

Reservoir: 05/20/23, 0:49:35.44, 1061  
 WTP: 05/20/23, 0:49:35.44, 1061  
 Booster: 05/20/23, 0:49:35.44, 1061  
 Pipe: 05/20/23, 0:49:35.44, 1061  
 PRV: 05/20/23, 0:49:35.44, 1061  
 City Limits: 05/20/23, 0:49:35.44, 1061  
 Social: 05/20/23, 0:49:35.44, 1061  
 Processor: 05/20/23, 0:49:35.44, 1061

- Reservoirs**
- (B) Booster Station
  - (R) Reservoir
  - (T) Water Treatment Plant

- Pressure (kPa)**
- < 140 kPa
  - 140-300 kPa
  - 300-600 kPa
  - > 600 kPa

- Red Deer City Limits
- Existing PRV

- Existing Water Pipes (mm)**
- 450
  - 500
  - 600
  - 750
  - 900
  - 1050
  - 1200
  - 2000

Completed By: AL  
Date: 6/9/2023

Project No.: 110170064

**Figure 5-2: Residual Pressures at 45th Hour In The 100% Full Scenario With Regional Demands - 900mm Trunk Analysis**  
 City of Red Deer Water Model Update  
 City of Red Deer



**Water Model Update  
Emergency Response Analysis**

With the reservoirs at 75% full, the model simulated the system performance with and without the NRD regional demands. The following **Table 5-2** presents the depletion time of the reservoirs.

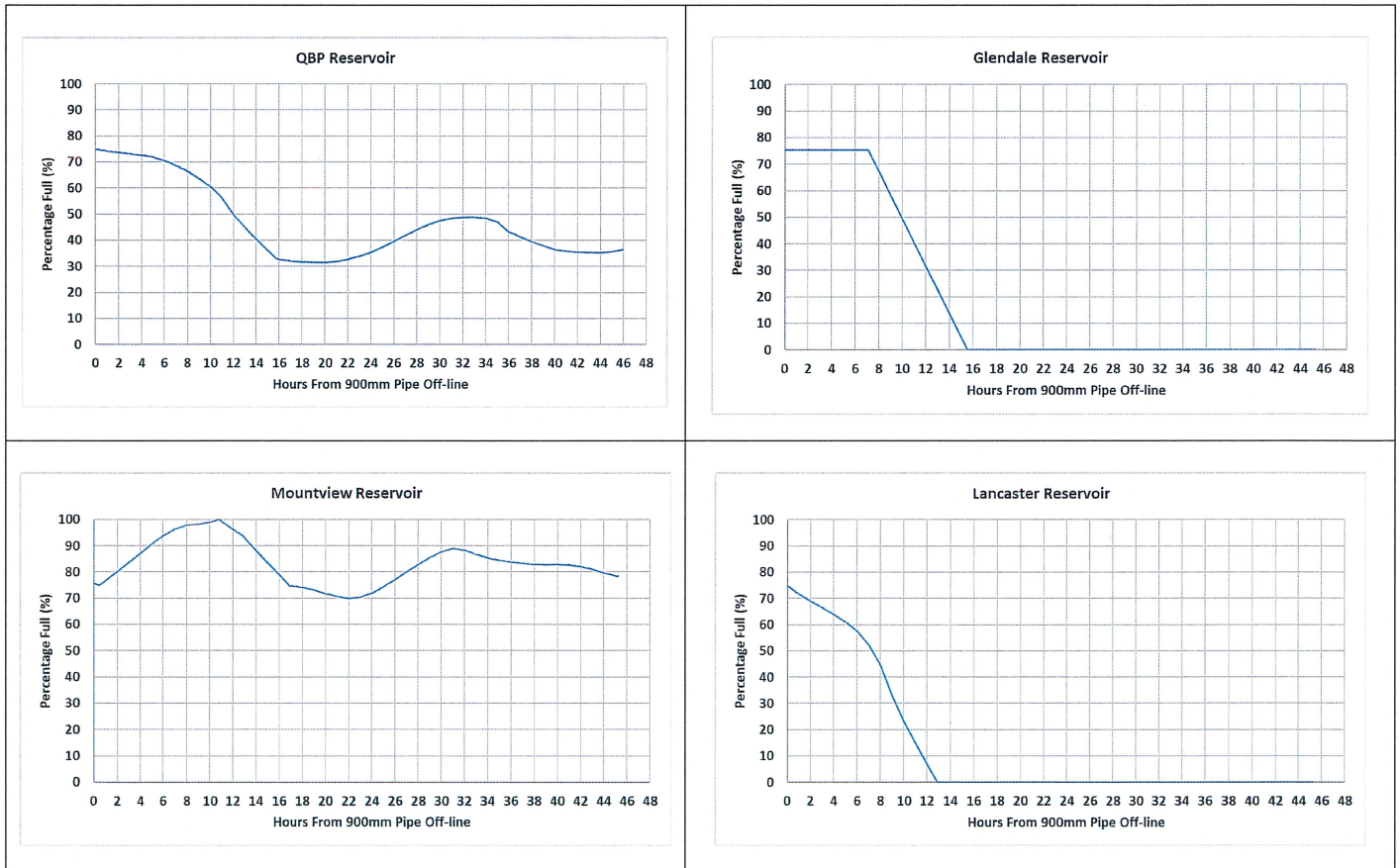
**Table 5-2: Depletion Time of The Reservoirs in 75% Full Scenario**

Reservoir	Storage Depletion Time (Hours)	
	With Regional Demands <sup>1</sup>	Without Regional Demands
Queens	Not depleted <sup>2</sup>	Not depleted
Glendale	15 <sup>3</sup>	18 <sup>4</sup>
Mountview	Not depleted <sup>5</sup>	Not depleted
Lancaster	12	12

Notes:

1. The flow to regional line is shut off when the upstream pressure to PSV is lower than 586 kPa.
2. Queens Reservoir was filled continuously at 50 L/s.
3. Glendale pumping started at 7<sup>th</sup> hour when pressures dropped below 300 kPa.
4. Glendale pumping started at 10<sup>th</sup> hour when pressures dropped below 300 kPa.
5. Mountview Reservoir was filled continuously at 100 L/s.

