

## Water Framework Directive Groundwater Monitoring Programme

### Site Information **Conna PWS**



Conna PWS is a borehole used as a public water supply. The abstraction rate is 552m<sup>3</sup>/day. A GSI source report has been completed.



Cork

**August 2011**

| SITE INFORMATION                  |                      |  |                                 |                    |                       |
|-----------------------------------|----------------------|--|---------------------------------|--------------------|-----------------------|
| Site Name:                        | Conna PWS            |  | County:                         | Cork               |                       |
| RBD:                              | SWRBD                |  | EU Reporting Code:              | IE_SW_G_074_04_011 |                       |
| Easting:                          | 191887               |  | GWB Name:                       | Tallow             |                       |
| Northing:                         | 93391                |  | GWB Code:                       | IE_SW_G_074        |                       |
| Site Use:                         | Drinking Water (PWS) |  | Drinking Water Code:            | 0500PUB1205        |                       |
| Hydrometric Area:                 | 18                   |  | Water Level Monitoring Network: | Level              | Flow                  |
| Townland:                         | KILCLARE UPPER       |  |                                 | N                  | N                     |
| Ownership:                        | Cork County Council  |  |                                 |                    |                       |
| Water Quality Monitoring Network: | Surveillance         |  | Operational (Point)             |                    | Operational (Diffuse) |
|                                   | N                    |  | N                               |                    | Y                     |
| Site Comments:                    | ---                  |  |                                 |                    |                       |

| SITE DIRECTIONS                  |   |
|----------------------------------|---|
| Location and Access Information: | Conna village borehole is about 600 m to the west of the village behind an old farmhouse off the R628. The borehole is located inside a small concrete bunker next to the pumphouse situated inside a fenced area of 25 m2. |
| Additional Comments:             | ---   |

| WELL INFORMATION               |  |   |     |                                    |      |
|--------------------------------|--|---|-----|------------------------------------|------|
| Monitoring Point Type:         | BH   | Abstraction Rate (m³/d):                    | 552 | Ground Elevation (m OD):           | 20   |
| Borehole Log Available:        | ---  | Total Drilled Depth (m bgl):                | 30  | Depth to Bedrock (m bgl):          | 10.7 |
| Top of Casing (m agl):         | ---  | Upper Casing Diameter (mm):                 | 200 | Lower Casing Diameter (mm):        | ---  |
| Final Borehole Depth (m):      | Screened to Bedrock 11m  | Upper Casing Bottom Depth (m bgl) :         | --- | Lower Casing Bottom Depth (m bgl): | ---  |
| Screen Interval (m bgl):       | ---  | Screen Type (PVC,Steel,other):              | --- | Screen Slot Size (mm):             | ---  |
| Grout Type (cement,bentonite): | ---  | Grouted above (m bgl):                      | --- | Grout Volume Injected (m³):        | ---  |
| Gravel Pack Interval (m bgl):  | ---  | Gravel Pack Volume (m³):                    | --- | Open Hole Interval (m bgl):        | ---  |
| Potential Yield (m³/day):      | ---  | Comments on Monitoring Site:                | --- |                                    |      |
| Specific Capacity (m³/d/m):    | ---  |   |     |                                    |      |
| Static Water Level (m bgl):    | 22.34  |   |     |                                    |      |
| Scheme Name:                   | Conna  | Number of Abstraction Points in the Scheme: | 1   | Source Report Available            | Y    |
| Source Report Info:            | Source report prepared by GSI in 2000.   |   |     |                                    |      |
| Scheme Summary:                | Conna village borehole is about 600 m to the west of the village behind an old farmhouse. The borehole is located inside a small concrete bunker next to the pumphouse situated inside a fenced area of 25 m2. |   |     |                                    |      |

