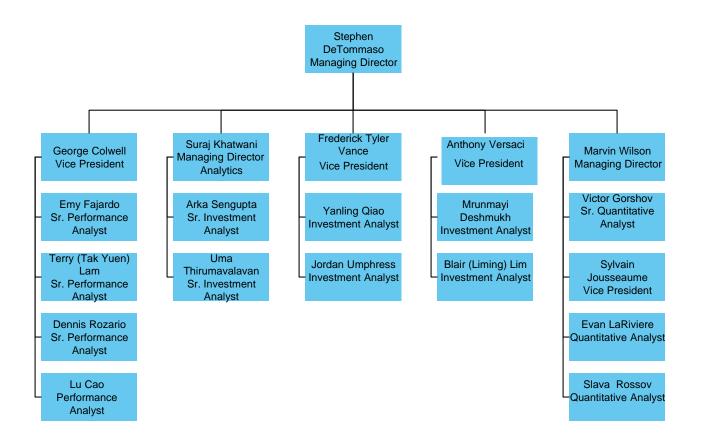
Securities & Portfolio Analytics Services (SAPAS)





Securities & Portfolio Analytics Services (SAPAS)

Steve DeTommaso Analytics & Performance

Performance Measurement / Content Generation:

Total Returns; Attribution; Index Sourcing/Mgmt; Aggregate Portfolio Mgmt, Client Mngmt

Asset Modeling / Content Generation:

Market Risk Analytics, Cashflow Projections/Reports, RW Economic Scenarios, Documentation, Controls, IAG/FCU/PWC, Client Mngmt

Scenario Modeling / Content Generation:

Real World Scenario Expansion, Risk Neutral Scenario Generation, STS Support, Documentation; Controls; Client Mngmt

Quantitative , Technical, and Desk Support (MIDAS):

Relationship Mgmnt with Desks: Adhoc Desk Support; Process improvement / model implementation consolidation, etc.

Administration / Planning / Other: Model LifeCycle Mngmt; Op Risk / RCSA; BCP/BIA; Process Analysis / Redsign; Program Mngmt; Sourcing / Licensing; Records Mngmt; Future Business Req'ts / Coordination

PMOAS:

Performance Measurement Operations and Analytics Services

AMOAS #1:

Asset Modeling
Operations and Analytics
Services

AMOAS #2:

Asset Modeling
Operations and Analytics
Services

MIDAS:

Model Integration and Data Aggregation Solutions

AMOAS #3:

Asset Modeling Operations and Analytics Services



FAS 91 Process

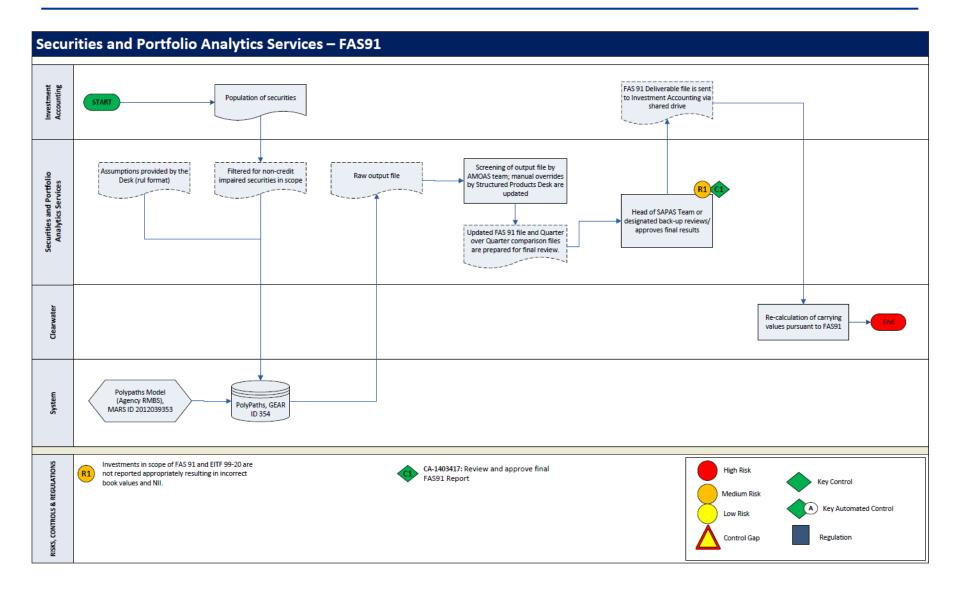
2018 Control CA-1403417 (Risk – Medium, Frequency – Quarterly)		
Description	Additional Description	
Quarterly, based on the population of securities provided by Investment Accounting, the Investment Analytics (IA) Production Process Team uses the Polypaths Enterprise analytics platform to generate an excel file with unitized cashflow projections, daycount, delay, original face, and current face, in format required by Clearwater for amortization calculations on certain non-credit impaired structured product securities. The excel file generated from Polypaths is screened by the IA Production Process Team and a sub-set of information is provided to applicable structured product desks to review. Overrides by the structured product desks are updated in a revised FAS 91 file. The Head of IA Production Team or designated back-up reviews/approves final results, using additional outputs that compare change in first/last principal due date and Average Life. The final updated file is provided to Investment Accounting via share drive to facilitate re-calculation of carrying values pursuant to FAS 91 by Clearwater.		

