

A Comparison of Proposed PM CPMS Limits

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What will be covered...

- EPA's Proposed Limit Techniques
- Data Comparing each Technique
- Alternate Look to PM CPMS Limits
- Final Thoughts / Questions

PM CPMS Limit Techniques

- Highest 1 – Hour Average
- Average Results
- Scaling to 75%

Highest 1 – Hour Average

- Does not use any M5 Results
- M5 Results < 75% of allowable limit
- Highest 1-Hr Average of PM Monitor Output during three M5 Runs
- No Calibration, only PM Monitor Raw Output

Average Results

- Does not use any M5 Results
- M5 Results < 75% of allowable limit
- Average of PM Monitor Output over three M5 Runs
- No Calibration, only PM Monitor Raw Output

Scaling to 75%

- M5 Results < 75% of allowable limit
- Basically 2-point scaling of the emission limit
- Forcing through zero

$$O_L = I_z + \frac{0.75(E_L)}{R}$$

Scaling to 75%

$$O_L = I_z + \frac{0.75(E_L)}{R}$$

Where:

- O_L = Operating/Compliance Limit
- I_z = PM CPMS Instrument (milliamps) at Zero (0) PM
- E_L = Emission Limit
- R = The ratio of the emission limit per PM CEMS output from performance test results

Scaling to 75%

$$R = \frac{(E_a)}{(I_a - I_z)}$$

Where:

- R = The ratio of the emission limit per PM CEMS output from performance test results
- E_a = Average Emissions Results from the 3 compliance test runs
- I_a = Average PM CPMS Instrument Output (milliamps) from the 3 compliance test runs
- I_z = PM CPMS Instrument Output (milliamps) at Zero (0) PM

RMB's Data

- Field study of three (3) PM CEMS
- Nearly (6) months of raw hourly average data
- Computed the 30-day rolling averages for
 - Maximum 1-Hour Average
 - Average Results
 - Scaling to 75% to New coal-fired Units (0.09 lb/MWh)
 - Scaling to 75% to Existing coal-fired Units (0.30 lb/MWh)

RMB's Analysis

Approach Used	CPMS-1		CPMS-2		CPMS-3	
	Exceedences	Time	Exceedences	Time	Exceedences	Time
Maximum	59	42%	35	25%	32	23%
Average	71	51%	38	27%	67	48%
75% - New	18	13%	0	0%	32	23%
75% - Existing	0	0%	0	0%	0	0%

Bonus Material on RMB Data

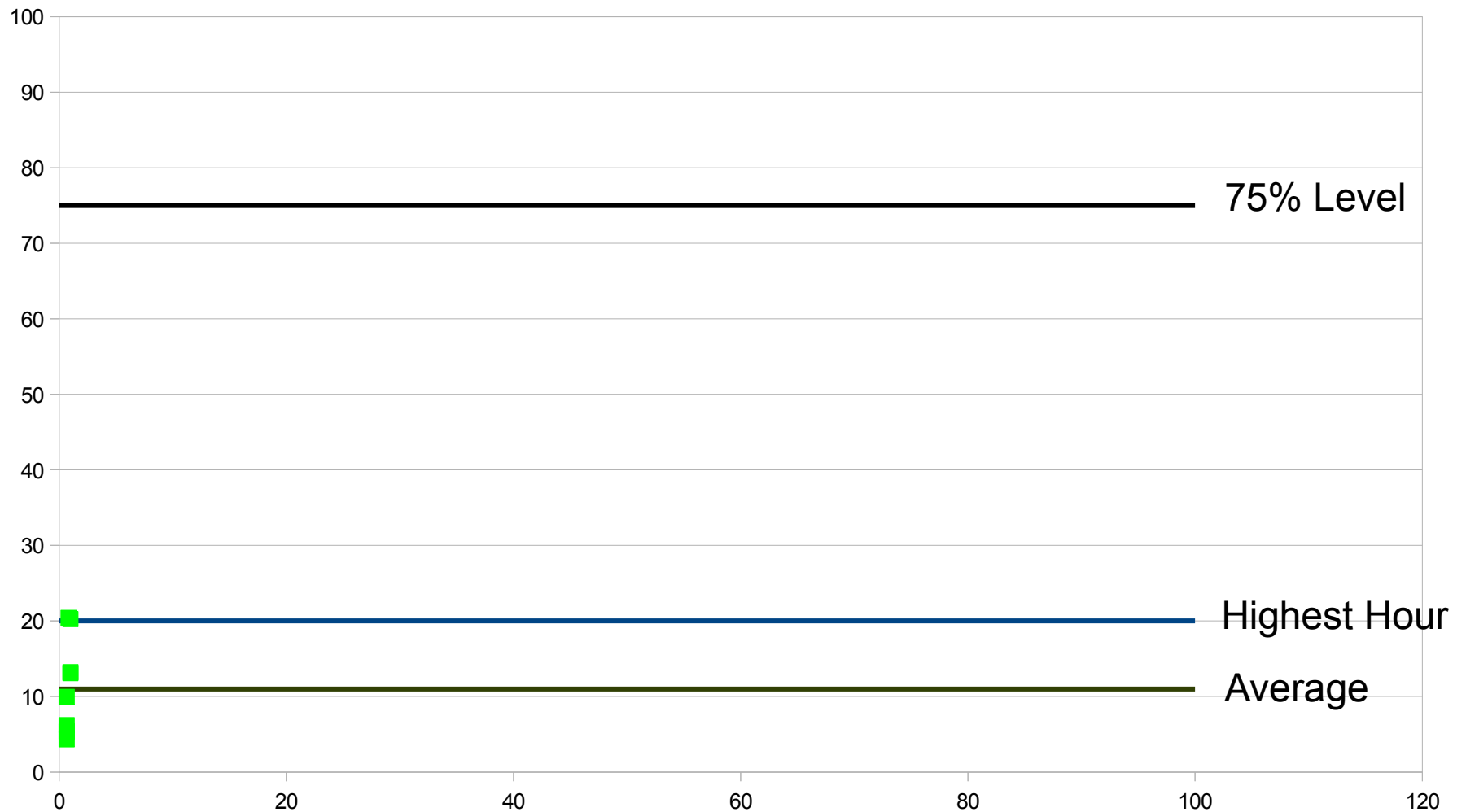
(... more to think about ...)

