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Water Analysis in Integrated Data Services Limited (IDSL) Camps in Parts of Gheleghele-Oredo LGA of Edo State

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Abstract: **Drinking water is in very short supply in many regions of the world. Nigerians resort to wells or bore-holes as a source of water. Although ground water (depending on the depth) can be a source of "clean" water, this raw water should still be tested and ultimately treated prior to usage. Drinking water quality standard ensures the safety of the drinking water supplies and the protection of public health. aw samples of water were taken from the fifteen camps in the IDSL area of Gheleghele in Oredo Local Government Area of Edo State for analysis, results are tabulated and discussed. The water from the camps borehole after analysis was observed not too bad and that it requires minimal treatment to meet with the recommended standard for drinking water.**

Keywords: **Drinking water, Samples, Analysis, Camps, IDSL.**

I. INTRODUCTION

Lack of access to clean water and sanitation kills children at a rate equivalent of a jumbo jet crashing every four hours [1]. 780 million people lack access to an improved water source; approximately one in nine people [2] .

35% of people in sub-Saharan Africa are living without access to clean water and 70.4 per cent are without basic sanitation [3].

Nigerian Government set out several firm commitments to address the water and sanitation crisis in Nigeria and-committed to national Increasing access to potable water supply to 75% and 65% for sanitation by 2015. But these commitments were largely unimplemented with 63 million Nigerians (39% of the population) still without access to safe drinking water, and 112 million (69% of the population) without basic sanitation, putting the country off-track and off-target the MDG water and sanitation targets [4].

FIG 1: SHOWING A GIRL FETCHING WATER FROM THE STREAM

According to Aquafield services [5], Nigeria presently has a population in excess of 150 million. However, some reports suggest that less than a fifth of this population has access to clean pipe borne drinking water. The issue of provision of good quality drinking water has been the source of several efforts by the government and non-governmental organizations. This is to alleviate the suffering due to poor drinking water quality. Drinking untreated water can result in several unwanted effects for the individuals, communities and ultimately for the nation.
Nigerians resort to wells or bore-holes as a source of water. Although ground water (depending on the depth) can be a source of "clean" water, this raw water should still be tested and ultimately treated prior to usage. The bore holes and

wells are easily exposed to heavy minerals which on its own are carcinogenic like arsenic, cadmium, cobalt, lead etc. Due to the presence of these pollutants, it is necessary to test and perhaps treat this water prior to use. However, this is presently not the case due to lack of access to water test kits as well as treatment options.
Ground water can also be contaminated by biological agents depending on the source. Shallow wells can be exposed to contamination from sewage systems, thereby increasing the risk of presence of water-borne diseases. In Nigeria, due to the poor sewage systems, this risk is significantly enhanced. These water-borne agents can be detected by proper analytical tests, followed by water treatment.

II. IDSL NIGERIA

Integrated Data Services Limited (IDSL) was established in 1988 as a subsidiary company of the NNPC, to provide hydrocarbon exploration services in the local and international Oil and Gas industry. The company is a merger of the National Hydrocarbon Reserves Evaluation Centre (NHREC), the Seismic Data Processing Department (DPD) and Parties X and Y.

IDSL has been around for over 25 years providing Seismic Data Acquisition, Processing, Interpretation and Reservoir Management Services to a wide range of clients from wholly owned to multinational Oil and Gas companies.

IDSL operates commercially and markets world-class Geophysical, Geological, Reservoir Engineering and Data Storage and Management Services.

I. Services/Businesses

- Seismic Data Acquisition (Acquisition of 2D, 3D & 4D Seismic Data on Land, Swamp, Transition and Marine)
- Seismic Data Processing (Geophysical Processing of 2D, 3D & 4D Land, Swamp, Transition and Marine Data)
- Reservoir Engineering Services (Engineering study of the Oil & Gas Reservoir for optimum聽 and efficient Reservoir performance)
- Data Storage and Management Services (Provision of Data Storage and Management services for all data acquired from E&P operations)

Seismic acquisition activities are also currently going on in the Niger Delta areas, including Edo, Delta and Ondo States.

III. BOREHOLE

Drinking water is in very short supply in many regions of the world. Furthermore, with global warming and the forecast disruption to rain patterns many people are turning to creating their own water boreholes. The number of individual households seeking permission to sink boreholes has grown dramatically in recent years [6].

Borehole drilling is a common phenomenon in Nigeria. But there is more to it than just drilling, as Olukayode Olayemi, Country Manager for Grundfos, who recently convened a seminar in Abuja on the technology [7]. Typically, a borehole used as a water well is completed by installing a vertical pipe (casing) and well screen to keep the borehole from caving. Borehole sites could reach as deep as 600m (200ft) [8]. The practice of well logging in boreholes dates to 1927, for the French Pechelbronn oil field [9].

