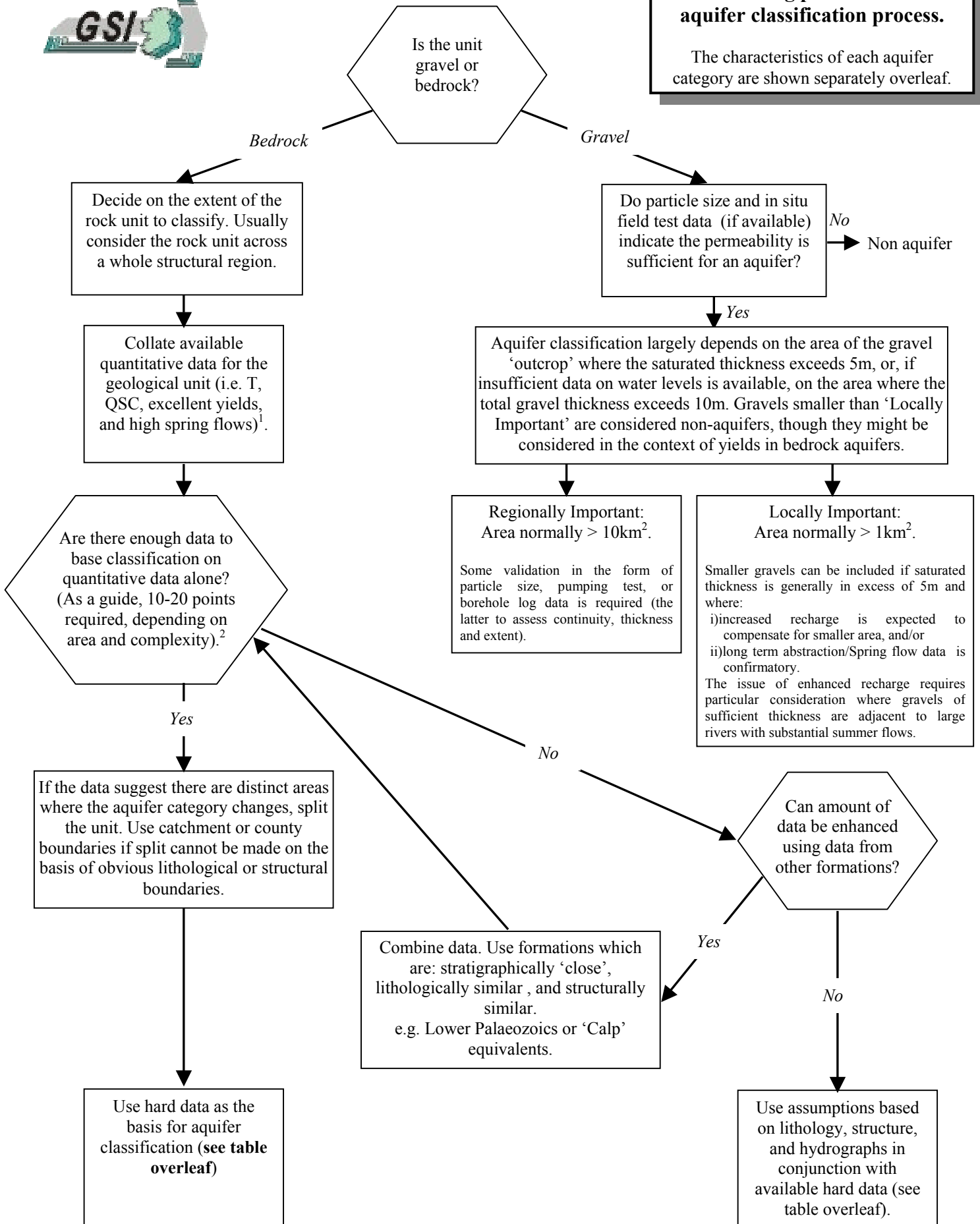




Data handling procedures in the aquifer classification process.

The characteristics of each aquifer category are shown separately overleaf.



1. 'T' is aquifer transmissivity, measured in m²/d. QSC refers to the borehole's productivity index. This ranges from I (best) to V (worst). Excellent yields are >400 m³/d. High spring yields are >2,160 m³/d.

