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Journal Name:	British Journal of Applied Science & Technology
Manuscript Number:	2014_BJAST_14541
Title of the Manuscript:	Estimating Geohydraulic Parameters With Geoelectric Soundings: Case Study From Orerokpe, Western Niger Delta, Nigeria
Type of the Article	Original Research Article

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	<p>This paper addresses the problem of the assessment of groundwater resources and aims to highlight that the geophysical methods, in particular those geoelectric, are more suitable for this purpose than the pumping tests. In fact, the authors wish to emphasize that the geoelectric investigations allow to characterize a portion of the aquifer greater than that characterizable by pumping tests. Specifically this is done taking into account an aquifer located within the Niger Delta Basin of which the transmissivity was calculated by geo-electric methods and pumping tests.</p> <p>The present study addresses a topic of great interest for the aquifers characterization aimed at the evaluation of groundwater resources, so it can be considered for publication in BJASt.</p>	



SDI Review Form 1.6

	However, the paper requires a major revision before it can be published. Moreover the paper requires a careful reviewing and correction of English.	
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SDI Review Form 1.6

<u>Major</u> REVISION comments	<p>In the paper reference is made to some methods that must be explained. Thus the entire paper must be carefully rewritten and reorganized. In addition, many figures are not well understandable and must be properly clarified. The results obtained and described should more properly reflect the purpose of the work. Therefore there are many important concepts that must be properly clarified, in particular the following:</p> <ul style="list-style-type: none">- In the text one says that the geoelectric method allows to characterize areas larger than those characterized by one pumping test. Truly, even if the concept is clear, the volumes of aquifer involved by the two methods of measurement must be compared and not the corresponding surface areas. In fact at the line 106 one refers to a prism of aquifer. In addition, one must determine the volume of the aquifer involved in a pumping test.- In my opinion the fundamental problem is to make a useful assessment of the costs and	<p>The problem in ascertaining hydraulic parameters is the paucity of pump test data. Most wells drilled in this region are privately owned, these wells usually do not undergo pumping test except some few government owned well. Moreover, because of fear of water poisoning and lack of awareness the individuals will not allow their wells to be used for pumping test</p> <p>Pumping test gives the hydraulic characteristics within the vicinity of the well where the pumping test was carried out (small area). These characteristics however vary from place to place. Integrating geoelectric data with pump test data from one location allows estimation of hydraulic characteristics of areas where no pump test was carried out thereby characterizing a larger area.</p>
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	<p>reliability of the results obtained by the two methods. Indeed, by pumping tests performed in different wells and distributed on the same area investigated by SEV, it is possible to obtain values of the parameters investigated (k or T) to which to apply techniques of data interpolation, so as to obtain a distribution relative to the whole area. However, the problem in this case seems to be the determination of the reliability of the results obtained by the two different measurement types of the parameters investigated and the related costs. But, if the relative costs of performing the SEV are certainly less than those of pumping tests, at least in the absence of wells in the area considered, the same cannot be likely said for the reliability.</p> <p>Others concepts emerging from the specific comments.</p> <p><u>Specific comments:</u></p> <p>Pag.3, lines 61-62: English reviewing.</p>	<p>Lines 61 – 62 have been deleted.</p>
