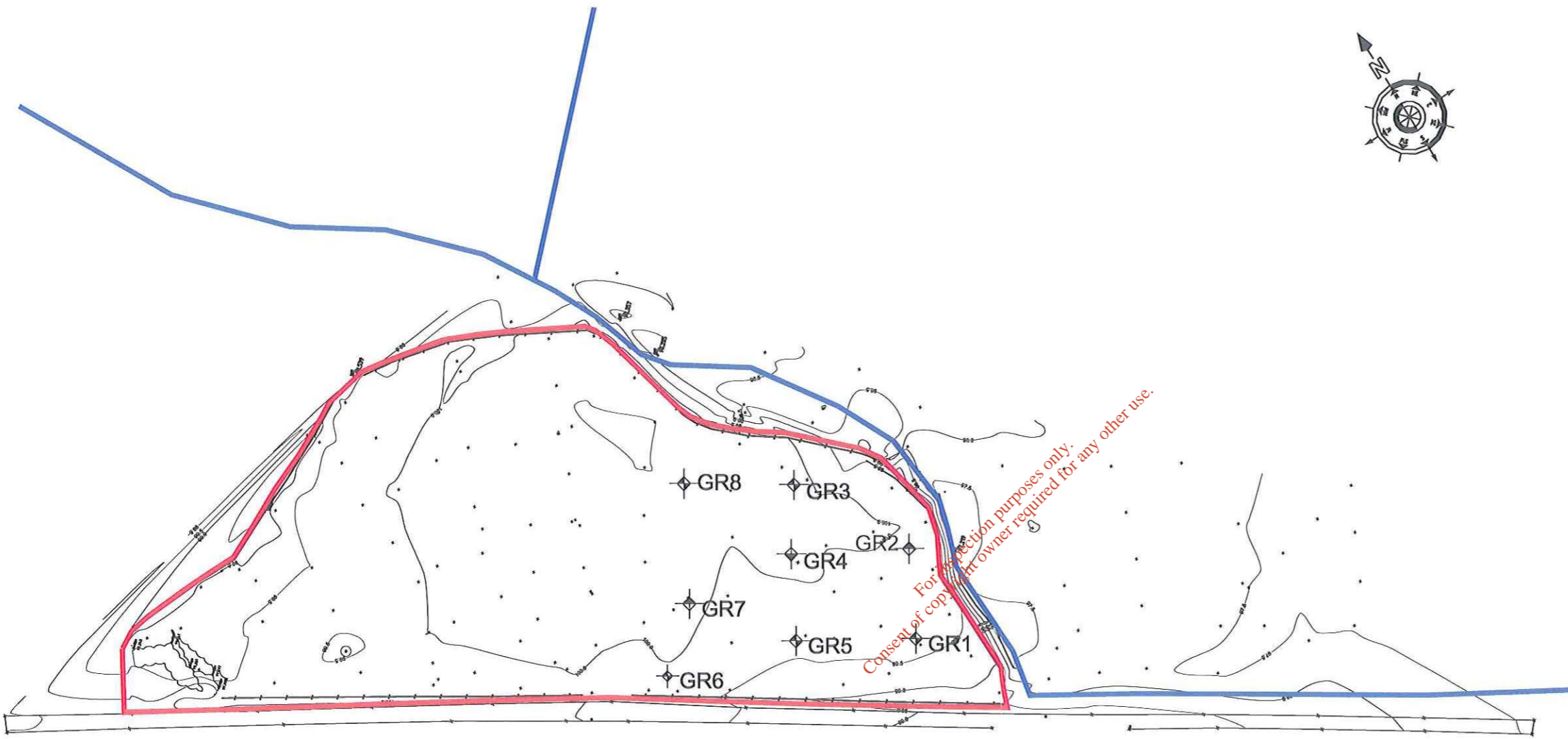
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NOTES



- OPEN DRAINS
- SITE BOUNDARY
- ◆ GR1 GAS RECORDING POINT

**GAS RECORDING POINTS**  
SCALE 1:1000

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DRAWING TITLE  
 GAS RECORDING POINT

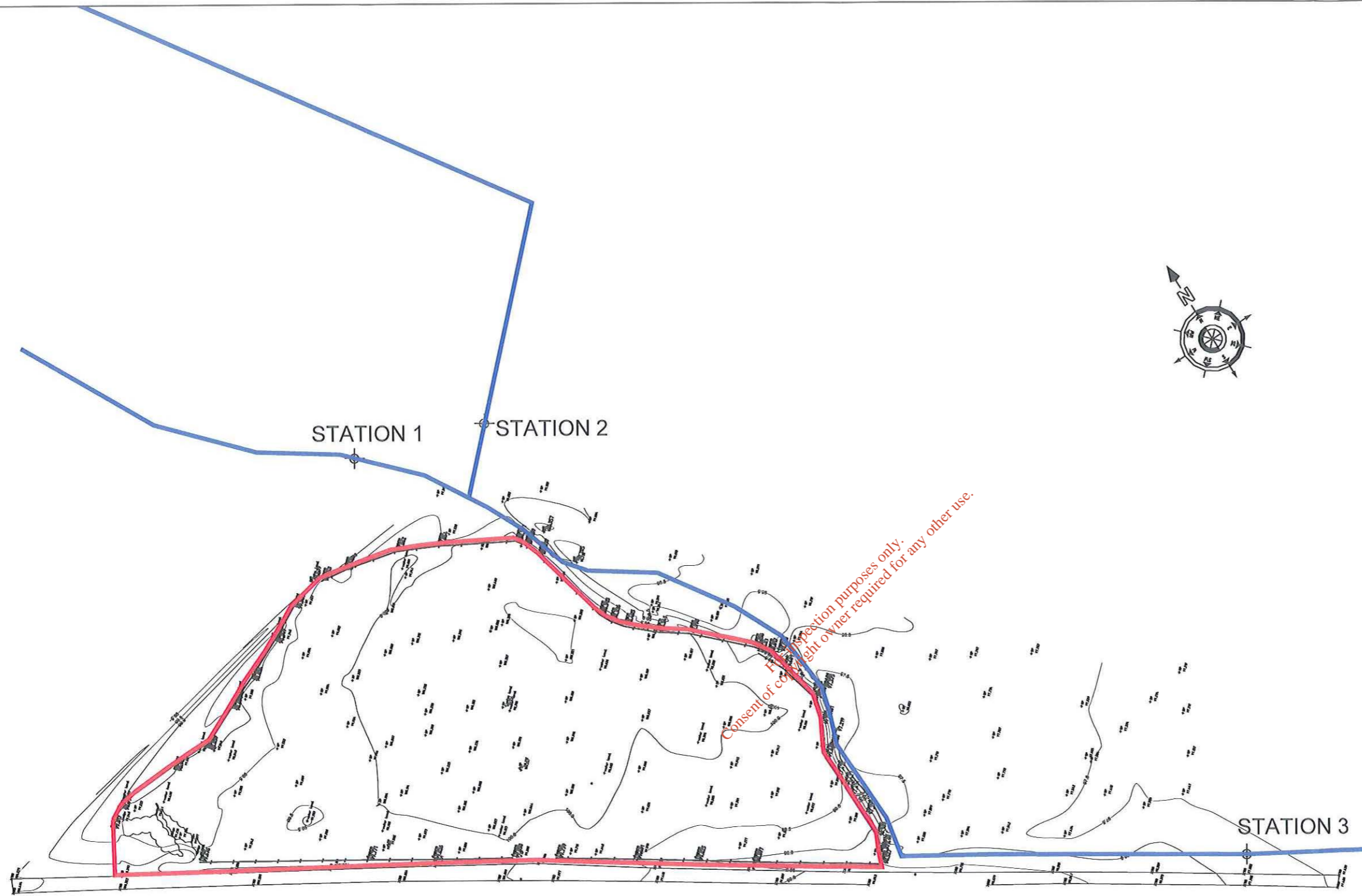
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	DATE	DATE	DATE
	NOVEMBER 2010	NOVEMBER 2010	NOVEMBER 2010

