

PM2.5 Federal Reference Method Filter Recovery Extension Study

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Filter Recovery Extension Study

- Background
- Study Design
- Results
- Next Steps

Filter Recovery Extension Study Background

- Specific Requirement in PM2.5 Reference Method
 - ▶ 40 CFR, Part 50, Appendix L
 - ▶ "Within 96 hours of the end of the sample collection period, the filter, while still contained in the filter cassette, shall be carefully removed from the sampler,..."
 - ▶ Included as a critical criteria in validation template
- Setup to allow for use of sequential samplers on 1 in 3 day sample schedule
- Requires Monitoring agencies to travel to sites with sample frequency of daily and 1 in 3 day schedule at least every 4 days
- Identified in National PM2.5 QA Workgroup as major resource burden

Considerations in Filter Recovery Extension Study

- What other criteria become important if filter recovery time requirement is extended?
 - ▶ Loading in WINS well. More sample days means more loading in the well. Changing well every 5 sample days is guidance; not regulation.
 - ▶ Post-weigh of sampled filters within:
 - 10 days of sample run when filter transported ≤ 25 degrees C or
 - 30 days of sample run when filter transported at ≤ 4 degrees C.
 - Recent guidance allows for sliding scale between these two points

Concerns over increasing recovery time:

- Are FRM samplers currently achieving the data quality objectives?
- Will an increase in recovery time affect achieving data quality objectives?
- Volatilization versus Contamination?
 - ▶ many differences in local environmental factors such as:
 - Component of nitrate in collected fine particulate
 - passive dust
 - diurnal temperature changes

Deciding what to test for:

- Stakeholders involved in test design:
 - ▶ National QA Workgroup
 - OAQPS, Regions, States, locals
 - ▶ OAQPS and NERL
- Announced test design to:
 - ▶ National Monitoring Workgroup:
 - OAQPS, Regions
 - ▶ Stappa/Alapco
- Received positive support to carry out study.

Filter Recovery Extension Study Design

- Determine if recovering a sample after 7 days does not result in a violation of the CV and bias DQO's.
- Estimated CV by running multiple samplers of similar method designation
- Estimation of bias by comparing experimental design (recovering filter cassette after 7 days to baseline case (Performance Evaluation Program protocol).

Baseline versus Experimental

■ Baseline Case

- ▶ Performance Evaluation Protocol
- ▶ Recover sample <48 hours
- ▶ Recovery usually < 24 hours
- ▶ Use portable samplers used in national performance evaluation program
 - Andersen portables
 - BGI portables
 - R&P portables

■ Experimental Case

- ▶ Recover sample at greater than 7 days
- ▶ Recovery time ~177 hours
- ▶ Use samplers States/locals would use as routine
 - Andersen Sequential
 - R&P Sequential
 - BGI Single
 - other singles and portables

