# Instructions for Using PSA Worksheets

Forms on pages 6 to 10

**1. Begin by filling out the date and PSA values for three or more PSA tests.**

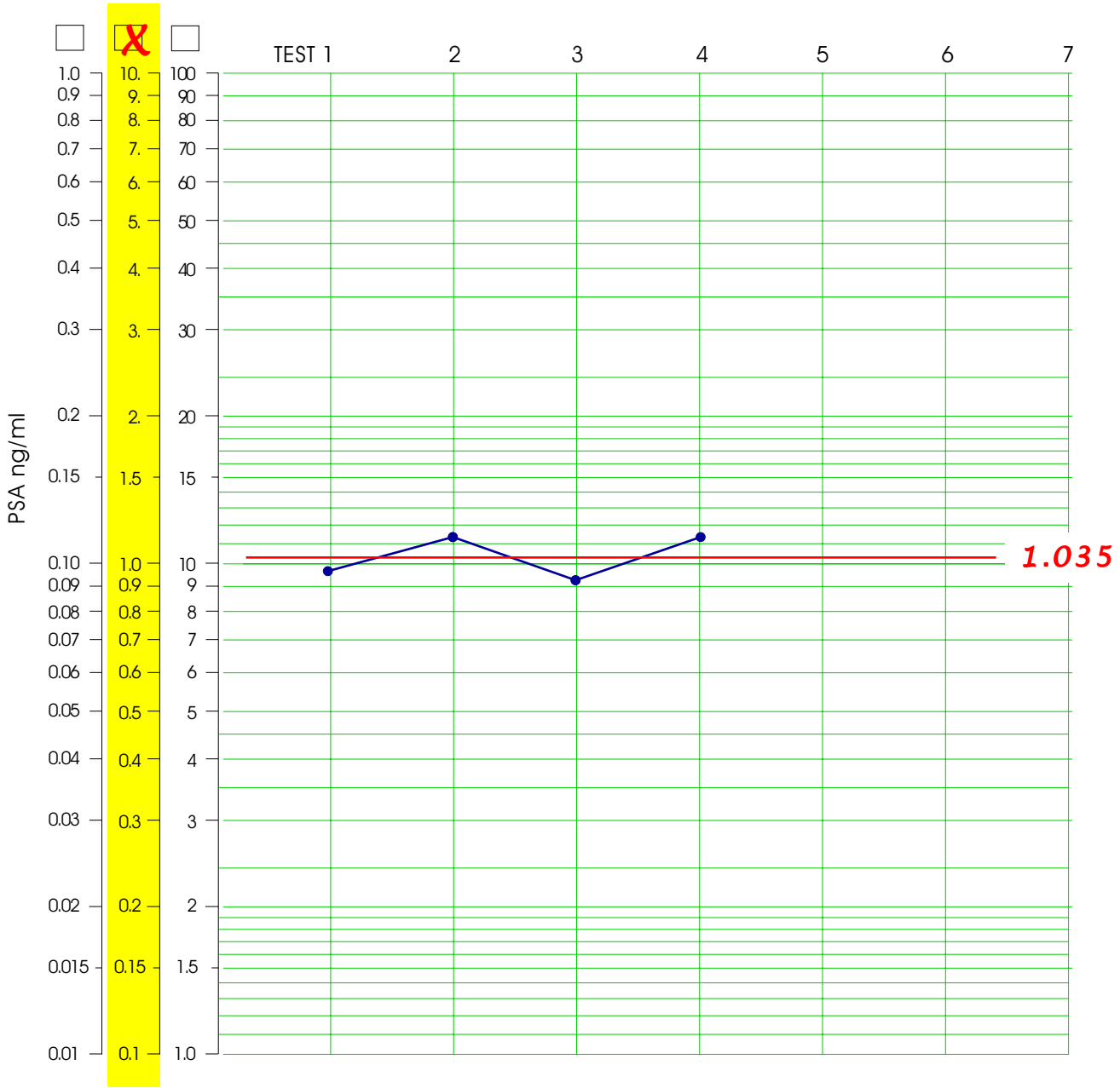
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date | 4/14/09 | 6/9/10 | 9/28/11 | 6/9/12 | | | |
| PSA value | 0.97 | 1.12 | 0.92 | 1.13 | | | |
| Mark Baseline Used (3 or more values) | ← | ← | ← | ← | → | → | → |