- Field study was for PS11 application
- PS11 Correlation was conducted for all units
- Never exceeded PM Limit, per PS11 Correlation

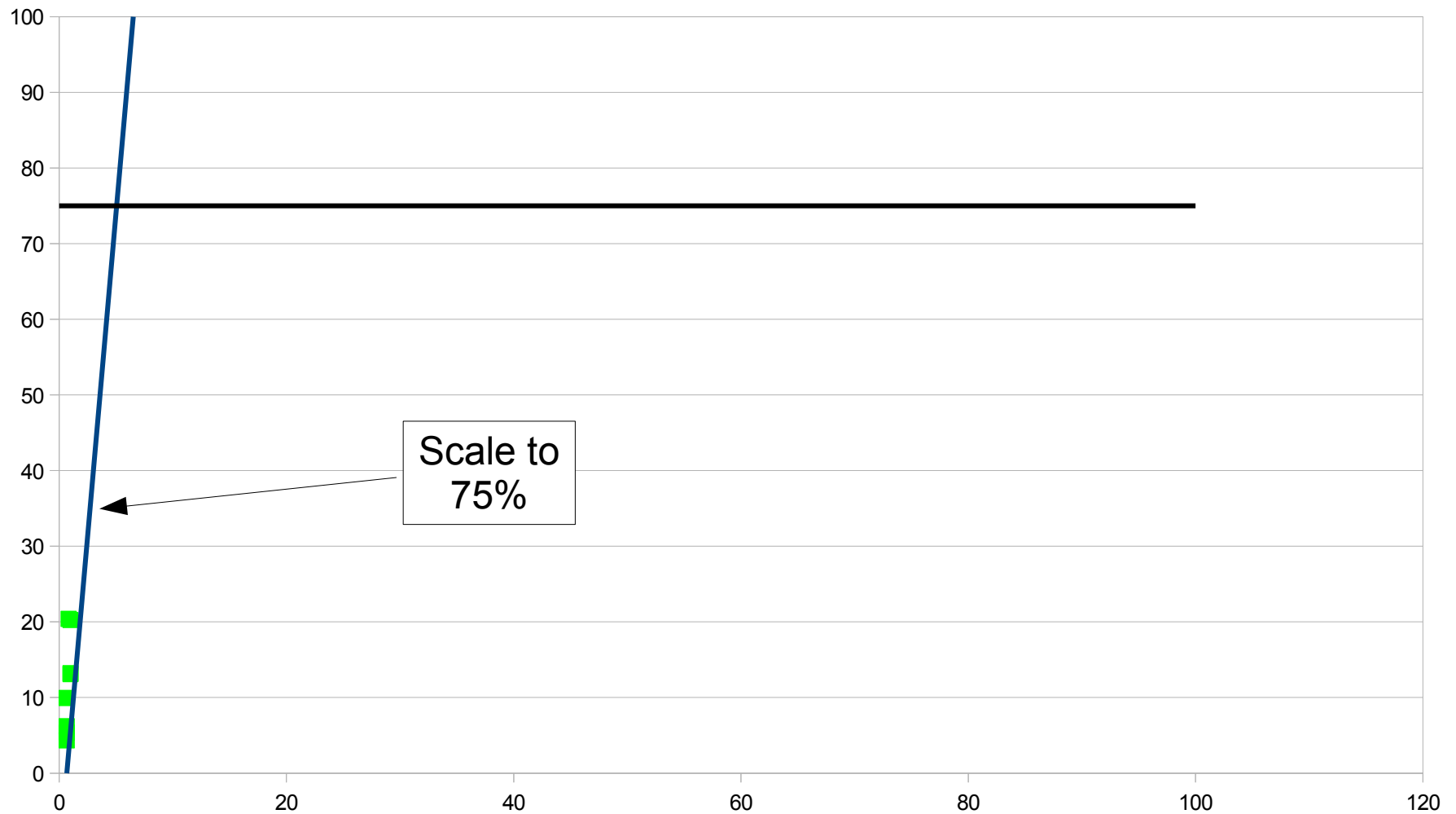
Things to Consider

- PM CPMS is concentration ONLY
- PS11 is Mass Rate
- Hardware is basically the same as PM CEMS
- New limit established every year

