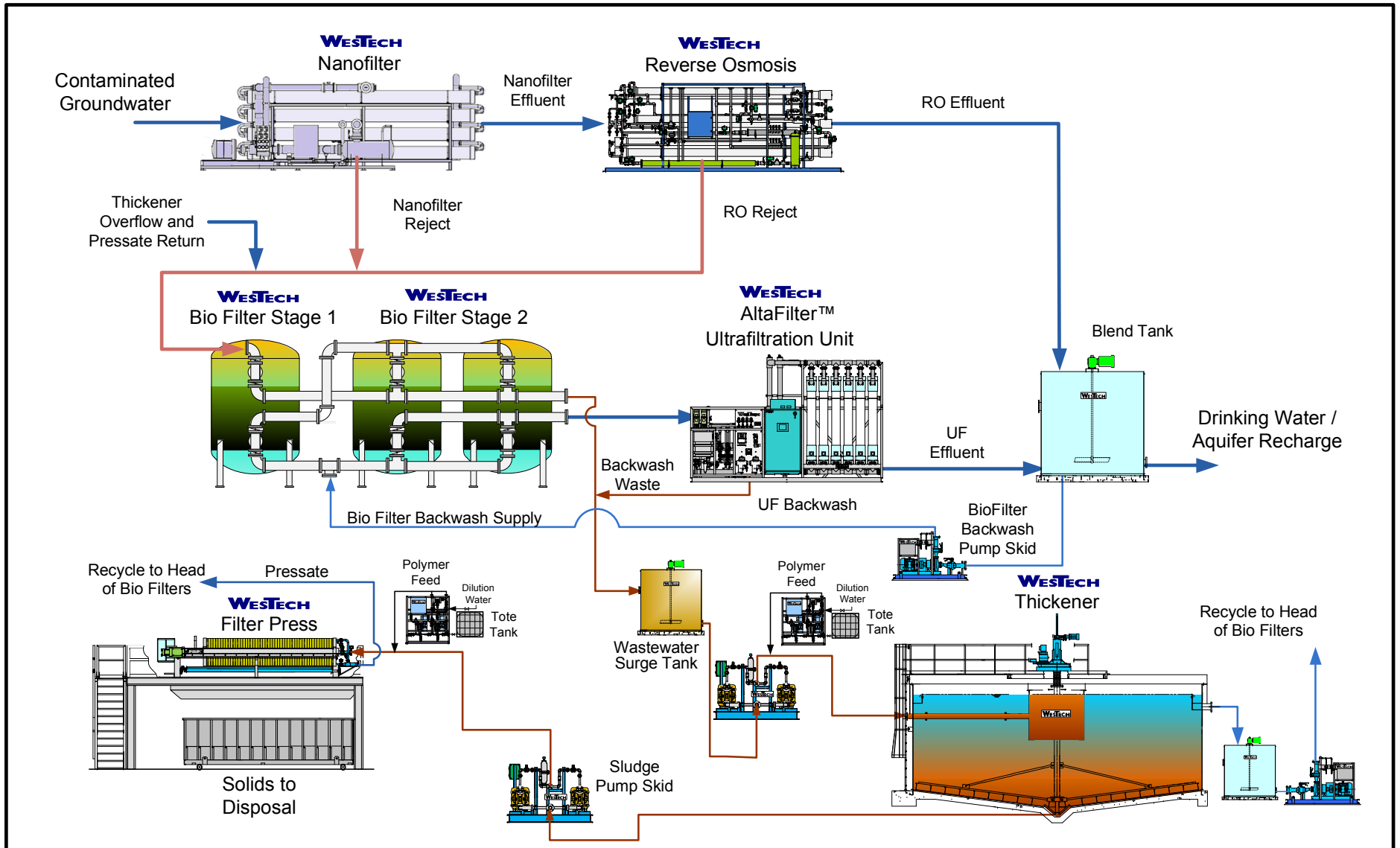

Groundwater Contamination Treatment

WesTech

DWN: **RCS** DATE:

WesTech ***Pressure Filtration Systems*** are designed for industrial water treatment where the removal of suspended solids such as particulates, iron, manganese, free oils, mill scale, and other precipitates in ground or surface water is required. Pressure filters are commonly placed after WesTech clarification equipment. When used as pretreatment equipment, these filters will prolong the life and efficiency of granular activated carbon, ion exchange, and membrane systems.

Groundwater Contaminant Removal

The number of contaminants and possible treatment methods for groundwater are vast. Physical, chemical, and biological treatment methods are all used with regularity. Concentrations of contaminants and regulations both vary widely.

Biological treatment has proven to be a low cost and sustainable solution for many water treatment applications. Advantages of biological treatment include low energy consumption, little or no chemical addition requirement, and non-hazardous waste products. Operational challenges exist; balanced biological systems are easily disrupted, and are sensitive to physical and chemical conditions.

Concentration may be necessary in some cases where biological treatment is desired. Solutions include ultrafiltration (UF), reverse osmosis (RO), ion exchange (IX), and electrodialysis reversal (EDR).

If concentrations are low, the contaminated water can be filtered for suspended solids removal and then passed through activated carbon beds (see the VOC removal page for more information).

Groundwater Contamination Steps

Concentration

A number of possibilities exist for concentrating solids to a level that is suitable for biological treatment including UF, RO, IX, and EDR. Evaluation of these processes is based on influent water quality, contaminant to be removed, and chemicals required for the biological process.

Biological Treatment

Biological processes can be fixed-film or suspended growth. They may be aerobic or anaerobic with varying oxidation/reduction potential (ORP).

A number of reactor types have been successfully utilized for biological reactions. These include aeration tanks, trickling filters, bio filters, and rotating biological contactors (RBC). The removal mechanism varies based on the contaminant. It may include substrate utilization, reduction, assimilation, or adsorption. Concentrated water characteristics may require addition of carbon sources, electron acceptors, or nutrients to facilitate biological growth.

Effluent Polishing

An effluent polishing step may be required. This is generally dictated by reactor configuration and effluent requirements. This step could include filtration, UF, RO, disinfection, chlorination, or UV.

Backwash Thickening

Biological reactions yield waste biomass resulting from substrate utilization. Typical separation techniques include gravity thickening, dissolved air flotation (DAF), and centrifugation. Polymer and coagulant addition enhances process performance.

Solids Dewatering

Dewatering has the advantage of waste solids weight reduction which reduces disposal costs. Dewatering can be accomplished by a number of technologies including belt press, filter press, and dewatering filters.