Average of Baseline PSA values = CENTRAL LINE = **1.035** plot as a line

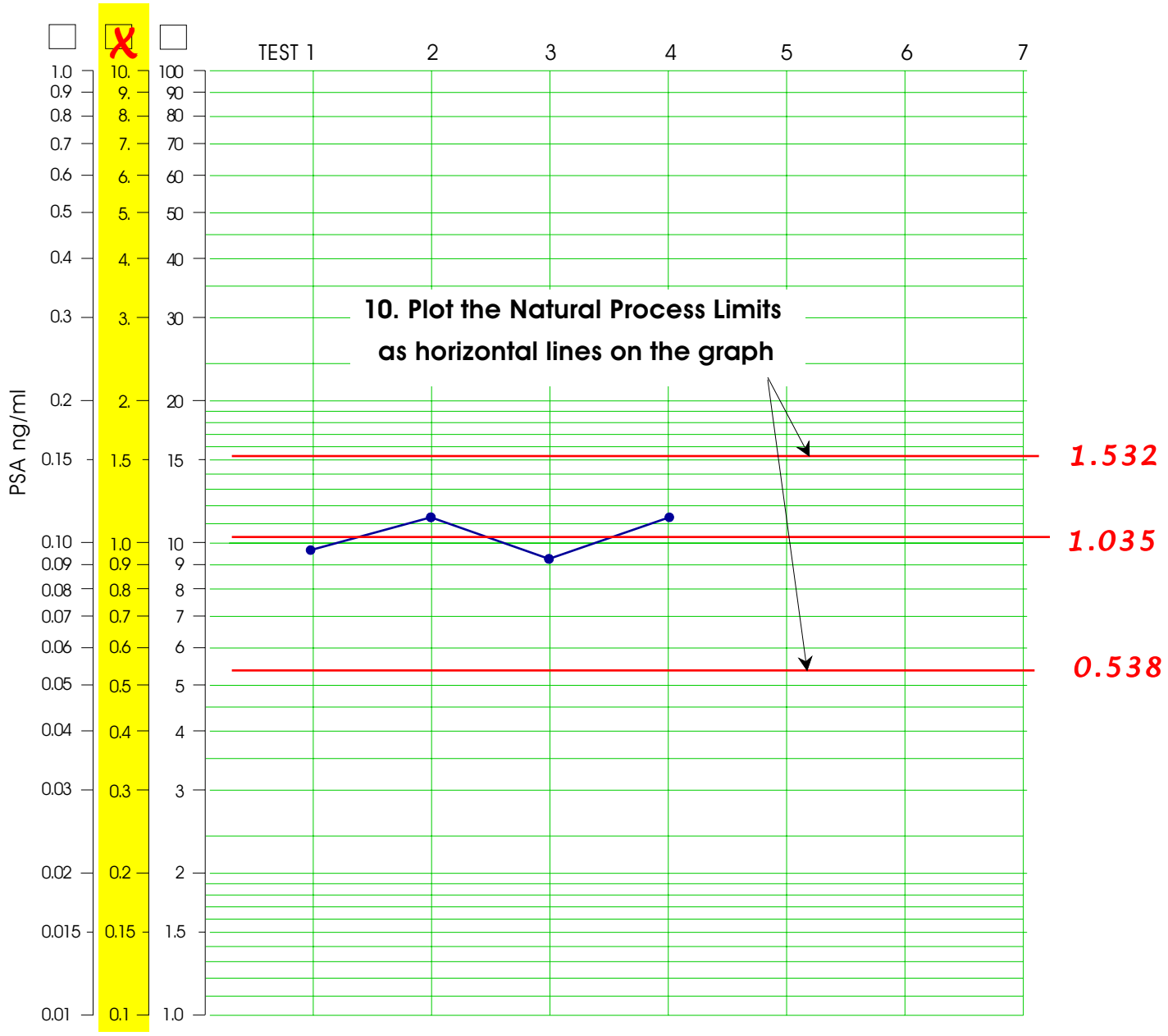
**2. Compute the Average PSA value.**

**3. Pick a scale that will cover the values listed above.**

**4. Plot the PSA values on the graph using the selected scale, and draw a (horizontal) line across the graph at the average value.**



5. **(Below the graph) Compute the differences between the successive PSA values**
6. **Compute the average of these differences.**
   **This value is known as the Average Moving Range.**
7. **Multiply the Average Moving Range by the scaling factor of 2.66.**
8. **Add the value from Step 7 to the Central Line to get the Upper Natural Process Limit**
9. **Subtract the same value from the Central Line to get the Lower Natural Process Limit**




**Step 5**

Differences Between Successive PSA values … (if negative, change sign)

| | | | | | |
|---|---|---|---|---|---|
| 0.15 | 0.20 | 0.21 | | | |

**Step 6**

Average of Differences Between Successive Baseline PSA values = AVERAGE MOVING RANGE = 0.187

**Step 7**

Multiply Average Moving Range by 2.66 = 0.497

**Step 8**

Upper Natural Process Limit = Central Line + 2.66 times Average Moving Range = 1.532 plot

