

Water Model Update  
Existing System Analysis

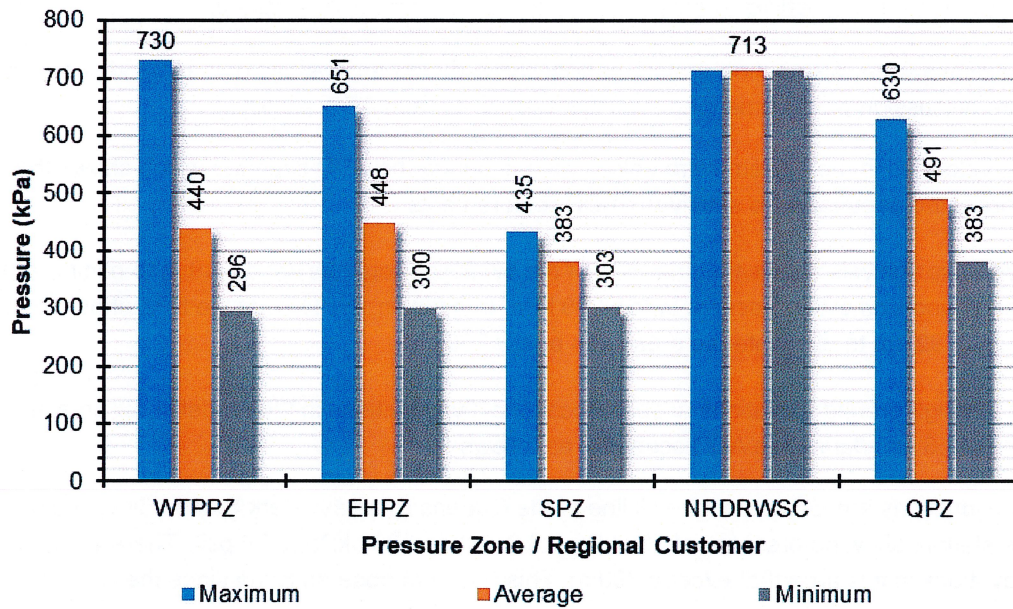


Figure 4-3: Pressure Statistics of the Existing System at ADD

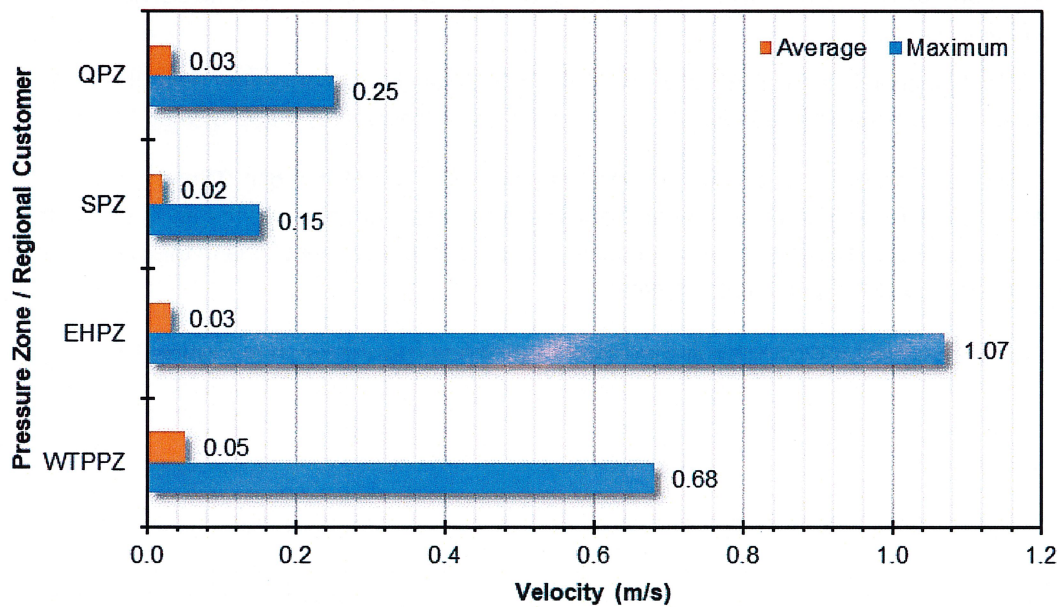


Figure 4-4: Velocity Statistics of the Existing System at ADD

Note: The line feeding the NRDRWSC was included in the WTPPZ.