Fig 2: Shell and auger drilling

Drillers may sink a borehole using a drilling rig or a hand-operated rig. The machinery and techniques to advance a borehole vary considerably according to manufacturer, geological conditions, and the intended purpose. For offshore drilling floating units or platforms supported by the seafloor are used for the drilling rig [10]. The progressive increase in population has also raised the demand for potable water both in the rural and urban areas. Since groundwater has a good quality and boreholes can give appreciable quantity of water for domestic uses, the use of these infrastructures in the rural and urban areas can surely alleviate water problems of the people in Nigeria [11] .

Usually, water from the boreholes is free from danger pathogens for humans like cholera, typhoid, dysentery, guinea worm and many others. Borehole water is groundwater available in an aquifer. Any contaminated surface water with pathogen that infiltrates into the soil and become groundwater would be filtered by the soil profile before the depth of aquifer. An aquifer is saturated water bearing stratum that is capable of holding, transmitting and yield sufficient water in underground to well [12].

IV. WATER STANDARD

Drinking water quality standard ensures the safety of the drinking water supplies and the protection of public health. The establishment of Nigerian Standard for Drinking Water Quality (NSDQW) will ensure the protection of the consumers. Since water quality issues are health related issues, the Federal Ministry of Health, collaborating with the Standards Organisation of Nigeria (the only body responsible for developing National Standards in Nigeria) and working through a technical committee of key stakeholders developed this Standard.

Raw samples of water were taken from the fifteen camps in the IDSL area of Gheleghele in Oredo Local Government Area of Edo State for analysis and the results are tabulated below.

TABLE 1: SHOWING ANALYSIS OF THE PHYSICAL PARAMETER OF THE RAW WATER SAMPLES

PHYSICO ANALYSIS

Parameter, Unit	**Limit, N.I.S.**	**Camp 1**	**camp 2**	**Camp 3**	**Camp 4**	**Camp 5**	**Camp 6**	**Camp 7**	**Camp 8**	**Camp 9**	**Camp 10**	**Camp 11**	**Camp 12**	**Camp 13**	**Camp 14**	**Camp 15**
Temperature ^{o}C	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient
Colour, TCU	Colourless	Colourless	Colourless	Colourless	Colourless	Light yellow	Milky	Colourless	Colourless	Milky	Colourless	Colourless	Milky	Colourless	Milky	Milky
Odour	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless
Taste	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless	Tasteless

Table 1 above shows the results of the raw water sample for the physical parameters analysis and from the table the temperature, odour and taste conforms with the limits but in the case of colour all are colourless except for camp 6, camp9, camp 12, camp 14 and camp 15 in which case the water are milky.

TABLE 2: SHOWING THE RAW WATER SAMPLE CHEMICAL ANALYSIS

CHEMICAL ANALYSIS

Parameter, Unit	Limit, N.I.S. STD	Camp 1	camp 2	Camp 3	Camp 4	Camp 5	Camp 6	Camp 7	Camp 8	Camp 9	Camp 10	Camp 11	Camp 12	Camp 13	Camp 14	Camp 15
pH	6.5-8.5	5.6	5.39	4.87	5.59	5.43	4.81	5.01	6.5	6.14	6.6	4.96	5.58	5.57	5.96	5.61
Turbidity, NTU	5	Nil	Nil	Nil	Nil	Nil	12	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Conductivity,uS/cm	1000	0.1	0.2	0.2	0.1	0.3	0.3	0.1	0.9	0.1	16.7	0.2	0.1	0.1	0.1	0.1
TDS, mg/l	500	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.6	0.1	11.1	0.1	0.1	0.1	0.1	0.1
Hydrocarbon,"	0.0002	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Nitrate, "	10	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Nitrite"	0.1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Sulphate,"	100	3	4	4	4	12	9	3	6	5	7	3	3	4	5	2
Hardness, CaCO3, "	100	7	13	7	7	18	22	16	21	6	11	10	9	8	5	7
Iron, "	0.03	0.03	0.04	0.04	0.03	1.1	1.17	0.06	0.05	0.07	5.08	0.05	0.05	0.03	0.07	0.03
Fluoride"	1	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Chloride, "	100	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Magnesium, "	0.2	0.02	0.04	0.02	0.02	0.05	0.19	0.07	0.06	0.02	0.19	0.07	0.02	0.02	0.03	0.03
Manganese"	0.05	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Zinc, "	5	Nil	0.02	0.06	0.01	0.02	0.05	0.08	0.02	0.05	0.13	0.04	0.04	0.02	0.04	0.05
Lead, "	0.01	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Cadmium, "	0.003	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Mercury, "	0.003	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Copper"	1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