2019 Control CA-1403417 (Risk – Medium, Frequency – Quarterly)		
Description	Additional Description	
Quarterly, based on the population of securities provided by Investment Accounting, the Asset Model Operations & Analysis Services (AMOAS) Team under Securities and Portfolio Analytics Services (SAPAS) Group uses the Polypaths Enterprise analytics platform to generate an excel file with cashflow projections, daycount, delay, original face, in format required by Clearwater for amortization calculations on certain non-credit impaired structured product securities. The excel file generated from Polypaths is screened by the AMOAS team and a sub-set of information is provided to applicable structured product desks to review. Overrides by the structured product desks are updated in revised FAS 91 cashflow file(s).		
The Head of SAPAS Group or designated back-up reviews/approves final results, using additional outputs that compare change in first/last principal due date and Average Life. The final updated file is provided to Investment Accounting via share drive to facilitate re-calculation of carrying values pursuant to FAS 91 by Clearwater.		

On 04/16/2019, Steve DeTommaso verified that the above control descriptions are accurate for 2019.

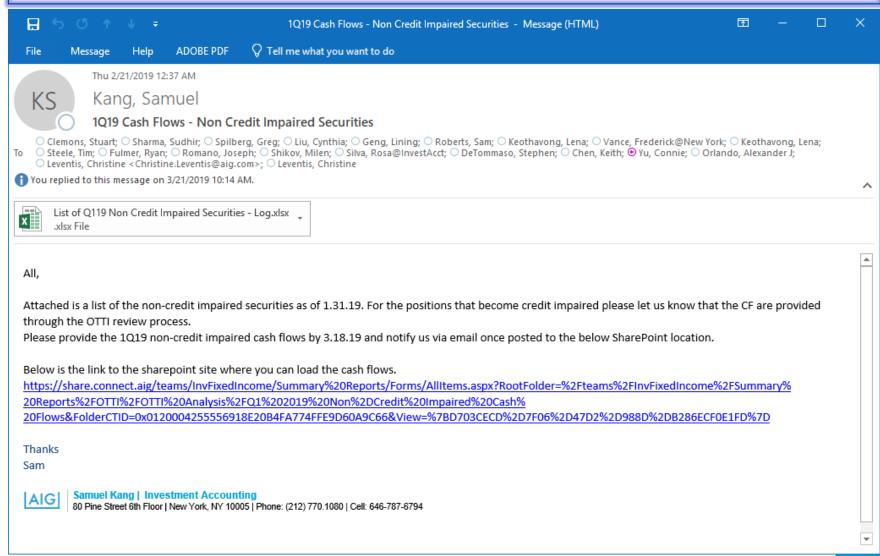


Process Flow - FAS 91 Process

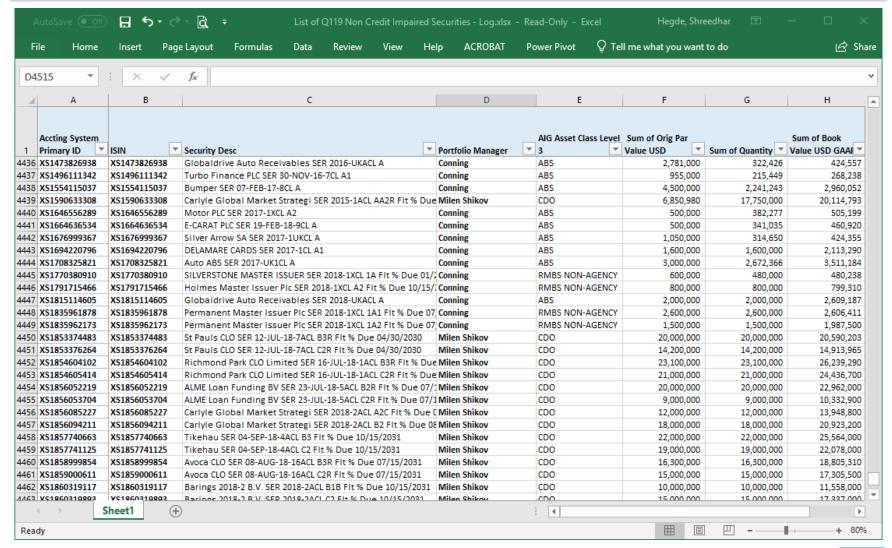




Email from Investment Accounting with list of Non-Credit Impaired securities to AMOAS team