## Water Model Update Existing System Analysis

### 4.1.1 Discussion on Existing System Average Day Demand Analysis

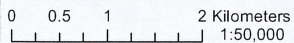
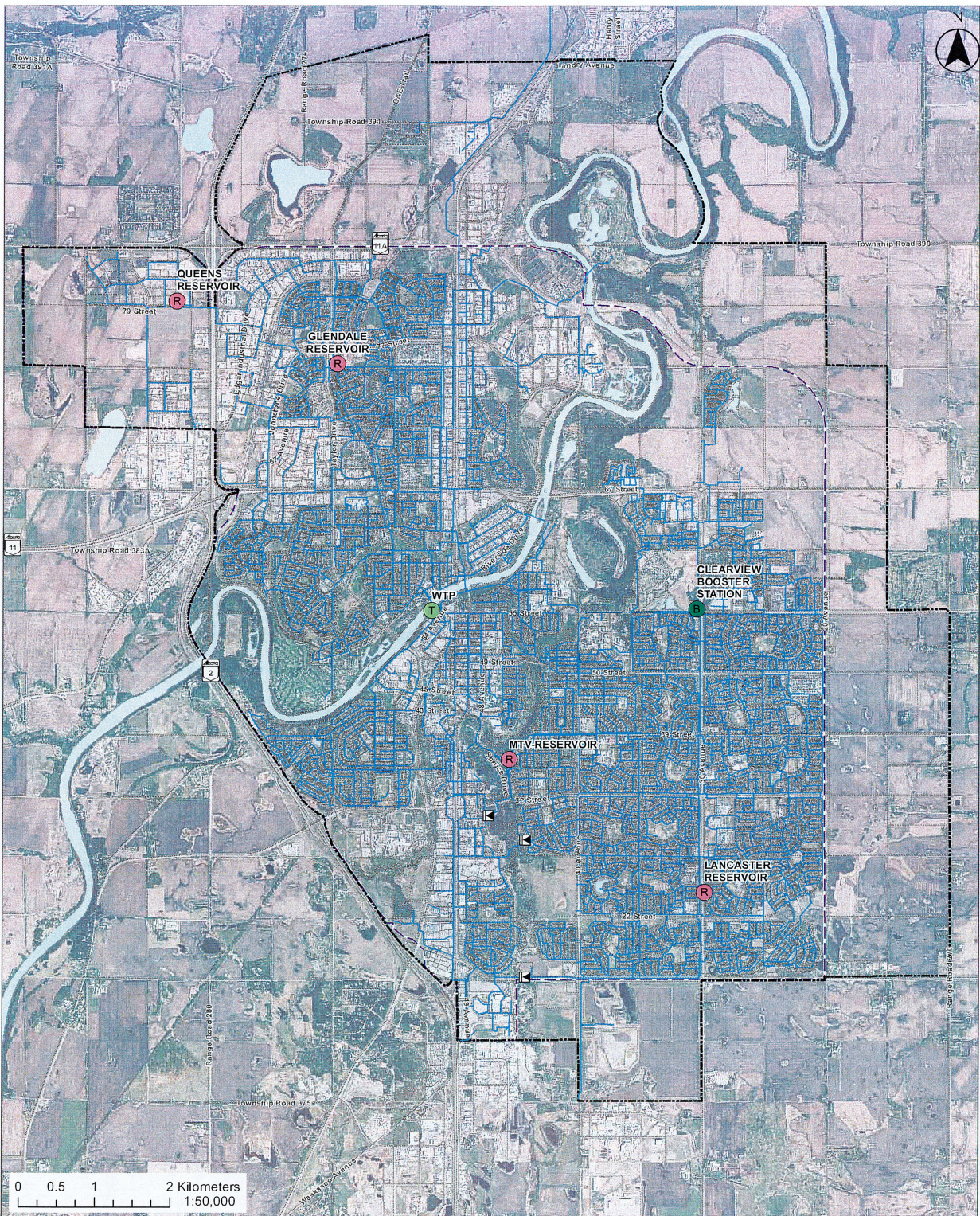
The City's existing water distribution system performs well during an average day demand scenario. The following are discussion points emerging from the existing system ADD analysis.

1. All pipe velocities in the system were below 1.5 m/s during the ADD scenario which shows that all pipes are sized adequately to satisfy the ADD requirements.
2. The hydraulic analysis shows that the HGL of the WTPPZ should be set at 919 m to minimize the number of junctions with pressures below 300 kPa. In addition, the HGL of the SPZ should be set at a minimum of 922 m to eliminate the pressures below 300 kPa.
3. Due to the high ground elevations at some locations, five junctions in the model show pressure below 300 kPa (43.5 psi) during the ADD scenario, as follows:
  - Two junctions are located on the fill line of the Queens Business Park Station directly upstream of the station, showing pressure of 193 kPa (28.0 psi) and 261 kPa (37.9 psi). There are ground elevations in this area that exceed 890 m. This does not pose an issue since there are no service connections on the fill line.
  - Two other junctions are located on the fill line of the Clearview Station directly upstream of the station, showing pressures of 291 kPa (42.1 psi) and 296 (43.0 psi) as the elevations in this area reach approximately 888 m. This does not pose an issue since there are no service connections on the fill line.
  - The last junction is located directly south of the Glendale Reservoir on the Greenhouse PI Road showing a pressure of 296 kPa (43.0 psi) as the ground elevation is approximately 889 m.
4. There are four junctions that exceed 700 kPa, reaching 730 kPa (105.9 psi). These junctions are located in the Northland Drive area near the wastewater treatment plant, at the north end of the industrial area. Local service PRVs can be installed on servicing connections in this area to prevent potential damage to the plumbing systems.

The results from the ADD analysis are illustrated in **Figure 4-5**, **Figure 4-6**, and **Figure 4-7**.