BGI PQ200a PM2.5 Sampler



R&P 2025 sequential PM2.5 sampler



Andersen RAAS2.5-300 sequential sampler



Site visits per quarter

13 week period with no visits on weekends

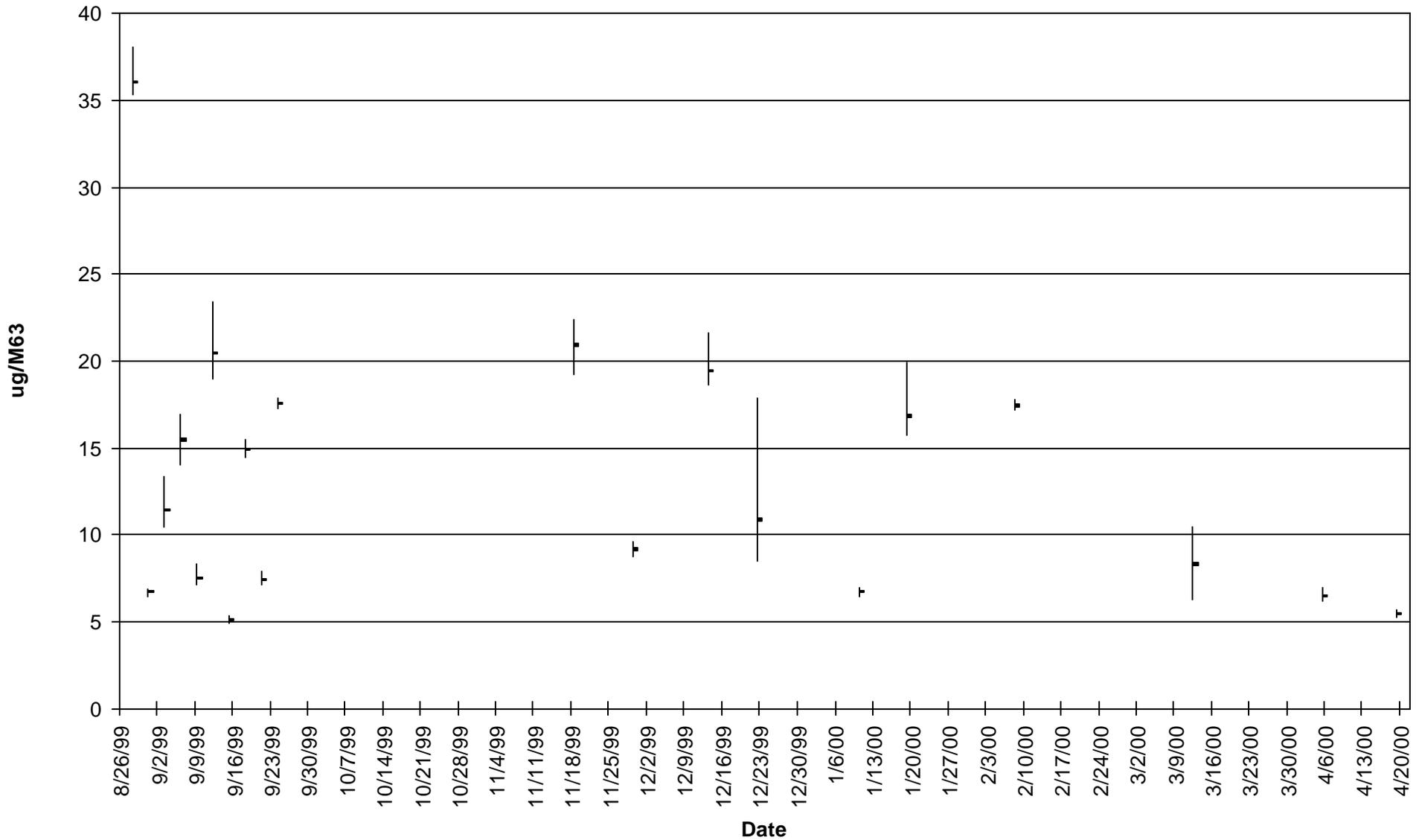
Sample Schedule	Samples per quarter	trips with 96 hour recovery requirement	trips with 168 hour recovery requirement
Daily	91	26	13
1-3	30	17	13
1-6	15	15	15

