

**Open Comment on Open Letter from the Scrutiny Panel to the President of the Environment and Public Services Committee - 14th October 2005**

by

**Dr John Renouf, BSc., Ph.D.**

**Background**

Two important points are (1) that my Ph.D. and much of my subsequent research has been on the old rocks of Armorica (Brittany + Lower Normandy) including scientific publications on Jersey and geological consulting in the island and (2) that I was an active member of the GRG (Groundwater Review Group) of local geologists involved with the BGS surveys of the late 1980s and early 1990s.

During the last 18 months I have attended and submitted evidence to the Scrutiny Panel and have subsequently met Dr Peach and others under the aegis of Mr Christ Newton to update and extend knowledge of the groundwater and related water flows for Jersey.

During this same period I have become deeply alarmed at the degree to which the scientific evidence on which the BGS reports are based have been eroded by unsupported claims of their failure to properly understand the complexity of the island's water situation.

To attempt to address the issues, I take the letter of the title and make comments on the content. I reproduce in italic each paragraph for convenience.

I emphasise some of the most important issues in bold

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***Open Letter** : Despite years of research by the British Geological Survey there is still only a limited understanding of the Island's groundwater resources largely due to an over-simplified view of the Island's complex geology adopted by your consultants and their resistance to considering the evidence of deep water sources supplied by the local knowledge and experience of water engineers and diviners.*

Since there is implicit criticism of BGS in the opening statement here, I offer a quote from this month's Geoscientist (Magazine of the Geological Society):

**BGS ISO-lated again**

*Following its success last year in securing registration to ISO 9001:2000, the British Geological Survey (BGS) has now 'done the double' by becoming the first of the Natural Environment Research Council's (NERC) research centers (and one of the very few public sector research establishments) to achieve registration to ISO 14001:2004, the international environmental management standard.*

*ISO 14001 registration is only awarded to companies which the British Standards Institute considers have effective environmental management systems in place. As the BGS is the UK's national centre for Earth science information and its work relates directly to energy and groundwater resources, land use and the protection of the environment, this award reinforces the organisation's environmental credentials.*

From : Geoscientist, **15**, 10 : p. 9

This serves as a reminder of the high professional standing of the BGS, an organization which is widely used to determine and advise on water resources the world over.

The specific criticism that BGS shows only *limited understanding* of the local geology was built on the misinterpretation of a 1994 interim and ongoing report by the GRG. In this we, as a group, were critically seeking further information and offering constructive ways forward. What has not been taken on board by the Scrutiny Panel is that we were always supportive of the BGS and particularly supported their overall separation of the island's water reserves into two distinct sources an upper and a lower level. The upper level, along with surface water, provides something like 95% of the island's supply. The remaining 5% is that supplied by the deeper boreholes. In the upper level the water generally moves more freely than that lower down.

The discussions held more recently with Dr Peach of BGS (Dr Ralph Nichols and I of the GRG were involved) made it crystal clear that we agreed a BGS interpretation that the water held below the surface fell into the two above categories. We further agreed that the main circulation of the 95% was in the upper levels but that the interface between the two varied considerably in its depth from ten to twenty metres down to several tens of metres.

Below the interface the water does not move fairly freely because the joints are tighter and become increasingly so with depth. However, and it is an important however, there are many zones of irregular and unpredictable size —though generally only hundreds of metres across— where the rocks are much more permeable to water. This is the result of specific layers and units of rock which are inherently more altered (e.g. some andesite volcanic rocks) or which have suffered structural strains producing a mosaic of broken rock. These zones are themselves not predictable without a pattern of fairly closely spaced borehole investigations.