**Step 9**

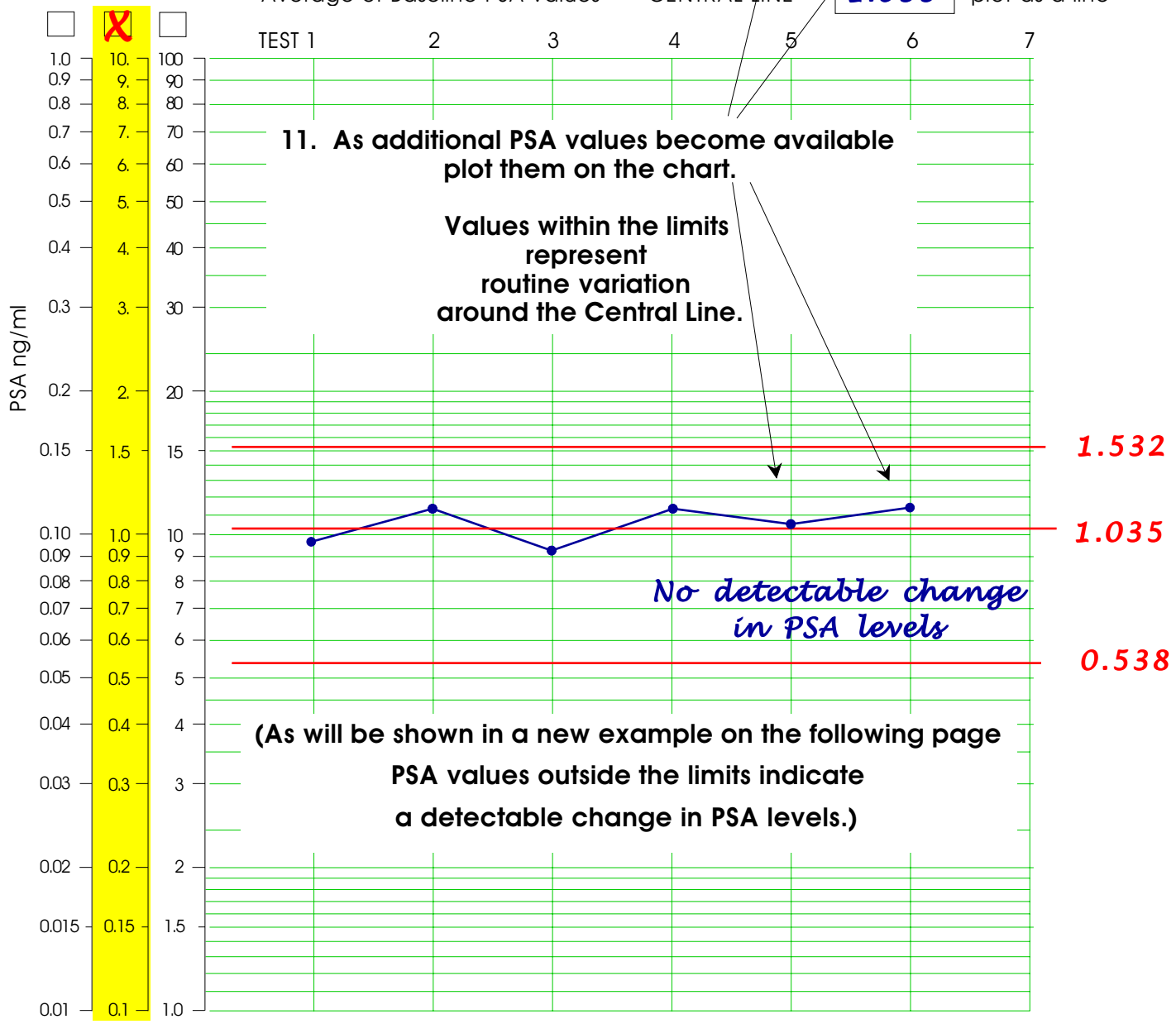
Lower Natural Process Limit = Central Line – 2.66 times Average Moving Range = 0.538 plot

Process Behavior Chart for Example One

| Date | 4/14/09 | 6/9/10 | 9/28/11 | 6/9/12 | 1/6/14 | 1/5/17 | |
|---|---|---|---|---|---|---|---|
| PSA value | 0.97 | 1.12 | 0.92 | 1.13 | 1.06 | 1.15 | |

Mark Baseline Used (3 or more values)

Average of Baseline PSA values = CENTRAL LINE = **1.035** plot as a line




| Differences Between Successive PSA values … (if negative, change sign) | 0.15 | 0.20 | 0.21 | | | |
|---|---|---|---|---|---|---|

Average of Differences Between Successive Baseline PSA values = AVERAGE MOVING RANGE = **0.187**

Multiply Average Moving Range by 2.66 = **0.497**

Upper Natural Process Limit = Central Line + 2.66 times Average Moving Range = **1.532** plot

Lower Natural Process Limit = Central Line – 2.66 times Average Moving Range = **0.538** plot

Plot PSA values, Central Line, and Upper and Lower Natural Process Limits on graph above.
May plot future PSA values on graph and compare them with the limits.
Future PSA values outside the limits represent a detectable change in PSA levels.