| HYDROGEOLOGY   |                           |  |   |  |                            |                       |              |
|--|---------------------------|--|---|--|----------------------------|-----------------------|--------------|
| GEOLOGY  | Soil:                     | Deep well drained mineral (AminDW)   |   |  |                            | Subsoil Permeability: | Moderate     |
|  | Subsoil:                  | Tills (diamictos) (TDSs)   |   |  |                            |                       |              |
|  | Bedrock:                  | Dinantian Pure Unbedded Limestones   |   |  |                            |                       |              |
| HYDROGEOLOGY   | Aquifer Category:         | Rkd  | Vulnerability at Monitoring site:       | High to Low  | Flow Regime:               | Karstified            |              |
| ZONE OF CONTRIBUTION                                 | Estimated ZOC Size (km²): | 1.33   | ZOC Delineated By:                      | GSI  | Recharge Estimate (mm/yr): | 300                   |              |
|  | ZOC Delineation Comments: | The GSI delineated a ZOC based on abstraction, recharge, topography and hydrogeological characteristics of the area. See the source report for details. ZOC allows for 150% increase in abstraction. Recharge take from source report. |   |  |                            |                       |              |
| Groundwater Vulnerability within ZOC (% area):       | Extreme (X)               | Extreme (E)  | High                                    | Moderate   | Low                        | High to Low           | Unclassified |
|  | 7.55                      | 31.83  | 0                                       | 0  | 0                          | 60.62                 | 0            |
| HYDROCHEMISTRY                                       |                           |  |   |  |                            |                       |              |
| Hydrochemical Signature:                             | Ca-HCO3                   |  | Additional Water Chemistry Information: | During the monitoring period: The average nitrate concentration was 40 mg/l NO3 and the maximum nitrate concentration was 55 mg/l NO3. The average ammonium concentration was 0.015 mg/l N and the maximum ammonium concentration was 0.079 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.009 mg/l P and the maximum MRP concentration was 0.038 mg/l P. The average chloride concentration was 20.9 mg/l Cl and the maximum chloride concentration was 28 mg/l Cl. |                            |                       |              |
| Alkalinity (mg/l HCO3):                              | Average:                  | Range:   |   |  |                            |                       |              |
|  | 184                       | 61-283   |   |  |                            |                       |              |
| Hardness (mg/l CaCO3):                               | Average:                  | Range:   |   |  |                            |                       |              |
|  | 230                       | 126-330  |   |  |                            |                       |              |
| Conductivity (uS/cm):                                | Average:                  | Range:   |   |  |                            |                       |              |
|  | 455                       | 126-632  |   |  |                            |                       |              |
| Monitoring Record Period:                            | From:                     | To:  |   |  |                            |                       |              |
|  | 1995                      | 2010   |   |  |                            |                       |              |
| RISK ASSESSMENT                                      |                           |  |   |  |                            |                       |              |
| Pressure (e.g., Nitrates, Phosphates, Abstractions): | Diffuse                   |  | Typical Contaminants:                   | Nitrate  |                            |                       |              |
| Risk Category:                                       | At risk, high confidence  |  | GWB Status:                             | Good   |                            |                       |              |
| Impact Potential within ZOC (% area):                | Extreme:                  | High:  | Moderate:                               | Low:   | Negligible:                |                       |              |
|  | 0.00                      | 100.00   | 0.00                                    | 0.00   | 0.00                       |                       |              |
| OTHER INFORMATION                                    |                           |  |   |  |                            |                       |              |
| ---  |                           |  |   |  |                            |                       |              |



Borehole Housing



Borehole



Sampling Point



## Data Summary Sheet - July 2011

**Disclaimer:** The data in this document are based on the best available information and understanding at time of writing. Neither the Environmental Protection Agency, nor the individual bodies supplying data for this document and accompanying maps will be responsible for any loss or damage from the use or interpretation of these data.

