

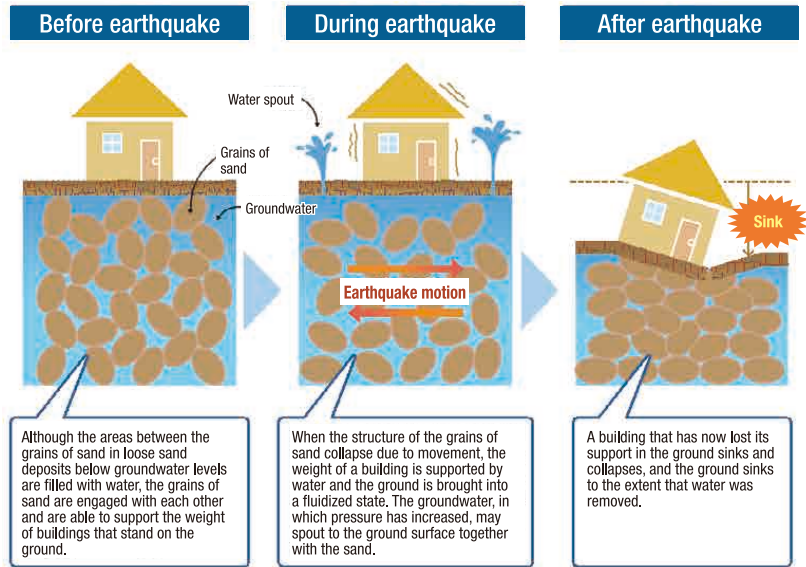
Liquefaction

● How liquefaction occurs (mechanism)

Liquefaction is a phenomenon in which the ground temporarily behaves like liquid due to earthquake motion.

Areas where the liquefaction phenomenon is more likely to occur are said to be areas where sandy soil is loosely accumulated such as around rivers and where groundwater levels are high.

When strong movement due to an earthquake is applied to this kind of ground, the connections between grains of sand collapse and liquefy, causing buildings, etc., to sink or tilt and manholes, light pipelines, etc., to rise up. Moreover, in areas near river embankments and gentle slopes, the ground may flow a few meters horizontally.



Source: Fukuroi City Liquefaction Hazard Map

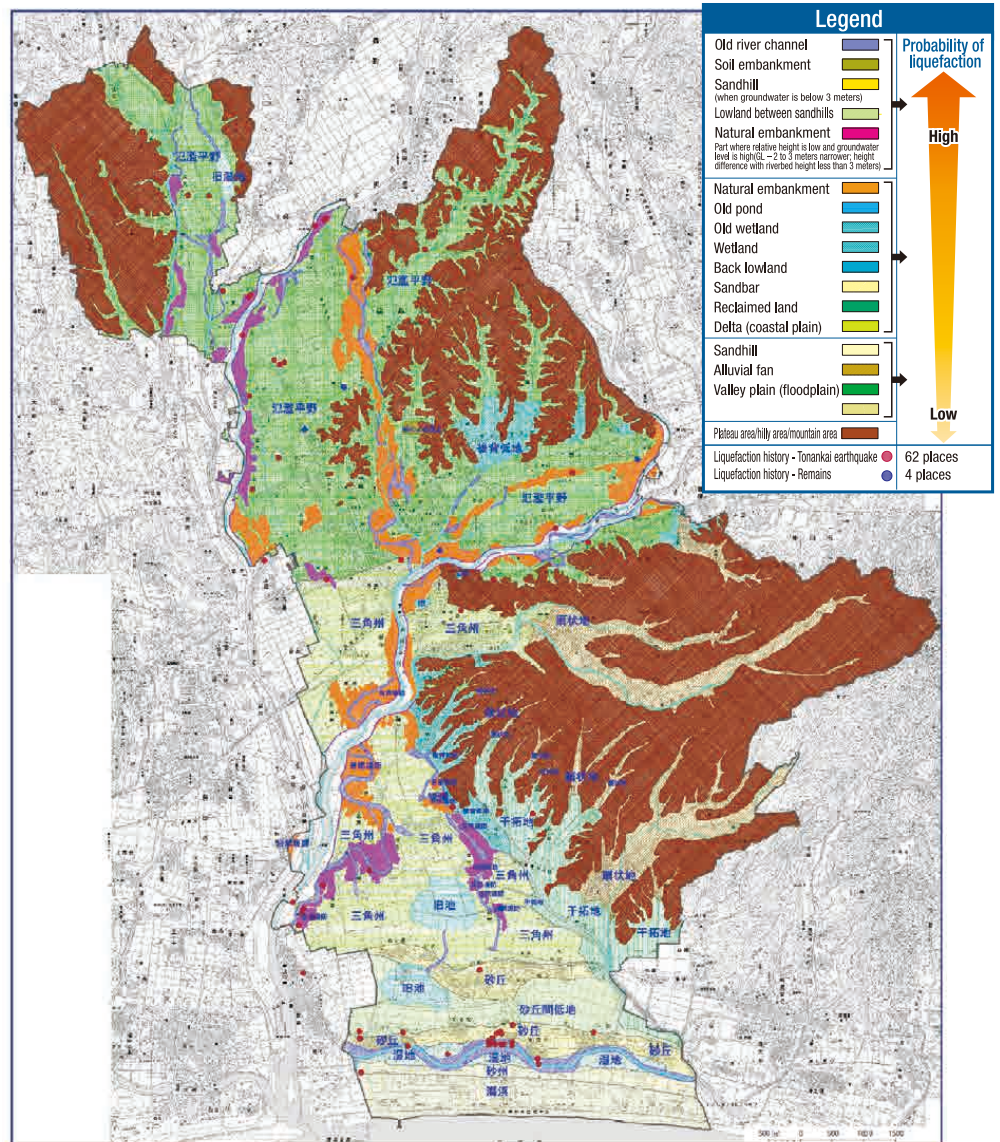
● Micro-topographic classification, the history of liquefaction and the degree of liquefaction risk