When evidence of changing PSA levels is found choose one of the following forms and Plot PSA Values versus Test Dates (month & year) to create a Celeration Chart

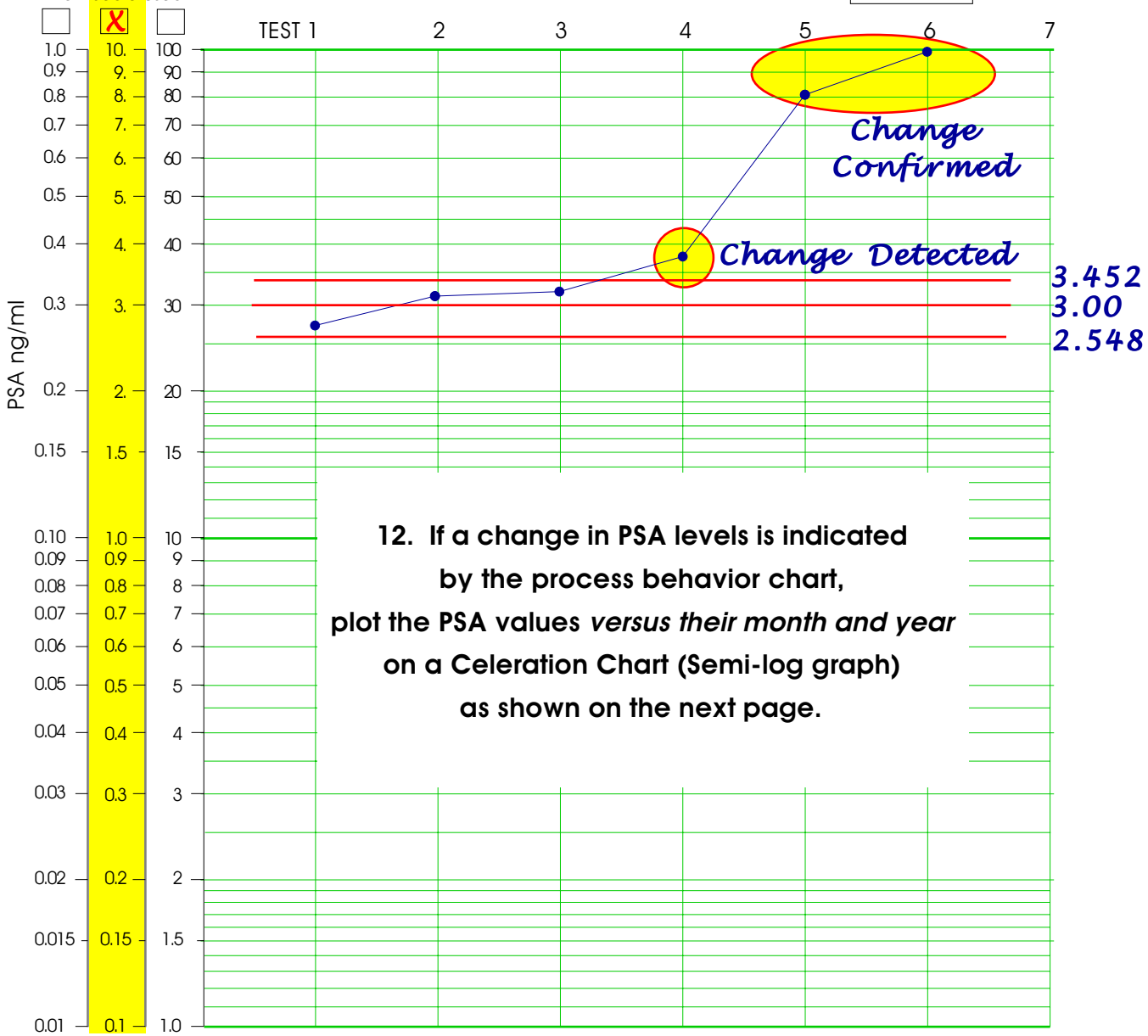
Process Behavior Chart for Example Two

| Date | 8/1/11 | 1/9/12 | 7/11/12 | 1/14/13 | 5/9/14 | 6/2/14 | |
|---|---|---|---|---|---|---|---|
| PSA value | 2.78 | 3.10 | 3.12 | 3.75 | 8.08 | 9.98 | |

Mark Baseline Used (3 or more values)

Average of Baseline PSA values = CENTRAL LINE = **3.000** plot as a line

Mark Scale Used




**12. If a change in PSA levels is indicated by the process behavior chart, plot the PSA values *versus their month and year* on a Celeration Chart (Semi-log graph) as shown on the next page.**

| Differences Between Successive PSA values … (if negative, change sign) | 0.32 | 0.02 | | | | |
|---|---|---|---|---|---|---|

Average of Differences Between Successive Baseline PSA values = AVERAGE MOVING RANGE = **0.17**