**Rock Unit Geology Map:** GSI, 2009

**Aquifer Type Map:** GSI, 2009

**Groundwater Vulnerability Map:** GSI, 2009

**Soils & Subsoils Type:** Teagasc, 2007

**Recharge Map:** GSI, 2009

**Impact Potential Map:** EPA, 2009

**Risk Assessment Map:** EPA WFD Risk Assessment, 2006

**Groundwater Body Status:** EPA WFD Status Assessment, 2008

**Water Quality Data:** EPA WFD Monitoring, 2008

### Groundwater Threshold Values

Groundwater threshold values for selected parameters:

Nitrate - General Chemical Test/ Drinking Water Test (37.5 mg/l N03)

Ammonium - Drinking Water Test (0.175 mg/l N) / Surface Water Test (0.065 mg/l N)

Molybdate Reactive Phosphorus (MRP) - Surface Water Test (0.035 mg/l P)

Chloride -Saline/Intrusive Test (24 mg/l) / Drinking Water Test (175 mg/l Cl)

Electrical Conductivity -Saline/Intrusive Test (800 µS/cm) / Drinking Water Test (1,875 µS/cm)

Further information on groundwater threshold values is contained in the Groundwater Regulations (S.I. No.9 of 2010).

### General Downgradient Distances

General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

|             |       |
|-------------|-------|
| Rk, Rkd, Lk | 225 m |
| Lm          | 150 m |
| LI, PI      | 60 m  |

It is assumed that groundwater downgradient of a spring cannot flow back up to the spring, however a precautionary 30m buffer is generally applied which allows for instances where pumping under dry weather periods may induce a drawdown or where the ground may be sloping toward the spring from the downgradient side.

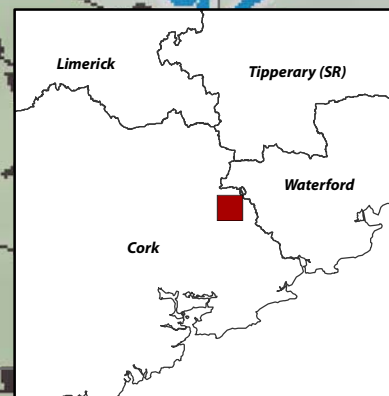
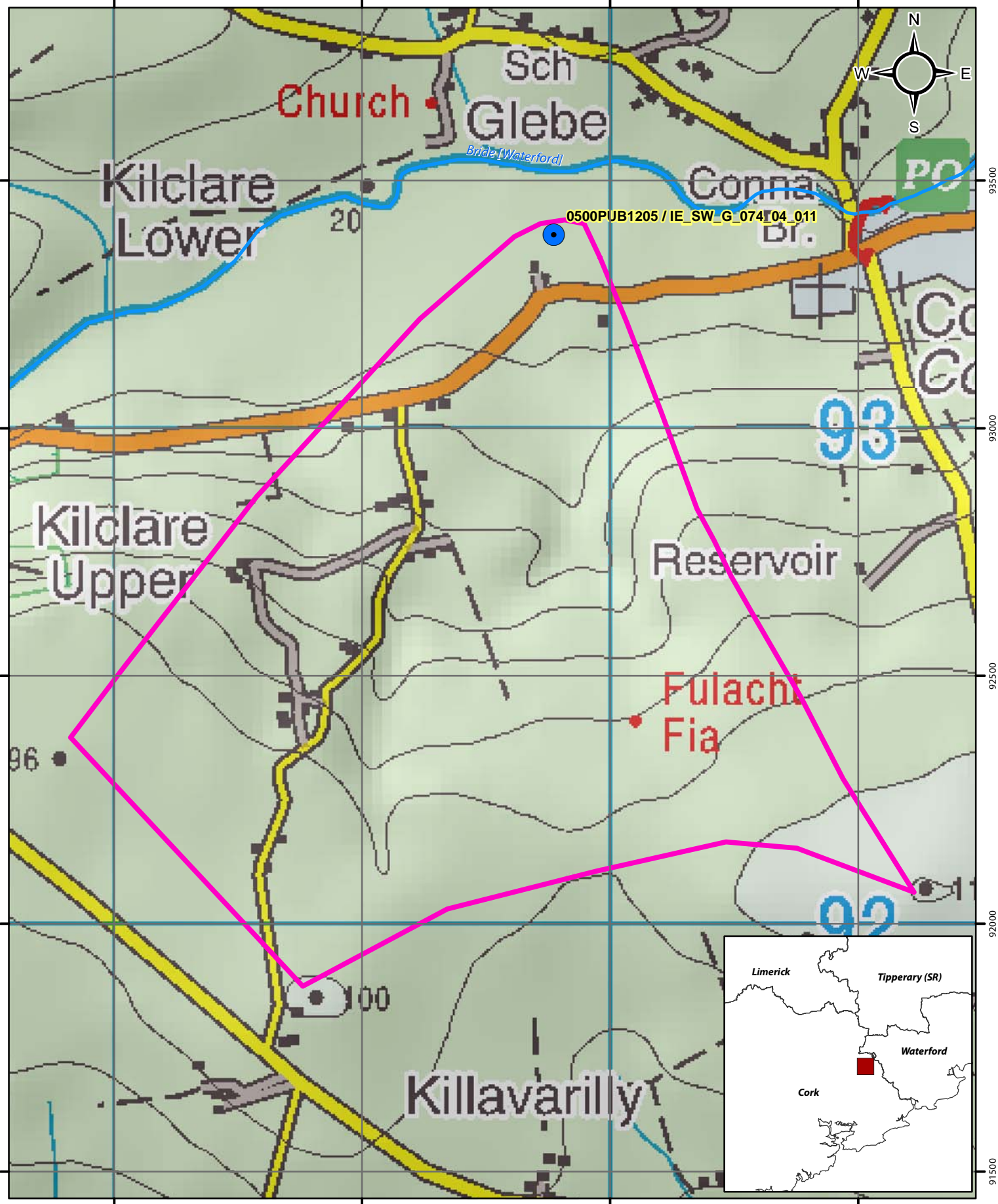
|            |             |          |       |          |
|------------|-------------|----------|-------|----------|
| Version 0: | Prepared by | GSI      | Date: |          |
| Version 1: | Prepared by | OCM (DC) | Date: | Feb 2011 |
| Version 2: | Prepared by |          | Date: |          |
| Version 3: | Prepared by |          | Date: |          |
| Version 4: | Prepared by |          | Date: |          |