The “loose sand deposit” and the “high groundwater level” that are conditions in which liquefaction occurs can be predicted to some degree from the formation of the land.

Therefore, a micro-topographic classification map* that indicates the conditions of the land and cases of ruins excavation in the city can be used as reference in determining the degree of liquefaction risk.

In Fukuroi City, comprehensive determination is made not only by these materials, but also by, for example, checking soil layers that may potentially be brought into a state of liquefaction based on geological survey results, and the probability of liquefaction occurrence is indicated in the Liquefaction Hazard Map.

※ Micro-topographic classification map
A micro-topographic classification map is a more detailed classification of large terrains including mountains, rivers and plains according to their formation and characteristics.



Source: Fukuroi City Liquefaction Hazard Map

● Probability of liquefaction occurrence

In the Liquefaction Hazard Map, the probability of liquefaction occurrence is classified into four stages in the table below.

Whether liquefaction will or will not occur depends on the magnitude and duration of earthquake motion, the attributes of the ground and the groundwater level condition.

The degree of liquefaction occurrence probability and the magnitude of damage depend on the conditions. Even when in a place where the probability of liquefaction is low, significant damage may result should liquefaction occur depending on the attributes of the land and the building structures, etc. Even when the probability of liquefaction is high, the entire area may not be brought into a liquefied state. And even within an area that is determined to have a high probability of liquefaction, the area ratio of liquefaction occurrence is about 20% of the entire area.

Guidelines for liquefaction occurrence area ratio

Probability of liquefaction	Liquefaction occurrence area ratio
High probability of liquefaction occurrence	About 20% or more
Liquefaction occurrence is probable	About 10%
Probability of liquefaction occurrence is low	About 2%
Probability of liquefaction occurrence is extremely low	About 0%

Source: Liquefaction Area Zoning Manual (1998 version)

January 1999 National Land Agency, Disaster Prevention Bureau, Earthquake Disaster Countermeasures Division

● Fukuroi City Liquefaction Damage Reduction Countermeasure Consultant System

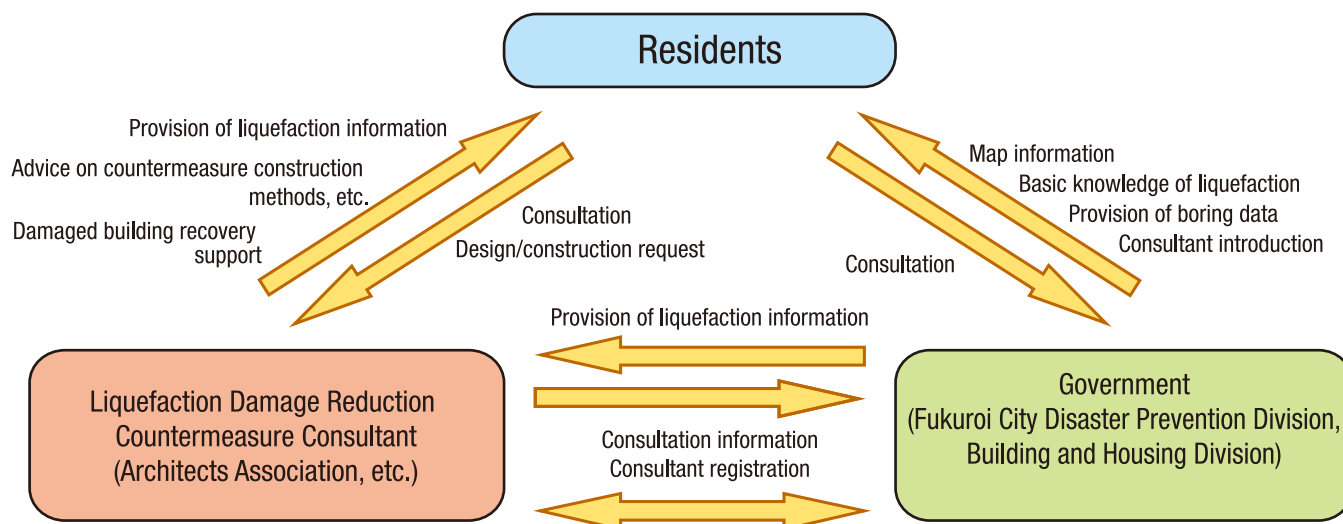
In Fukuroi City, the “Fukuroi City Liquefaction Damage Reduction Countermeasure Consultant System”^{*} was established as a contact point in which residents can freely consult experts such as architects free of charge.

