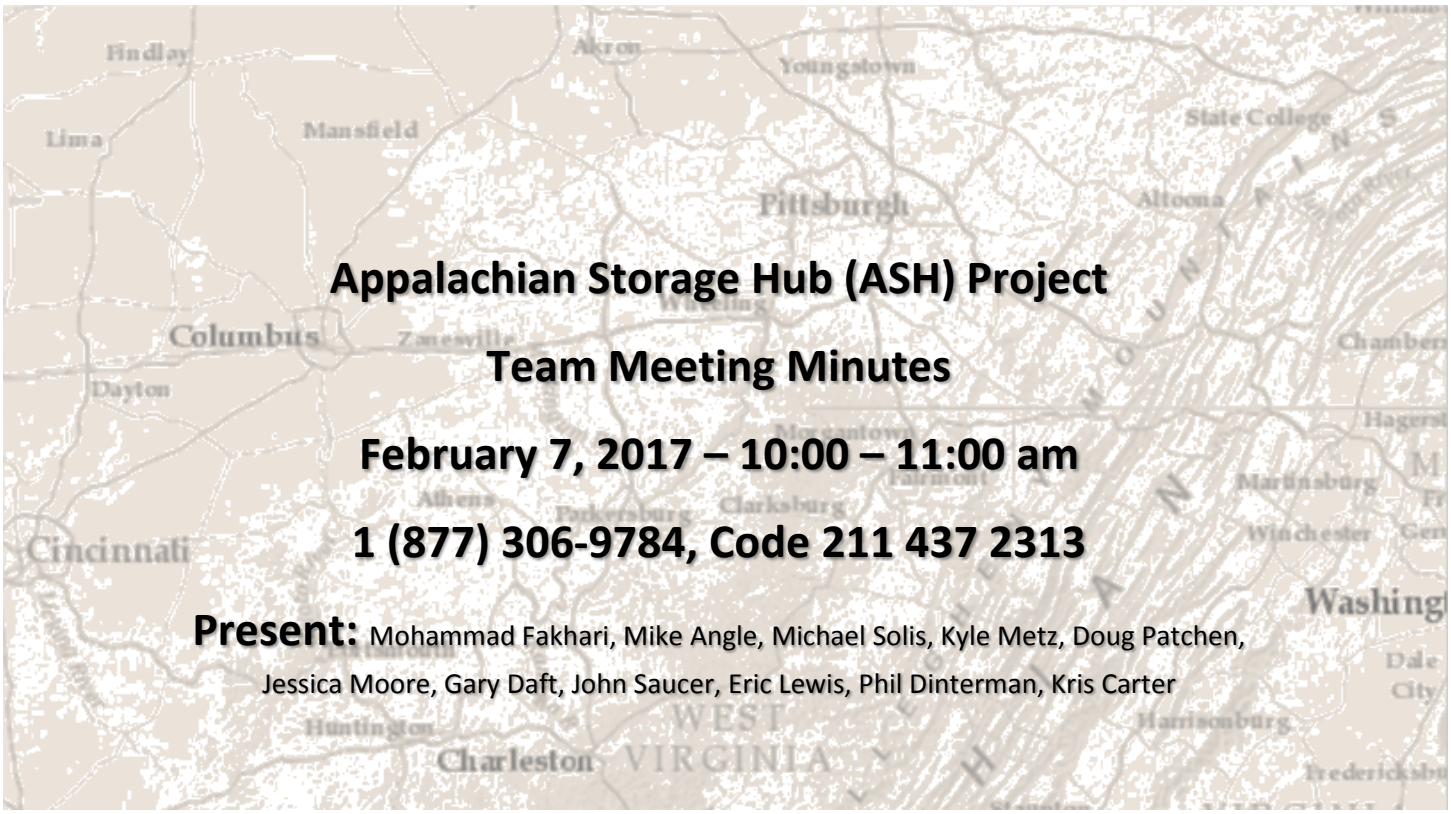

Appalachian Storage Hub (ASH) Project

Team Meeting Minutes

February 7, 2017 – 10:00 – 11:00 am

1 (877) 306-9784, Code 211 437 2313

Present: Mohammad Fakhari, Mike Angle, Michael Solis, Kyle Metz, Doug Patchen, Jessica Moore, Gary Daft, John Saucer, Eric Lewis, Phil Dinterman, Kris Carter

1) Strategy Progress and Project Milestones

a. Strategy 1 – Data Collection (WV) – Michele Cooney has finished the legacy data review, and is now working on annotated bibliography relevant to this project (keyword search to be included on website). WV will continue to take suggestions for annotated bibliography until the end of the project (just send Michele an email). John Bocan is retooling the Partners website now, and Jessica will provide cards with login information for partners at the March meeting.

b. Strategy 2 – Stratigraphic Correlation of Key Units (OH) – Kyle Metz led the discussion regarding OH's PETRA® project work. Kyle has completed his geologic correlations and shared a .PPF on the ftp site for research team members to review. Kyle reported that ~77 OH wells still have bad information, and that he is still working on draft maps now. He will share a revised .PPF when it is ready.

Kyle noted that the CATG (Cataract Group, i.e., Clinton- Medina) logs are only in TIFF format, and asked if PA was willing to assist with digitizing these logs. Kris Carter asked OH to send a representative list of images so that PA could assist with this effort (no more than 200).

