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TYPICAL ALWI APPROACH
MUNICIPAL / PUBLIC WATER SUPPLY PROJECTS: FINDING AND DEVELOPING A NEW SOURCE

PHASE 1: HYDROGEOLOGIC FEASIBILITY EVALUATIONS

Development and permitting of supplemental municipal water capacity entails a substantial investment of time and capital. The economic feasibility of each identified water supply improvement usually is influenced (perhaps strongly) by the quantity and quality of the water and the ability to obtain the necessary permits and approvals. Preliminary screening evaluations to identify and focus on the most favorable options while de-emphasizing less feasible alternatives usually have a favorable benefit-cost ratio.

Some Public Utility Clients Know Where the Source is to be (Preferably) Located

Sometimes the Town or water utility already has one or more properties in mind where groundwater exploration and development efforts are preferred. Such preferred locations usually are predicated on land ownership (i.e., parkland or other open space already publicly owned), developer agreements, infrastructure layout and/or treatment and distribution system cost considerations. We possess a fine track record in selecting and prioritizing successful drilling locations among areas a client already deems feasible for non-hydrogeological reasons.

Many Clients Value ALWI's GIS-Based, Comparative Hydrogeologic Siting Evaluations

For many community water supply exploration projects, municipal and other public utility clients do not have preset notions about the specific location of a new supply source. In such circumstances, hydrogeological and hydrological factors may be given greater weight. After the Town or client agrees on the overall, outer boundaries of the study area (usually a buffer around the existing footprint of the water system out to one to three miles), ALWI typically begins by identifying properties within the included buffer area where high-capacity groundwater or surface water development appears feasible.
Feasibility is predicated on a custom-developed set of hydrogeological, hydrological, regulatory, property size, financial and engineering criteria to be discussed and mutually agreed. We check potentially favorable areas for conformity with applicable regulations (i.e., to maintain appropriate setbacks from existing and future buildings, parking areas, wetlands, flood plains and sewer lines) to the degree practicable while maintaining the overall confidentiality of our still-preliminary evaluation.

Our Quantitatively-Based, Matrixed Approach Lends Systematic Objectivity

We use a matrixed evaluation to evaluate comparatively a comprehensive suite of related physical, logistical, regulatory and economic factors, listed below in the typical order of decreasing overall importance. Once we obtain client input and concurrence, each criterion is

assigned a weighting factor ranging from 1 to 4. Higher weights will be accorded to criteria judged more important.

- **Comparative Treatment and Conveyance Costs, Including Real Estate (4) -** Distant sources and those requiring more elaborate treatment cost more in filtration and conveyance. Engineering, construction, operation and real estate costs all escalate, particularly with distant river or spring sources.

- **Potential for High Sustainable Capacity (3)** - Experience teaches that the potential for a prolific well is maximized at locations where two or more lengthy fracture traces meet at high angles. We will assign two points for the presence of such a fracture trace intersection on a given parcel. Since the aquifer system beneath the area is perceived as reasonably prolific overall, this criterion is weighted only with three points; cost considerations have greater import. Properties with more than one identified fracture trace intersection were assigned one bonus point (for a total of three points) to reflect the greater overall odds of successful groundwater development on a property with more drilling targets.

- **Larger Properties Afford Options (2) -** Wellhead protection considerations, such as setbacks related to contamination hazards, private septic and neighboring wells (residential or municipal) are not as limiting on larger parcels. Larger properties also have a greater chance of containing one or more fracture intersections which makes them more favorable for drilling.

- **Well Interference and Adverse Impact Potential (2)** - Based on the hydrogeological setting of the Town, we conceptualized an oval-shaped probable zone of influence around each prospective drilling location, depending on the hydrogeologic setting, extending from each given intersection 3,000 feet along geologic strike (north-northeast to south-southwest), but only 500 feet across geologic strike (east-southeast to west-northwest). The presence of competing wells within such ovals will be a weighting factor.

- **Zoning Criteria (2)** - Development of municipal sources outside of Town presumably requires the approval of other agencies (State and/or County) from a planning and zoning perspective. Water source development is more compatible in areas not zoned for competing water uses. Compatible zoning lessens the chance for public opposition as well. Existing planning and zoning criteria usually is given a weighting of two, pending Town concurrence.

- **Setback Criteria (1)** - Criteria affecting specific well siting include required setbacks from sanitary facilities, wetlands, streams, property lines, buildings and contamination hazards. Such setbacks may lessen hydrogeological feasibility to some degree, but are unlikely to pose an insurmountable problem on properties 25 acres or larger. One point was assigned if such setback issues seemed absent; zero if setbacks or offsets are anticipated

Typically the results then are used to prioritize and rank specific properties for more detailed evaluations using techniques such as fracture trace analysis, geologic fabric analysis, water balance assessments and geophysical methods.