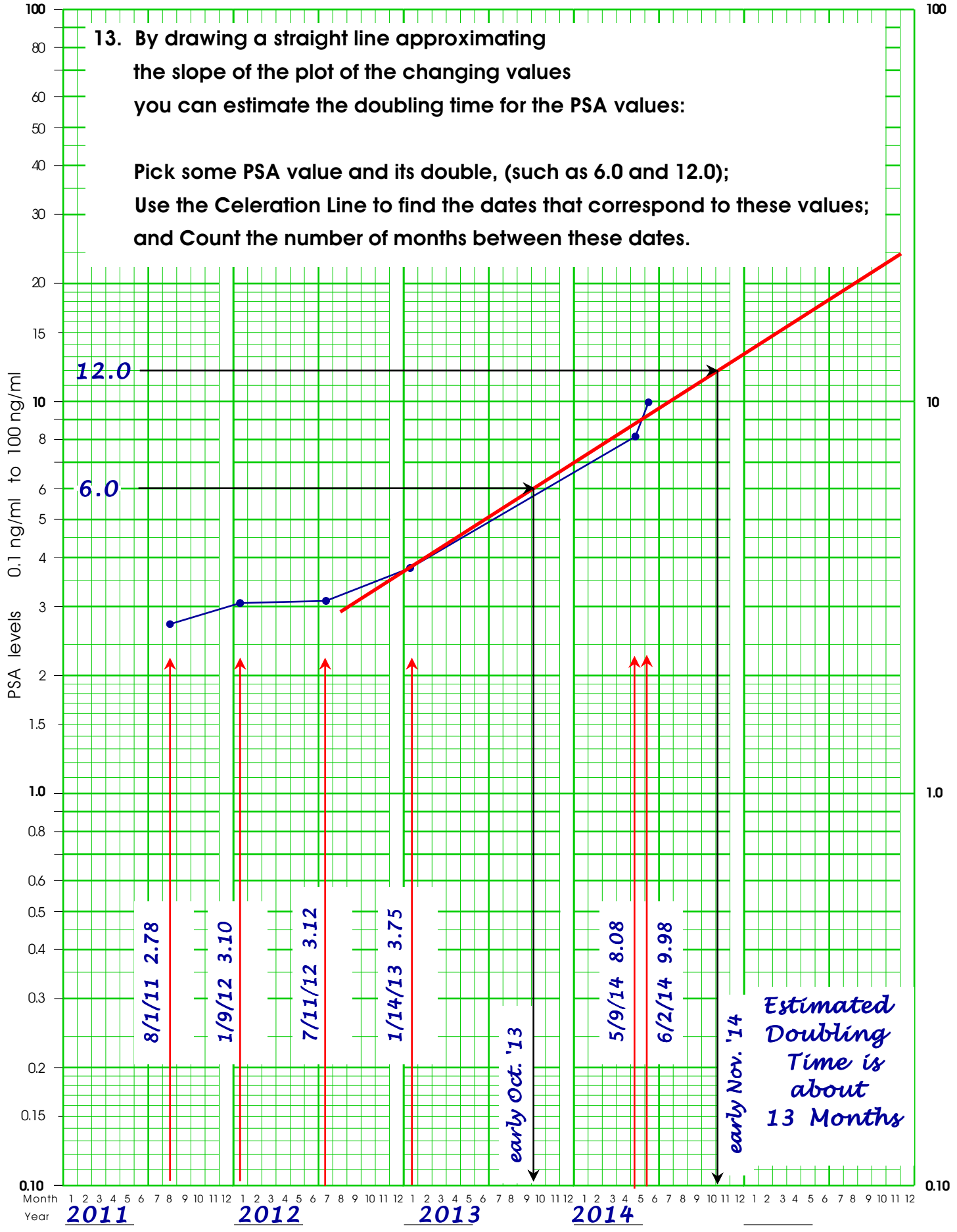
Multiply Average Moving Range by 2.66 = **0.452**

Upper Natural Process Limit = Central Line + 2.66 times Average Moving Range = **3.452** plot as line

Lower Natural Process Limit = Central Line – 2.66 times Average Moving Range = **2.548** plot as line

When evidence of changing PSA levels is found choose one of the following forms and Plot PSA Values versus Test Dates (month & year) to create a Celeration Chart

