



Iron and manganese

Iron and manganese within water supplies are a common cause of complaints of "dirty water". We recognise that supplies which are discoloured are not satisfactory and we take action in the areas where these problems occur as soon as possible. However iron and manganese often arise from entirely natural sources and are in fact essential elements in our diet.

Both iron and manganese occur naturally in many water sources in Wales. They are usually associated with water abstracted from the rivers and reservoirs in the Welsh hills, but can also be found in some lowland ground waters. This naturally occurring iron and manganese can be removed by carefully controlled processes at our water treatment works. The majority of our works already treat the incoming water satisfactorily, but if the level in the outgoing water should exceed the legal standards, optimisation of treatment is investigated to correct this.

There are other sources of iron in drinking water. Iron compounds may be added during the process of water treatment to remove impurities at water treatment works, and are particularly useful in reducing the colour, cloudiness and bacterial content of water before the final stages of treatment and disinfection. This process is very carefully controlled but can occasionally result in water supplies with levels above the permitted standard. A small amount of the iron added in the treatment process may stay in the water supply and in order to keep the amount of iron remaining in the treated water at a level well below the permitted standard of 200 microgrammes per litre, we have installed equipment to improve and control the treatment process, particularly concentrating on automatic control to control the process.

Iron can also be found in water supplies because of direct contact with iron pipes. Many older water mains pipes were made of cast or galvanised iron; in some cases they were lined to prevent iron being in contact with the water, but often these linings did not prove to be effective. Modern mains only use iron where it is essential to have a very strong construction, such as near major roads, and these are now lined with longer lasting materials.

Iron and manganese tends to form loose deposits in water mains, and contribute to the turbidity (cloudiness) of water supplies, when the flow in the mains is disturbed or reversed, causing the deposits to mix with the water in the mains. This can happen when a mains burst occurs, or if there is a particularly

heavy demand in part of an area of supply. The iron and manganese deposits are visible as orange, brown or black particles in the water and usually settle out on standing. In severe cases they may cause staining of sinks or laundry, and can give rise to a slightly bitter taste to the water.

Neither of these elements are considered to be harmful to health at the levels normally found, even in severely discoloured drinking water. The limits set for iron and manganese by the World Health Organisation reflect the staining and nuisance which may be caused, and not because of any potential risks to health. Water quality regulations in the UK are even lower than this to produce water supplies which gave far greater satisfaction to customers. The limits are set for iron at 200 microgrammes per litre and for manganese at 50 microgrammes per litre.

Where there are difficulties in meeting the quality standard at the customer's tap, or where there are areas of concern from customers, the Company takes the appropriate measures to improve the quality of its supplies. With elements such as iron and manganese it may take longer to find permanent solutions, especially when considerable distances of new mains are required. We operate nearly 25,000 kilometres of mains and refurbishment/maintenance of this distribution system is necessary to improve the quality of water supplied to our customers. Between 1995 and 2000, 1900 km of cast iron water mains were renovated. This programme of improvement continues with a further 4500 km due to be refurbished by 2010. The work is targeted in areas which may experience water quality above the regulatory limits. Areas which are less affected will have the water mains flushed on a regular basis and will be subjected to further investigation. Whilst we accept that dirty water can occur when operational problems, such as bursts, take place, this problem is normally only for a short period of time. Where longer term problems exist this is to be addressed within the remit of the improvement programme.

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Haearn a Manganîs

Mae presenoldeb haearn a manganîs mewn cyflenwadau dŵr yn gallu arwain at gwynion o 'ddŵr budr'. Mae Dŵr Cymru yn cydnabod fod cyflenwadau afliwiedig yn anfoddhaol a bydd yn gweithredu'n gyflym i ddatrys y ffaith broblemau pryd bynnag byddant yn codi. Fodd bynnag, yn aml mae haearn a manganîs yn deillio o ffynonellau cwbl naturiol ac yn wir maent yn elfennau hanfodol o'n diet.

Gwelir haearn a manganîs yn bresennol yn naturiol mewn llawer o ffynonellau dŵr yng Nghymru. Fel arfer, maent yn gysylltiedig â dŵr a gymrir o afonydd a chronfeydd ar dir uchel, ond gwelir nhw hefyd mewn dyfroedd ar dir isel. Gellir gwaredu'r haearn a manganîs yma wrth ddilyn prosesau gofalus yn ein gweithfeydd trin dŵr. Mae'r mwyafrif o weithfeydd trin dŵr y cwmni eisoes yn trin dŵr fel hyn yn foddhaol, ond os digwydd i'r lefelau godi'n uwch na'r safonau cyfreithiol, cymrir camau i ail-drin y dŵr yn dod allan o'n gweithfeydd.

