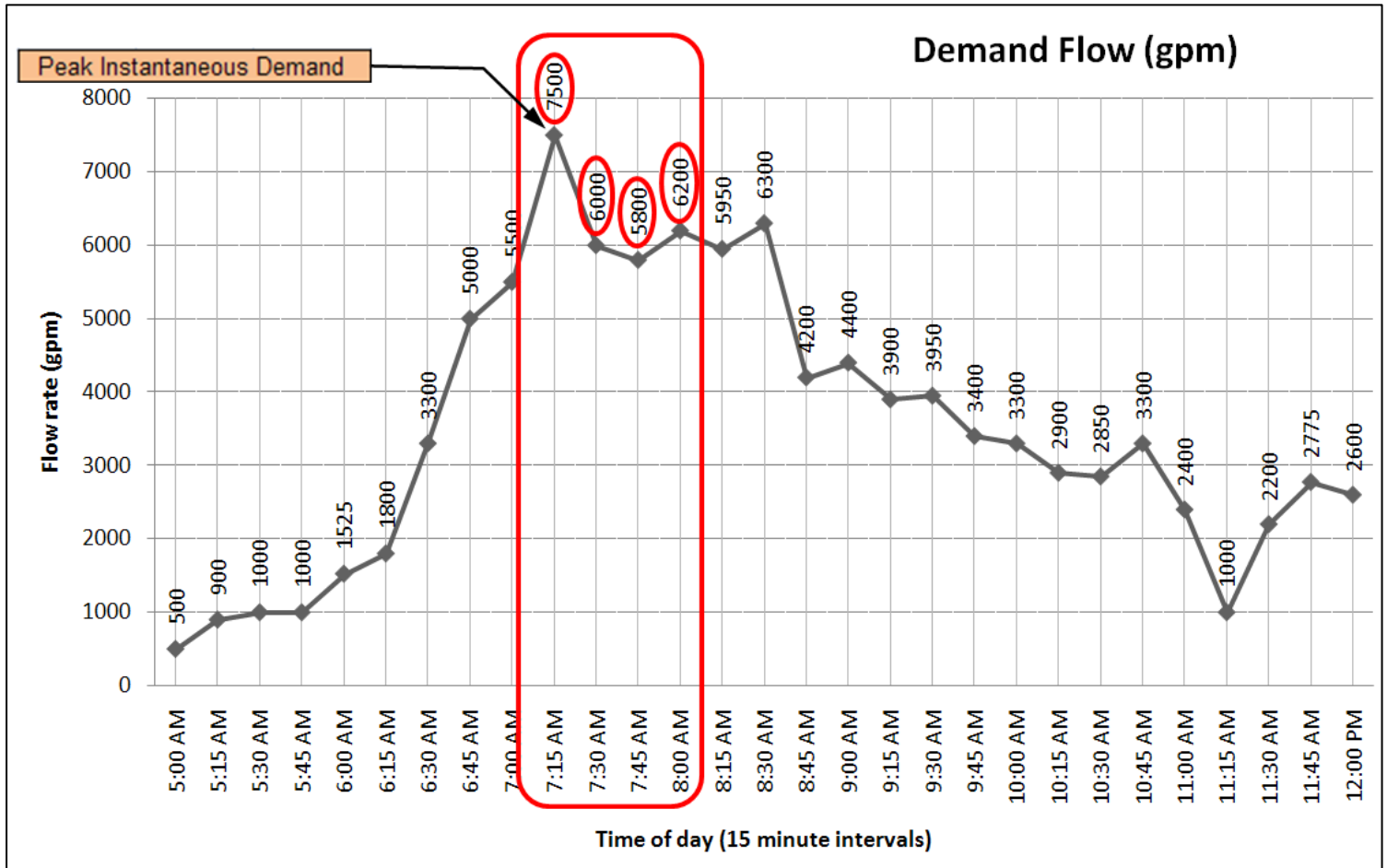# ESSENTIALS OF SURFACE WATER TREATMENT TRAINING

Exercise #4: Calculating Peak Hourly Demand Flow

Directions: Work as a group to determine what the peak hourly demand flow is based on the graph below.

Questions:

At what 1-hour interval did PHD occur?