1 in 6 schedule based upon use of single channel sampler

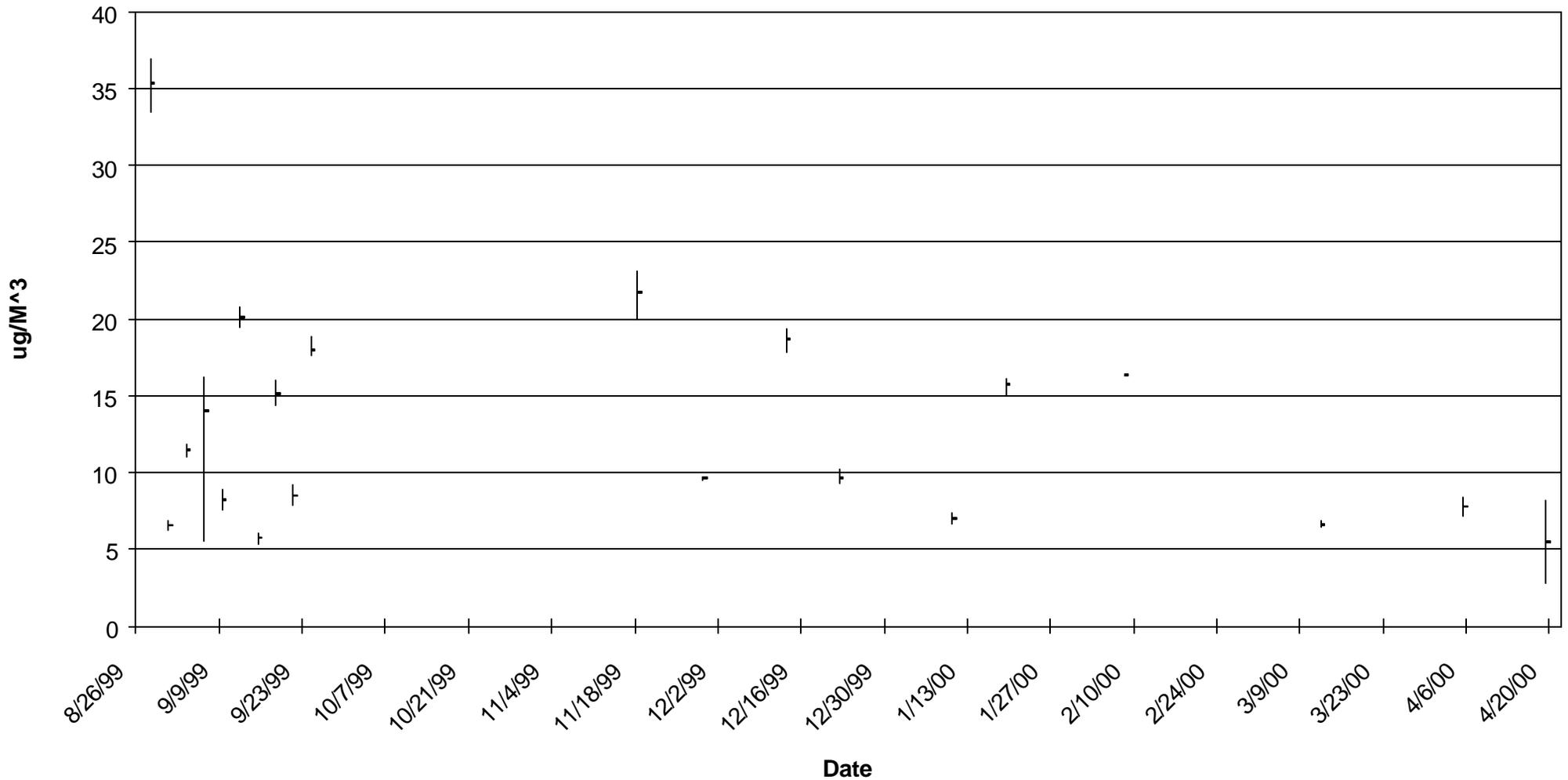
Filter Recovery Extension Study Kickoff

- Ran intensive screening study in RTP, NC to determine if larger study worth pursuing.
 - ▶ Screening study conducted August - September 1999.
 - ▶ High concentrations on first sample day
 - ▶ Then the rain came!

