

# Groundwater Under the Direct Influence of Surface Water (GWUDI)

By Mike Hayes, Groundwater Technician

This term specifically refers to groundwater systems that have conditions where near by surface water with a significant occurrence of insects or other large diameter pathogens such as giardia or cryptosporidium that may infiltrate into a groundwater source naturally or as a result of pumping.

In order to determine if a hydrologic connection exists between a ground water source and a surface water source the ground water source must meet two of the following requirements. The source must be within 500 feet of a surface water source and either must have shown a source related presence of coliform bacteria or have an inadequate grout seal or no impervious barrier. If the source only meets one of these three requirements then the source is excluded from further testing. However if the source meets two or more of these requirements then the water system has the option to conduct either a Hydrogeologic Assessment performed by a registered geologist or a Water Quality Assessment, which is performed by the water system. The water quality assessment consists of one year of testing for temperature, pH, or conductivity from both the groundwater and the surface water source. If the results of the tests from the surface water and the ground water yield similar characteristics or trends with time, then it is likely that a hydrologic connection is present between the ground water and the surface water. If the tests show that the characteristics are very different then it is likely that no connection is present between the two sources.

Once this is completed the water system will know if there ground water source is in hydrologic connection (shares water with) with the near by surface water source or not. If it is determined that a hydrologic connection exists then the next step is to perform a Microscopic Particulate Analysis (MPA). A minimum of two tests is required, taken at high-risk time, i.e., high surface water stage and during a high demand period. The results of the MPAs are in the form of a risk score. After performing these tests the Department of Human Resources, Drinking Water Program will determine if your source is under the influence of surface water or not. If your

source is determined to be under the influence of surface water then your source will fall under the surface water treatment rules.

Why is this an issue? The microorganisms and large diameter pathogens can gain access to groundwater sources and can be very difficult to treat. Some of the parasites produce cysts that are very resistant to harsh environments and are resistant to chlorine treatment. Adults do not have to ingest very many cysts to become ill. When ingested they germinate, reproduce quickly causing illness. Treatment following the surface water treatment rule and developing a drinking water protection plan will go a long way to protecting your water consumers.