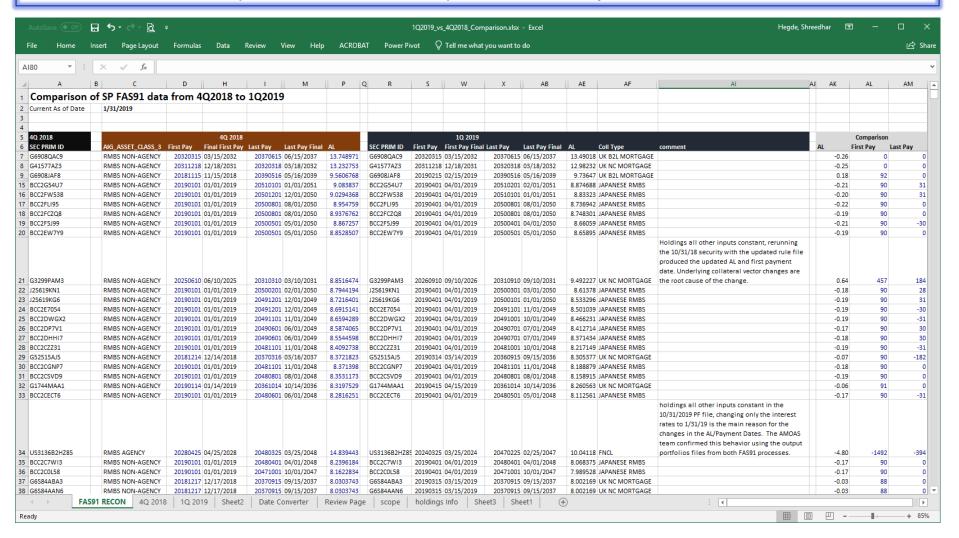


List of Non-Credit Impaired securities received from Investment Accounting



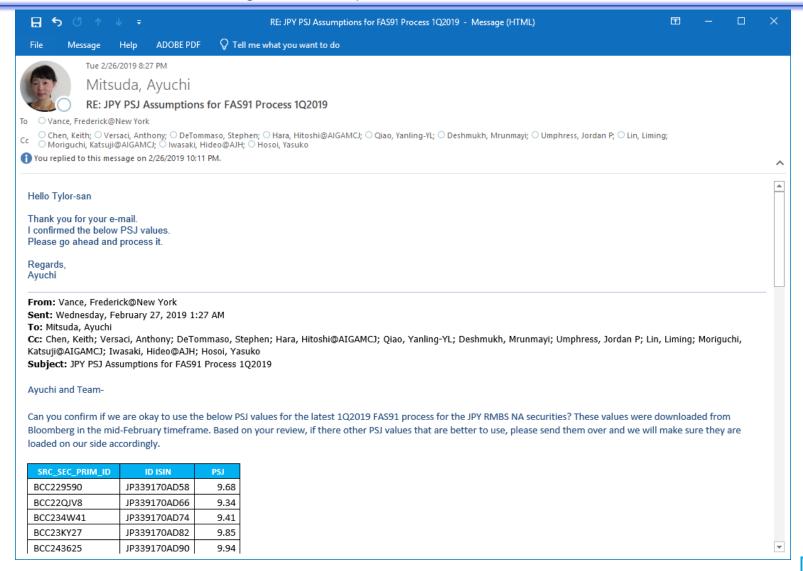


Quarter over Quarter comparison of Non-Credit Impaired securities by AMOAS team

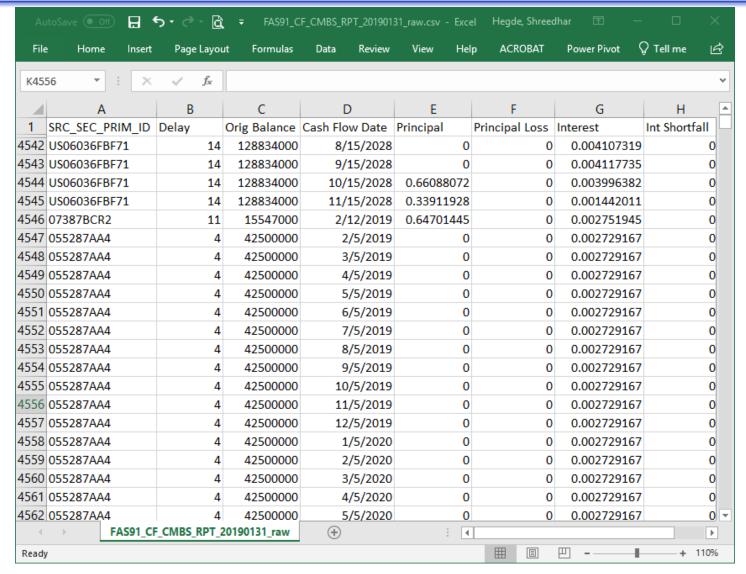




Email from Front Desk confirming PSJ Assumptions