Celeration Chart for Example Two



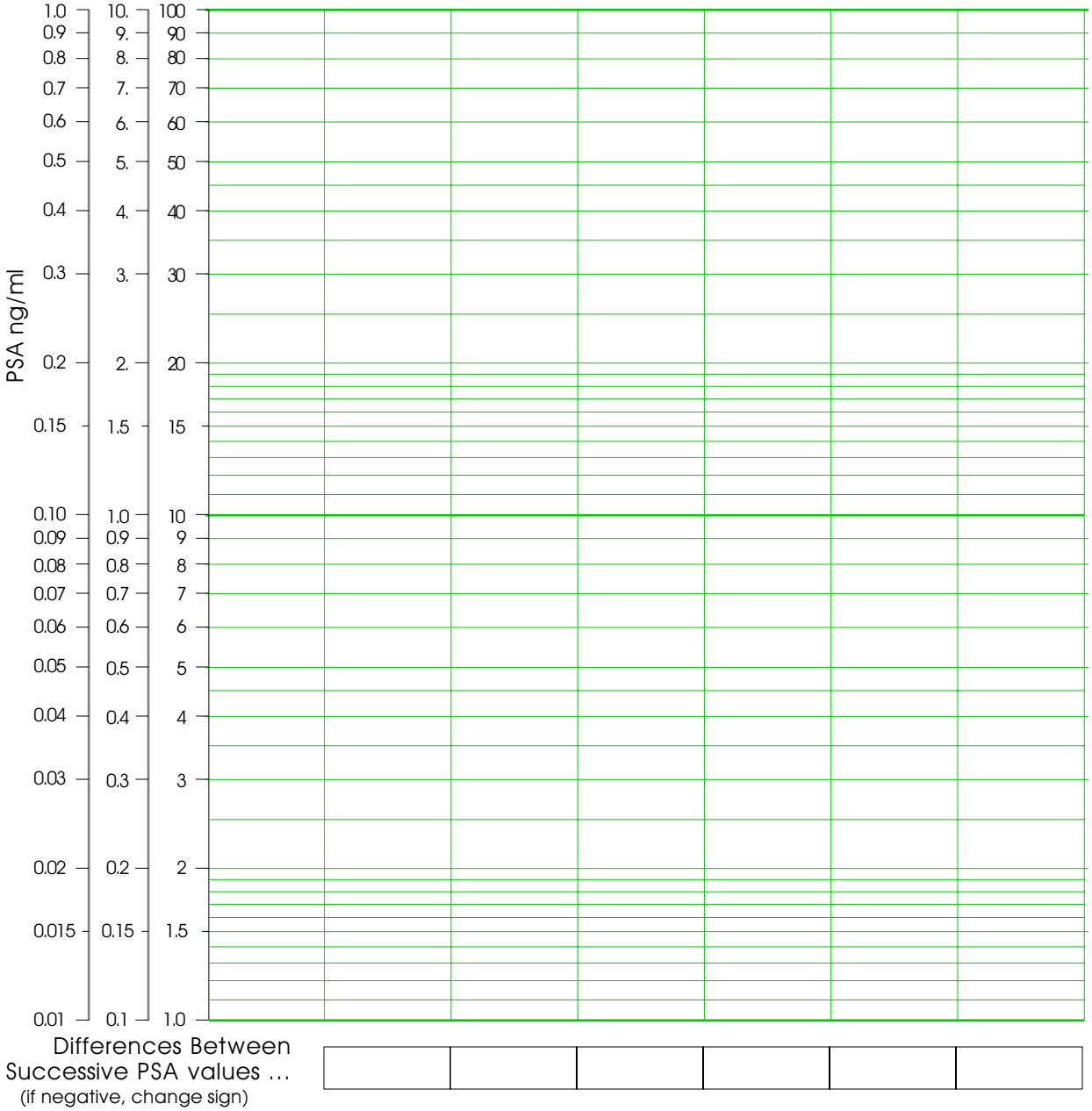
PSA Worksheet for Creating a Process Behavior Chart

| Date | | | | | | | |
|---|---|---|---|---|---|---|---|
| PSA value | | | | | | | |

Mark Baseline Used (3 or more values)

Average of Baseline PSA values = CENTRAL LINE = [ ] plot as a line

Mark Scale Used [ ] [ ] [ ]




Differences Between Successive PSA values ... (if negative, change sign)

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |

Average of Differences Between Successive Baseline PSA values = AVERAGE MOVING RANGE = _____

Multiply Average Moving Range by 2.66 = _____

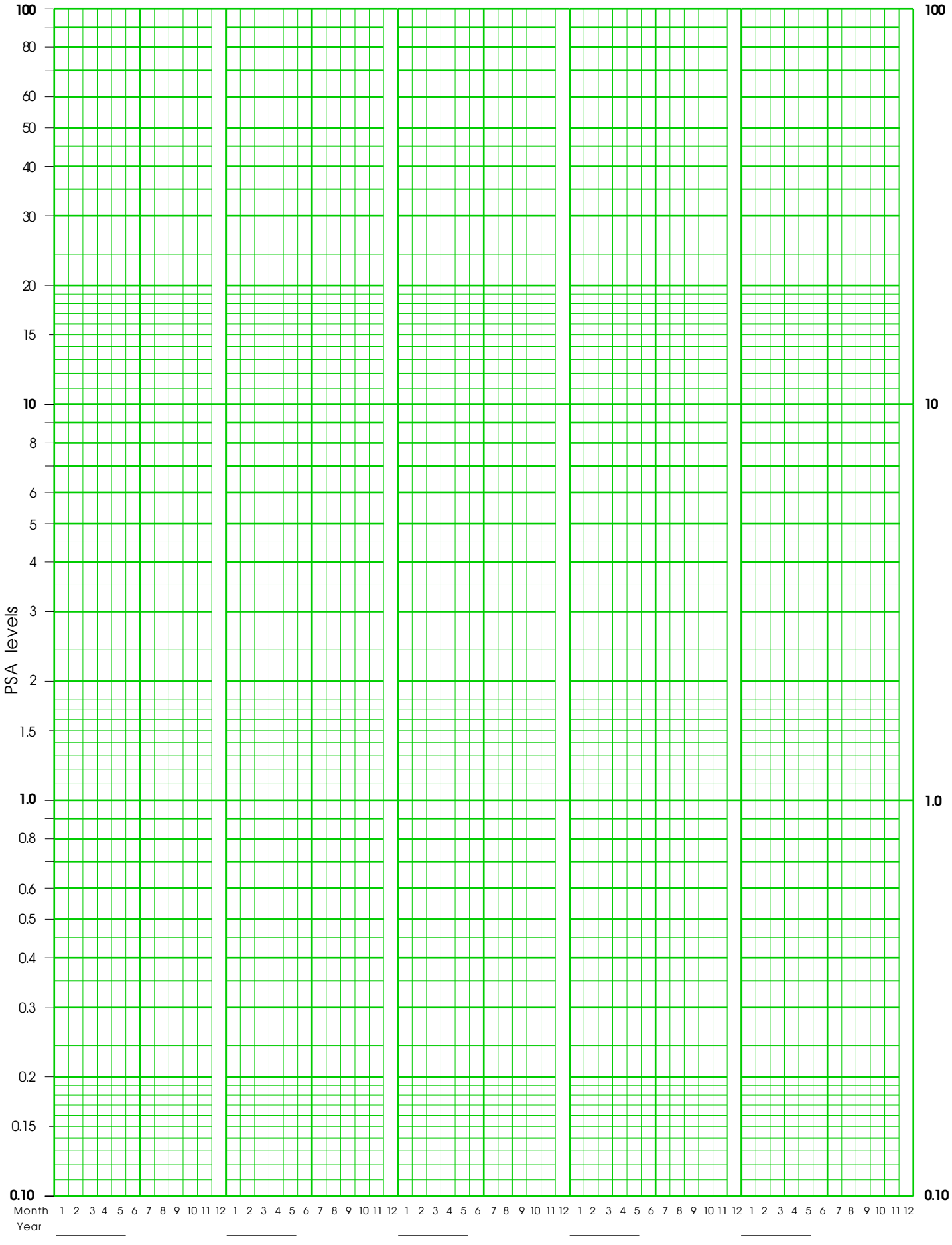
Upper Natural Process Limit = Central Line + 2.66 times Average Moving Range = [ ] plot as line