191000




191500

192000

192500



## Location Map for Conna PWS

-  Abstractions
-  River
-  Zone of Contribution

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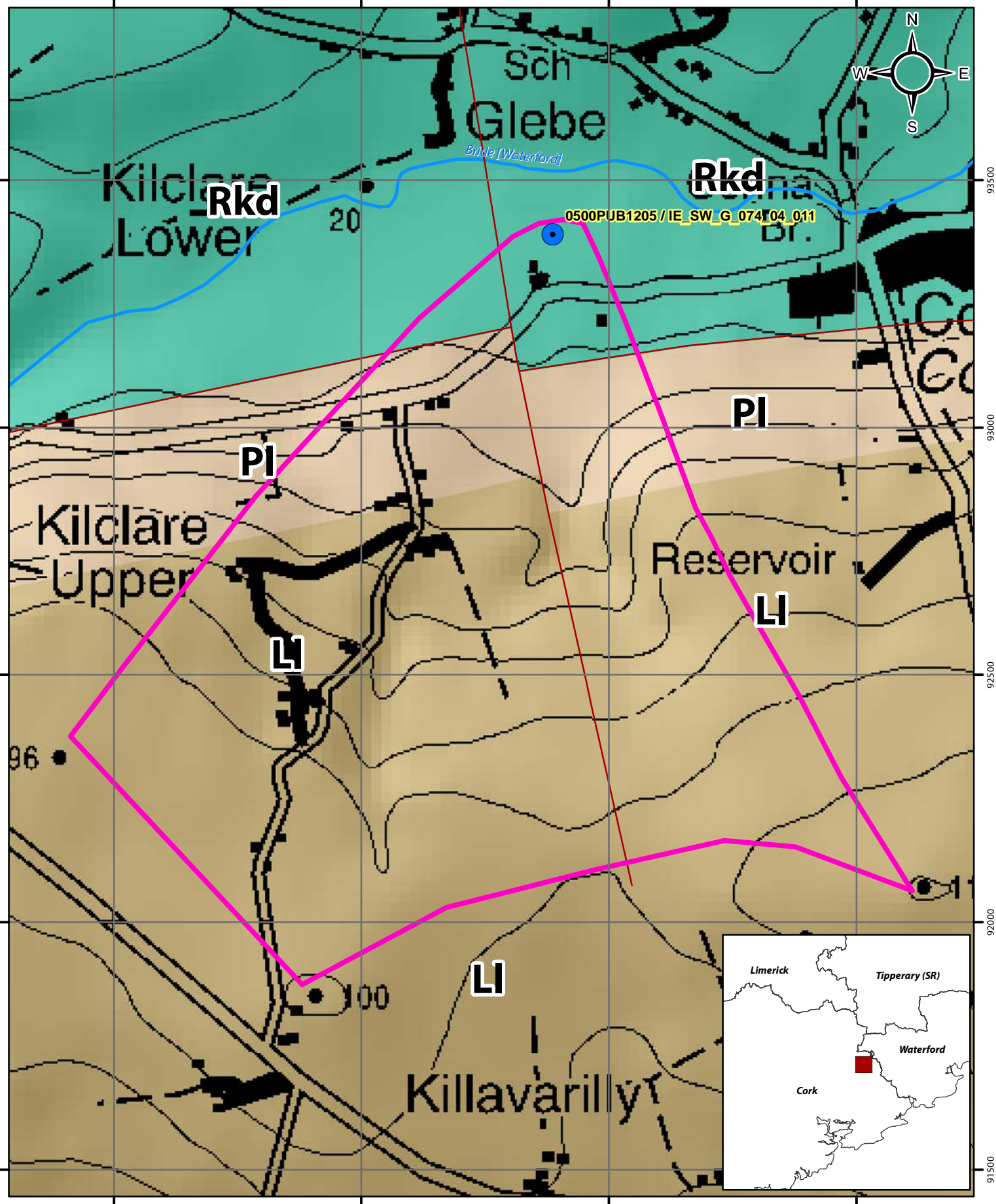
0 0.25 0.5 1 km