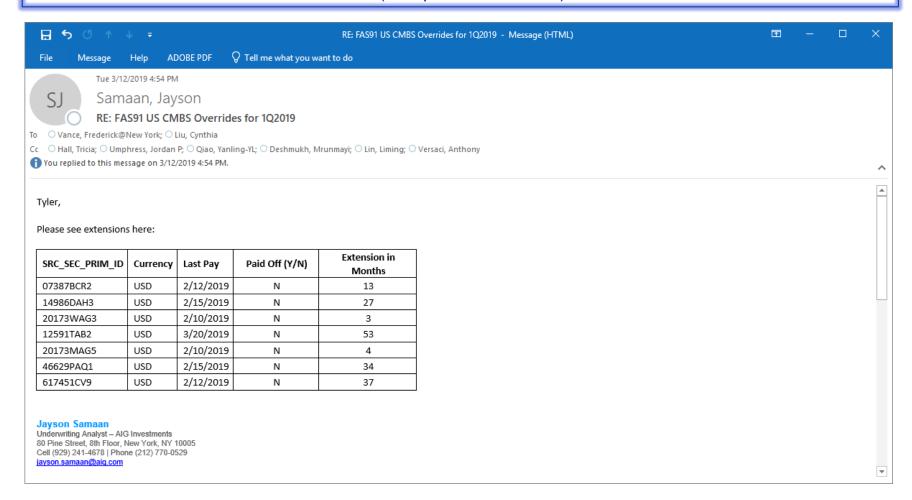


FAS91 Output report for CMBS from Polypaths



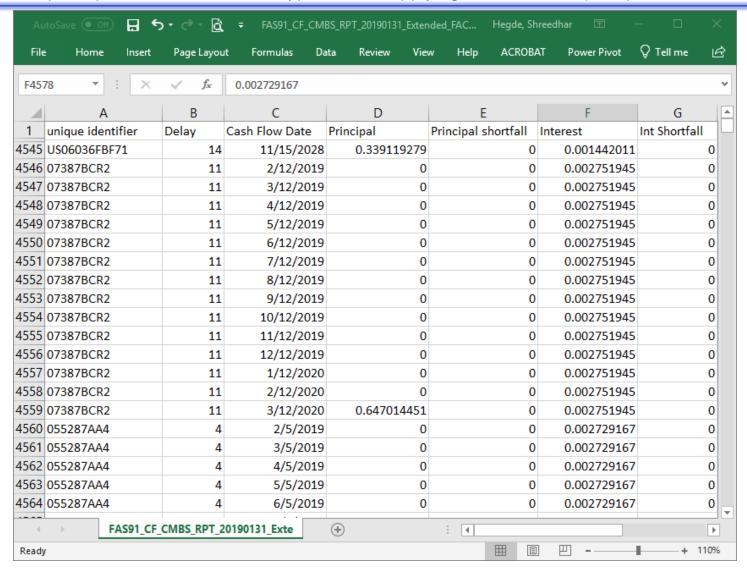


FAS91 Overrides Received for US CMBS (Sample: 07387BCR2)



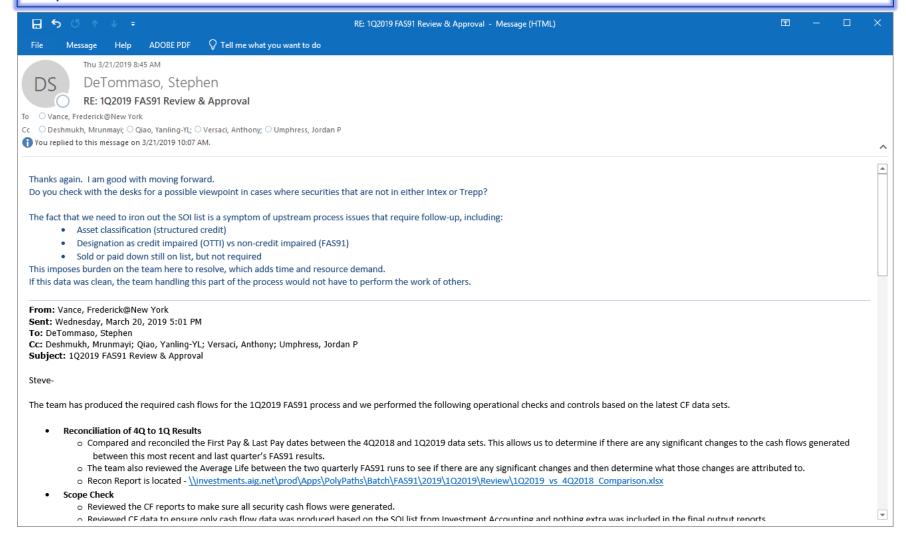


FAS91 Output report for CMBS from Polypaths after applying the Overrides (Sample: 07387BCR2)



