

EPA ACTION PLAN FOR CLASS VI GEOLOGIC SEQUESTRATION PERMITTING

February 18, 2020



OFFICE OF GROUND WATER
AND DRINKING WATER



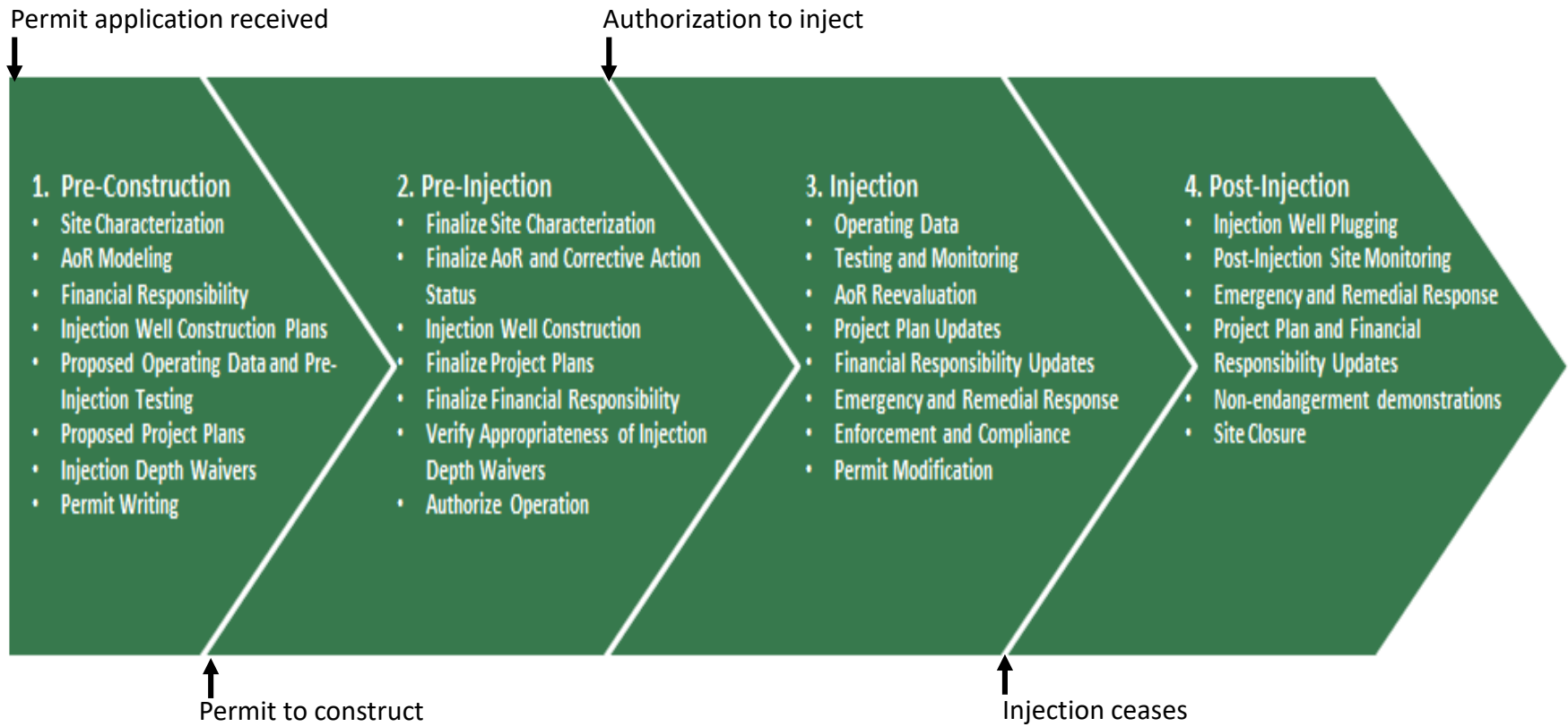
EPA – REGION 7 SUMMARY OF THE
CLASS VI PROGRAM PERMITTING PROCESS
FOR THE WELLINGTON/BEREXCO GS PROJECT
AND LESSONS LEARNED

Class VI Permit Application: Required Elements

40 CFR 146.82(a) and (c)

- Site characterization (geologic) information
 - Maps/cross sections, structure, lithology, faults/fractures, geochemistry, hydrology/hydrogeology, USDWs, seismic history
- AoR delineation (details submitted via the Input Advisor) and proposed (and final) corrective action
- GS Project Plans
 - AoR and Corrective Action, Testing and Monitoring, Well Plugging, Post-injection Site Care (PISC) and Site Closure, Emergency and Remedial Response
- Proposed (and final) well construction/specifications
- Proposed (and final) operating plan and pre-injection testing plan
- Financial responsibility demonstration (i.e., cost estimates and instruments)
- Injection depth waiver application and aquifer exemption expansion (if necessary)