**Neither the BGS nor the GRG has ever sought to deny what the WDEG (Water Diviners' and Engineers' Group) claim by way of boreholes at depth yielding substantial amounts of water. What we have both consistently maintained is that such water is (1) not a major accessible resource for public supply and (2) is vital to the maintenance of the whole groundwater system.**

*Open Letter : Voluntary means of monitoring the use of groundwater by borehole users throughout the Island have been neglected. Witnesses to the Panel, representing landowners and farmers, declared that they would be willing to co-operate with your Department in providing access and information*

Perhaps the question of voluntary co-operation as a way forward is best tackled by making two points. (1) This way was tried in the early stages of the BGS surveys in the late 1980s and early 1990s and was found to be a dismal failure. We were unable to set up the network of boreholes that were needed because of either lack of knowledge of where the boreholes were or lack of co-operation on the part of owners in a number of cases. (2) If there had been a law which required co-operation on yields and on sampling when the survey began, then we would not still be in the position of having to initiate yet more sampling - and still as we understand on a voluntary basis.

**In spite of repeated demands over the last 15 years and more, the WDEG have never provided any scientifically valid quantitative information on borehole yields. They have always promised, but never delivered, other than qualitative statements about borehole yields they claim to know about.**

*Open Letter : A licensing scheme which will cover an estimated 400 commercial users (those who abstract over 3 cubic metres per day or about ten per cent of all those who abstract groundwater). The exemption level has been set at such a low level that many small scale businesses including farms and guesthouses will be included in the licensing net. A charge will be imposed on them to cover the costs of the scheme amounting to approximately £120,000 per year, together with other possible significant costs such as installation of meters.*

*In addition, the 5000+ borehole users in the Island, the vast majority of whom are ordinary domestic users, will be required to register with the regulator and provide such information as the regulator prescribes.*

The negative phrasing of this paragraph is notable. In fact, the demands of the new law would be for

two elements : registration (no cost) and licensing (a low level annual fee). The level at which licensing would occur is entirely reasonable if effective monitoring of abstraction is the intention. The monitoring is vital so that the island authorities can know whether, and where, over-abstraction is occurring. It would also provide data on the effect that adjacent boreholes were having on each other.

*Open Letter : In our view, this piece of legislation introduces new levels of red tape in contradiction of the States Strategic Plan (Strategic Aim 1.3.1) which aims 'to reduce unnecessary regulation and bureaucracy in the Island'.*

To say that *new levels of red tape* are being introduced is putting the cart before the horse. If the law is required to monitor boreholes then it is not red tape to introduce the necessary controls and if properly implemented could not be construed as red tape. But take the decision on the scientific evidence first.

*Open Letter : We are not opposed to a proportionate scheme to protect a resource which is crucial for the whole of the Island's population. Jersey, by virtue of its size and independent legislative status, has the opportunity to establish a balanced and coherent programme of monitoring and protection which takes account of the actual needs both of the environment and those who rely on groundwater abstraction for their homes or businesses. The Island could follow the example of Sweden which does not have a licensing system governing groundwater abstraction. In Sweden, as in Jersey, there is little evidence of interference between abstractors. The Environmental Code published by the Swedish government states that all landowners have the right to water below their property for agricultural use and permits are not required for private water use. The Geological Survey of Sweden monitors groundwater (water levels and quality) through a sampling network containing stations evenly distributed throughout the country.*

The Scrutiny Panel, in suggesting the application of a model based on Swedish practice, are comparing the water situation in an environment that is completely different from Jersey. Sweden has a different climate, totally different geology and totally different water requirements. It is interesting that the Panel records in the last sentence that the *Geological Survey of Sweden monitors groundwater (levels and quality) through a sampling network containing stations evenly distributed throughout the country.*

**This contradicts the Scrutiny Panel's opposition to the proposed legislation (registering and licensing) in paragraphs 5.a. and 5.b. in that the island has no *sampling network containing stations evenly distributed throughout the country* (substitute Jersey here). This is one of the most compelling arguments for its introduction in the island so that at long last the compilation of proper and effective records can begin.**

*Open Letter : We understand that the case for bureaucratic regulation of groundwater in Jersey is questionable due to the nature of the rocks which prevents the removal of excessive volumes of water from any single location. The groundwater system is effectively self-regulated.*

Yet again the use of biased wording by damning regulation as bureaucratic. But the issue raised in this paragraph introduces another complete scientific misunderstanding, namely the nature of the source of Jersey's groundwater.

