# ESSENTIALS OF SURFACE WATER TREATMENT TRAINING

## Exercise #3: Creating a chemical feed pump curve

**Directions:** Use the data provided in the examples below to create a pump curve. Pump curves should be smooth and fairly linear. A bouncing or jagged pump curve indicates the pump needs maintenance. Maintenance needed may include cleaning, diaphragm replacement and/or seal replacement.

**Feed pump #1 pump curve data:**

| Setting | Time | Volume | Flow Rate |
|---|---|---|---|
| % Speed | Minutes | ml | ml/min |
| 10% | 3 | 60 | 20 |
| 20% | 3 | 360 | 120 |
| 30% | 3 | 420 | 140 |
| 40% | 3 | 810 | 270 |
| 50% | 3 | 900 | 300 |
| 60% | 1 | 450 | 450 |
| 70% | 1 | 400 | 400 |
| 80% | 1 | 525 | 525 |
| 90% | 1 | 530 | 530 |
| 100% | 1 | 575 | 575 |

Plot the data points on the graph. Does the pump need maintenance?　　**Yes (jagged line)**
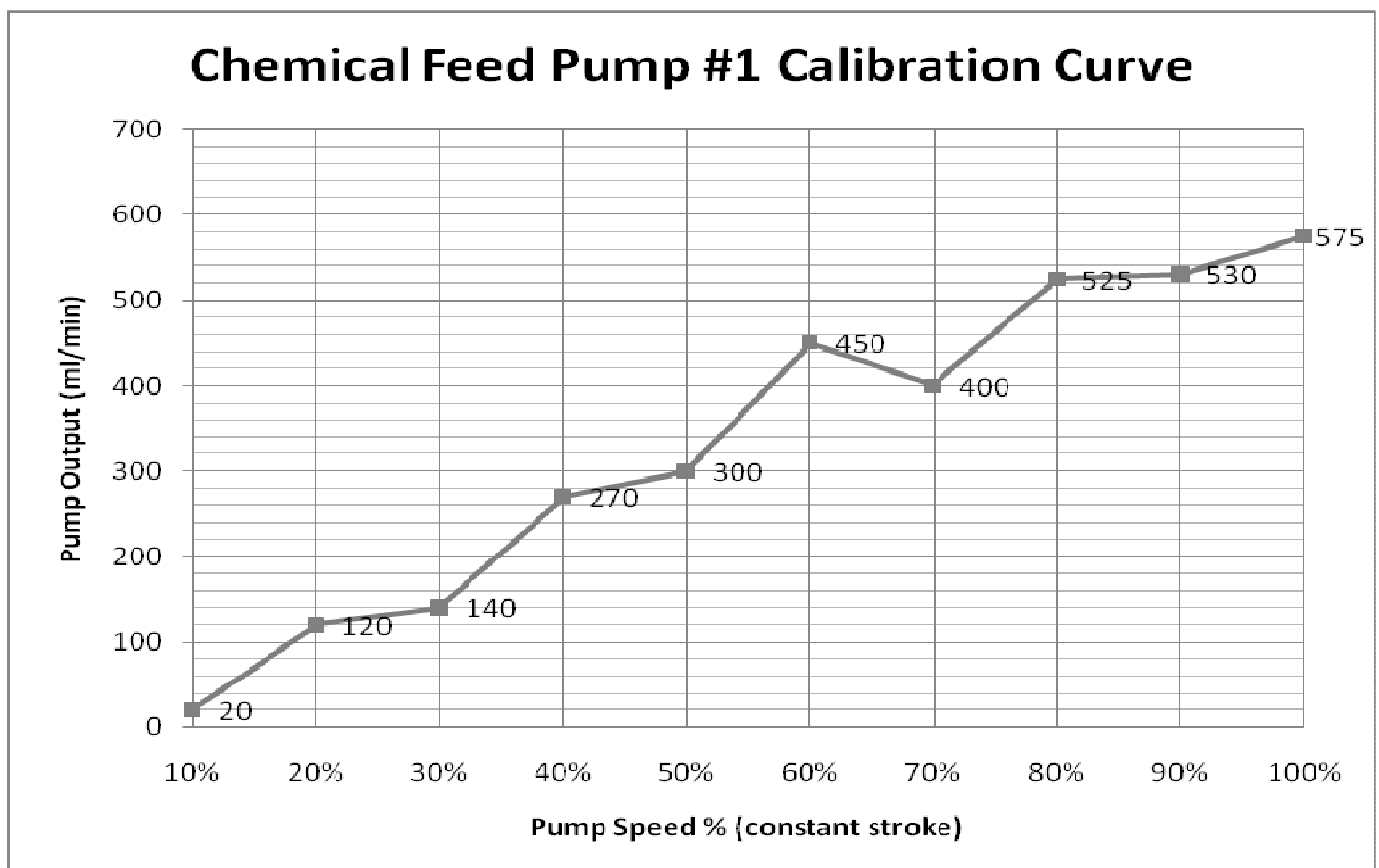
**Feed pump #2 pump curve data:**

| Setting | Time | Volume | Flow Rate |
|---------|------|--------|-----------|
| % Speed | Minutes | ml | ml/min |
| 10% | 3 | 120 | 40 |
| 20% | 3 | 270 | 90 |
| 30% | 3 | 480 | 160 |
| 40% | 3 | 690 | 230 |
| 50% | 3 | 960 | 320 |
| 60% | 1 | 400 | 400 |
| 70% | 1 | 460 | 460 |
| 80% | 1 | 500 | 500 |
| 90% | 1 | 540 | 540 |
| 100% | 1 | 560 | 560 |