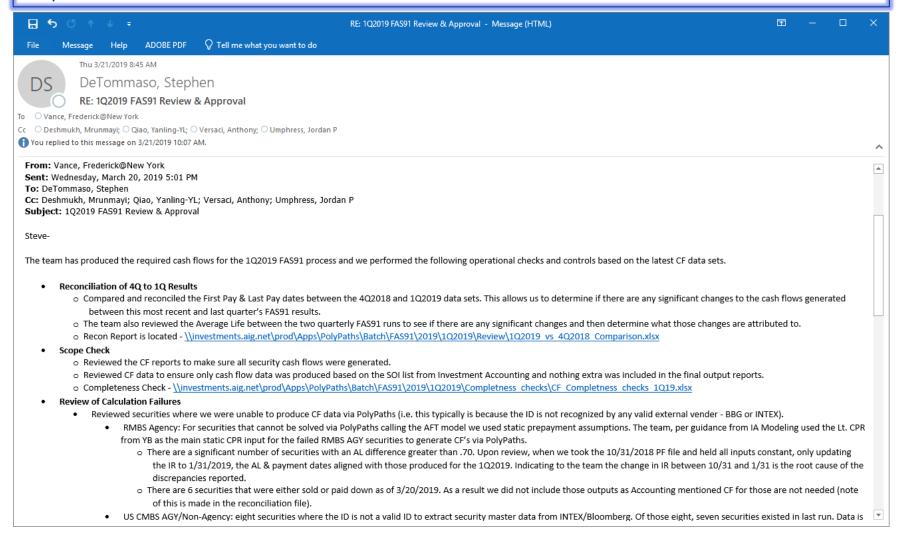


Preparer and Reviewer emails for Q1 2019 FAS91



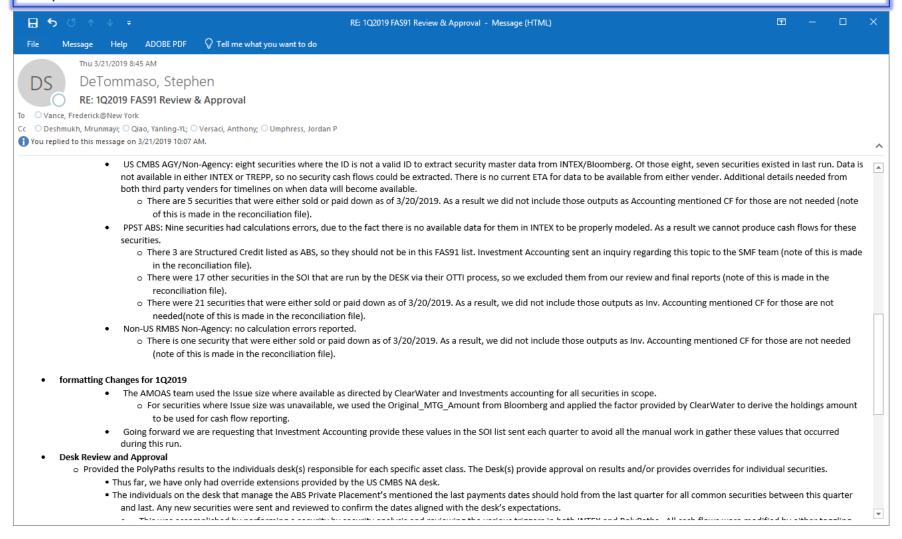


Preparer and Reviewer emails for Q1 2019 FAS91

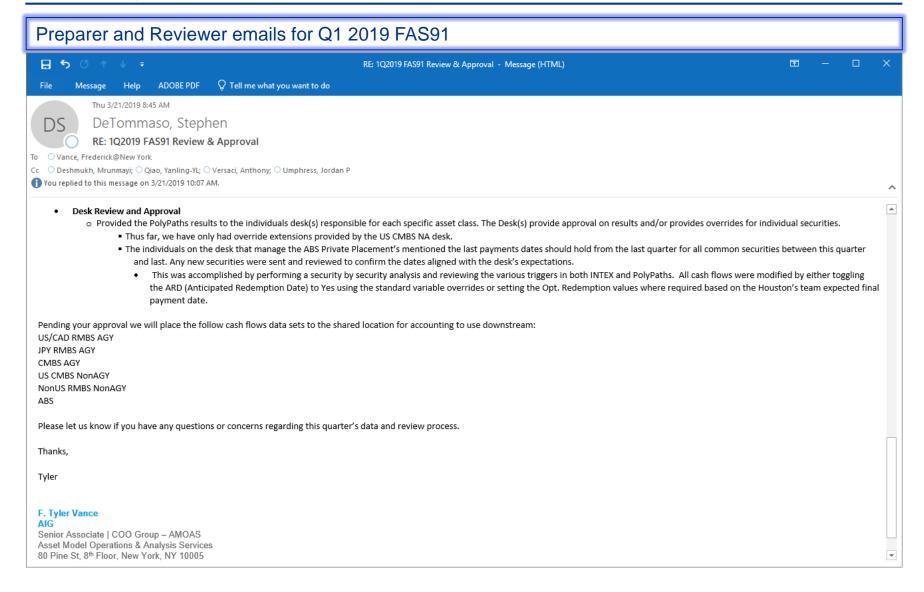




Preparer and Reviewer emails for Q1 2019 FAS91

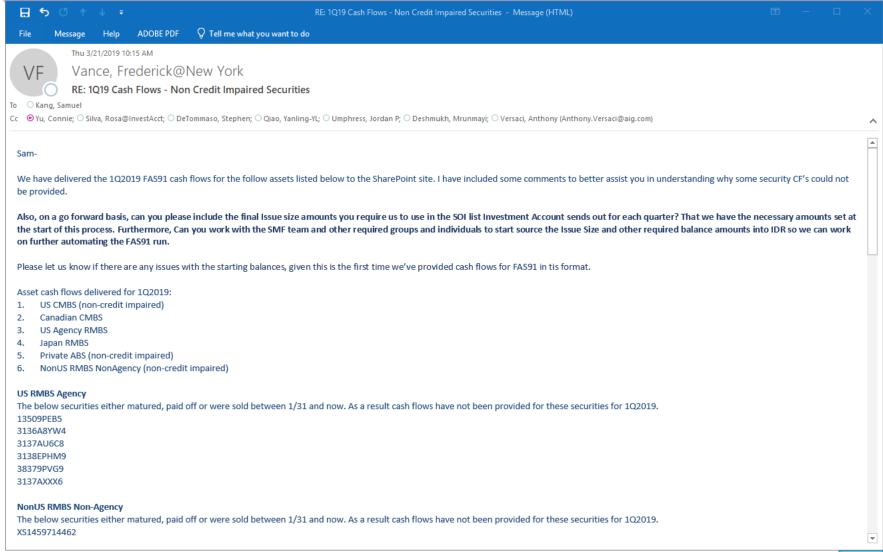






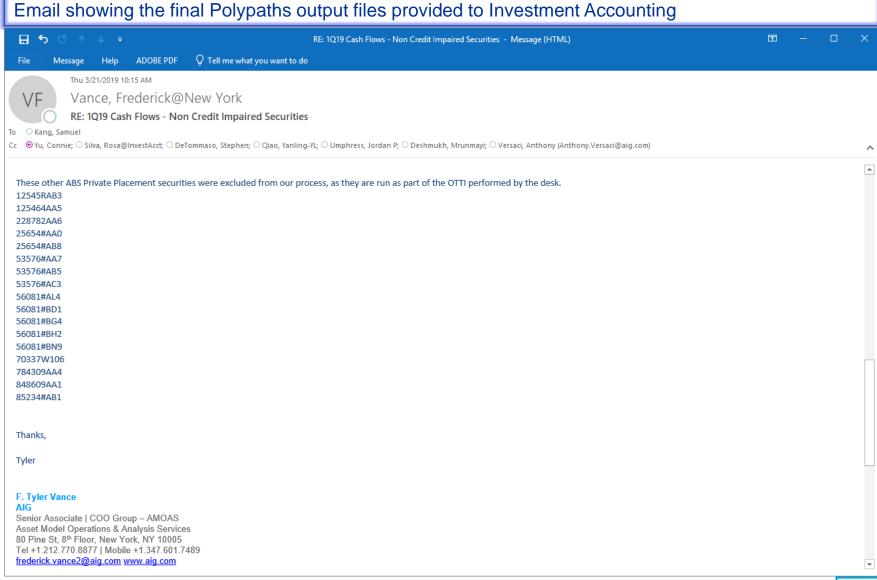


Email showing the final Polypaths output files provided to Investment Accounting



53576#AB5

Email showing the final Polypaths output files provided to Investment Accounting **⊞** 5 5 ↑ ↓ ₹ RE: 1Q19 Cash Flows - Non Credit Impaired Securities - Message (HTML) Tell me what you want to do Message ADOBE PDF Thu 3/21/2019 10:15 AM Vance, Frederick@New York RE: 1Q19 Cash Flows - Non Credit Impaired Securities To Kang, Samuel Cc 🕑 Yu, Connie; 🔾 Silva, Rosa@InvestAcct; 🔾 DeTommaso, Stephen; 🔾 Qiao, Yanling-YL; 🔾 Umphress, Jordan P; 🔾 Deshmukh, Mrunmayi; 🔾 Versaci, Anthony (Anthony. Versaci@aig.com) US CMBS Agency/NonAgency These securities are not valid ID's recognized by INTEX or any external DB (TREPP/BBG). 00216AAA5 00216AAB3 04682AAA2 64987BQQ4 BCCX3ADE8 U8148UAA4 U81503AA9 These securities either matured, paid off or were sold between 1/31 and now. As a result cash flows have not been provided for these securities for 1Q2019. 46590LAU6 46625YDG5 61762DAW1 95000AAV9 95000DBE0 ABS (Private Placement): These securities are structured credit, not ABS. You sent an inquiry regarding these to the SMF team. We did not provide results for these securities as they are not in scope and have not been provided historically. 98566JAA6 98566YAA3 98566YAB1 These other ABS Private Placement securities were excluded from our process, as they are run as part of the OTTI performed by the desk. 12545RAB3 125464AA5 228782AA6 25654#AA0 25654#AB8 53576#AA7



