

## NRR-PMDAPEm Resource

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**From:** Ernie Kee [erniekee@gmail.com]  
**Sent:** Tuesday, December 02, 2014 8:31 AM  
**To:** Stang, John  
**Cc:** Harrison Albon; Drew Richards; Singal, Balwant  
**Subject:** Slides for 12/02/14 meeting on L\*  
**Attachments:** JL L-Star Procedure.pptx

John,

Please find slides attached as requested.

Ernie Kee

**Hearing Identifier:** NRR\_PMDA  
**Email Number:** 1757

**Mail Envelope Properties** (9881DC7C-AC18-4E51-A497-9ACD27F55D88)

**Subject:** Slides for 12/02/14 meeting on L\*  
**Sent Date:** 12/2/2014 8:31:25 AM  
**Received Date:** 12/2/2014 8:31:23 AM  
**From:** Ernie Kee

**Created By:** erniekee@gmail.com

**Recipients:**

"Harrison Albon" <awharrison@STPEGS.COM>  
Tracking Status: None  
"Drew Richards" <amrichards@stpegs.com>  
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"Singal, Balwant" <Balwant.Singal@nrc.gov>  
Tracking Status: None  
"Stang, John" <John.Stang@nrc.gov>  
Tracking Status: None

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MESSAGE	73	12/2/2014 8:31:23 AM
JL L-Star Procedure.pptx		63067

**Options**

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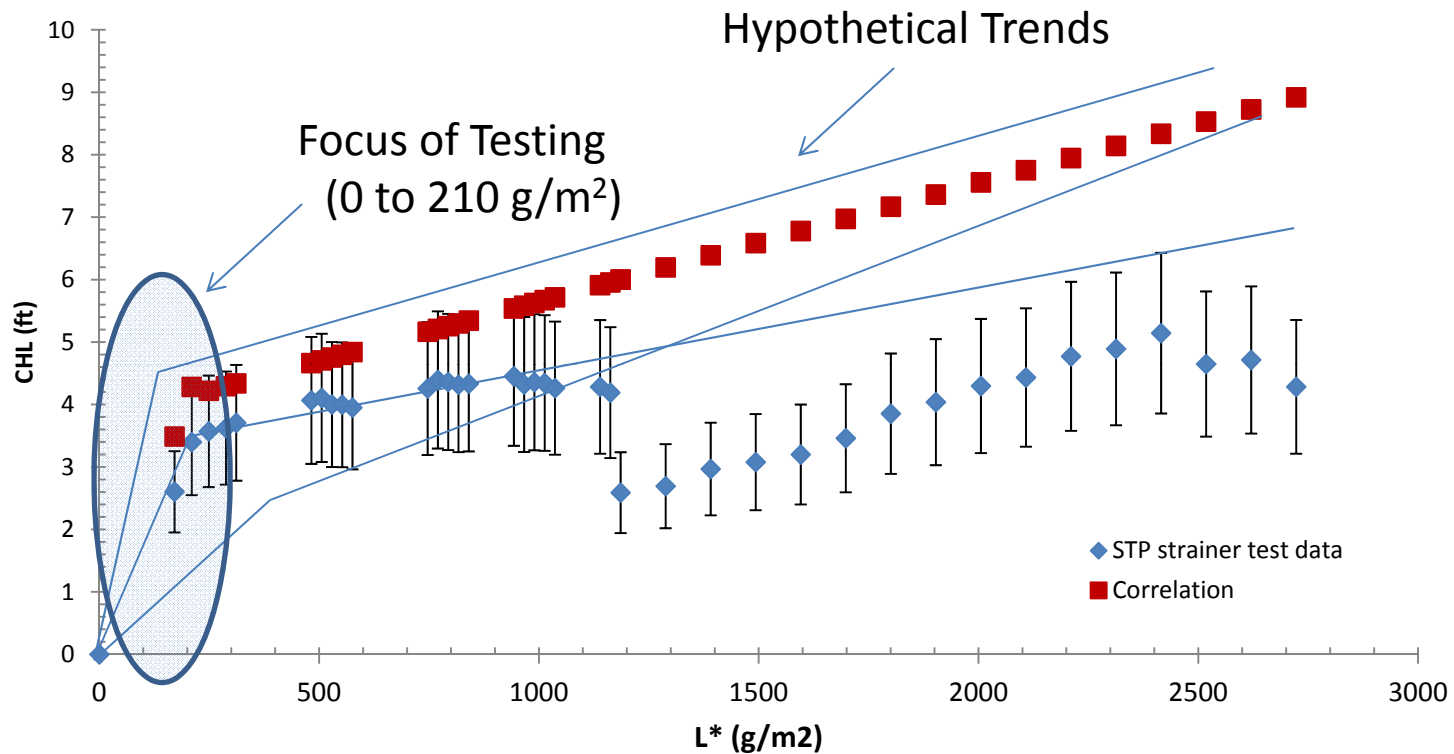
# L\* Test Procedure and Application

