

Thank you for choosing **Fitz Scientific**

The following are basic guidelines on how to understand and read your Certificate of Analysis

The columns listed on the Certificate that are relevant to you are those listed **Test Parameter** and **Result**.

If any of the parameters are **highlighted in grey** then this means that the sample has failed to comply with standards for this particular test and the water is not suitable for drinking.

The next step is to contact a water treatment company for advice on treatment.

Please note that there is no standard for hardness so a treatment company will also advise you on how hard your water is and will treat it accordingly.

After installation of the treatment system by an appropriate company you will require a retest of the drinking water supply to ensure that the problem has been solved. Not all of the parameters will require a retest just the ones you failed on. Contact us again at this stage and we will provide a price for individual parameters and arrange for bottles to be supplied to you.

Test Parameter = the chemical, metal or bacteria we analysed for in the Water sample.

SOP = Standard Operating Procedure – the method we used in the lab in other words.

Analytical Technique = the instrument or technique used

PVL = Parametric Value Limit acceptable for potable water

Result = Your result

Units = The units relating to the result

Acc = If we have Accreditation for the test

Please see below a list of the parameters which were tested on your drinking water sample, their common causes, Parametric Value Limits PVL (the maximum allowable limit), our laboratory Limit of detection (LOD) ie how Low we can detect to and their effect on the water from a human consumption point of view.

Aluminium – (PVL – 200 ug/l, LOD= 1.7 ug/L) is a significant element in the earth's crust and is therefore widespread in the natural environment. A level greater than 200 ug/l can cause turbid and discoloured water. There is no conclusive evidence on the health effects although it is known to have a tendency to accumulate in the brain and bones.

Ammonia – (PVL - 0.3 mg/l as NH₄, LOD=0.01 mg/L as NH₄) is found naturally in groundwater however generally it is in low concentrations as it absorbs to soil particles and clays and is not easily leached. Ammonia may have public health connotation associated with it. Ammonia is an indicator of recent contamination, typically septic tank discharges, and agricultural waste.

Clostridia – (PVL- 0 no/100ml, LOD= None Detected) the disease gangrene is caused by Clostridium Perfringens. Although this organism is present in various environments it is especially common in wastewater indicating faecal contamination.

Coliforms (Total) – (PVL – 0 no/100ml, LOD= None Detected) this is a measure of the presence of bacteria which may be harmful to humans and as such bacteria from this group should not be present in drinking water. Their presence is due to sources of contamination, usually septic tanks in close proximity to the well, or run off from farming activity or storage/spreading of silage effluent or slurry. Coliforms can cause serious health risks.

Colour (Apparent) – (PVL – Acceptable to consumers and no abnormal change, LOD= 1.1 PtCo units) Colour in water may result from the presence of neutral metallic ions (iron and manganese), humus and peat materials, plankton, weeds and industrial wastes. Colour is removed to make water suitable for domestic and industrial applications.

Conductivity – (PVL – 2500uScm-1 @20C, LOD= 0.5 uScm-1 @20C) is a measure of the total amount of ions in a particular water supply and is also a measure of the water's ability to carry an electrical current. The conductivity of potable waters ranges generally from 50 – 1650uScm-1 and samples which exceed this higher value indicate some form of contamination.

E Coli – (PVL – 0 no/100ml, LOD= None Detected) E Coli belongs to the faecal coliform group of bacteria. Potable water systems can become polluted with coliform bacteria from normal, diseased or carrier human and animal excrements. This can occur by gross connections between a water main and a sewer or from the entry of sewage water through leaks in damaged pipes.

Iron (Total) – (PVL – 200 ug/l, LOD= 3.7 ug/L) is found naturally in groundwater and has no major health connotations but is of concern as a nuisance parameter causing problems with staining of laundry and tableware.

Nitrite – (PVL – 0.5 mg/l as NO₂, LOD= 0.03 mg/L as NO₂) Nitrite has health connotations with it and is the actual etiological agent of methemoglobinemia (or more commonly known as blue baby syndrome). Nitrite is an indicator of recent contamination.

pH – (PVL – 6.5-9.5, LOD= 0.01 pH units) pH below 7 is acidic in nature while pH above 7 is basic. Most natural waters in Ireland are slightly basic in nature due to the presence of carbonates and bicarbonates of the alkali and alkaline earth metals. pH has no real health connotations associated with it except in extreme cases.

Hardness (Total) – (PVL – Not Specified, LOD = 4.3 mg/L CaCO₃) Total hardness is defined as the sum of the calcium and magnesium concentrations. Hardness may range from zero to hundreds of mg/l depending on the source of the treatment to which the water has been subjected. Hardness can be treated with a filtration system.

Turbidity – (PVL – Acceptable to Consumers and no abnormal change, LOD=0.02 NTU) Clarity of water is important in producing products destined for human consumption and in many manufacturing operations. The clarity of a natural body of water is an important determinant of its condition and productivity. Suspended and colloidal matter such as clay, silt, microscopic organisms etc. cause turbidity in water.

Manganese – (PVL 50ug/l, LOD=0.7 ug/L) This is widely found in soils and ground waters. Manganese, like iron, is of concern as a nuisance parameter causing problems with staining but with this metal the problems can be more severe hence the more stringent limit. The presence of manganese much above the limit can also cause an unacceptable taste.

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Lead – (PVL – 10 ug/L, LOD = 0.38 ug/L) Lead is one of the most commonly determined heavy metals because it accumulates in body tissue. It follows that strict limits on its presence in raw and finished drinking waters must be imposed. Particular attention is paid to this element as in many older houses extensive use is made of lead piping and there is a danger of lead being brought into solution ("plumbosolvency"). Levels may be quite marked in samples taken first thing in the morning when the initial yield will be of water which has been standing in such pipes for perhaps twelve hours. Hence the recommendation that drinking water pipes be flushed briefly in the morning before the water is consumed. (This test is accredited to ISO 17025:2005)

Copper – (PVL – 2 mg/L, LOD = 0.0002 mg/L) Copper is not particularly toxic to humans (indeed, it is an essential dietary requirement) and medicinal doses up to 20 mg/l are not unknown. However, astringent tastes in water can be caused by levels above 1 mg/l Cu. Background Information: This element is present naturally in metalliferous areas but more often its presence in waters is due to attack on copper piping. Rarely, its occurrence may be due to its use as an algicide. Unless used with great care for algal control there is a grave risk of fish kills. (This test is accredited to ISO 17025:2005)

Nitrate – (PVL – 50 mg/L as N, LOD = 0.16 mg/L as N) Hazard to infants above 11 mg/l N [50 mg/l NO₃]. Relatively little of the nitrate found in natural waters is of mineral origin, most coming from organic and inorganic sources, the former including waste discharges and the latter comprising chiefly artificial fertilisers. However, bacterial oxidation and fixing of nitrogen by plants can both produce nitrate. Interest is centred on nitrate concentrations for various reasons. Most importantly, high nitrate levels in waters to be used for drinking will render them hazardous to infants as they induce the "blue baby" syndrome (methaemoglobinaemia). The nitrate itself is not a direct toxicant but is a health hazard because of its conversion to nitrite which reacts with blood haemoglobin to cause methaemoglobinaemia. (This test is accredited to ISO 17025:2005)