DRAWING No.	REV.
10-198-015	



NOTES

- OPEN DRAINS
- SITE BOUNDARY
- ⊕ STATION 1 Q VALUE MONITORING POINT



Q-VALUE MONITORING POINTS  
SCALE 1:1000

REV.	DATE	DESCRIPTION	APPROVED

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CAVAN COUNTY COUNCIL

PROJECT TITLE  
SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT RANTAVAN, MULLAGH, CO CAVAN

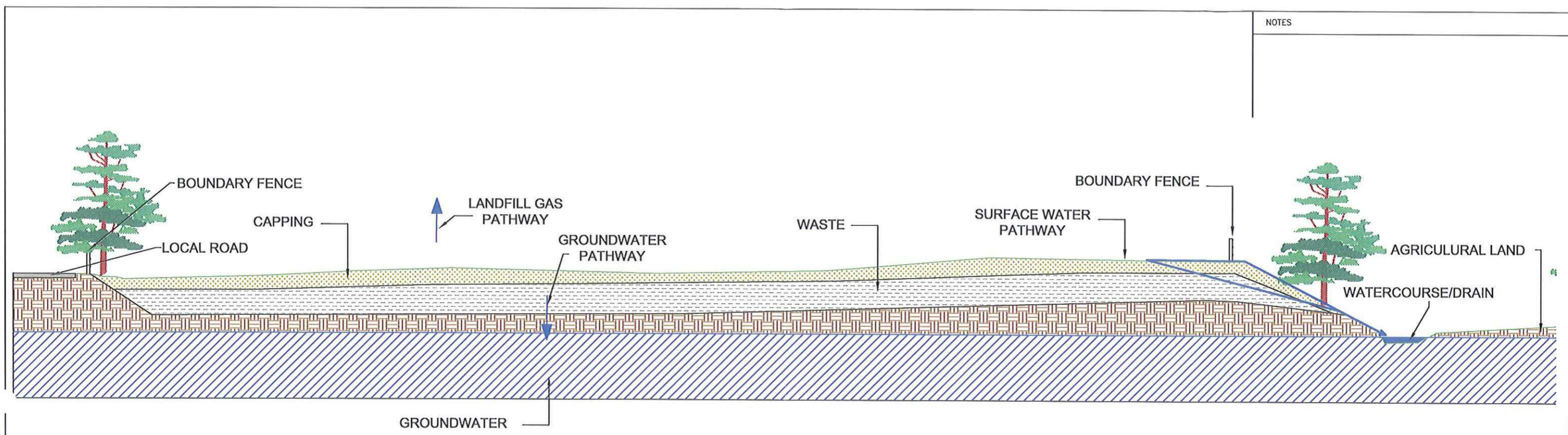
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	DATE	DATE	DATE
	NOVEMBER 2010	NOVEMBER 2010	NOVEMBER 2010

DRAWING No.	REV.
10-198-016	










NOTES



CONCEPT MODEL  
SCALE 1:200

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-  LANDFILL WASTE SOURCE
-  PATHWAY
-  EVIDENT PATHWAY
-  RECEPTOR (GROUNDWATER)
-  RECEPTOR (STREAM)
-  CAPPING
-  EXISTING SUBSOIL

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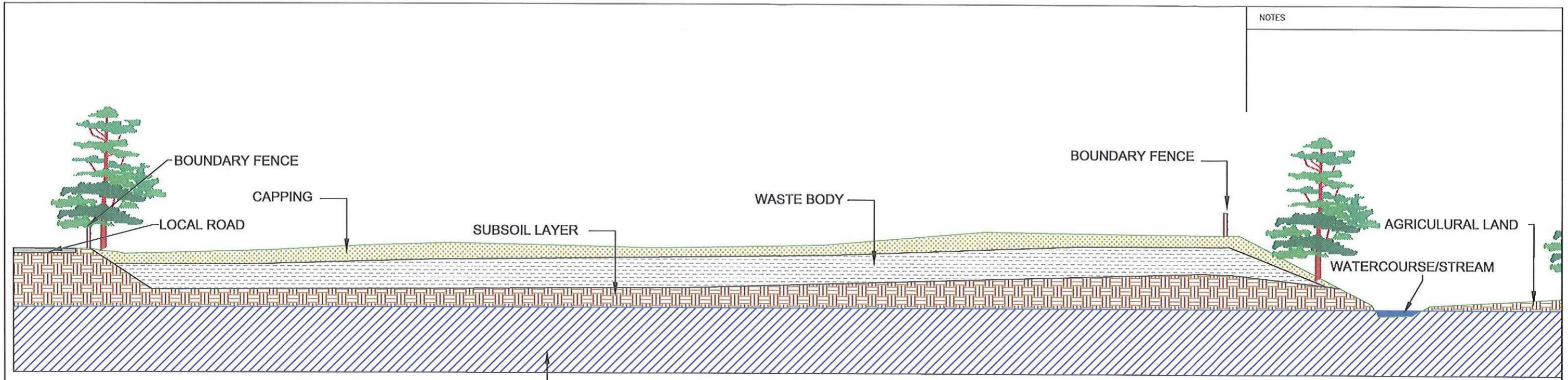
PROJECT TITLE  
SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE  
CONCEPT MODEL OF THE SITE