December 2, 2014

Nuclear Regulatory Commission

Rockville, MD

# Generate Additional L\* Data

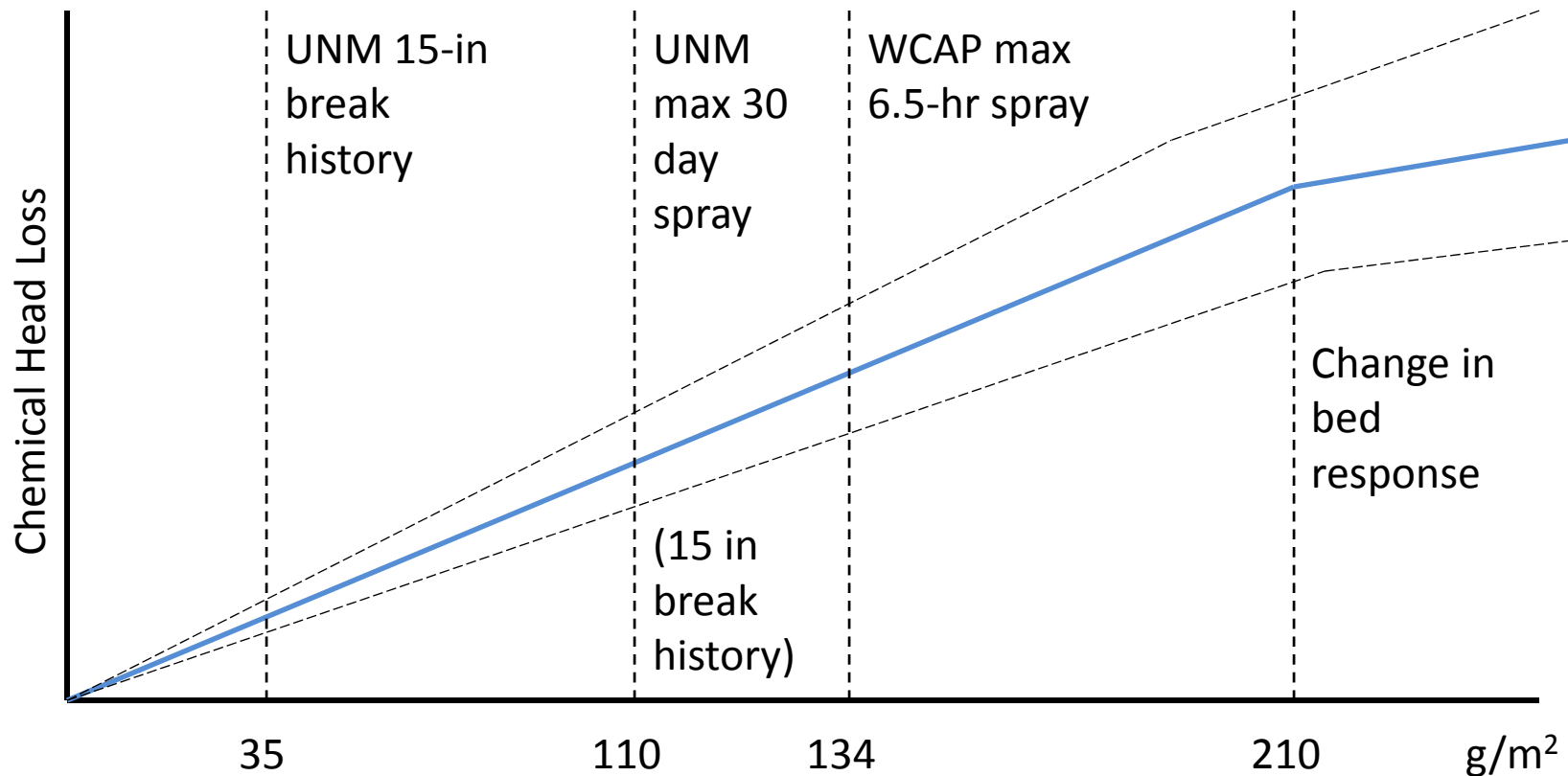


- July test used 30-day WCAP inventories with full spray, max fiber, etc.
- Focus batch resolution on low concentrations
- Check L\* envelope with alternate conventional beds
- Calibrate reasonable uncertainty for application to total head loss

# Test Considerations

- Incremental chemical addition
  - provides desired head-loss response *regardless* of release rate (WCAP 16530, UNM, conditions, etc.)
  - Release rate model sets *max* inventory of interest
  - 1 to 2 pool turn over between additions
- Finite test duration
  - Meet objectives in ~2 days of chemical addition
  - Add resolution (timed batches) near concentrations of special interest
  - Maximum resolution practical (more small additions)