191000

191500

192000

192500



## Aquifer Category Map for Conna PWS

-  Abstractions
-  Zone of Contribution
-  Rkd
-  PI
-  Fault
-  River
-  LI

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0 0.25 0.5 1 km

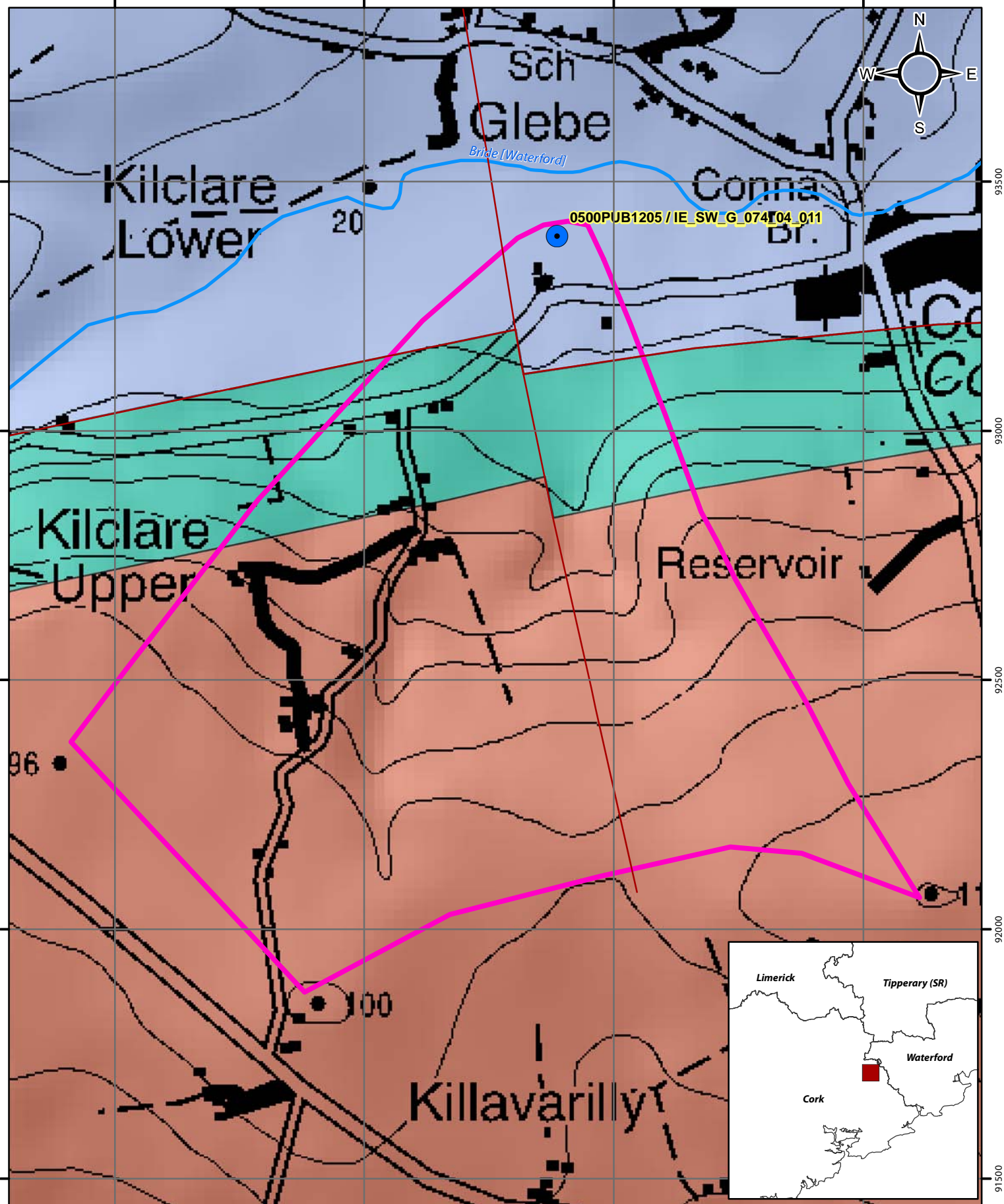


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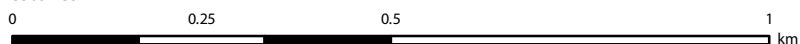
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## Bedrock Map for Conna PWS

-  Abstractions
-  River
-  Zone of Contribution
-  Devonian Old Red Sandstones
-  Dinantian (early) Sandstones, Shales and Limestones
-  Dinantian Pure Unbedded Limestones
-  Fault