^{*}Fukuroi City Liquefaction Damage Reduction Countermeasure Consultant System

The Fukuroi City Liquefaction Damage Reduction Countermeasure Consultant System is a system in which people who participate in training sessions including liquefaction countermeasure construction methods, etc., sponsored by Fukuroi City and who are recognized as satisfying specified requirements are certified as “Fukuroi City Liquefaction Damage Reduction Countermeasure Consultants” and respond to inquiries from residents.

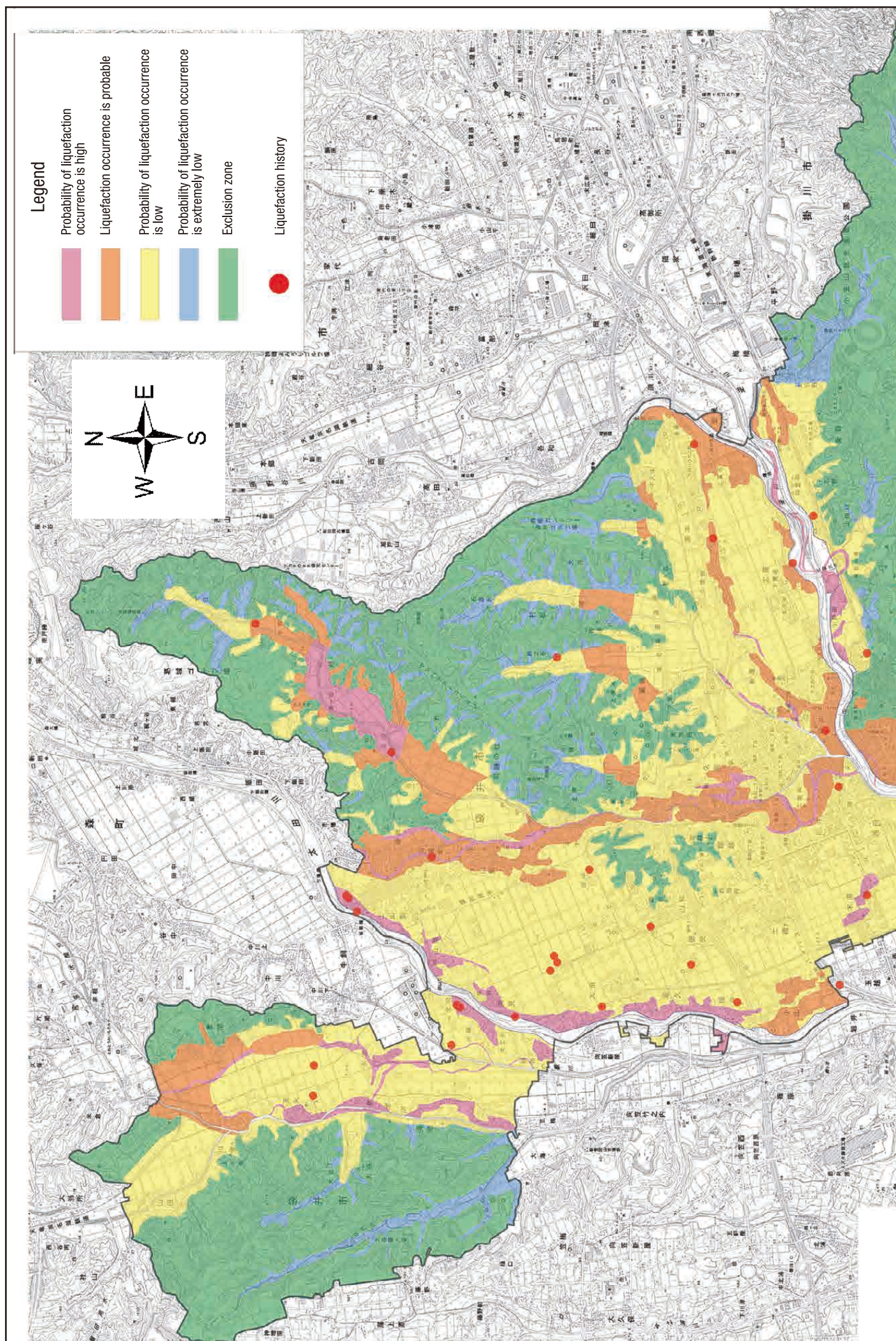
For Fukuroi City Liquefaction Damage Reduction Countermeasure Consultants, check the Fukuroi City website or contact the Disaster Prevention Division.