SCALE	DRAWN	CHECKED	APPROVED
1:200	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2010	NOVEMBER 2010	NOVEMBER 2010

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10-198-017	










NOTES

CROSS SECTION OF WASTE  
SCALE 1:200

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-  LANDFILL WASTE SOURCE
-  EXISTING SUBSOIL
-  GROUNDWATER
-  WATERCOURSE / DRAIN
-  CAPPING

REV.	DATE	DESCRIPTION	APPROVED

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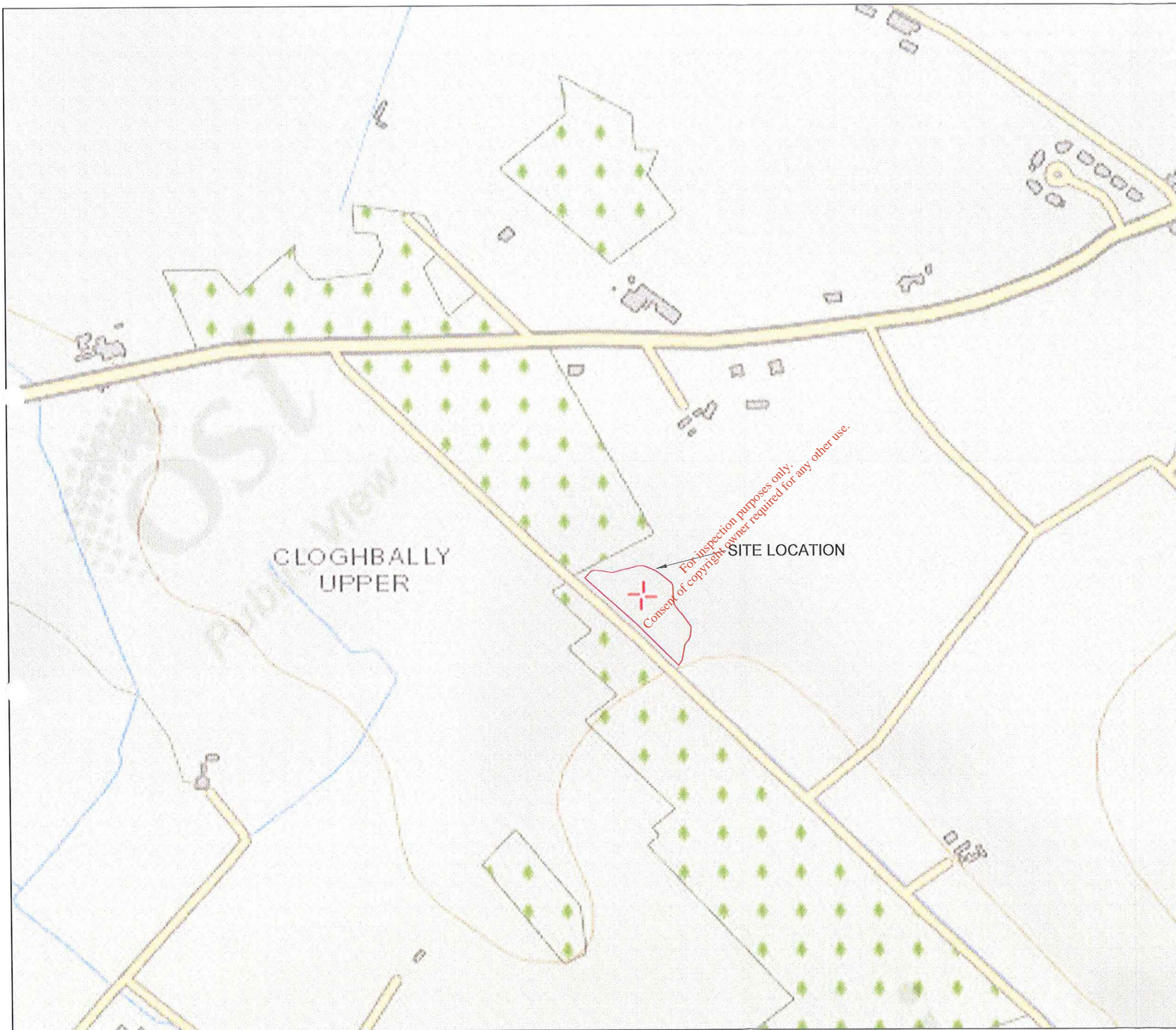
PROJECT TITLE  
SITE INVESTIGATION & RISK ASSESSMENT  
OF EXISTING LANDFILL SITE AT  
RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE  
INITIAL CONCEPTUAL MODEL

SCALE	DRAWN	CHECKED	APPROVED
1:200	PAURIC LOUGHLIN	PAURIC JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
	July 2012	July 2012	July 2012

DRAWING No.	REV.
10-198-018	





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PROJECT TITLE  
SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE  
SITE LOCATION MAP

SCALE	DRAWN	CHECKED	APPROVED
1:5000	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
			July 2012

DRAWING No.	REV.
10-198-019	





NOTES

— OPEN DRAINS

LEGEND  
 AREA OF GROUND TO BE REMEDIATED

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PROJECT TITLE  
 SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT RANTAVAN, MULLAGH, CO CAVAN