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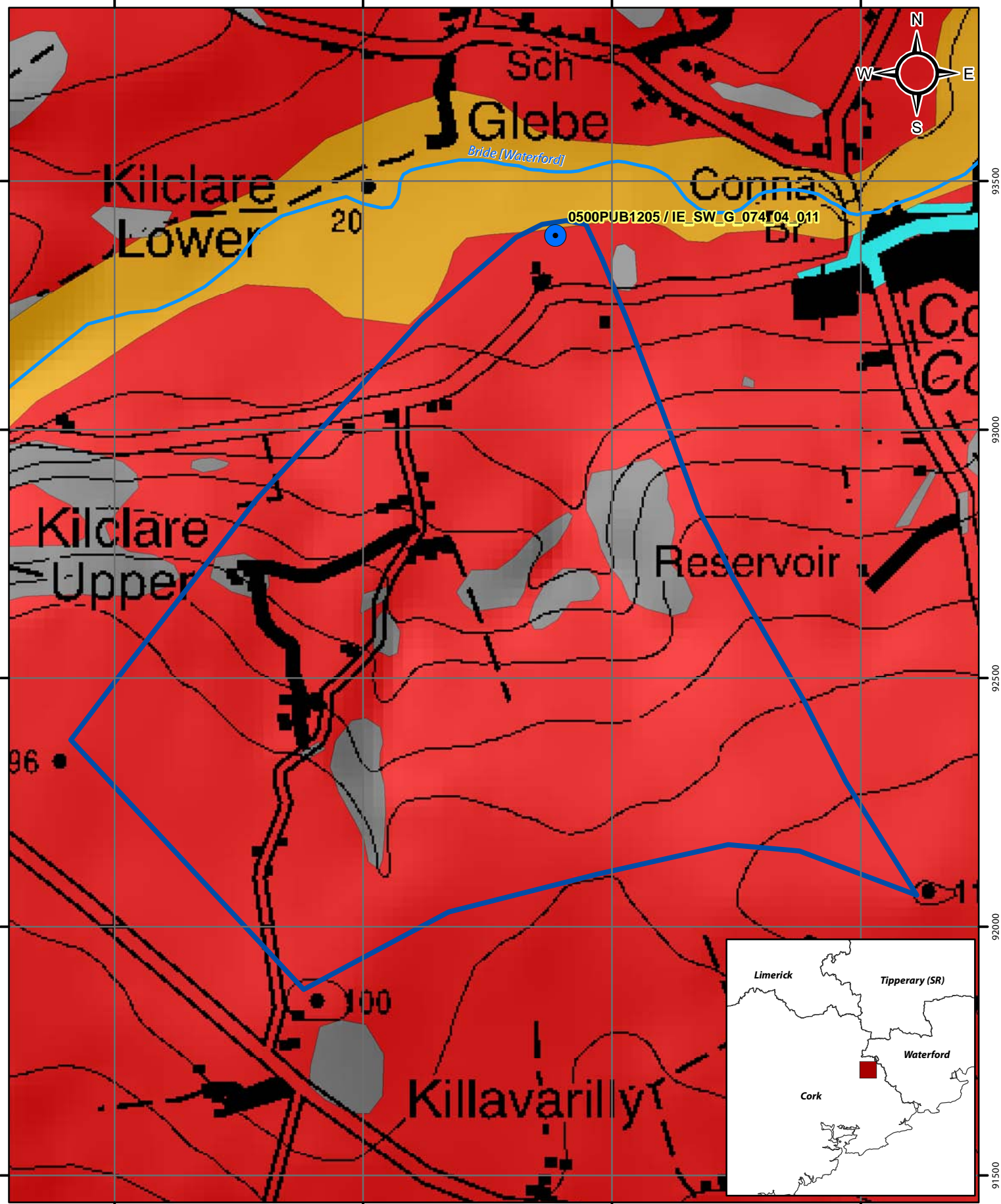


