used as calibration standards are reanalyzed every 200 samples to verify the calibration throughout the session. If the ratio of reported to calculated concentrations for these standards drifts outside the 0.95-1.05 range during an analysis run., the cyclotron is re-tuned, system is recalibrated, and samples reanalyzed. Figure 3 shows calibration verifications and recalibrations during the analysis of March 2005 (for context) and April - June 2005 samples.

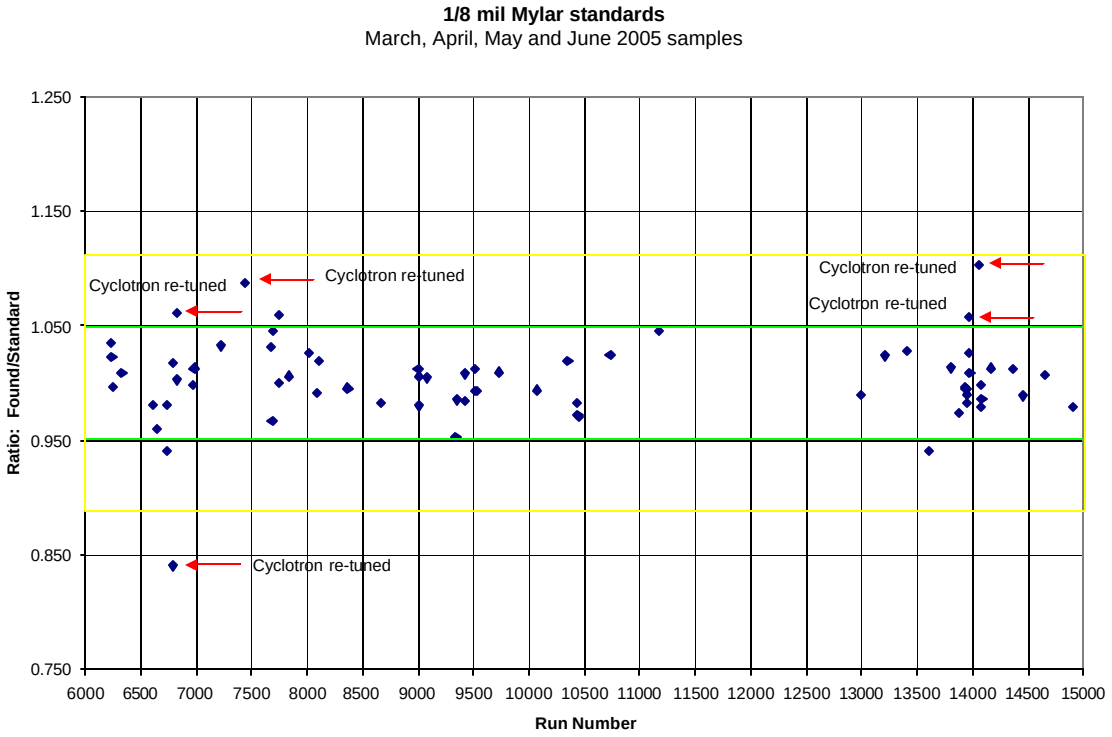

Figure 3. PESA standards for March, April, May and June 2005 samples

3.2 X-ray energy calibration

In addition to the peak counts associated with a known concentration (concentration calibration), the energy channel associated with a known fluorescence line must also be determined; this is the energy calibration. Energy calibrations were performed for the analyses of each sample month on each system to establish relationships of the form

*energy = intercept + slope * channel*

The following energy calibration equations (in energy units of KeV) were used for the analysis of April, May, and June 2005 samples, respectively:

- for XRF-Cu intercept= -0.05603950, slope= 0.01692728
  intercept= -0.03073931, slope= 0.01665470
  intercept= -0.03399334, slope= 0.01664978

- for XRF-Mo intercept= -0.07314897, slope=0.03592077
  intercept=-0.07138395, slope=0.03590873
  intercept=-0.07087657, slope=0.03601250

In addition, the resolution of the Si(Li) [detector~~s~~ in the Mo-anode XRF system~~s~~] is frequently checked using an Fe-55 source. Results indicating changes of 5% or more in the width of the K-alpha peak for Mn are reported and further investigated. [Corrected 2/9/07.]