SOX Control - WAL Calculations for Private Placements securities

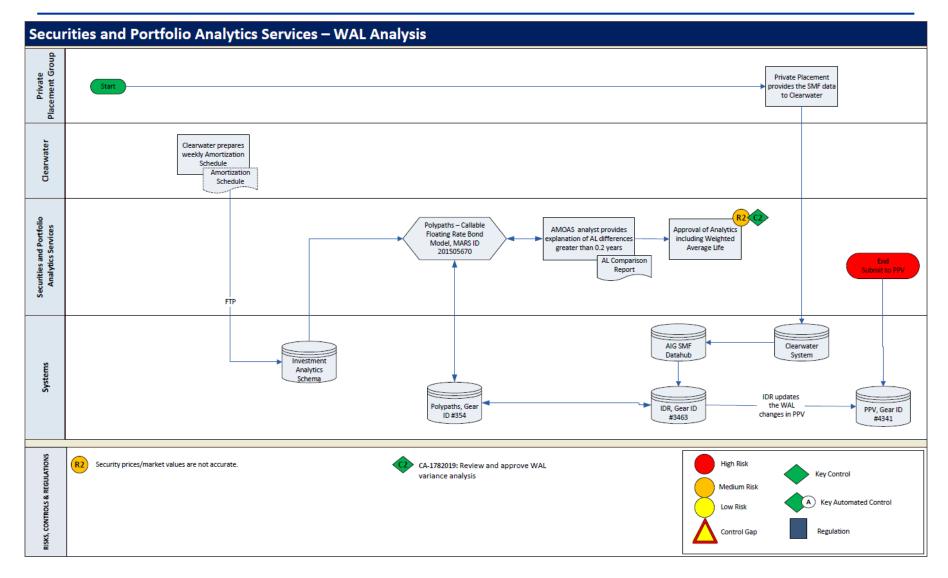
2018 Control CA-1782019 (Risk – Medium, Frequency – Daily)		
Description	Additional Description	
Quarterly, Investment Analytics performs a weighted average life (WAL) variance analysis of all previously held Private Placement matrix priced securities. An independent member of the Investment Analytics team reviews and approves the analysis as evidenced by email.	WAL changes greater than 0.2 years are investigated and results documented. Additionally, Investment Analytics identifies and reviews the WAL of all newly purchased Private Placement matrix priced securities for reasonableness.	

2019 Control CA-1782019 (Risk – Medium, Frequency – Daily)		
Description	Additional Description	
Quarterly, the Asset Model Operations & Analysis Services (AMOAS) Team under Securities and Portfolio Analytics Services(SAPAS) Group performs a weighted average life (WAL) variance analysis of all previously held Private Placement matrix priced securities. An independent member of the SAPAS Group reviews and approves the analysis as evidenced by email.	WAL changes greater than 0.2 years are investigated and results documented. Additionally, SAPAS identifies and reviews the WAL of all newly purchased Private Placement matrix priced securities for reasonableness.	

On 04/16/2019, Steve DeTommaso verified that the above control descriptions are accurate for 2019.