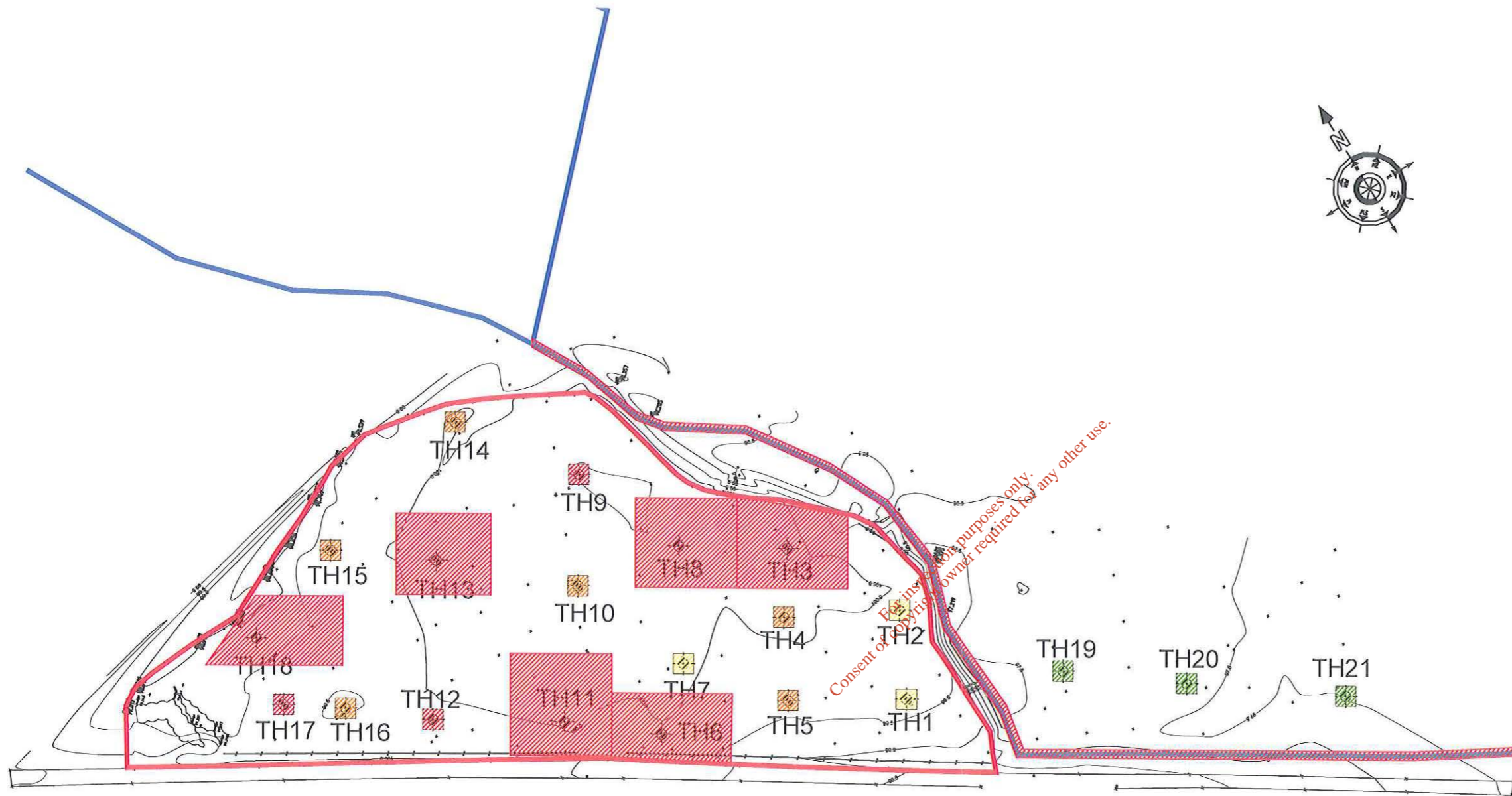
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 CONTAMINATED SOIL AND WASTE TO BE REMEDIATED

SCALE	DRAWN	CHECKED	APPROVED
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	DATE	DATE	DATE

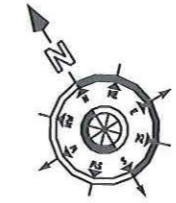
DRAWING No.	REV.
10-198-020	



NOTES



-  TH1 TRIAL HOLE LOCATION
-  SITE BOUNDARY
-  CONTAMINATED SOIL AND WASTE TO BE REMOVED



TRIAL HOLE LOCATION  
SCALE 1:1000

REV.	DATE	DESCRIPTION	APPROVED

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PROJECT TITLE  
 SITE INVESTIGATION & RISK ASSESSMENT  
 OF EXISTING HISTORIC LANDFILL SITE AT  
 RANTAVAN, MULLAGH, CO CAVAN