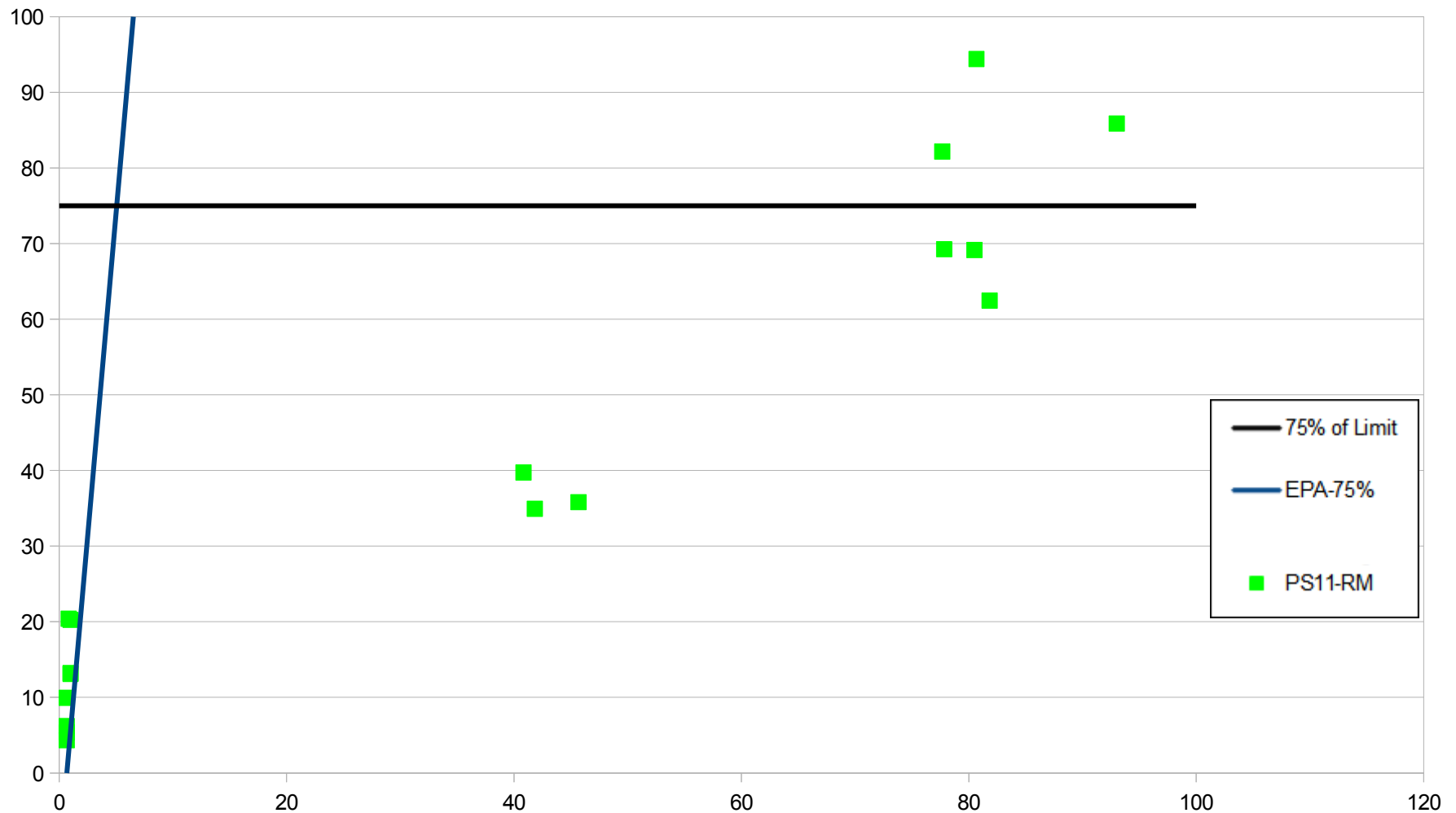
Another Look at Data



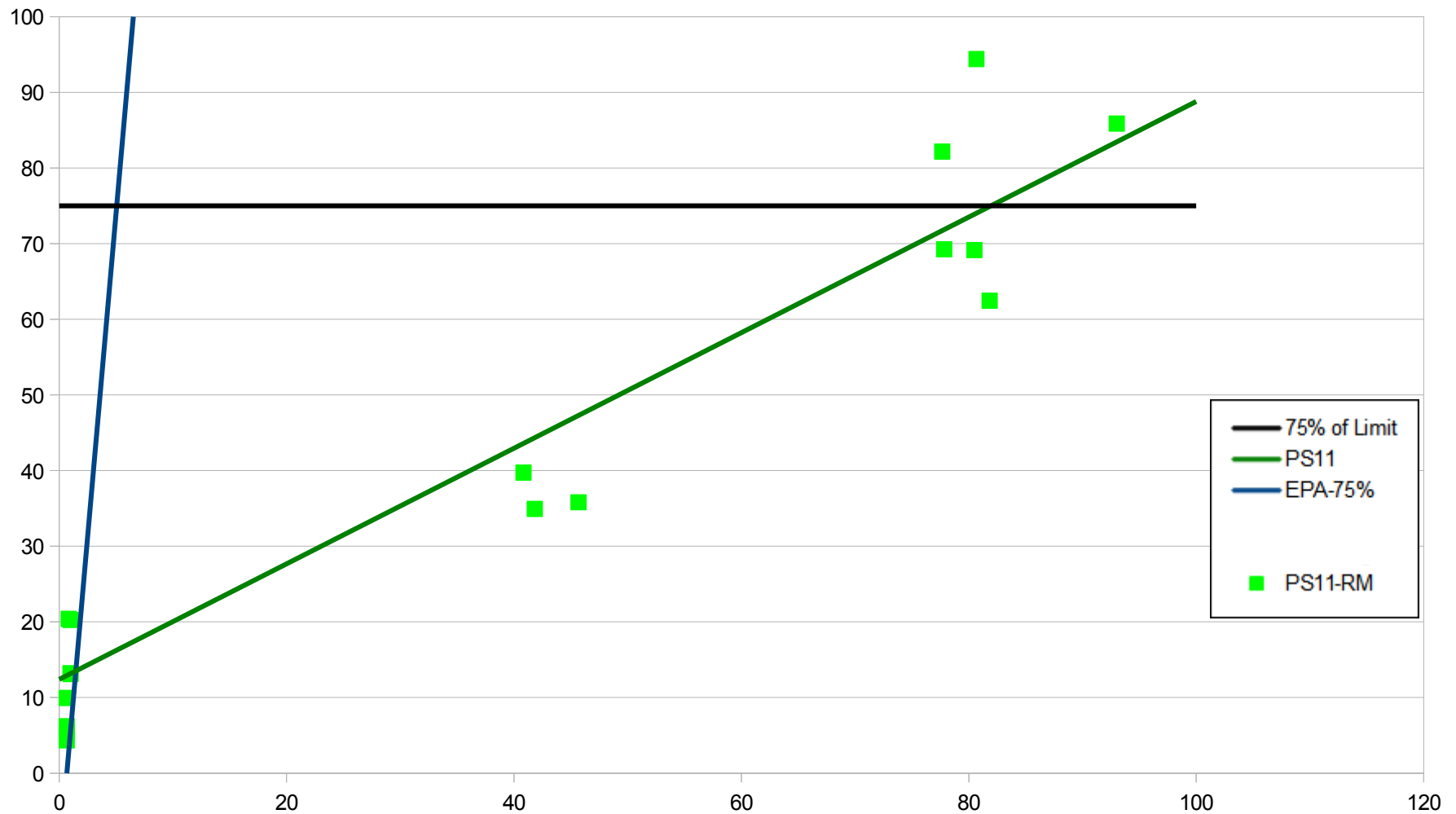
Another Look at Data