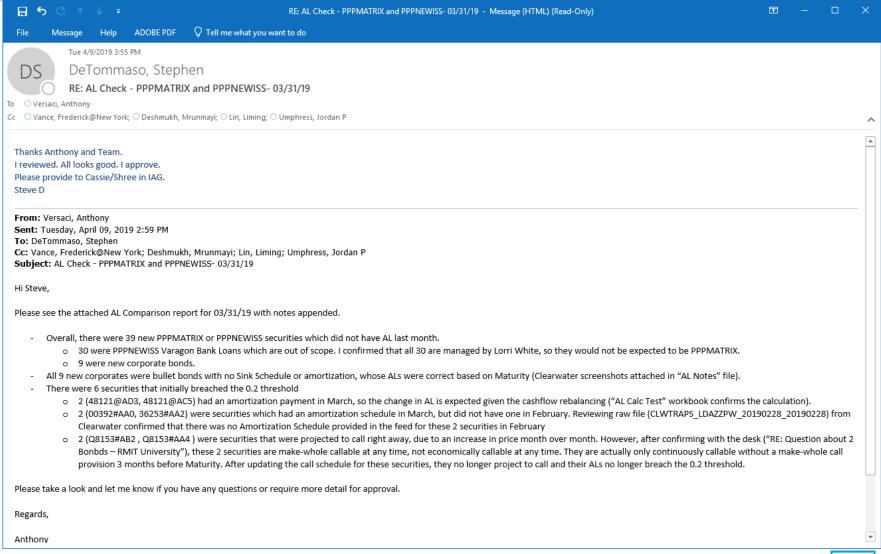


Process Flow – WAL Calculations for Private Placements securities

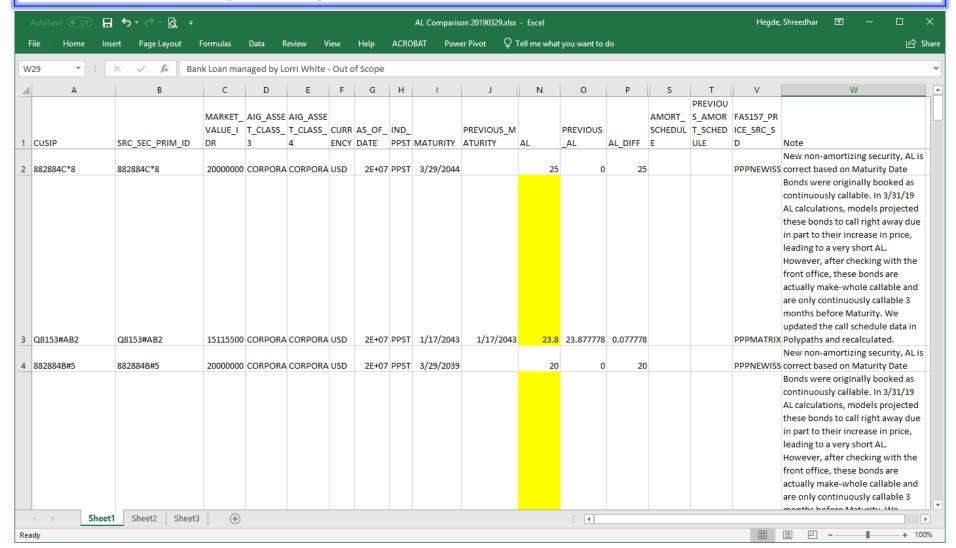




Approval of WAL Comparison Report – Q1 2019

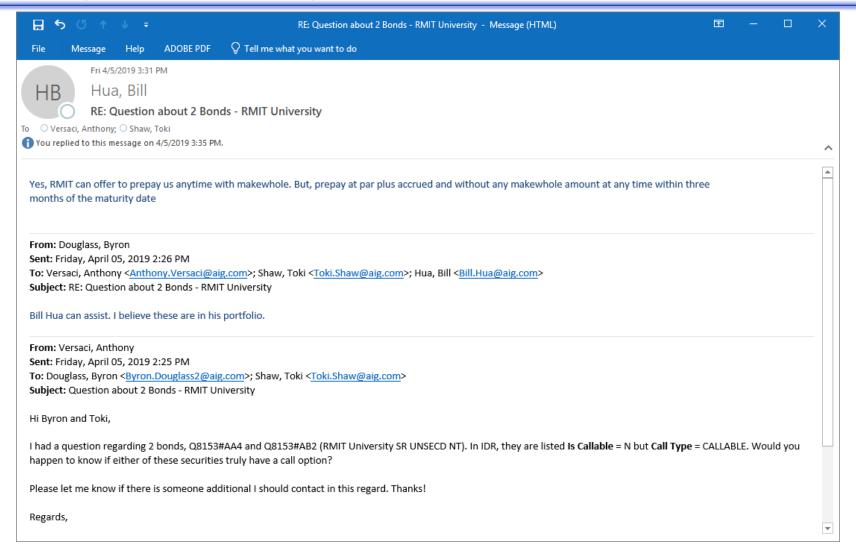


Screenshot of WAL Comparison Report - Q1 2019



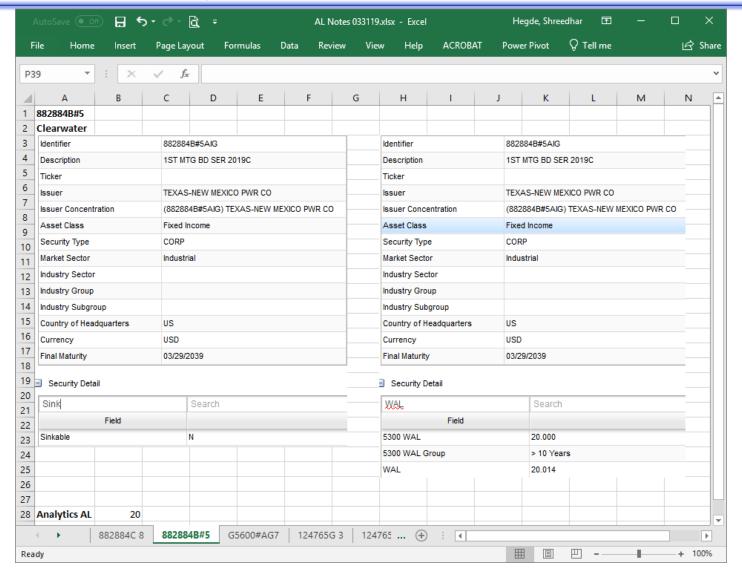


Supporting Documents for WAL changes





Clearwater screenshot showing maturity date for sample New Issue security





WAL Calculation by AMOAS for securities with Amortization payment in the review period