The WDEG have always claimed, and still do, that the water they tap into at depth comes effectively from moving water that originates outside the geographical confines of the island. In other words they take as read that the island's rainfall is not necessary to its continued well-being. In all the times I have heard or read what the WDEG say, they have never once been able to quote a single piece of hard, acceptable scientific evidence in support of the claim. Indeed the only piece of evidence offered was that of the well on the Écréhous. I was able to show the degree of realism in this by demonstrating that the so-called well on the Écréhous is no more than a lined hole several feet deep in shingle. It is thoroughly contaminated by sea water on every tide since its linings are not in repair. In contrast to the unsubstantiated folklore claims of the WDEG for a non-island source of fresh water, the BGS have demonstrated how there is an overall flow of water from the north to the south of the island in the superficial groundwater levels. This is proven by isotope geochemistry that shows water in the south to be older than that in the north. In other words the BGS have modern proven methods of determining what happens to water underground

As to water at depth, there is a blatant contradiction here in that *due to the nature of the rocks which*

*prevents the removal of excessive volumes of water from any single location . . . the groundwater system is effectively self-regulated.* The question I put is this : How can this be true if in fact the water is supplied from outside the island to the deep borehole sources? The water cannot both move freely and not move freely on the whim of the WDEG.

The BGS use fully accepted and proven scientific equations governing the movement of water through rocks. These are applied successfully wherever they are used.

It is interesting to look at a quarry face in the island and see that there are more joints close to the surface than lower down. Water moves with difficulty through rocks even when they are fissured and it takes years for water to cover any horizontal distance at depth. Your native common sense will tell you this if you imagine being given the personal task of forcing water through even well fissured granite or any other rock. Therefore water from France would take thousands of years to reach Jersey given that the land opposite is not much higher than Jersey and therefore does not provide the necessary head of pressure.

When you think about this it becomes ever more evident that a borehole could abstract water much more rapidly than it is replenished and therein lies one of the real dangers to which those concerned with agreeing or rejecting the legislation should be made fully aware.

**Put very simply, the argument is this : Once a deep groundwater resource has been seriously depleted, its regeneration is not guaranteed over a time span of less than tens of years. It may regenerate in a shorter time but it is not guaranteed and will in any case draw down water from the higher levels of the groundwater system, the very levels which are needed to maintain the island's surface and near surface water supplies, i.e. those used by Jersey Water and many private users with shallow wells. In our coastal areas saline intrusion would be significant.**

**It is all very well to suggest that the Riley and BGS reports were overtly alarming in the early 1990s but you need to recall that there were a number of years around this time of less than average rainfall aggravated by different annual distribution patterns. Even given the problems of uncertainty in the agreed figure of annual recharge, the predictions of problems in the future are realistic. The registration and licensing of water boreholes is needed to provide the information that will allow the best use of available island water now and into the future. Are you prepared to wait until a sequence of a few effectively dryer years, plus the accelerated usage of borehole abstraction in such circumstances, combine to create a likely, at minimum, short term and, at maximum, longer term unacceptably slow recharge of the island's groundwater reservoir? This outcome does not bear thinking about and the action to forestall it needs to be taken now.**

*Open Letter : In your response, you criticise us for focussing on the 'deep sources issue' stating that 'there are only approximately 50 known boreholes at depths of 40 metres+ beneath the Island, which is in sharp contrast to the 5000+ boreholes that rely on the "shallow aquifer" (approximately 25 metres' depth)' This mistake is repeated in your interview with the Jersey Evening Post, published on 10th October 2005. The actual position is the opposite statement - we were informed that the vast majority (98%) of the 5000+ boreholes that currently exist in the Island exceed 40 metres in depth. The figure of '50 known boreholes' refers to a sample list of deep boreholes given to the Public Services Department and BGS by the Water Diviners and Well Drillers Association (WDEA) about ten years ago as evidence that BGS' dismissal of deep water resources below the Island needed to be re-appraised.*

It is my understanding —and once again I stress that these facts would be known without dispute if registration and licensing had been in place some years back— that 90% of the island's water supply is provided by Jersey Water, some 5% of boreholes are in shallow aquifers and the remaining 5% tap deeper levels. But the detail is neither here nor there since there is room for all many of fruitless arguments until the facts are properly known. Boreholes must be registered and proper sampling undertaken.