7:00 am to 8:00 am (7:01 am – 8:00 am, exludes 7 am reading)

What is the peak hourly demand flow (gpm)? **6375 gpm (sum 4 data pts & divide by 4)**

Time (min)	Demand Flow (gpm)	Running Hourly Average Flow (gpm)
5:00 AM	500	
5:15 AM	900	
5:30 AM	1000	
5:45 AM	1000	850.0
6:00 AM	1525	1,106.3
6:15 AM	1800	1,331.3
6:30 AM	3300	1,906.3
6:45 AM	5000	2,906.3
7:00 AM	5500	3,900.0
7:15 AM	7500	5,325.0
7:30 AM	6000	6,000.0
7:45 AM	5800	6,200.0
8:00 AM	6200	6,375.0 <= Peak Hour Demand
8:15 AM	5950	5,987.5
8:30 AM	6300	6,062.5
8:45 AM	4200	5,662.5
9:00 AM	4400	5,212.5
9:15 AM	3900	4,700.0
9:30 AM	3950	4,112.5
9:45 AM	3400	3,912.5
10:00 AM	3300	3,637.5
10:15 AM	2900	3,387.5
10:30 AM	2850	3,112.5
10:45 AM	3300	3,087.5
11:00 AM	2400	2,862.5
11:15 AM	1000	2,387.5
11:30 AM	2200	2,225.0
11:45 AM	2775	2,093.8
12:00 PM	2600	2,143.8

What was the peak instantaneous demand flow (gpm)?   **7500 gpm**
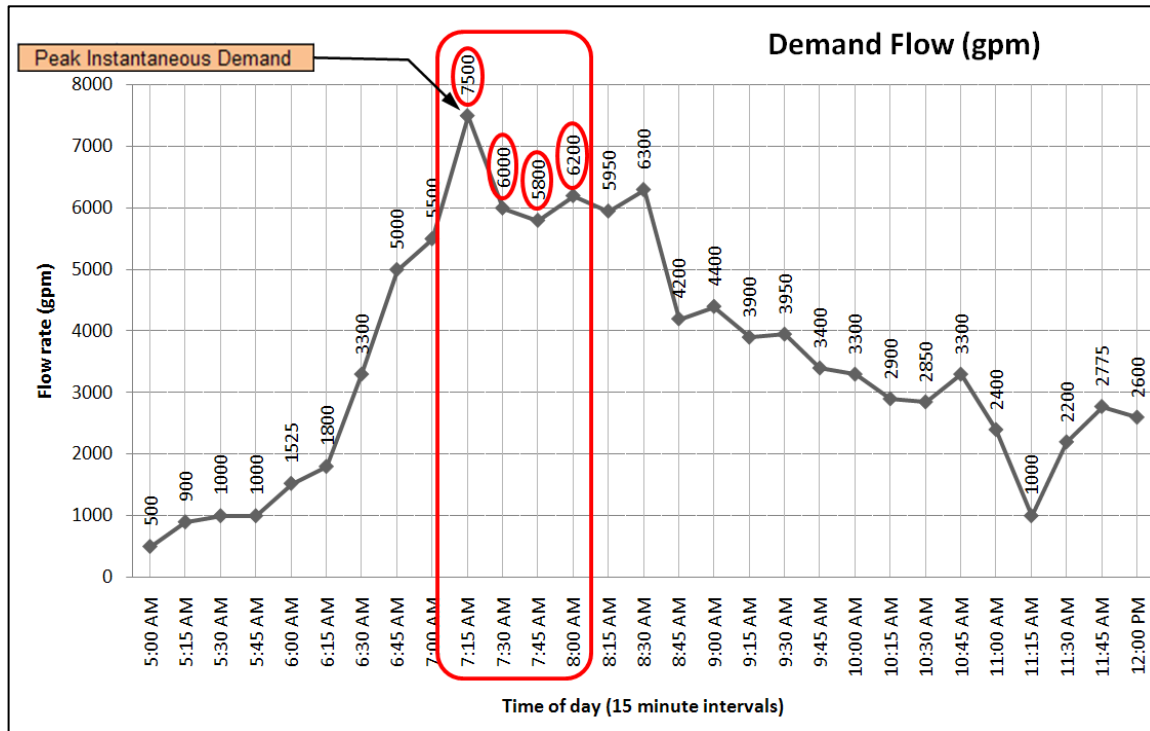
Bonus questions:

Is it ok to use the peak instantaneous flow instead for calculating time T?
Yes; it's more conservative

If so, what are the advantages/disadvantages?
Advantage: easy to determine. Disadvantage: it may exceed the tracer study flow by more than 10%

Is it ok to use the average daily flow instead for calculating time T?   **No**

Why or why not?   **Averaging the whole day would not be conservative enough (it would not account for sustained period of high flow which is when it is important for CTs to be met)**