- Pressure Reducing Valve
- Existing Service Boundary (Infill Development)
- Red Deer City Limits

- Facilities
- Booster Station
  - Reservoir
  - Water Treatment Plant/Reservoir

- Velocity
- >1.5 m/s
  - 1.25 - 1.5 m/s
  - 1.0 - 1.25 m/s
  - 0.5 - 1.0 m/s
  - 0.0 - 0.5 m/s

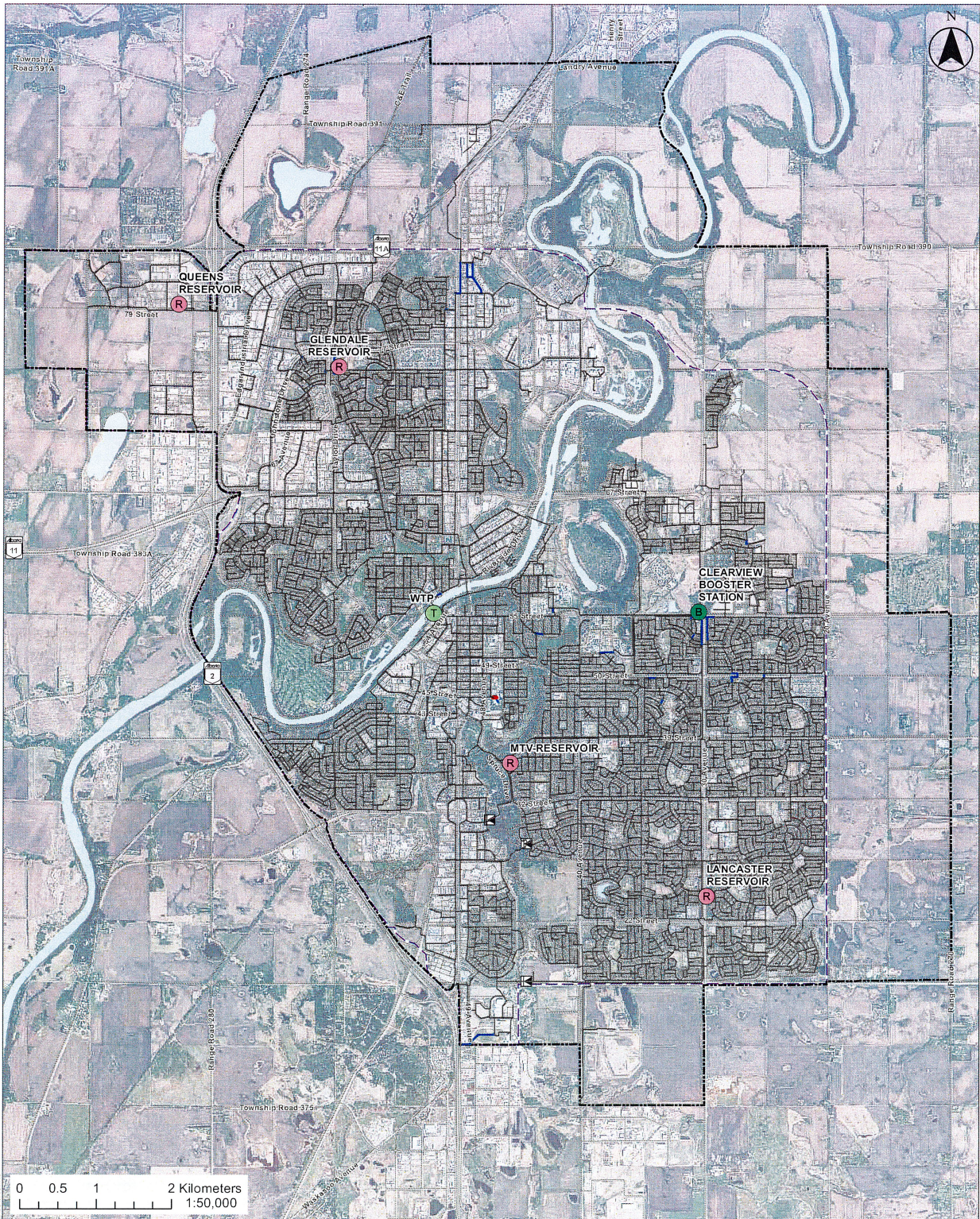
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**Figure 4-6: Existing System - Average Day Demand Scenario Pipe Velocity**  
 City of Red Deer Water Model Update  
 City of Red Deer



- Pressure Reducing Valve
- Red Deer City Limits
- Existing Service Boundary (Infill Development)

- Facilities**
- Booster Station
  - Reservoir
  - Water Treatment Plant/Reservoir

- Headloss Gradient**
- 0.0 - 0.5 m/km
  - 0.5 - 2.5 m/km
  - 2.5 - 5.0 m/km
  - 5.0 - 7.5 m/km
  - 7.5 - 10 m/km
  - >10 m/km

Site Code: 202203\_01\_13\_17\_A01\_1100\_alpha  
 No: 202203\_01\_13\_17\_A01\_1100\_alpha  
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**Figure 4-7: Existing System - Average Day Demand Scenario Headloss Gradient**  
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