Performance Evaluation Samples Filter Recovery Extension Study RTP, NC



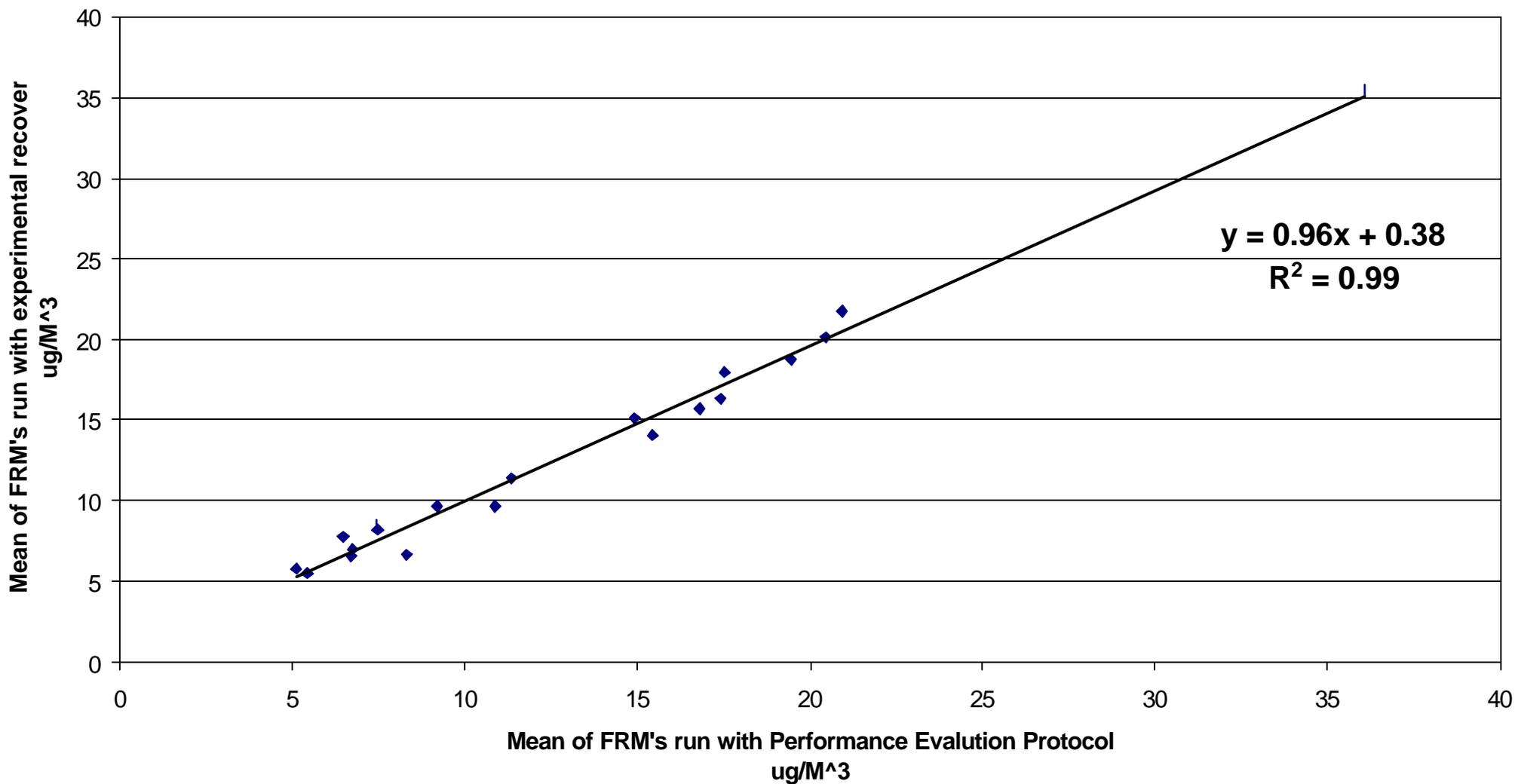
177 Hour Recovery Filter Recovery Extension Study RTP, NC