2. The amount of data that is 'enough' cannot be rigorously specified. However, 10-20 QSC points or 10-20 T points should be sufficient. The numbers required will be at the higher end of this scale for aquifers with large outcrop areas (in the hundreds of square kms) and where the data is widely scattered across a number of T or QSC categories. Extra care should be taken where a number of data points have been taken from one site. Usually, one representative value should be taken from such a site, but the whole data set from the site may be taken if the variability appears to match the variability across the unit(s) as a whole. Well yields and spring flows: only the presence of excellent yields and/or high spring flows is a consideration in terms of 'hard data' (i.e. the distribution of yield and spring data points across a variety of categories is not a significant influence on aquifer classification). As such, once there is a sufficient number of QSC or T points, the number of yield and spring data points which are also available is usually not an issue.

Aquifer Category (see over for codes)	T values (m ² /day)	Productivity	Borehole Yields	Potential extent of flow systems	Large springs	Lithology			Structure	Surface water discharge zones in areas of thin or free draining subsoil.	Annual fluctuation in water levels
						Type	Dolomitic	Karst features			
Rf	Most >50. Several >500	Mostly I & II	Excellent yields very common	Regional	Potentially	Thin bedded sandstones, limestones volcanics	Potentially	Little or none	Volcanics and thick bedded limestones generally highly fractured	Lowland drainage density < 0.5 km/km ²	Generally <10m
Rk_d	Variable. A few >500	Mostly I & II but fair proportion may be lower	Excellent yields very common	Regional	Potentially	Pure or dolomitic limestones	Potentially	Abundant	Thick bedded limestones generally highly fractured		Annual baseflow > 60% annual river flow.
Rk_c	Variable. A few >500	Probably all classes, average may be III	Extremely variable	Regional	Potentially	Pure limestones	Potentially	Abundant	Thick bedded limestones generally highly fractured	Low flows > 2 l/sec/km ² and low flows > 20% average flows (Rk _d may have lower low flows).	Often > 15m
Lm	Some >50. A few >500	Average III	Excellent yields very common	Regional to local	Potentially	Pure limestones, thin-bedded sandstones, volcanics	Potentially	Occasional	Volcanics and thick bedded limestones generally highly fractured		No criteria
Lk	As for Rk _c or Rk _d	As for Rk _c or Rk _d	As for Rk _c or Rk _d	Local	No	As for Rk _c or Rk _d	As for Rk _c or Rk _d	As for Rk _c or Rk _d	As for Rk _c or Rk _d	No criteria	As for Rk _c or Rk _d
LI	Some >50. A few >500	Average III - IV, some II	Some excellent yields	Local (occasionally longer along fault zones)	Perhaps but unusual	Impure limestones, sandstones, shales, others	Perhaps, but not extensive	Occasional (in limestones)	No criteria	High drainage density, low baseflows	No criteria
PI	Most <50. One or two >500	Mostly V & IV, some III	Excellent yields very rare if any	Local	No	Impure limestones, sandstones, shales, others	No	None	No criteria	Values will be complicated by upland climatic setting and steep slopes.	No criteria
Pu	<50	Mostly V & IV	No excellent yields. Good yields rare if any	Very localised	No	Impure limestones, sandstones, shales, others	No	None	No criteria		No criteria

- “Excellent” well yields defined as >400 m³/d. “Good” well yields defined as >100 m³/d but less than 400 m³/d.
- Productivity class ranges from I to V. Class I implies that significant quantities of groundwater can be abstracted with little consequent drawdown of the groundwater level in the borehole. A productivity class of V indicates that the drawdown of the groundwater level in a borehole can be significant for a given abstraction rate.
- The amount of groundwater recharge, and the degree of aquifer connectivity/compartimentalisation, are considered as additional factors when determining the aquifer classifications.

There are eight aquifer categories defined in *Groundwater Protection Schemes* (DELG/EPA/GSI, 1999), and they are as follows:

Regionally Important (R) Aquifers

- Karstified bedrock (**Rk**)
- Fissured bedrock (**Rf**)
- Extensive sand & gravel (**Rg**)

Locally Important (L) Aquifers

- Sand & gravel (**Lg**)
- Bedrock which is Generally Moderately Productive (**Lm**)
- Bedrock which is Moderately Productive only in Local Zones (**LI**)

Poor (P) Aquifers

- Bedrock which is Generally Unproductive except for Local Zones (**PI**)
- Bedrock which is Generally Unproductive (**Pu**)

Note that during the course of the National aquifer delineation for the Water Framework Directive, a further aquifer category was established: **Lk** – locally important karstified bedrock. Regionally important karstified bedrock aquifers (**Rk**) may, depending on the degree and nature of the karstification, be further characterised as either **Rk_c** – dominated by conduit flow or **Rk_d** – dominated by diffuse flow.