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	<p>Pag. 4, Fig. 1: The map of Fig. 1 is not readable.</p> <p>Pag. 4, line 80 and so on: change “([14] to “[14]”, namely the round bracket should be removed.</p> <p>Pag. 4, lines 79-84: This part should be clearly rewritten, explaining the partial curve matching and computer iteration methods. Moreover it should explain the reasons why the iteration program winResist 1.0 reduces the errors. I think that the section 2.2 (Goelectric Investigation) must be substantially rewritten and rearranged, expanding greatly the discussion of the methods used, even if only for the fundamental aspects.</p> <p>Pag. 5, line 89: change “Where” to “where”.</p> <p>Pag.5, lines 91-92: In these lines a statement is made: “...while groundwater flow in a porous medium is governed by Darcy’s law...”. This statement is valid only if the flow is steady-state. Afterwards in section 2.3 one refers to the method of Cooper-Jacob that, on the contrary, takes into account the unsteady-state flow. In fact, the time t</p>	<p>The quality of the map has been improved.</p> <p>This part has been rewritten and is now in lines 128 – 135.</p> <p>Section 2.2 is now section 3.2 (line 110)</p> <p>The fundamental aspects of geoelectrical investigation have been discussed in lines 112 – 122.</p> <p>Darcy’s law provides an accurate description of flow of groundwater in almost all hydrogeologic groundwater environments except when flow is turbulent.</p> <p>The Cooper-Jacob’s method was used</p>
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	<p>is one of the variables taken into account, as is shown in equations (8) and (9). Thus in the text the flow conditions, that justify the use of the methods used in both cases, must be clearly specified, explaining the reasons.</p> <p>Pag. 5, line 98: change “Where” to “where”.</p> <p>Pag. 5, line 105: change “Where” to “where”.</p> <p>Section 2.3: The part where one demonstrates how to obtain the equations (12) and (13) can be omitted, as well as Fig. 2, inserting as reference any text of hydrogeology. Thus this section must also be reorganized.</p> <p>Pag. 7, lines 142-148: The values of the parameters T and S should be moved in the following section 3. “Results and Discussion”.</p> <p>Pag. 8, lines 152-156: It should be explained the meaning of the symbols HQ, QQ etc ...</p> <p>The current text is not clear and must be improved to make understand the figures from 3 to 6, making an accurate description of these and</p>	<p>because the aquifer in the study area is mostly confined.</p> <p>The equations and figure 2 have been removed.</p> <p>The values of K and T have been moved to the section “Results and Discussion (lines 204 – 209)</p> <p>Figure 6 have been removed</p>
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	<p>explaining what they represent and as they were obtained.</p> <p>Specifically: the Fig. 3 must be described and is not simple to connect to what is stated in the text; moreover it should to explain as the figures 5 and 6 were obtained, specifying whether they are the result of the iteration method, which must be described and characterized previously in the section 2.2 (Goelectric Investigation), explaining the principles on which it is based (geostatistics, etc....).</p> <p>Pag. 12, line 189: Please, insert a space, changing “...from 418.6 189 to 1637.3m²/day...” to “...from 418.6 189 to 1637.3 m²/day...”.</p> <p>Pag 12, line 190: The square brackets indicate only a bibliographic reference, so the text needs to be changed, pointing directly to the authors, in addition to the reference. For example: "... given by Gheorghe A. [24] based on...". In any case the entire period is not clear, and it must be rewritten</p>	<p>Figure 3 is the results of iteration techniques from which the goelectric parameters were deduced.</p> <p>Computer iteration has been discussed in lines 130 – 135.</p> <p>A reference pointing directly to the author has been added in line 233.</p>
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	<p>more clearly.</p> <p>Fig. 7: It must be explained as the Fig. 7, showing the transmissivity variation across the aquifer relative to the study area, was obtained.</p> <p>Section 4.: The conclusions should be connected in some way with the purposes of the study. But in the conclusions that were done here one does not find any comparison with a characterization by pumping tests and even about the magnitude of the aquifer involved in the two types of measurement here considered, or, if one prefers, about the size of the corresponding investigated area.</p> <p>Pag. 13, line 210: The computer iterative techniques must be described in some way, and in the section "Methods" this was not done.</p> <p>Pag. 13, lines 212, 216, 217, 220, 221: It should to insert a space between the number and unit of measure.</p>	<p>The calculated transmissivity values were used with SURFER 8 to generate this figure which is now figure 6.</p> <p>Computer iterative techniques have been described in the section "Methods" (lines 131 – 135.</p>
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SDI Review Form 1.6

<u>Optional/General</u> comments	The topic of the present paper is interesting and relevant. Nevertheless, in the paper the comparison between geoelectric methods and pumping tests, highlighting the advantages and disadvantages of each of these methods should be clarified. One must also keep in mind the purpose of the paper, which must be structured in a robust way.	
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