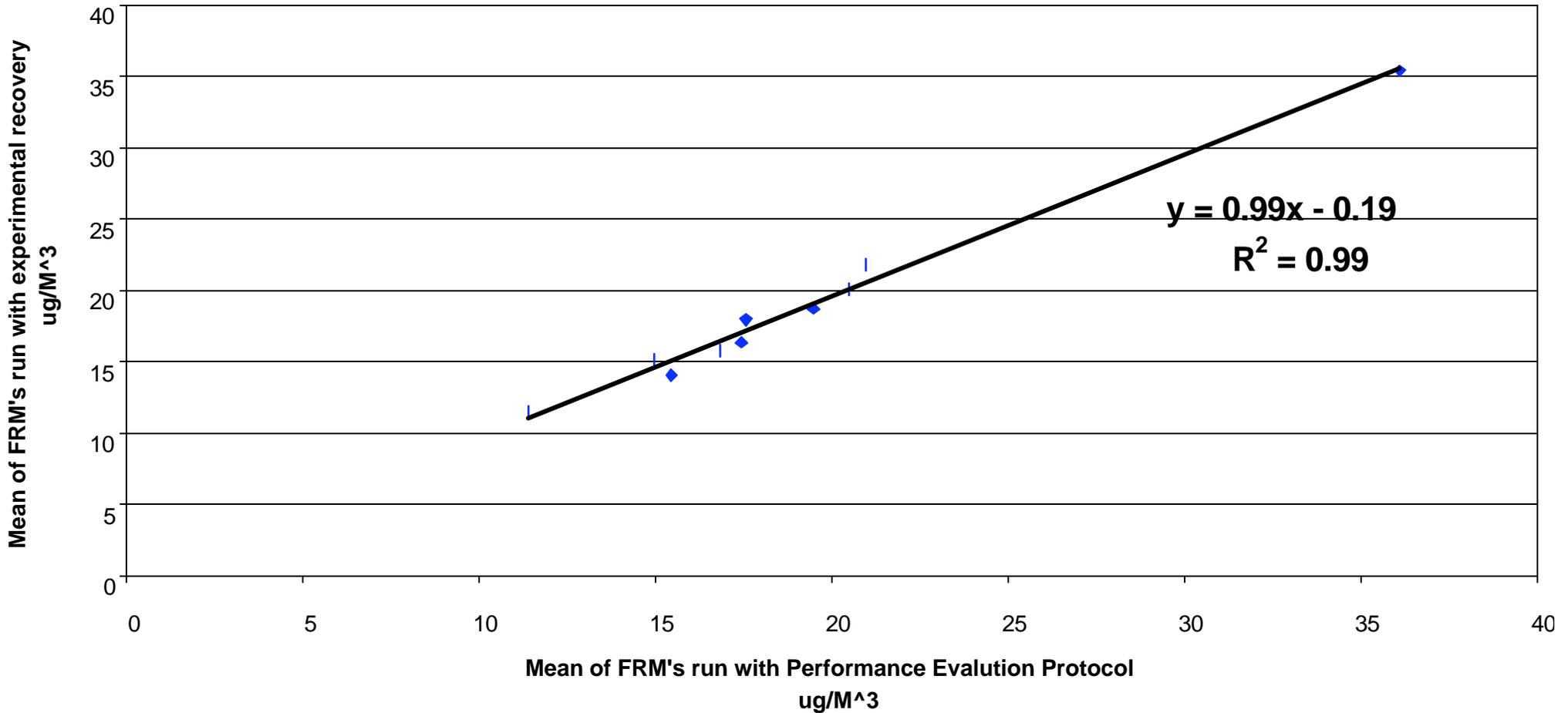
Filter Recovery Extension Study

RTP, NC

August 1999 - April 2000



**Filter Recovery Extension Study
with concentrations > 10 ug/M³
RTP, NC
August 1999 - April 2000**



Next Steps

- Continue RTP study through August 2000.
- Conduct study in other areas of the country to determine if spatial differences exist:
 - ▶ California, Georgia, Maine, Texas, Washington State
- Write technical report of data collected and results
- Determine applicability of study to change:
 - ▶ Reference Method (first option if data supports)
 - ▶ Application as equivalent method if one or more but not all methods meeting DQO's
 - ▶ Site specific waivers if some areas meeting DQO's, but not all.
- Apply for change