Lower Natural Process Limit = Central Line – 2.66 times Average Moving Range = [ ] plot as line

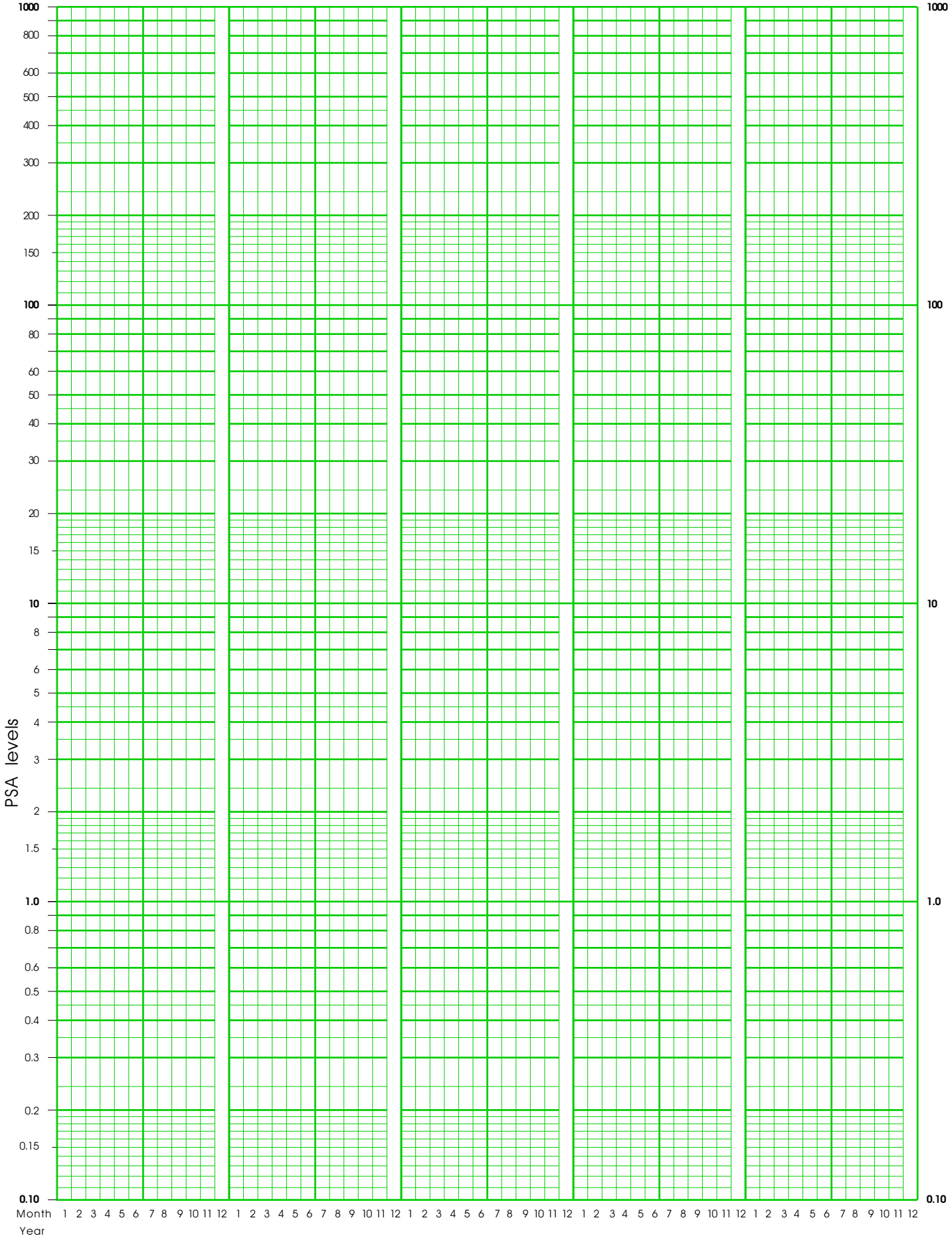
Plot PSA values, Central Line, and Upper and Lower Natural Process Limits on graph above.
May plot future PSA values on graph and compare them with the limits.
Future PSA values outside the limits represent a detectable change in PSA levels.