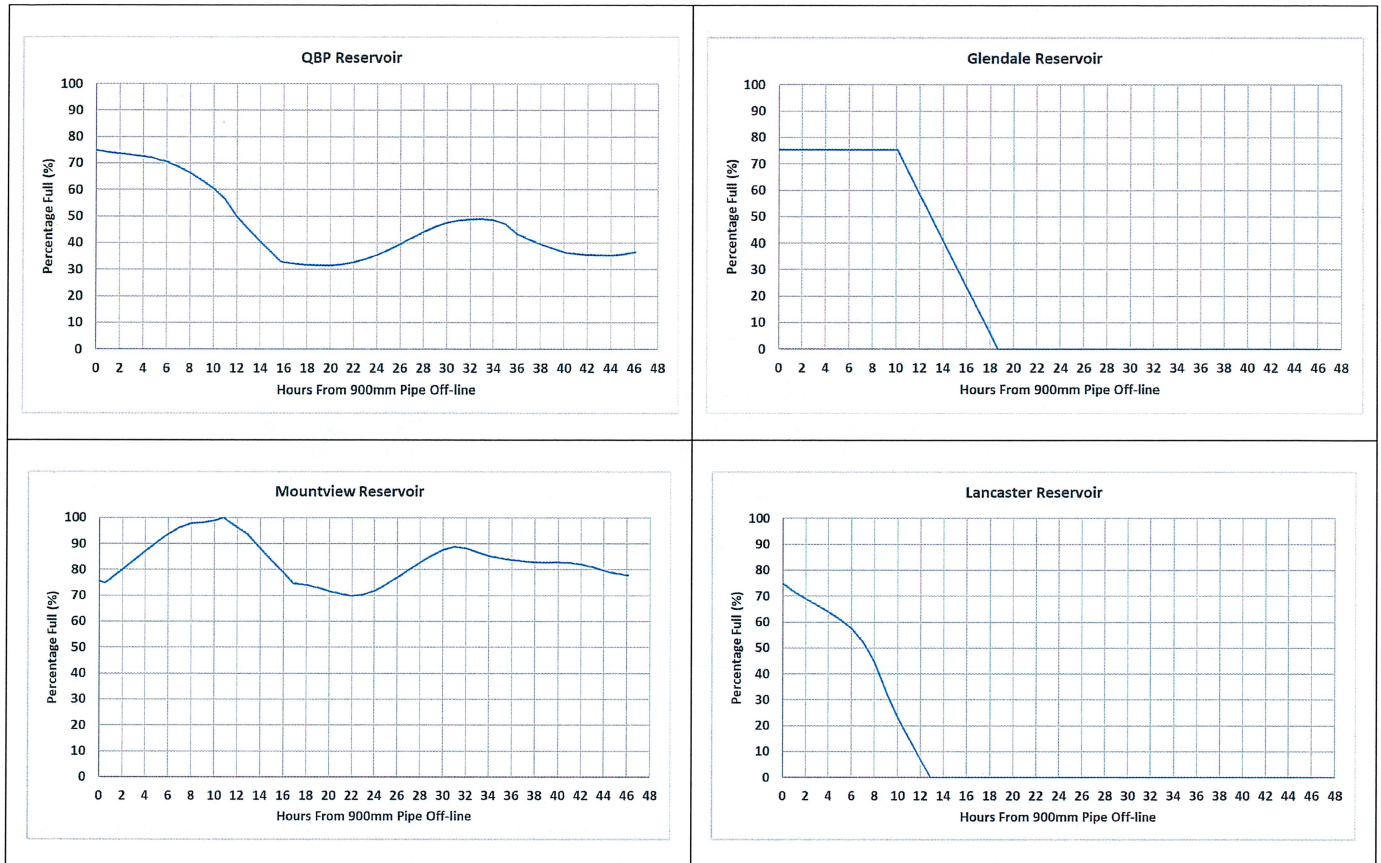
The water storage percent full for the four reservoirs in the 75% full scenario with and without the regional demands are presented in **Figure 5-5** and **Figure 5-6**.



**Figure 5-5: Reservoirs Full-Percentages With the Regional Demands: 75% Full Scenario**



# Water Model Update Emergency Response Analysis



**Figure 5-6: Reservoirs Full Percentages Without the Regional Demands:75% Full Scenario**

Similar to the 100% full reservoir case, the hydraulic performance of the distribution mains did not fail the emergency LOS in the 75% full reservoir scenarios within the 48-hour run time, with or without totally shutting of the NRD regional flow. **Figure 5-7** presents the distribution mains residual pressures at the 32nd hour when the system has the lowest residual pressures between 140 kPa to 300 kPa with NRD regional demand. **Figure 5-8** presents the distribution system residual pressures at the 32nd hour when the system has the lowest residual pressures between 140 kPa to 300 kPa without the NRD regional demand.