Plot the data points on the graph.  Does the pump need maintenance?**No (straight-ish, smooth line)**



Chemical Feed Pump #2 Calibration Curve
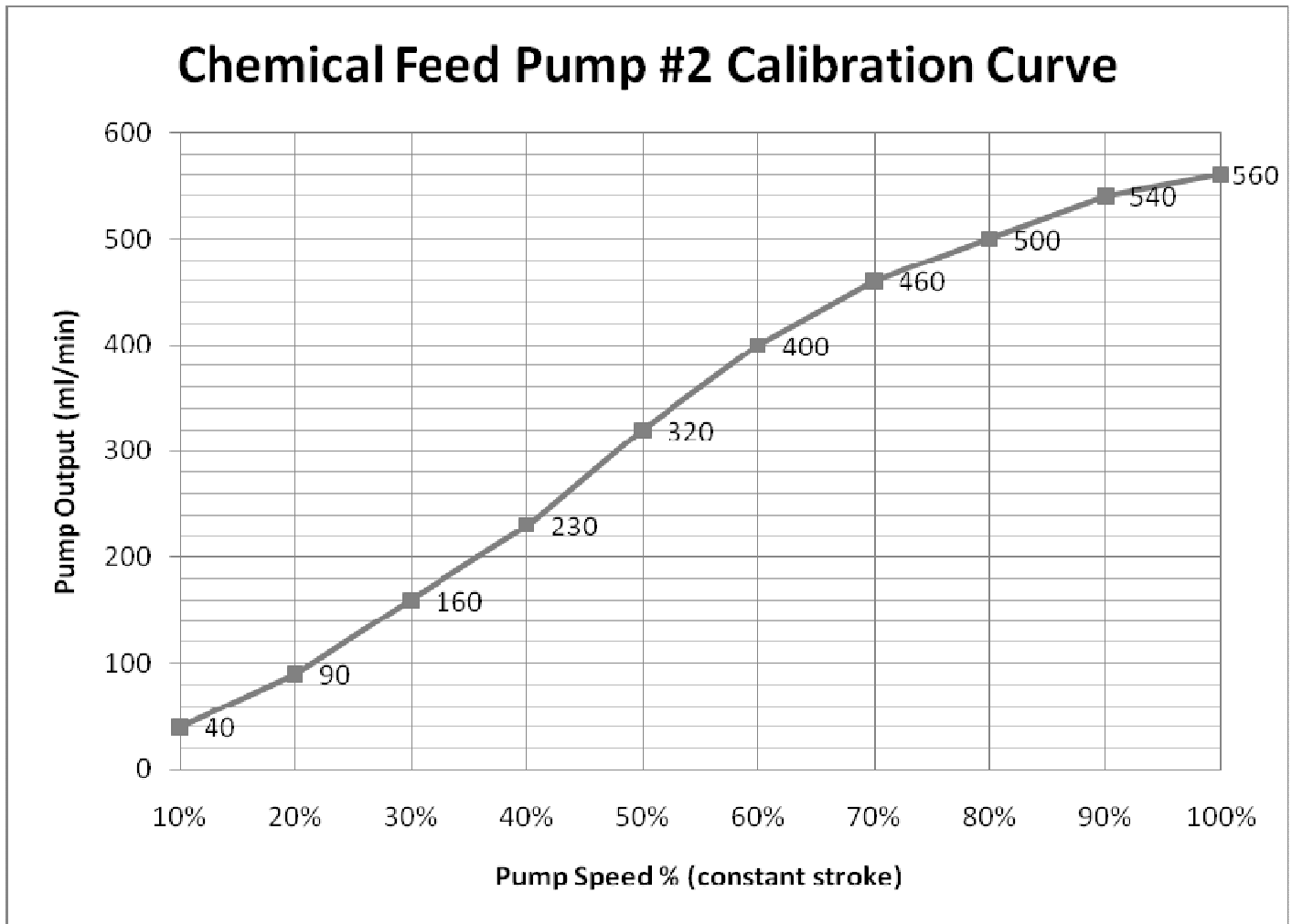
**Bonus question:** Referring to feed pump #2 data above, if you normally have your speed set at 50% in order to maintain 1 ppm of chemical, what speed do you need to change it to if you do a new pump curve and get the following results:

**Feed pump #2 *NEW* pump curve data**

| Setting | Time | Volume | Flow Rate |
|---------|------|--------|-----------|
| % Speed | Minutes | ml | ml/min |
| 10% | 3 | 60 | 20 |
| 20% | 3 | 120 | 40 |
| 30% | 3 | 270 | 90 |
| 40% | 3 | 480 | 160 |
| 50% | 3 | 690 | 230 |
| 60% | 1 | 320 | 320 |
| 70% | 1 | 400 | 400 |
| 80% | 1 | 460 | 460 |
| 90% | 1 | 500 | 500 |
| 100% | 1 | 540 | 540 |

Answer:_____**60%**_____



Chemical Feed Pump #2 Calibration Curve