When evidence of changing PSA levels is found choose one of the following forms and Plot PSA Values versus Test Dates (month & year) to create a Celeration Chart

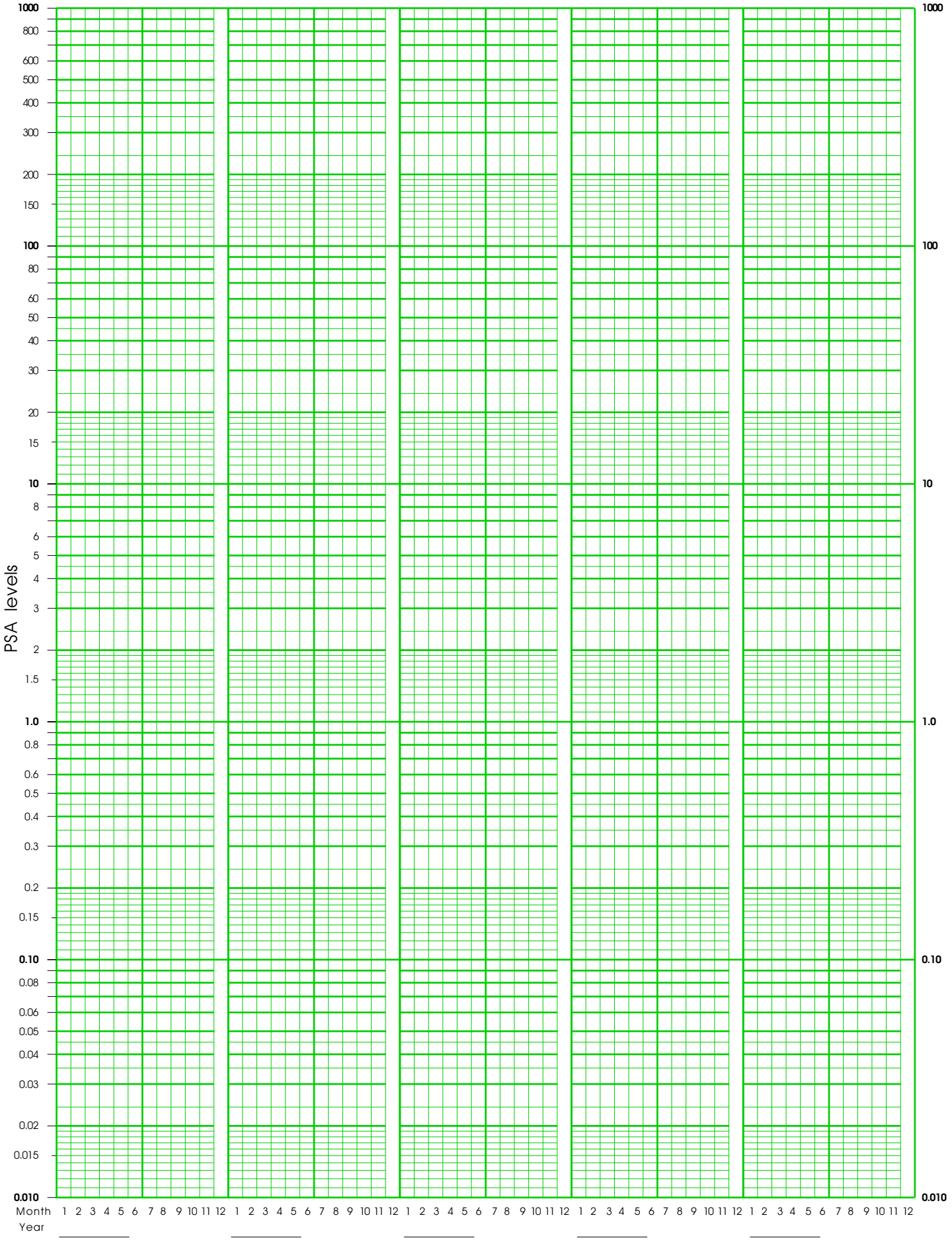
# Three-Cycle Celeration Chart for PSA values between 0.1 and 100



# Four-Cycle Celeration Chart for PSA values between 0.1 and 1000



# Five-Cycle Celeration Chart for PSA values between 0.01 and 1000



# Six-Cycle Celeration Chart for PSA values between 0.001 and 1000