*Open Letter : You also criticise us for failing to focus on the need to manage and protect the Island's known water resources, including the surface waters and the flora and fauna dependent thereon. We found little detail, however, in the written and oral submissions to substantiate the benefits claimed for the law. In our recommendations, we called for an assessment of the actual ecological needs of specific catchment areas; substantive details about the possible impacts of climate change and clarification of the provisions of the EU Water Framework Directive. To date we have received no further information on any of these issues from your Committee.*

No comment other than to suggest that it would be prudent to arm ourselves with the best information when faced by climatic change.

*Open Letter : Your response fails to address the crucial issue of the lack of evidence for declining trends of groundwater levels. In the early 1990s, work was started by the Public Services Committee on proposals to protect the water supply which was seen to be under serious threat of over-abstraction. BGS' own studies since that time have not produced evidence to support this theory. However, no publicised retraction has ever been made of the previously published position that the resource was under extreme stress.*

For the reasons stated above under paragraph 6, I would not ask the BGS to retract its statement that the island groundwater is under extreme stress. With the extant evidence it would be foolhardy to presume otherwise and it cannot be over stated that a few dry years, or the sort of different rainfall patterns forecast to accompany global warming, will see Jersey deep into a water problem from which it could take it years to recover.

*Open Letter : We felt that it was important to the review to talk to the leader of BGS studies of groundwater in Jersey, even though he was not included originally in the team of witnesses provided by your Committee. You state that the invitation to Dr N. Robins to attend a Panel hearing was 'withdrawn' by the Panel itself. Our report, however, makes it clear that the invitation was withdrawn because we found that the conditions required by BGS were unacceptable.*

No comment needed.

*Open Letter : You claimed that the Water Diviners and Engineers have 'abandoned' the issue of the possibility of a groundwater connexion with France. This is not the case. We were informed that, while they accept that the issue is difficult to prove they are not aware of any proper scientific research has been carried out to investigate the claims. The advice of Dr Sutton to the Panel was that, given the relatively short distance (14 miles) from the French mainland and the geological similarities between Jersey and the Cherbourg peninsular, it was not unrealistic to say that there was the possibility that there was hydraulic connection between the two.*

I have covered the ground about a French water source above under paragraph 6.

**Notwithstanding the advice by Dr Sutton, I stand unequivocally with the BGS in maintaining that a French source for island water is not geologically sound and is a dangerous and misleading diversion from established scientific facts.**

*Open Letter : Your response states that a joint meeting in 1993 between Dr Sutton, Dr Sharp, BGS and the Public Services Department was cancelled by Dr Sutton for 'personal reasons'. In fact Dr Sutton cancelled his visit to Jersey at the request of BGS.*

No comment needed.

*Open Letter : On 24th November 2004 you wrote to the Panel saying: 'There is ongoing work to do in further quantifying the deeper geology and groundwater resources so that we can determine licence conditions under the proposed law. I anticipate that this will require the continued involvement of BGS along with the Jersey geologists, Jersey Water and the well drillers and diviners.' What stage has been reached in the discussions with these groups since the publication of our report? How many meetings have been held and what has been the outcome?*

I do not offer a comment on this except to say how important is a continuance of BGS work.

