

# The Practical Use of Japanese Nationwide Database of Well and Hydrogeology

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## 1. Outline of the Well and Hydrogeology Database and Well King. Dic.

At the great earthquake hit Hanshin and Awaji area in 1995, the groundwater was closed up as a drinking water for emergencies. Since then, it is necessary to collect the information of groundwater and well data nationwide. Moreover, from a viewpoint of earth environment preservation, it is important to accumulate the groundwater data of present and the past. Therefore we developed Japanese Nationwide Database of Well and Hydrogeology and the original visualizing software Well-King Dic. (IDOJIBIKI in Japanese) Windows3.1 version in 1995. Then, it corresponds to Windows 98/2000/NT through two upgrades now.

This software is offered to the ministries and local organizations with free of charge, in order to collect the data. Those organizations that received this software can input the data of groundwater and the well, which used to be only in paper, with position (coordinates) information.

When this software was developed, we already inputted about 30,000 records from the Geological Survey of Japan (that time) and the National Land Agency (that time) as initial data, and now this database has about 40,000 records.

This software has functions such as, (1) the display of the well position on map, (2) input, display and print of groundwater and well data, (3) geologic column, well structure and so on. In this database, the geology of varieties was summarized into the 13 kinds of classification.

## 2. The Practical Use of Well Database

The following examples can be considered as the practical use of the well and groundwater data that collected with this software.

- (1) The influence of the urbanization gives to the water quality of a hot spring
- (2) The quality change of well water by the railroad and road construction, or large-scale facility construction
- (3) The prevention plan of disasters, such as an avalanche of rocks and earth
- (4) Hot spring development as new tourist attractions

In relation to (1), Isawa-onsen (Isawa hot spring resort in Isawa-machi, Yamanashi Prefecture), where next to Kofu-shi (the capital of prefecture), is prosperous in the fruit agriculture. In 1961, the hot spring of 40-60 degrees gushed in a vineyard, 50 or more hot spring hotels had been build, and 3 million tourists per year visit Isawa-Onsen now.

The population, which was about 15,000 in 1975, had been increased 1.8 times to about 27,000 persons in 1995 and increasing. Furthermore, the increase in population is remarkable in the southern area where a fruit tree field located. This southern area is comparatively close to the central part of Kofu-shi, and compared with the Urbanization Control Area in Kofu-shi, there are fewer regulation to development of houses. Since the development is progressing quickly in the influence of urbanization in Kofu-shi. Now, several groundwater and hot spring data around Isawa-onsen are registered on this software. By uniting with a future change, it becomes the index by which the influence of the environment on urbanization is evaluated.

## 3. Conclusion

Groundwater and well data are very important not only to use in emergency such as big earthquake, but also to know the influence on environment caused by city development. In the future, by collecting old and new data from wide area, these data can be utilized for environment evaluation. We are planning the extension of this software such as, the radar chart display by water quality, and hoping to use this for the management of groundwater and well data. Moreover, expansion of the data of the Southeast Asia area will be made in the future.

