Water Supply Strategy

In the following, we will discuss some alternative strategies for securing a sufficient supply of water for Willits to meet demand that complies with a reasonable level of conservation. That level is defined in another document. The West Yost (WYA) studies project a potential drought deficit of 1300 AF by 2025. As has been stated elsewhere this conclusion can be challenged in various ways. We have run numbers in various combinations and concluded that the actual deficit would be somewhere between 245 AF (assuming a project population served of 7720 and 42% conservation) and 381 (assuming a projected population served of 8017 and 30% conservation). For the purposes of this proposal, we will assume a need to add an additional supply of water of 350 AF in drought situations only.

Watershed enhancements

The success and reliability of the specific methods for supplementing our water supply mentioned below will depend, in part, on efforts needed to enhance the watershed's ability to capture and hold water in the rainy season and recharge the groundwater flow. The higher in the watershed we can slow rainwater runoff and force a maximum level of absorption and groundwater recharge the better. The negative impacts of logging and gravel mining in the Willits city watershed need to be mitigated with a program of restoration efforts that include a combination of water retention (on-contour) swales, small ponds and re-vegetation. This could dramatically increase water retention at a minimal cost. This would not only greatly increase the security of our water supply through drought periods, but would have a positive environmental impact and improve water quality (with reduced siltation), as well. The fact that the city owns the watershed means there are no barriers to implementing such a program other than – perhaps – a lack of political will. The specifics of this program will be discussed elsewhere.

In addition to increasing the success of other strategies, the groundwater recharge efforts must also be seen as an alternative water storage system that would deliver water in the later dry months of the year. It is known that water in groundwater passages moves very slowly and takes months to move downhill – in some cases even years. This fact has the tendency to increase late season stream flow and pond/lake/reservoir recharge as the natural ongoing interchange of ground and surface water occurs. The best place to store water is underground.

High-flow retention in off-stream holding ponds

Available high-flow water could easily be diverted from creeks into holding ponds that are located away from critical water drainage regions and constructed in such a way that they do not capture run-off water from the area uphill from the pond. Depending on the availability of appropriate locations these ponds could be either fewer larger ponds (up to 300 AF) or more but smaller ones (100 AF or less). In any case, they should be constructed with as much depth as is geologically possible to both minimize evaporation and to increase the groundwater recharge ability of the holding pond. As many of such

ponds could be constructed as is required, appropriate area is available, and/or the city decides to finance.

Horizontal Wells

Assuming good groundwater recharge is attained, well-placed horizontal wells drilled into the base of the Davis Creek watershed (uphill from the treatment plant) could provide either all or a part of the required supplementary water that might be required in dry years. These wells could also be used to simply refill the reservoirs that might be drawn down in late spring or early summer to ensure the maximum supply kept in the reservoirs. However, using the water directly from the wells into the treatment plant would probably have the same effect. Presumably, the installation of such wells would be a more cost-effective approach than constructing off-stream holding ponds, although a combination of both approaches might be an alternative that would increase supply security, since there would not be a complete reliance on one or the other strategy.

In Conclusion

Even if our projections for future water demand are too optimistic and the deficit needed to be offset it exceeded the 350 AF assumed here, these strategies could easily be expanded slightly to meet that demand.[1] We suggest these strategies (not included or examined in detail in the WYA reports) because we believe they are the most ecologically sound approaches as well as being the most economical solutions. The cost of a serious conservation program (see details elsewhere) in conjunction with these smaller scale supply solutions would most certainly amount to less than the well project proposed by WYA.

[1] It should be noted that the increased application of these strategies could and should be financed by the application of a rate structure that would generate additional funds (in the case that users do not conform to the conservation standards set) that would then be used to finance the additional infrastructure required to satisfy the excess demands. In this way, the rate structure would ensure that those who actually use more water also pay for the additional requirements they cause. See separate proposal related to rate structure for details.