*Open Letter : We were given evidence that significant supplies of water at depths of between 60m to 90m were being exploited in neighbouring areas of Brittany and recommended that further investigations be made into comparison with Jersey. Why was this recommendation ignored in your Committee's response?*

Since I was instrumental in providing this information I comment on it here. The geology of the Trégor (Côtes-d'Armor NW of St Brieuc) is somewhat similar to Jersey and the water authorities there have been able to locate a few zones (up to about 7) where water can be abstracted and fed into the public system. These are small pockets of rocks —probably volcanic in origin some 500 to 600 million years ago— which are deeply weathered and hence can carry water more easily than adjacent rocks. Comparable deeply weathered volcanic rocks of similar age occur in Jersey and may provide

such localised pockets. These pockets are not predictable in size or location since the volcanic rocks are so variable over short distances. They are unlikely to readily communicate laterally or vertically so are readily subject to over abstraction. These boreholes provide an infinitesimal proportion of the water in the Trégor and notably the abstraction is closely monitored because it is subject to legal statute.

**But it is worth noting that the water document (by M. Marjolet) does go into some detail to describe the general situation of water recharge. It is concluded without qualification that the recharge is from water falling at the surface. There is no reason whatsoever to believe that Jersey is any different.**

*Open Letter : We recommended that an analysis be undertaken of the types of businesses that would be affected by the proposed licensing system quantifying the administrative and financial impact it would have on small businesses dependent on borehole water sources. Your response merely repeats information already available on the costs of licences. Why has a full analysis of impact on businesses not been carried out?*

No comment on this.

*Open Letter : The proposed law allows those who abstract less than 3 cubic metres of groundwater per day exemption from licensing provided they register with the regulator, while those who abstract similar levels of surface water have no requirement to register. Why has such a low threshold been considered appropriate to the Island while a threshold of 20 cubic metres is the norm in the United Kingdom? What forms of information will be required by the Regulator from those who register their boreholes? How will this information be utilised to manage and protect groundwater resources?*

I have been over the abstraction amounts with those concerned in fixing them and find them perfectly suitable for our island needs. The needs of other countries are just not relevant because their climate, their geology and their population distributions are so completely different.

*Open Letter : We note that the Economic Development Committee expressed concern regarding the degree of Regulation to be applied to the Law and the resultant resource implications. We reiterate the Committee's request that the Director of Environmental Services identify areas where resources and regulation might be minimised.*

No comment on this.

*Open Letter : Your Committee considers that it is essential to introduce measures to manage and protect the 'shallow aquifer', which in its view provides the principal source of supply to the vast majority of users. Will it consider exempting groundwater sources at depths of over 25 metres exempt from licensing?*

**An exclusion of deeper boreholes does not make any sense. This is because of the complexity of the groundwater system in Jersey and the absolute need to gain information on all abstraction so that a valid vertical picture of water recharge can be built up.**

*Open Letter : We believe that the draft Water Resources (Jersey) Law 200- should not be debated in the States until a comprehensive response has been made to our recommendations and to the questions raised above.*

I disagree fundamentally with this conclusion which is the argument which has been advanced by those opposed to any regulation since I first became involved with the GRG (Groundwater Review Group) in the late 1980s. It should be pointed out that the chief opposition over the years, then and since, has come from the WDEG and the farming community. They have perceived any controls as inimical.

The engineers of the WDEG are essentially the well drillers and these have, and have always had, it must be pointed out, a vested interest in opposing legislation.

The farming community is content to soldier on referring to, or implying, allegiance to an inalienable right to unfettered access to water below their land. History will tell you of the innumerable law suits over the centuries over water conflicts and yet they continue to promote the value of no control. This is ironic given that the sort of legislation proposed can only enhance their access to water in the future.



**The only real restrictions to water access that will be applied will be those that are going to become law anyway —and have been in effect for many years now— and that is a continuance of special powers to be invoked in times of water shortage. What is needed now is the other part of the equation : The means to anticipate problems on an ongoing basis and to ensure that when crises occur water is distributed to all in the fairest way possible.**

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#### **Further Comment**

I have just received the Open Letter from the President of the Environment and Public Service Committee sent to the Scrutiny Panel and note the intention to set up a Deep Water Advisory Group and the nature and control of these investigations. This is a most welcome move and should produce acceptable conclusions for all. I look forward to participation.

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