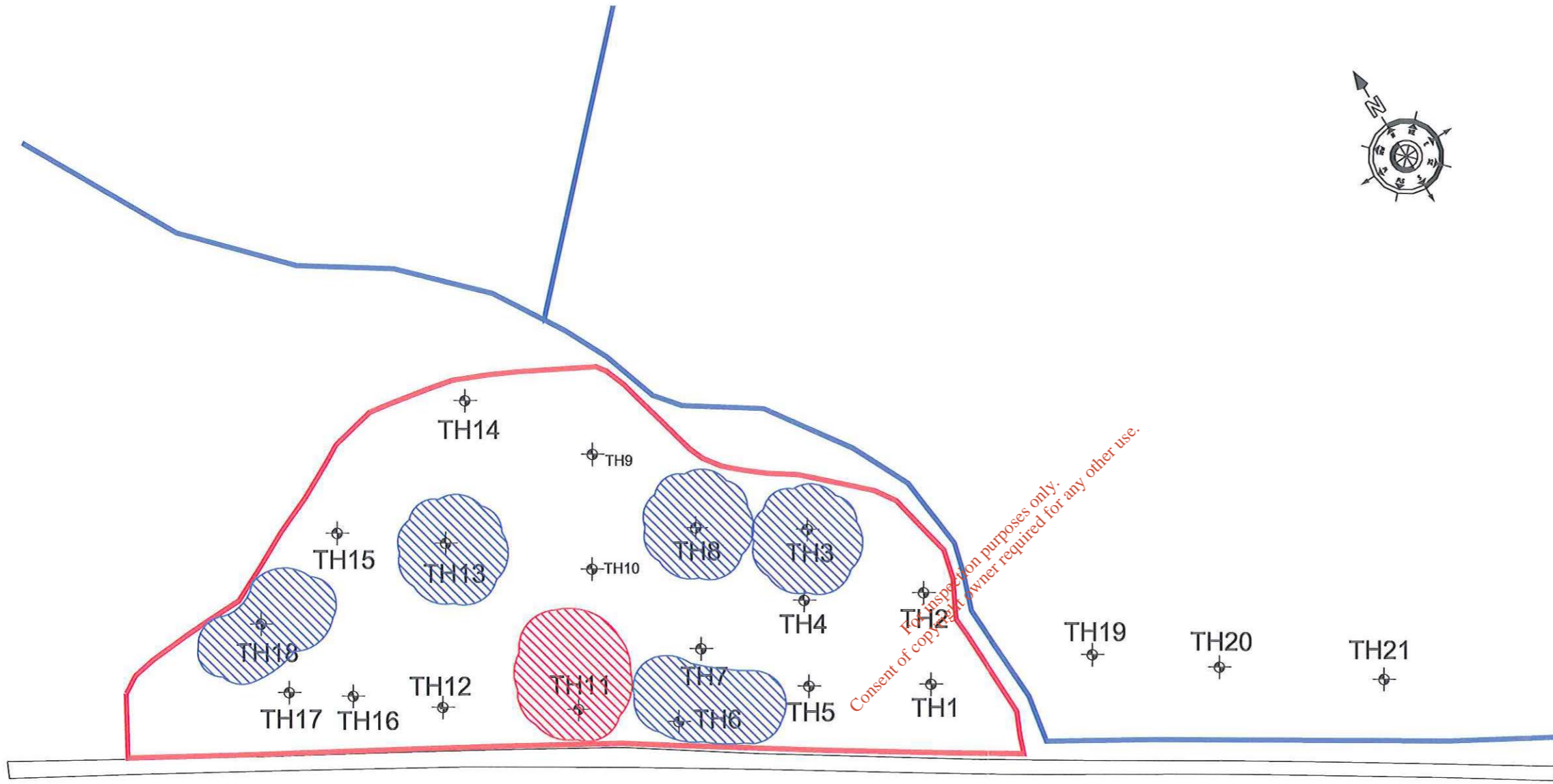
DRAWING TITLE  
 CONTAMINATED SOIL AND WASTE  
 TO BE REMOVED OF SITE

SCALE	DRAWN	CHECKED	APPROVED
1:1000	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE

DRAWING No.	REV.
10-198-021	



NOTES



- ⊕ TH1 TRIAL HOLE LOCATION
- OPEN DRAINS
- SITE BOUNDARY
- ▨ CONTAMINATED GROUNDWATER TO BE TREATED ON SITE THROUGH A INTERCEPTOR
- ▨ CONTAMINATED GROUNDWATER TO BE REMOVED TO RILTA

CONTAMINATED GROUNDWATER TO BE TREATED  
SCALE 1:1000

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PROJECT TITLE  
 SITE INVESTIGATION & RISK ASSESSMENT  
 OF EXISTING HISTORIC LANDFILL SITE AT  
 RANTAVAN, MULLAGH, CO CAVAN

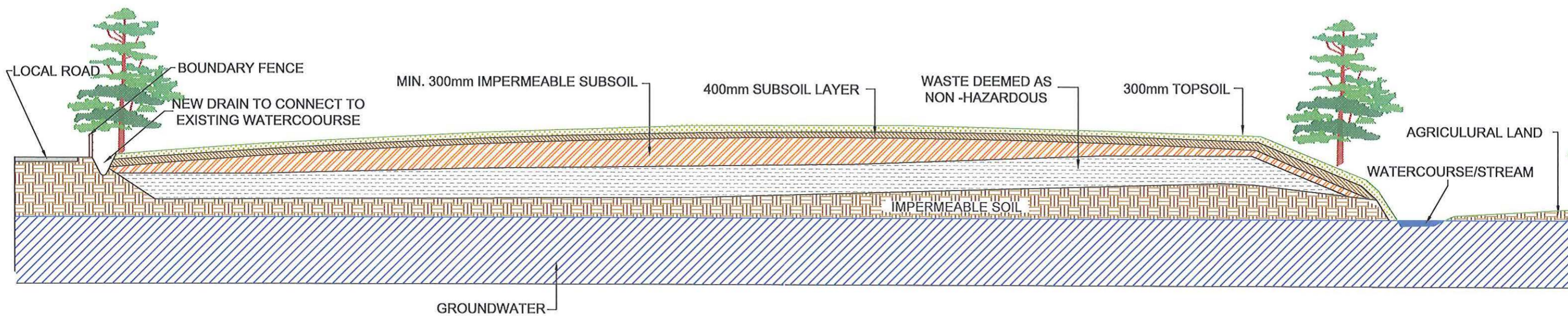
DRAWING TITLE  
 GROUNDWATER  
 TO BE TREATED ON SITE  
 AND WASTE REMOVED TO RILTA

SCALE	DRAWN	CHECKED	APPROVED
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	DATE	DATE	DATE

DRAWING No.	REV.
10.198.022	

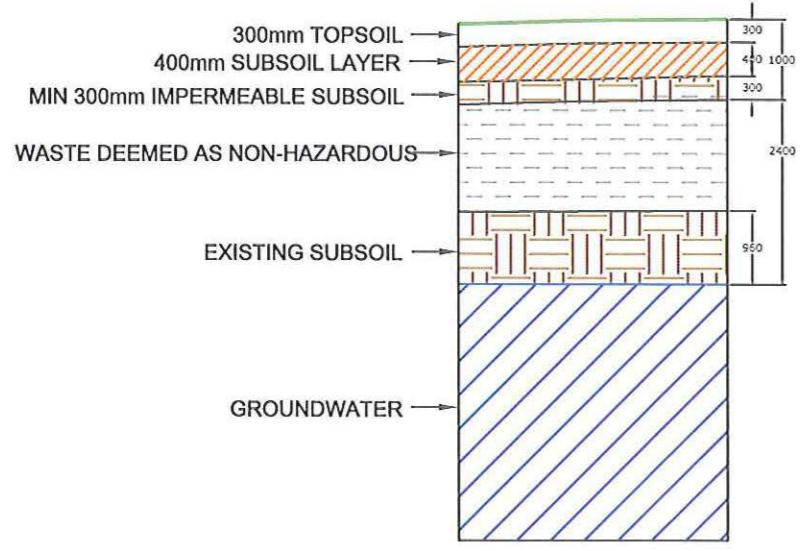


NOTES



CROSS SECTION OF CAPPING  
SCALE 1:200

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CROSS SECTION OF WASTE  
SCALE 1:100