# Key Concentrations of Interest



- Incremental additions planned near concentration points

# Batch Addition Strategy

- Available time (48 hr) divided by turn over interval equals max number of adds ( $N_{\text{add}}$ )
- Max  $L^*$  divided by  $N_{\text{add}}$  equals mass per add
- More frequent small adds near interest points if possible
  - Flexibility to collapse concentration intervals to assure distinct response for each addition
- Assume 3 trains of strainer area for  $L^*$  values

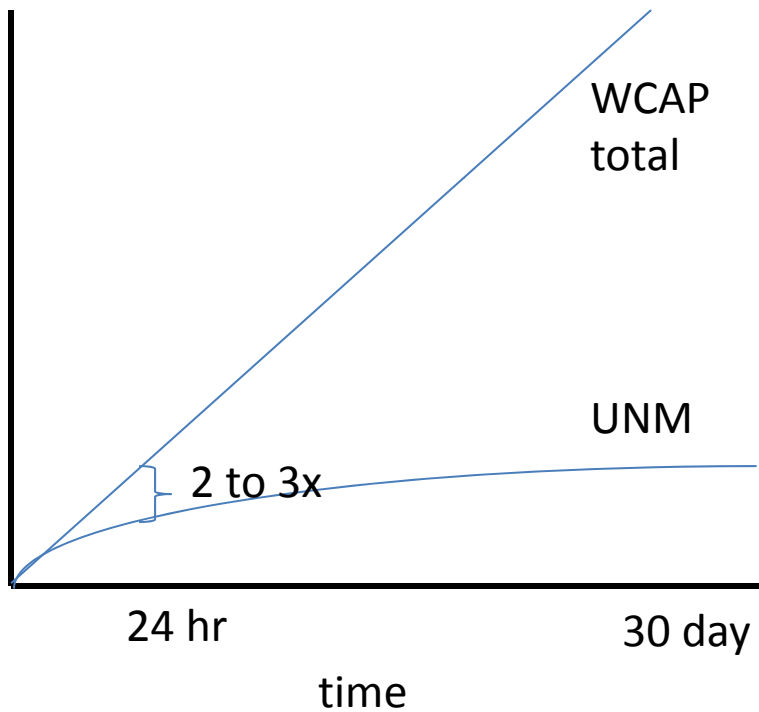
# Max Precipitate Generation Assumptions

- 20-in break temperature profile
- pH curve (min, max)
- Aluminum exposure
  - 5000 ft<sup>2</sup> vapor space and 500 ft<sup>2</sup> submerged
- Fiberglass
  - 2385 ft<sup>3</sup>, 218 ft<sup>3</sup> (15-in break)
- Concrete

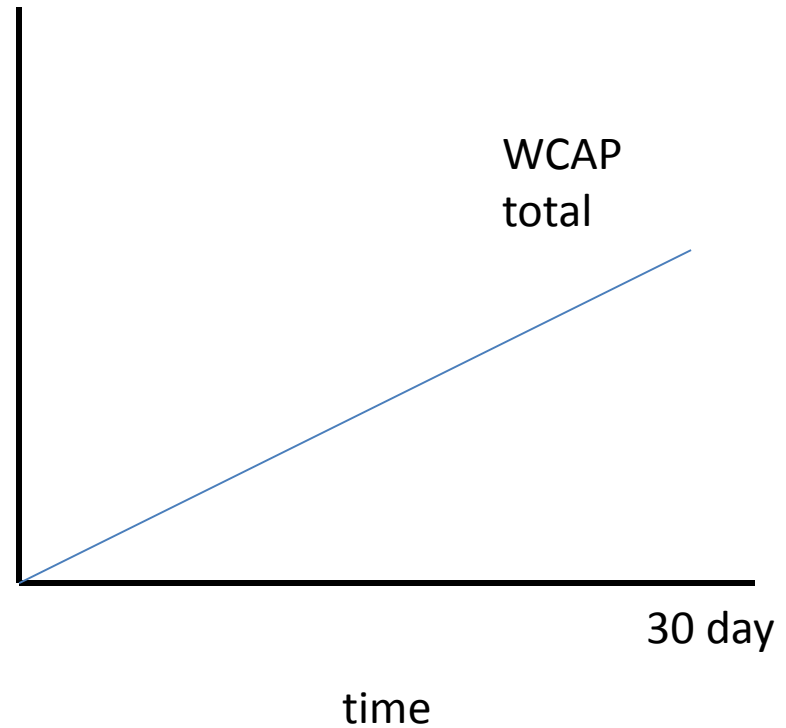


# Aluminum and Calcium

- Two Aluminum Limits



- WCAP-16530 Calcium



- Two Possible Precipitate Calculations
  - WCAP Al + WCAP Ca
  - Modified UNM Al + WCAP Ca

# L\* Application

- Standard WCAP or modified WCAP used to calculate time-dependent cumulative release of Al and Ca (now reasonable rate is a key)
- Release becomes precipitate with no solubility or saturation delay =>  $M(t)$  in pool
- Mass distributed to strainers depending on active flow
- Chemical head loss for each strainer read from test correlation