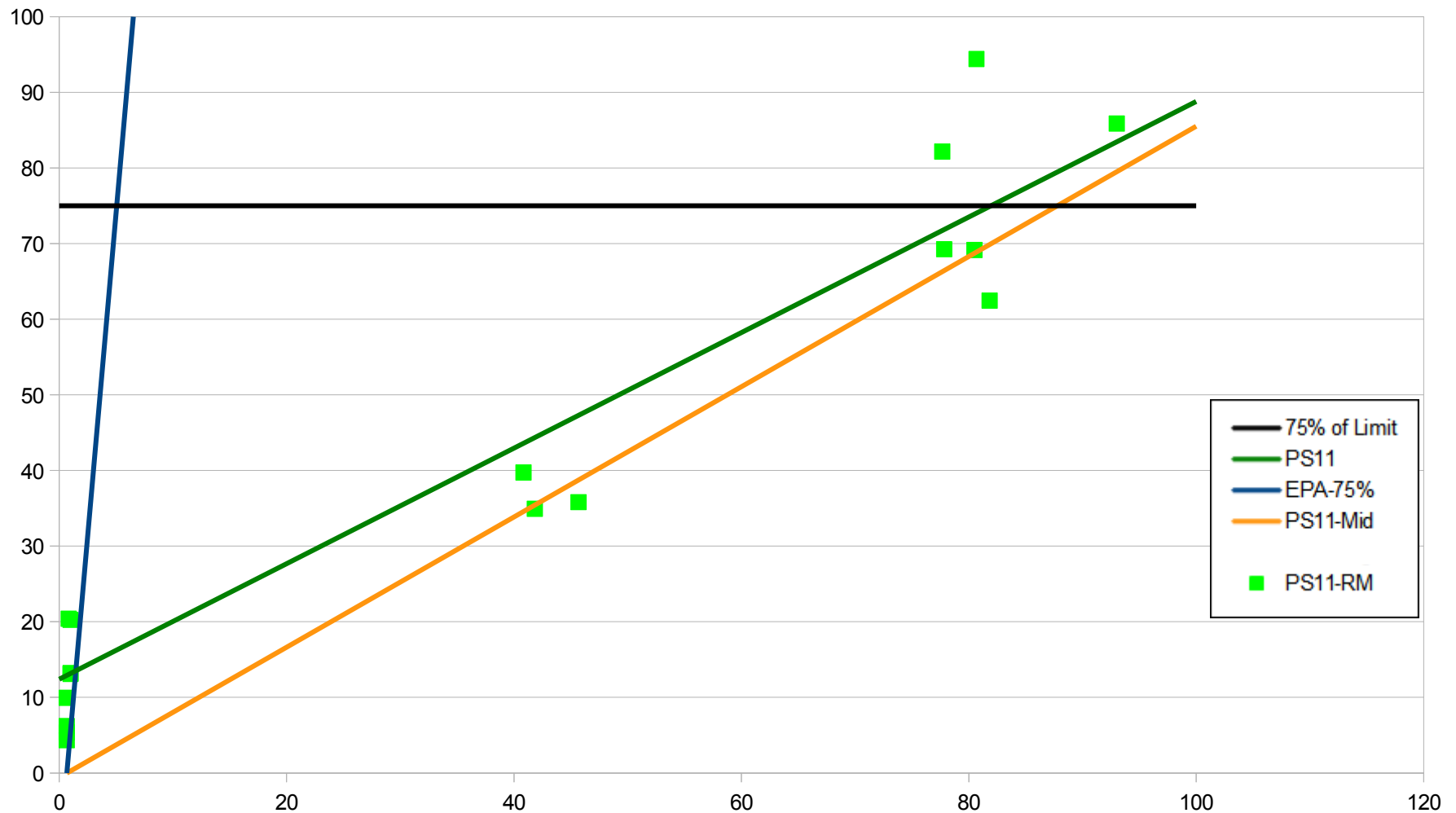
The Rest of the Data



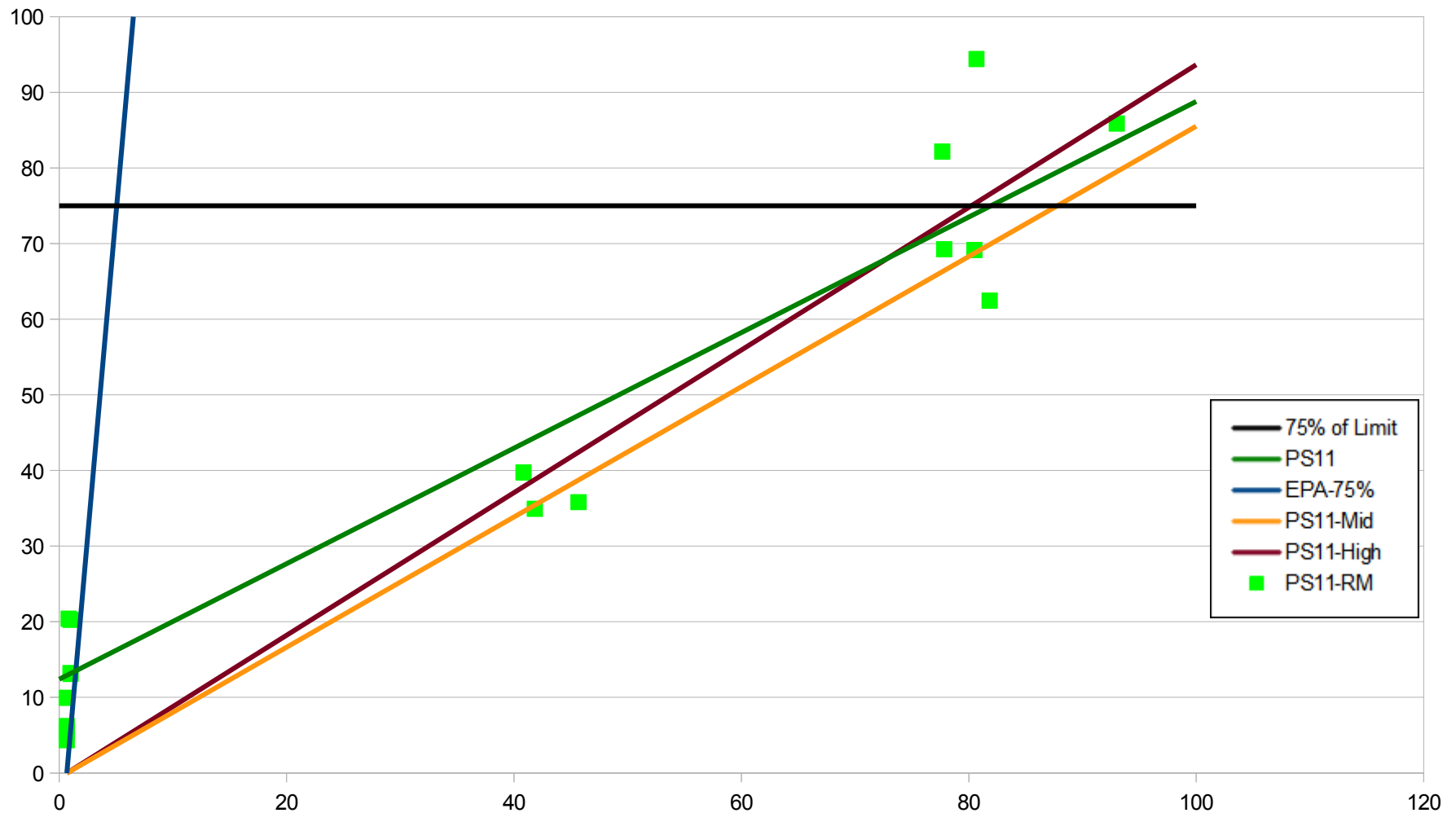
The PS11 Curve



Scale to PS11 Mid-Points



Scale to PS11 High-Points



Final Thoughts

- Extremely low PM is great for compliance.
- Higher PM is better for setting limits.
- Can you elevate your PM during testing?
- What other options are there?

The END.

Any questions...