- LANDFILL WASTE SOURCE
- EXISTING SUBSOIL
- GROUNDWATER
- WATERCOURSE / DRAIN
- CAPPING
- SUBSOIL
- IMPERMEABLE SUBSOIL

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PROJECT TITLE  
SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE  
CAPPING CROSS SECTION FOR THE EXISTING HISTORIC LANDFILL SITE

SCALE	DRAWN	CHECKED	APPROVED
See DWG	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE

DRAWING No.	REV.
10.198.023	



# LANDSCAPE MASTERPLAN

NOTES

## PLANTING LEGEND

Trees suitable for 2m wide screening belt along road to front of the site and fenced boundary to the east. (\* indicates native species)

### Tall/Medium trees

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 (conifer)</i>	7	visually attractive tree, grows well on poor exposed sites

### Small trees

No.	Species	Height at year 20(m)	Remarks
5	Holly* <i>Illex 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	Rowan* (mountain ash) <i>Sorbus aucuparia</i>	6	hardy tree suitable for exposed site, good for wildlife
8	Goat willow <i>Salix caprea</i>	4	associated with damp conditions

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

### Tall/Medium & Small trees

No.	Species	Height at year 20(m)	Remarks
1	Aspen* <i>Populus tremula</i>	8	grows well on poorer soils, suckers readily and tends to form groves of trees
2	Common Whitebeam* <i>Sorbus aria</i>	6	tolerant of exposed and coastal sites, attractive amenity tree
3	Green alder <i>Alnus viridis</i>	2	
4	European larch <i>Larix decidua</i>	8	high amenity and wildlife value,

## 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

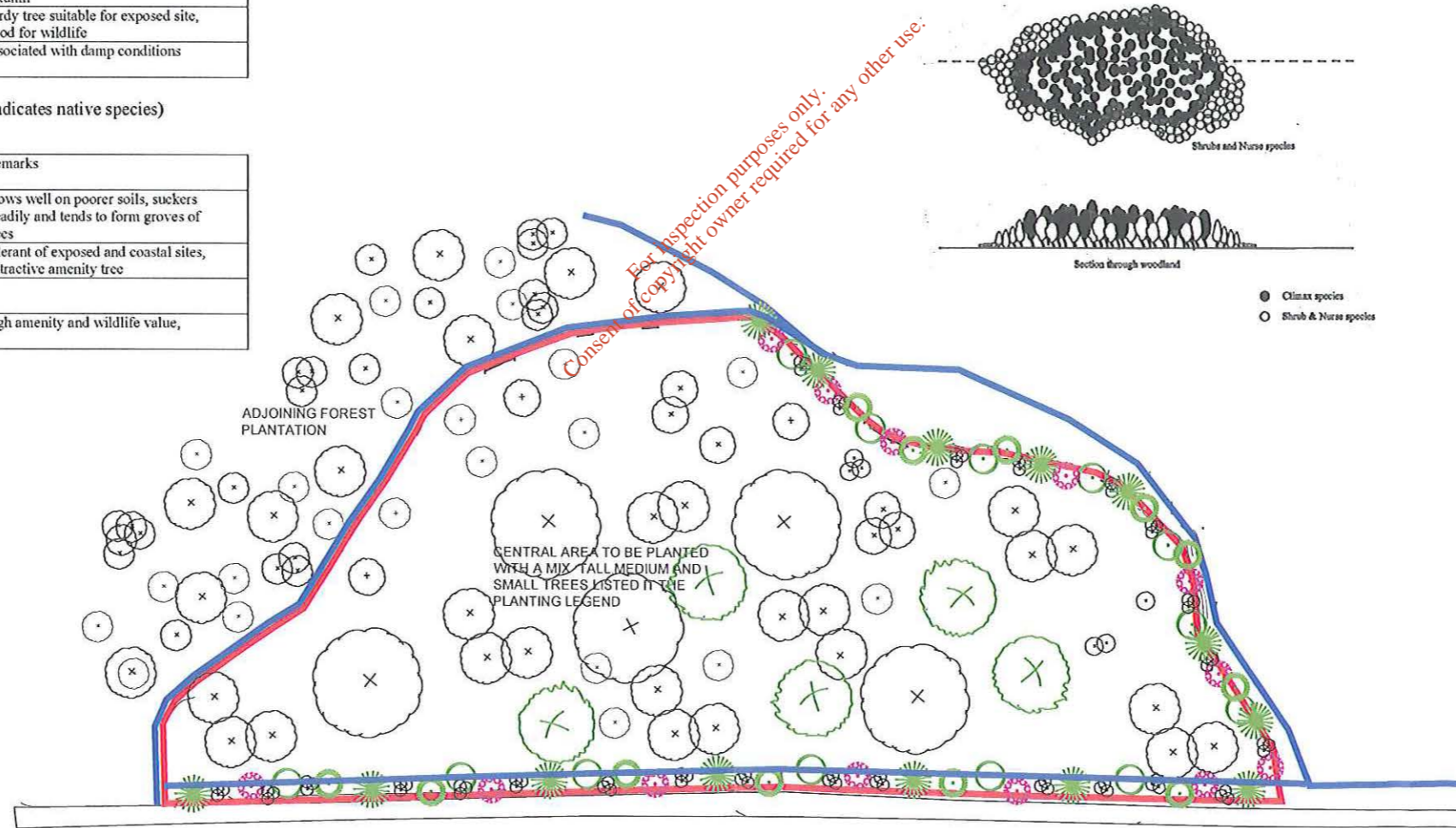
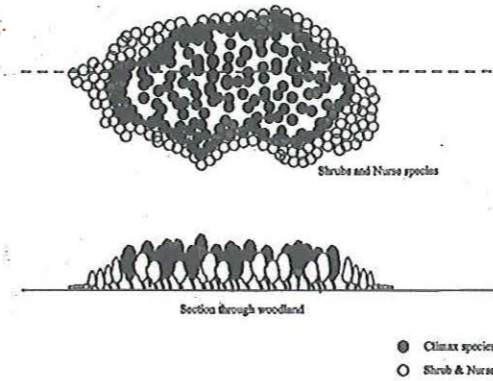
- Small trees marked 5-8 should be inter planted among the larger trees marked 1-4