From table 2 above which deals with the chemical analysis of the sample from the different camps, it is observed that the pH ranges from 4.81 camp 6 to 6.6 camp 10, Turbidity was only present in camp 6 (12), conductivity 0.1 to 16.7, TDS ranges 0.1 to 11.1 in camp 10, Hydrocarbon value is nil, Nitrates nil, Nitrites nil, Sulphate rages from 2 for camp 15 to 12

for camp 5, hardness ranges from 5 in camp 14 to 22 in camp 6, Iron ranges from 0.03 to 5.08 in camp 10, Flouride nil, chloride nil, Magnesium ranges from 0.02 to 0.19 for camp 6 and camp 10, Manganese nil, Zinc ranges from 0.01 for camp 4 to 0.13 for camp 10, Lead nil, Cadium nil , Mecury nil, Copper is 0.001

TABLE 3: SHOWING THE LIMITS AND THE MEAN FOR THE CHEMICAL ANALYSIS OF RAW SAMPLES OF WATER

Parameter, Unit	**Limit, N.I.S. STD**	**Mean**
pH	6.5-8.5	5.57
Turbidity, NTU	5	0.80
Conductivity, us/cm	1000	1.31
TDS, mg/l	500	0.88
Hydrocarbon,"	0.0002	0.00
Nitrate, "	10	0.00
Nitrite"	0.1	0.00
Sulphate,"	100	4.93
Hardness, CaCO3, "	100	11.13
Iron, "	0.03	0.53
Fluoride"	1	0.00
Chloride, "	100	0.00
Magnesium, "	0.2	0.06
Manganese"	0.05	0.00
Zinc, "	5	0.04
Lead, "	0.01	0.00
Cadmium, "	0.003	0.00
Mercury, "	0.003	0.00
Copper"	1	0.00

TABLE 4: SHOWS MICROBIAL RESULTS OF THE RAW WATER ANALYSIS

MICROBIOLOGY

Parameter, Unit	**Limit, N.I.S. STD**	**Camp 1**	**camp 2**	**Camp 3**	**Camp 4**	**Camp 5**	**Camp 6**	**Camp 7**	**Camp 8**	**Camp 9**	**Camp 10**	**Camp 11**	**Camp 12**	**Camp 13**	**Camp 14**	**Camp 15**
Coliform, 100cfu/ml	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Feacal Streptococci	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Specific E. Coli	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
Yeast after 5 days	"	6	6	38	13	31	28	33	12	17	TNTC	28	32	11	21	22

From the result of the microbial analysis it shows that like most boreholes according to literatures it is free fro E coli and other feacal contamination due to the filtration properties of the soil.

V. CONCLUSION

Borehole is one of the main ways to combat the water shortage experienced in the world today and from the investigations carried out in Gheleghele area of Oredo local government area of Edo State shows that the water from the camps is not too bad and it requires minimal treatment to meet with the recommended standard for drinking water. From table 3 which give the average chemical level of the different samples shows that the pH (5.57) needs improvement and other parameters are within the limits.

REFERENCES

[1] UNICEF, WHO 2009. Estimated with data from Diarhhoea: Why children are still dying and what can be done JMP, Joint Monitoring Programme for Water Supply and Sanitation. Progress on Sanitation and Drinking-Water 2012 up date.

[2] Abutu, A. Clean water and sanitation are 'missing pieces' in treatment for HIV patients. Daily Trust, Tuesday 9 December, 2014.

[3] E WASH www.assemblyonline.info

[4] www.aquafieldservices.com

[5] Ryan, V (2009). Drinking Water - Boreholes. www.technologystudent.com

[6] Offiong, A.V 'We've developed alternatives to boreholes and roof tanks', Sunday Trust, 07 September, 2007.

[7] Loewe, M. (1968). *Everyday Life in Early Imperial China during the Han Period 202 BC–AD 220*. London: B.T. Batsford Ltd.; New York: G.P. Putnam's Sons, p. 194.

[8] Telford, W.M, Geldart; L.P and Sheriff, R.E, (1990). *Applied Geophysics*. Cambridge University Press. pp.645–646. ISBN 978-0-521-33938-4. Retrieved 5 October 2012.

[9] Yusuf, K.O; Ibrahim, A.M and Famakinwa, J.O. Productivity and quality analysis of selected boreholes in Osun and Kwara States, Nigeria. (Agric Eng Int: CIGR Journal). Vol. 14, No.3. 2012.

[10] http://en.wikipedia,org

[11] Sharma, R. K., and T. K. Sharma (2007). Irrigation engineering including hydrology. S. Chand and Company Ltd, New Delhi. 3rd Edition, p. 7 – 45.

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