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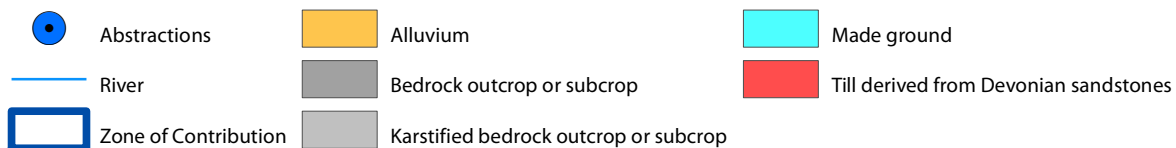
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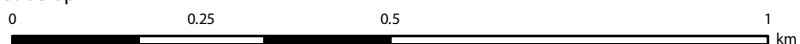
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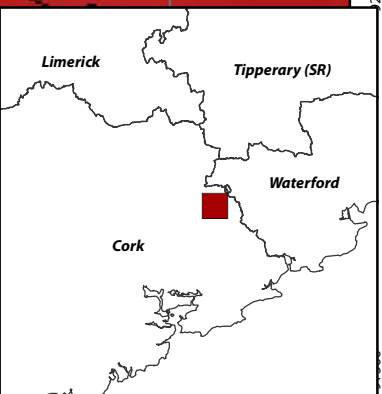
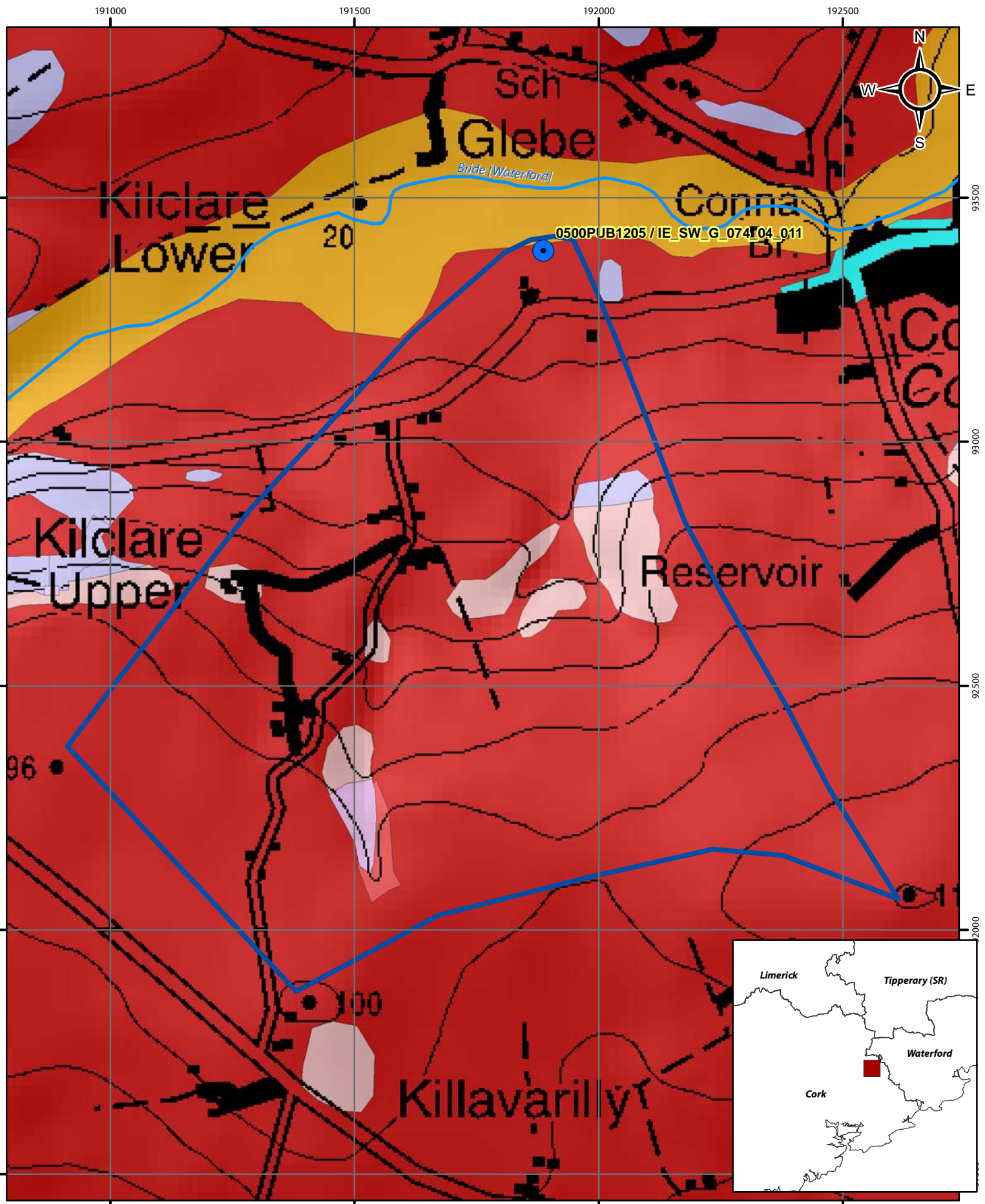
## Subsoils Map for Conna PWS



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# Soils Map for Conna PWS