- 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 Manual


-  OPEN DRAINS
-  SITE BOUNDARY
-  LANDSCAPE SYMBOLS

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

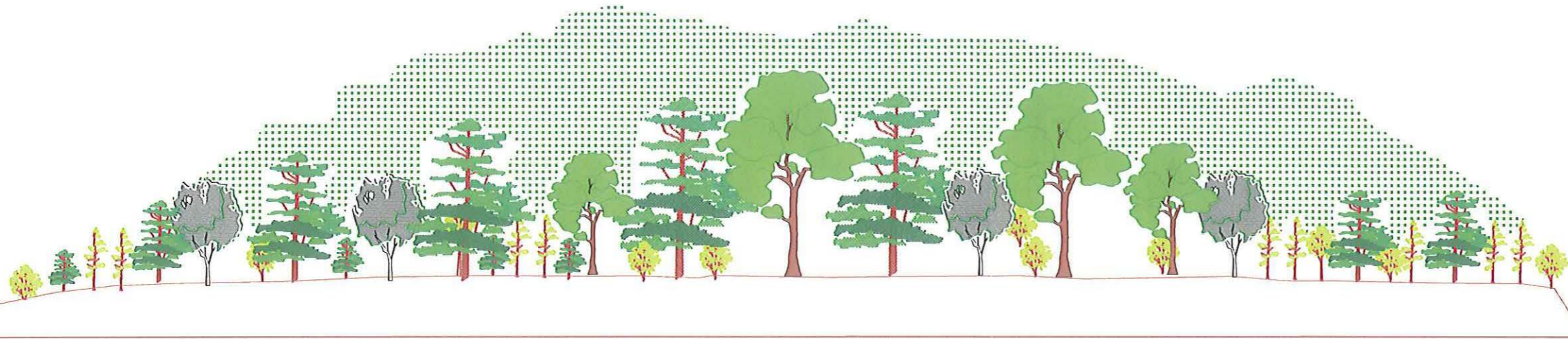


PROPOSED LANDSCAPE LAYOUT

SCALE 1:1000  
SITE AREA: 0.7 HECTARES

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CLIENT		CAVAN COUNTY COUNCIL	
PROJECT TITLE			
SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT RANTAVAN, MULLAGH, CO CAVAN			
DRAWING TITLE			
PROPOSED LANDSCAPE PLAN FOR THE EXISTING HISTORIC LANDFILL SITE			
SCALE	DRAWN	CHECKED	APPROVED
1:1000	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
			July 2012
DRAWING No.			REV.
10.198.024			