Gall haearn hefyd ddeillio o ffynonellau eraill mewn dŵr yfed. Er enghraifft, defnyddir cyfansoddion haearn mewn gweithfeydd trin dŵr er mwyn gwaredu amhureddau ac maent yn helpu i ostwng lefelau lliw, cymledd a bacteria mewn dŵr cyn y prosesau trin a diheintio olaf. Rheolir y prosesau hyn yn ofalus ond ar adegau mae lefelau'n gallu codi'n uwch na'r safonau cymeradwyedig. Er enghraifft, gall rhywfaint o haearn a ychwanegir yn ystod y driniaeth barhau yn y dŵr wedi hynny ac er mwyn cadw'r lefelau'n sylweddol is na'r safon o 200 microgram per litr, mae Dŵr Cymru wedi gosod offer i wella a rheoli'r prosesau hyn yn otomatig.

Bydd haearn hefyd yn cyrraedd cyflenwadau dŵr yn dilyn cysylltiad uniongyrchol â hen bibellau haearn. Yn y gorffennol cynhyrchwyd pibellau o haearn bwrw/galfanedig; rhoddwyd leinin mewn rhai er mwyn rhwystro'r haearn rhag dod i gysylltiad â'r dŵr, ond nid oeddent yn effeithiol iawn. Bydd pibellau modern ond yn cynnwys haearn pan fo angen rhai cryf iawn, er enghraifft ger heolydd mawr, a bryd hynny gosodir leinin llawer cryfach nag yn y gorffennol.

Mae haearn a manganîs yn tueddu i grynhoi mewn pibellau, a gallant liwio'r dŵr yn dilyn newid mewn cyflymder neu gyfeiriad y llif dŵr o fewn ein pibellau. Gall hynny ddigwydd pan fydd pibell fawr yn rhwygo, neu adeg galw mawr am ddŵr mewn ardal. Gwelir yr haearn a manganîs fel gronynnau oren, brown neu ddu yn y dŵr ond byddant fel arfer yn setlo mewn amser. Mewn achosion difrifol gallant staenio sinciau a londri, a gwneud y dŵr flasu'n chwerw.

Ni chredir fod un o'r elfennau hyn yn peryglu iechyd pobl ar y lefelau a welir fel arfer, hyd yn oed pan fydd dŵr yfed wedi'i afliwio'n ddifrifol. Mae terfynau haearn a manganîs y

WHO (World Health Organisation) yn adlewyrchu'r posibilrwydd o staenio a niwsans, nid unrhyw botensial beryglon iechyd. Mae rheoliadau ansawdd dŵr y Deyrnas Unedig hyd yn oed yn is na hynny er mwyn bodloni cwsmeriaid. Y terfynau cyfredol yw 200 microgram per litr yn achos haearn, manganîs 50 microgram per litr.

Os yn wynebu problemau cyfarfod â safonau ansawdd dŵr o dapiau cwsmeriaid, neu pan fydd cwsmeriaid yn pryderu, bydd Dŵr Cymru yn cymryd camau addas i wella ansawdd ei gyflenwadau. Yn achos elfennau megis haearn a manganîs, gall gymryd yn hirach i ddyfeisio atebion parhaol, yn arbennig pan fydd angen adnewyddu llawer o bibellau ar rwydwaith y cwmni. Mae rhwydwaith Dŵr Cymru yn cynnwys oddeutu 25,000 cilomedr o bibellau a bydd yn cynnal ac adnewyddu'r system yn barhaus er mwyn gwella safon y dŵr a gyflenwir i gwsmeriaid. Rhwng 1995 a 2000, adnewyddwyd 1900 cilomedr o bibellau haearn bwrw ac mae'r rhaglen yn parhau, er mwyn adnewyddu 4500 cilomedr pellach erbyn 2010. Targedir y gwaith yn yr ardal oedd hynny sydd fwyaf tebygol o gael dŵr o safonau is na'r rhai cymeradwyedig. Bydd y cwmni hefyd yn glanhau pibellau ardaloedd eraill yn rheolaidd ac yn cynnal ymchwiliadau pellach os bydd angen. Er bod Dŵr Cymru yn derbyn y gellir cael dŵr afliwiedig yn dilyn problemau gweithredu, megis torri pibellau, fel arfer bydd ond yn parhau am gyfnod byr. Bydd y cwmni'n trafod problemau mwy hir dymor fel rhan o'i raglen gyffredinol i wella'r rhwydwaith.

Angen cyngor neu wybodaeth?



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