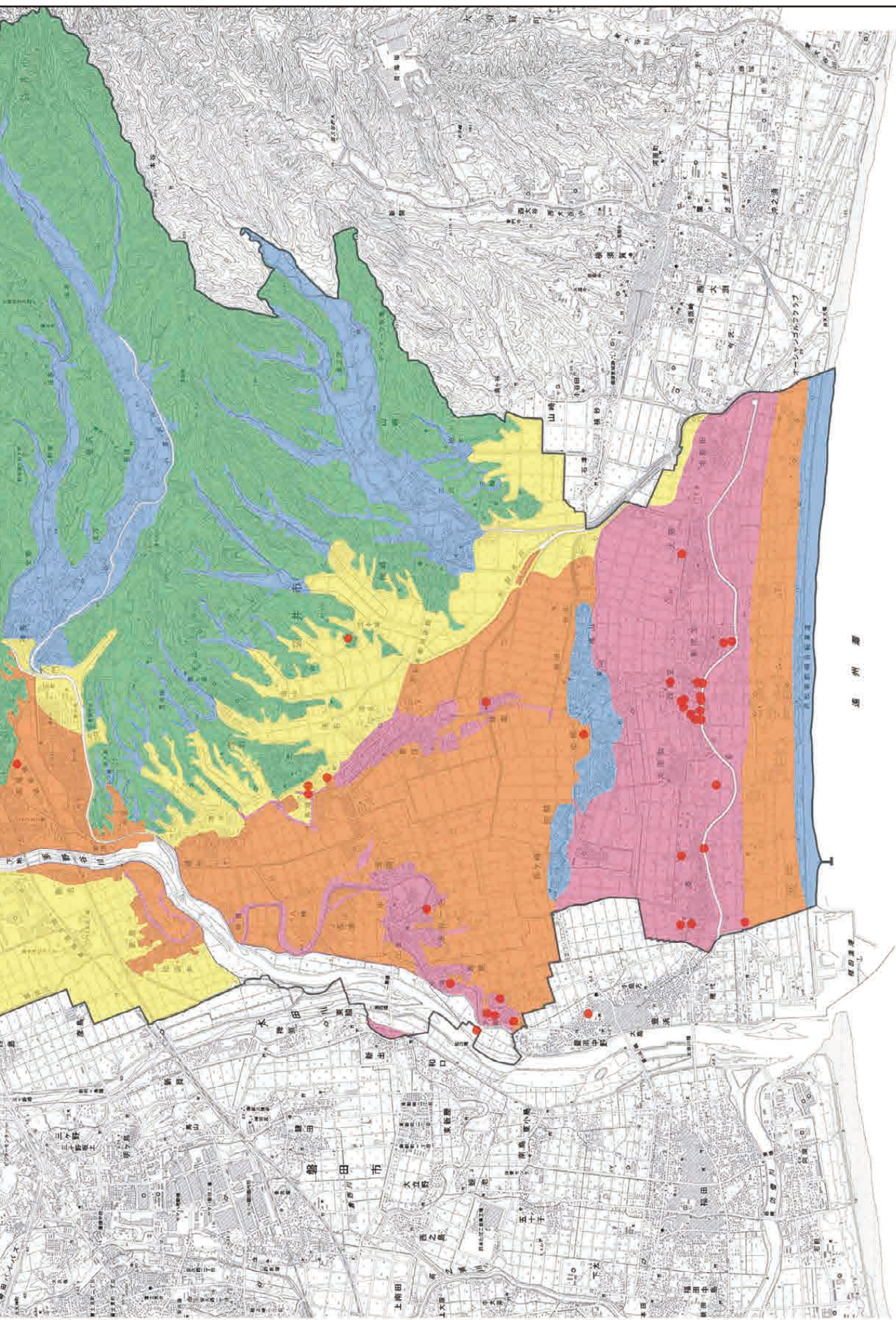
Fukuroi City Liquefaction Damage Reduction Countermeasure Consultant System



Liquefaction Hazard Map

Map information provision service
Also published at "Domannaka Fukuroi-navi."
<http://www2.wagmap.jp/fukuroi/Portal>





0 0.5 1 2 km

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