

CALCULATED FIXED RADIUS BASED ON 1 YEAR TRAVEL TIME

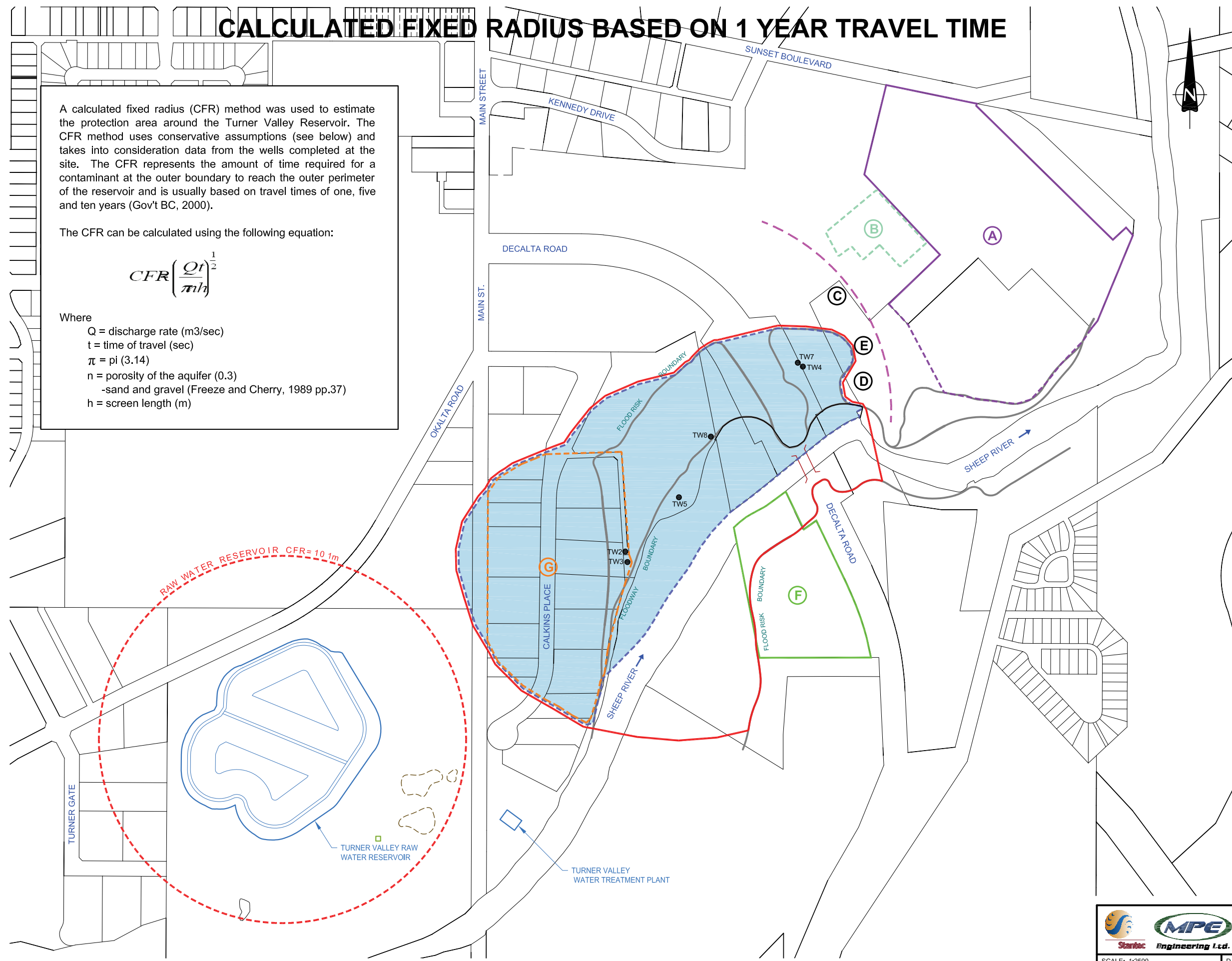
A calculated fixed radius (CFR) method was used to estimate the protection area around the Turner Valley Reservoir. The CFR method uses conservative assumptions (see below) and takes into consideration data from the wells completed at the site. The CFR represents the amount of time required for a contaminant at the outer boundary to reach the outer perimeter of the reservoir and is usually based on travel times of one, five and ten years (Gov't BC, 2000).

The CFR can be calculated using the following equation:

$$CFR \left(\frac{Qt}{\pi h} \right)^{\frac{1}{2}}$$

Where

- Q = discharge rate (m3/sec)
- t = time of travel (sec)
- π = pi (3.14)
- n = porosity of the aquifer (0.3)
 - sand and gravel (Freeze and Cherry, 1989 pp.37)
- h = screen length (m)



- Legend
- Town of Turner Valley Licensed Source Water Well ●
 - Approximate Extent of Gravel Aquifer (Source Water) [Blue dashed line]
 - Wellhead Protection Area [Red solid line]
 - Dashed Segments Represent Approximate Boundaries [Black dashed line]
 - Approximate Groundwater Divide [Purple dashed line]
 - Area of Former Turner Valley Gas Plant (A) [Purple circle]
 - Area of Former Tank Farm (B) [Green circle]
 - Horton Spheres (C) [Black circle]
 - Dingman 2 (D) [Black circle]
 - Potential Historical Dumping (E) [Black circle]
 - Area of Former Landfill (F) [Green circle]
 - Area of Former/Current Septic Fields (G) [Orange circle]
 - Calculated Fixed Ratio Based on 1 Year Travel Time CFR [Red dashed line]

- Notes:
1. Ground contours and background courtesy of Alberta Environment Black Diamond - Turner Valley Flood Risk, Mapping Study, July 1992.
 2. Water well locations courtesy of Tronnes Surveys (1976) Ltd. Wells surveyed august 2007.
 3. Well locations are approximate only.
 4. Legal base provided by MPE Engineering Ltd.

Drawing prepared by Stantec Inc.