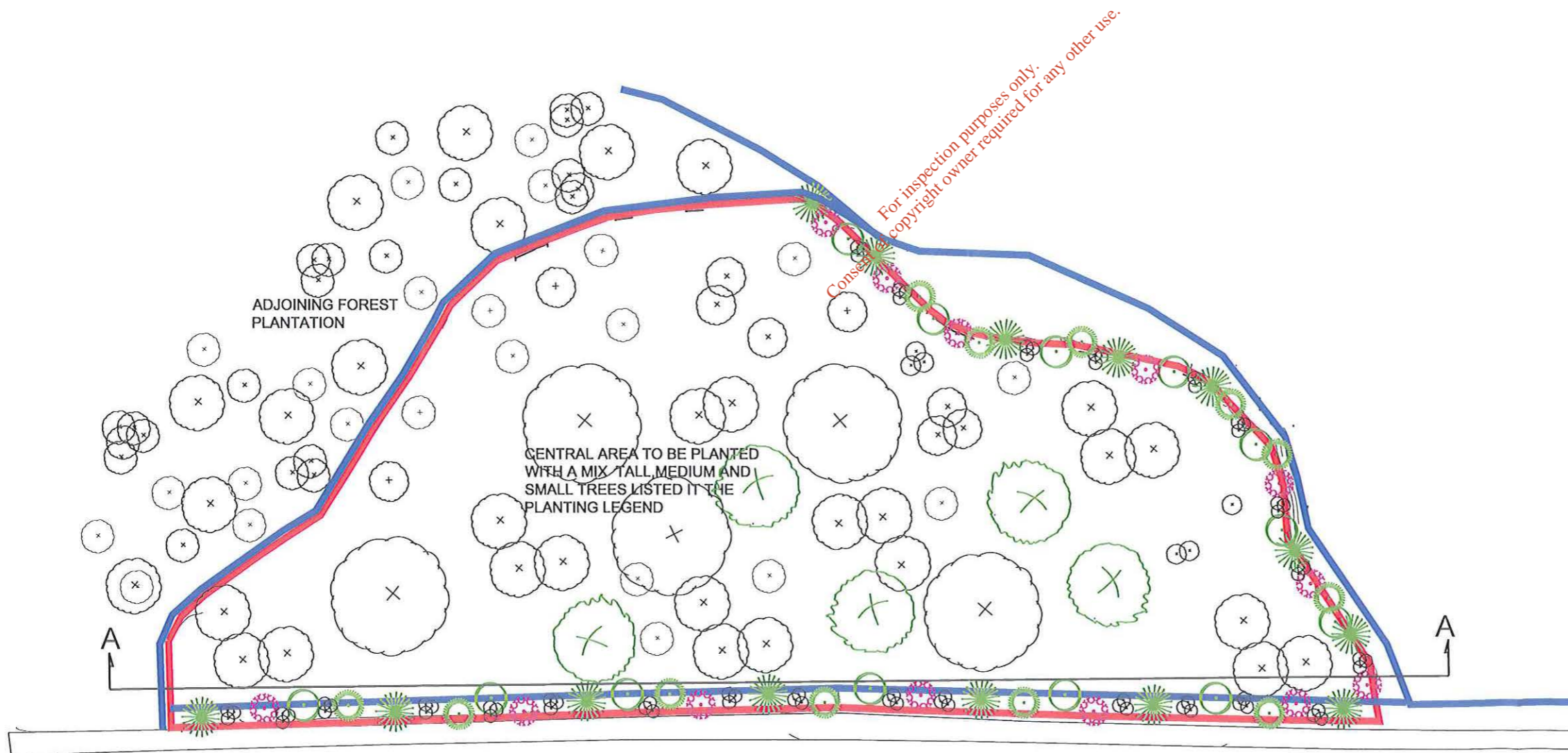




- OPEN DRAINS
- SITE BOUNDARY
- LANDSCAPE SYMBOLS

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

A-A CROSS SECTION OF PROPOSED LANDSCAPE  
SCALE 1:500



A-A CROSS SECTION OF PROPOSED LANDSCAPE  
DATE

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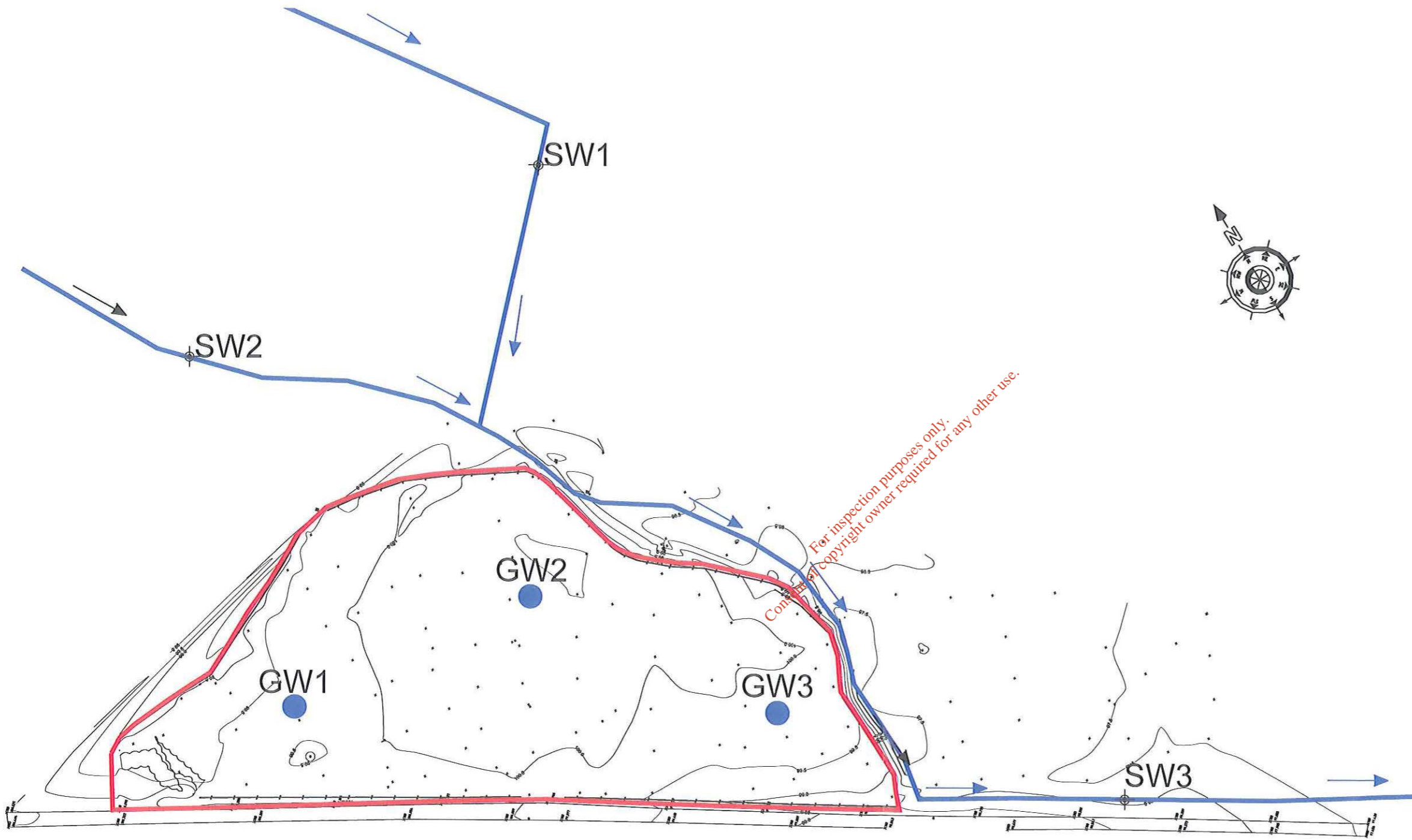
PROJECT TITLE  
 SITE INVESTIGATION & RISK ASSESSMENT  
 OF EXISTING HISTORIC LANDFILL SITE AT  
 RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE  
 PROPOSED LANDSCAPE CROSS SECTION  
 FOR THE EXISTING HISTORIC LANDFILL SITE

SCALE	DRAWN	CHECKED	APPROVED
NTS	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
			July 2012

DRAWING No.	REV.
10.198.025	





**PROPOSED SURFACE AND GROUNDWATER MONITORING POINTS**  
SCALE 1:1000

NOTES

- OPEN DRAINS
- SITE BOUNDARY
- ⊕ SW1 SURFACE WATER MONITORING POINT
- GW1 SURFACE WATER MONITORING POINT
- ➔ SURFACE WATER FLOW DIRECTION



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PROJECT TITLE  
**SITE INVESTIGATION & RISK ASSESSMENT OF EXISTING HISTORIC LANDFILL SITE AT RANTAVAN, MULLAGH, CO CAVAN**

DRAWING TITLE  
**PROPOSED GROUNDWATER AND SURFACE WATER MONITORING POINTS**

SCALE	DRAWN	CHECKED	APPROVED
1:1000	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE

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