Appalachian Storage Hub (ASH) Project

Team Meeting Minutes

December 7, 2016 – 10:10 – 11:10 am

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

Present: Mohammad Fakhari, Kyle Metz, Michael Solis, Mike Angle, Jessica Moore, Phil Dinterman, Gary Daft, Mary Behling, John Bocan, Mike Hohn, Doug Patchen, Kris Carter

1) Data Communication and Sharing

Partners and Advisory Board listservs – The team has noted a couple of error messages over the past few weeks, but John Bocan has since resolved them so that all partners and advisory board members are now connected and have access to the project website. In addition, John Bocan is working on a new website design/layout.

Status of PETRA data uploads – PA's uploads are 100% complete for each of its six counties. WV's uploads are at ~75% complete, with the deeper intervals done and shallower intervals still in progress. WV received Devonian sand data (cross sections and Excel files) from Ray Boswell at US DOE, and is still assimilating this information into their PETRA project. Phil Dinterman asked OH and PA for any type logs/unit picks for the Salina Group that may guide them in their work on this interval. Michael Solis and Kris Carter will share this data with Phil.

2) Project Schedule and Milestones

Strategy 1 – Data Collection – WV's contractor, Michele Cooney, continues to clean data (i.e., remove duplicates, apply naming conventions, etc.) on the project ftp site and transfer information to the website. Jessica Moore asked the group how do we ultimately want to serve these data to the public. The group identified shapefiles, asci text, and LAS files (for digital log curves) as the preferred file types.

Strategy 2 – Stratigraphic Correlation of Key Units – Kyle Metz indicated that OH will prepare one main strike line of section through the area of interest (AOI), with two or three dip cross sections intersecting it. Each cross section will look a little different due to the variable nature of the geology and data availability for our geologic intervals in the tri-state area. He may even decide to break out geologic intervals as separate cross sections. If team members have any specific wells or fields that should be showcased in these cross section lines, please let Kyle know by the end of December.

Strategy 3 – Mapping – Kyle Metz inquired about the many sands that are included under the 'Upper Devonian Sands' umbrella; which sands and/or what level of detail does the team expect to see in Ohio's mapping efforts? The group discussed this, and the tentative conclusion was to prepare maps at the group level, and show more detailed sand stratigraphy/architecture in the cross sections. At this point, the group can decide whether additional maps may be necessary for certain gas-producing sands (e.g., net-to-gross maps).

Strategy 4 – Studies of Reservoir Character– Kris Carter reported that this strategy officially began this month, and that PA will start with MRCSP reservoir characterization data to compile necessary information for this project's geologic intervals, as available. She asked team members for any thin sections they may have for the geologic intervals of interest (PA would use these to prepare standard petrography reports, including visual estimates of porosity). Kris also asked for any core-derived data that OH may have in their archives that are newer than what was shared with MRCSP as of 2011. Kyle Metz asked whether we would/could be compiling reservoir pressure data (information that is ultimately tied to the quality and frequency of production data reporting in each state). The group generally agreed that these data will not be easy to get in our project's timeframe, and Jessica Moore suggested that we refer to the 1996 Gas Atlas for these data.

Strategy 5 – Ranking Criteria – OPEN

Strategy 6 – Recommendations - OPEN

Strategy 7 – Suggestions for Follow-Up Study - OPEN

Strategy 8 – Project Management/Tech Transfer – Doug Patchen reported that he is satisfied with the team's current progress, and he happily announced that OH's subcontract has finally been executed. With the subcontract now in place, OH is looking at billing 'back time' as well as current time to the project. WV and PA cannot confirm whether they have been reimbursed for any invoices to date. Doug also noted that the second quarter ends January 31, 2017, so he expects quarterly report input from each state by February 10, 2017. Doug and Kris will edit the report and provide to partners by mid-February 2017.

Doug also discussed the semi-annual meeting requirement. The WVU Foundation has offered to host again at the WVU Alumni Center, and we're looking at having the meeting on February 22, 2017. Team members would practice in the am, have lunch, and then participate in the afternoon-long partners meeting.

3) Action Items and Next Steps

Michael S and Kris – send Salina unit type log information to Phil Dinterman.

Mohammad – check OH core repository for any core-derived data that might be shared with PA for the reservoir characterization strategy.

ALL – review thin section inventories to see whether any geologic intervals of interest are represented in what you have, and if so, please share with PA for thin section description work.

Kris – prepare meeting minutes.

Next meeting date – January 5, 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