Gary Daft asked about the Big Injun and Newburg tops (important to WV), as they weren't included in OH's .PPF. Kyle indicated that these are forthcoming, and that he also batched correlations for Upper Devonian reservoirs (Venango, Bradford, and Elk) to be consistent with the Gas Atlas.

There was general discussion regarding the research team's use of 'working' PETRA® files vs. 'clean' PETRA® project information that will be shared with Partners as part of the Study's deliverables.

c. Strategy 3 – Mapping (OH) – OH reported that regional mapping is coming along well. The Greenbrier Limestone map sent by WV is helpful, but OH doesn't have same level of detail/well control, and neither does PA. Kyle reported that structure maps of the Greenbrier and Keener-Berea intervals will soon be completed. Kyle is preparing these shallow maps by interjecting the interpretation that regional structure and lineaments influenced, to some extent, the deposition of these units. Structure contour maps for deeper intervals of interest will be based on previous mapping efforts (mostly MRCSP regional characterization map products, which include structure/fault coverage).

d. Strategy 4 – Studies of Reservoir Character (PA) – Kris Carter indicated that this strategy includes three types of data preparation: compilation of existing data; petrophysical calculations based on digital log data in PETRA®; and qualitative analysis of thin sections for geologic intervals of interest. OH and WV offered existing thin sections and billets for cores associated with the AOI. Sample identification and transfer will be coordinated over the next few weeks.

   Kyle asked about the availability of water saturation data for wells in the region. Both PA and WV indicated that we don't have this type of information in the public record.

   Doug Patchen asked about progress on the Salina interval. OH reported that our project information is all log-related and is currently being mapped. Doug asked if anyone knew anything about old salt caverns in the AOI – where are they? how big were they? WV reported that Mountaineer NGL's site has Salina salt 130 ft thick for ethane storage (max), and that smaller caverns may be created for other NGLs here. Doug said that our Partners will be keenly interested in our salt mapping/characterization progress, and Kyle said that OH will provide a net salt map at the March 14 meeting.

e. Strategy 5 – Ranking Criteria (open)

f. Strategy 6 – Recommendations (open)

g. Strategy 7 – Suggestions for Follow-Up Study (open)

h. Strategy 8 – Project Management/Tech Transfer (Patchen) –Quarterly reports are due to Doug this Friday, February 10; please use the first quarter report as your template for this quarter's input.

   Doug reviewed the tentative agenda for the March 14 Semi-Annual Partners meeting (it will use the same format as before).

Doug asked for invoices from each state, and asked that they be current with respect to billable and cost-share items as of January 31, 2017.

Doug mentioned an Appalachian Storage Hub Conference to be held on June 15, 2017 at the Hilton Garden Inn, Southpointe, Canonsburg, PA. At a minimum, Doug, Jessica and Kris will attend this workshop.

2) Action Items and Next Steps

a. WV and PA will review OH's PETRA® .PPF for correlations.
b. All states will prepare for the semi-annual meeting on March 14 – please upload any slides and handouts to the ftp site by March 7, so that Doug can review and PA can print handouts.
c. Quarterly reporting items are due to Doug by February 10.
d. All states should send their invoices to Doug.
e. Kris will prepare meeting minutes for today's call.
f. Kris will send Phil Dinterman information regarding number of samples for WV billet preparation.

Next meeting date - March 7, 2017 at 10 am.

Strategies/Activities	Start Date	End Date
Strategy 1: Data Collection		
• Identify and assemble well log and core data	Month 1	Month 2
• Identify previous studies of interest	Month 1	Month 2
• Create a project database (format, prototype)	Month 1	Month 2
Strategy 2: Stratigraphic correlation of key units		
• Develop cross sections of the Salina Formation	Month 3	Month 8
• Develop cross sections of the Greenbrier Formation	Month 3	Month 8
• Develop cross sections of the Keener to Berea Interval	Month 3	Month 8
• Develop cross sections of the Upper Devonian Sandstones	Month 3	Month 8
• Develop cross sections of the Oriskany Sandstone	Month 3	Month 8
• Develop cross sections of the Clinton-Medina through Tuscarora Interval	Month 3	Month 8
• Develop cross sections of the Rose Run and Upper Sandy Member of the Gatesburg Formation	Month 3	Month 8
Strategy 3: Map the thickness, extent, and structure of potential storage units in the study area		
• Map the Salina Formation	Month 5	Month 7
• Map the Greenbrier Limestone	Month 5	Month 7
• Map the Keener-Berea, Upper Devonian, Oriskany, Clinton-Medina, and Gatesburg Formations	Month 5	Month 7
Strategy 4: Conduct studies of reservoir character		
• Characterize potential storage intervals in the Salina Formation	Month 5	Month 8
• Characterize potential storage intervals in the Greenbrier Formation	Month 5	Month 8
• Characterize potential storage pools in gas-depleted sandstone reservoirs	Month 5	Month 8
Strategy 5: Develop ranking criteria for potential storage zones		
• Determine criteria and weighted priority of potential storage zones	Month 8	Month 9
Strategy 6: Recommendations		
• Rank all candidates within each category	Month 10	Month 11
• Rank the top candidates in each category	Month 10	Month 11
Strategy 7: Suggestions for engineering follow-up study		
• Make suggestions for additional field and lab studies	Month 10	Month 11
Strategy 8: Project management and technology transfer		
• Project management	Month 1	Month 12
• Final Report	Month 11	Month 12
• Technology transfer		Month 12+ ongoing