the aquifer matrix, and a shorter aquifer contact time over a large area has been shown to lower overall arsenic concentration along the Kenai River basin in this area (Coble, 2006).

This is just one public benefit resource conflict that needs to be addressed, noting that the City of Soldotna drinking water interests involve the whole community – and as community populations can increase, the demand for materials sites increases just as these areas for groundwater exploration had been cited as wise to set aside from a water quality perspective (Coble, 2006).

Confined Aquifer

Wellhead protection seeks to reduce the incidence of groundwater pollution by activities 'within a wellhead' which can be loosely defined as the area where a well is extracting water.

The City of Soldotna Well E is a relevant well in this memorandum, as it has a large wellhead encompassing the Patson Materials Site and produces a significant amount of the water for the City. During a single pumping test in 2003 it produced over 9 feet of drawdown in a well *across the river in Swiftwater Park* (Coble, 2003), and measurable at three wells between 7,000 and 9,000 feet away. This is why we say the wellhead of Well E likely *does* impact confined aquifer levels under the Patson Material Site (e.g. the confined Foster Construction well of Appendix A) which is about 3,500 feet away.

This means we really rely on this confining layer. But what if contaminants did breach the confining layer…in other words, should a discussion be had about a potential fuel spill on top of a confining layer regarding public water supply? Confining layers are far from perfect; flow has been shown in KPB pumping tests between the unconfined and confined aquifers, especially close to the pumped well – and no such test was performed on Well E.

Given the long and expensive efforts by the City of Soldotna to reduce arsenic in its water supplies, we would benefit from looking at Soldotna's wellhead protection. This would include subjects such as *Roles and Responsibilities*, or the individuals responsible for the development, implementation of the local public water supply (a resource that concerns everyone), basic *Wellhead Protection Area Delineation*, in order to dentify and limit potential sources of contamination within the wellhead protection area, *Wellhead Protection Area Management* which would provide ways to prevent potential sources of contamination from reaching the public water supply wellfield, a *Contingency Plan* in case of a water supply emergency related to use of conflicting resources, *New Wells* to provide information on existing groundwater availability and future demands, and the vulnerability of the existing wells to contamination, as well as *Public Education and Outreach* to generate community awareness in wellhead protection.

So from a regulatory standpoint, there is at least some effort to determine how large the important public wellhead areas are, where future groundwater exploration may be in conflict with material sites, and how robust the confining layer is within the wellhead etc.

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