Class VI Permitting: Stages



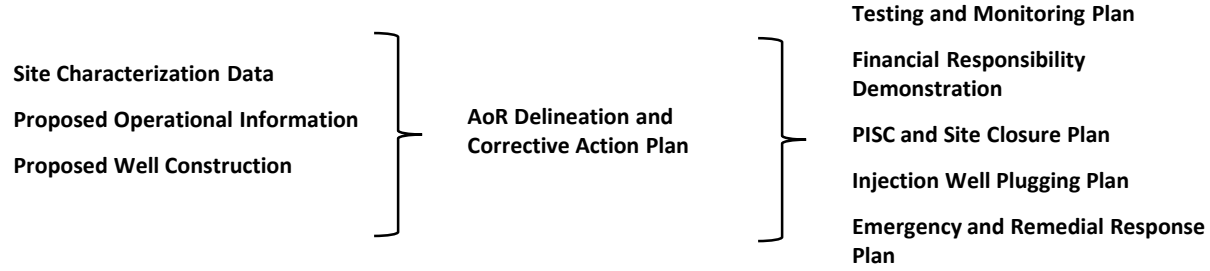
Class VI Permitting: Process



Class VI Permit Application Submission



- Technical review of permit application information



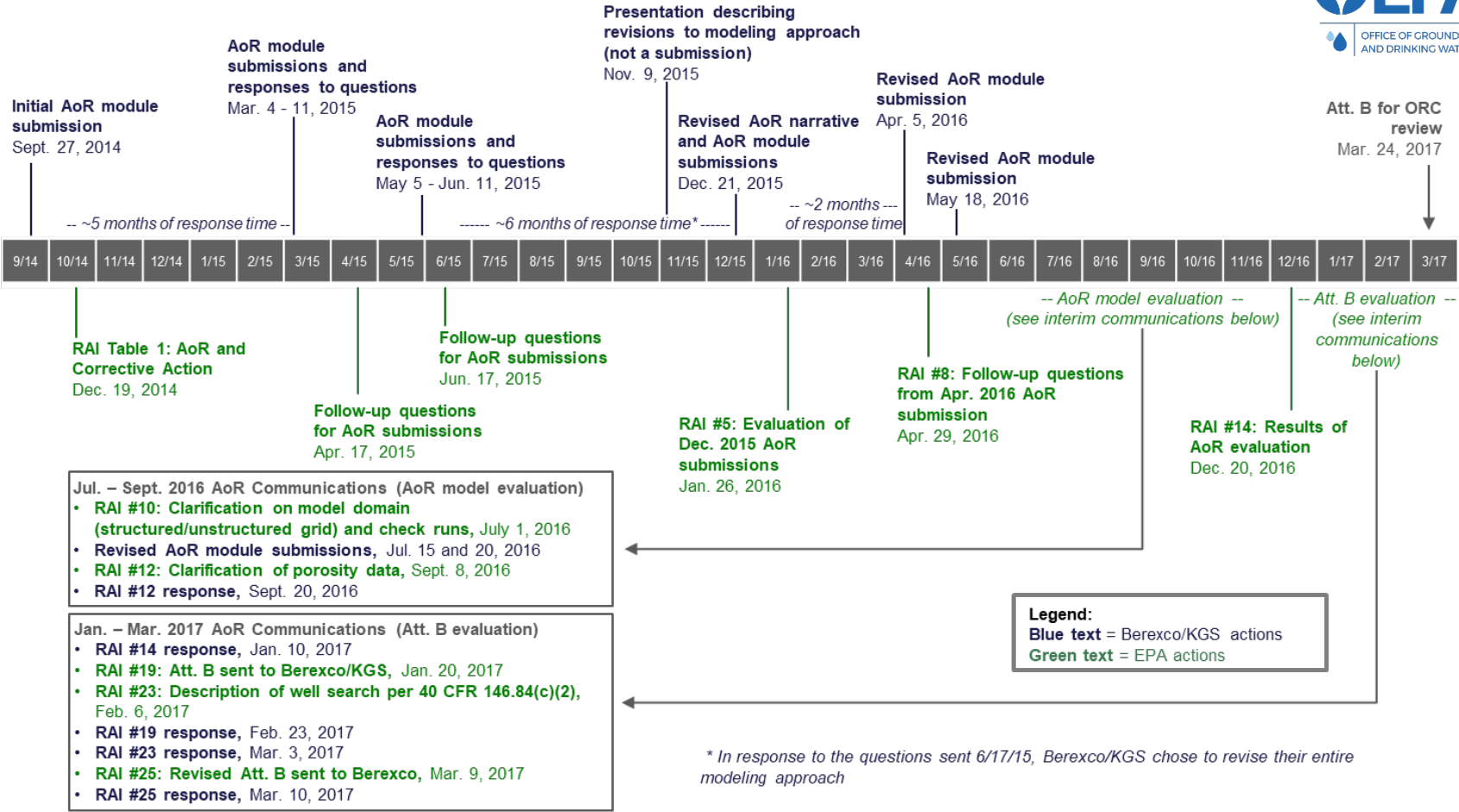
Wellington/ Berexco GS Project Generalized Timeline

- KGS project to evaluate CO₂-EOR in Mississippian and Arbuckle oil reservoirs and saline aquifer sequestration in southern Kansas funded by DOE (12/08/2009)
- Discussions between EPA and DOE/KGS about this project (02/24/2011)
- Well KGS 1-28 completed to a total depth of 5250' BGS into the Arbuckle Formation (08/24/2011)
- KGS/Berexco Wellington small scale geologic sequestration testing funded by DOE (10/01/2011)
- Contact by KGS with EPA about permitting a geologic sequestration well (11/10/2011)
- Discussions between KGS/Berexco and EPA about application and what the contents should cover (11/10/2011 through 02/02/2012)

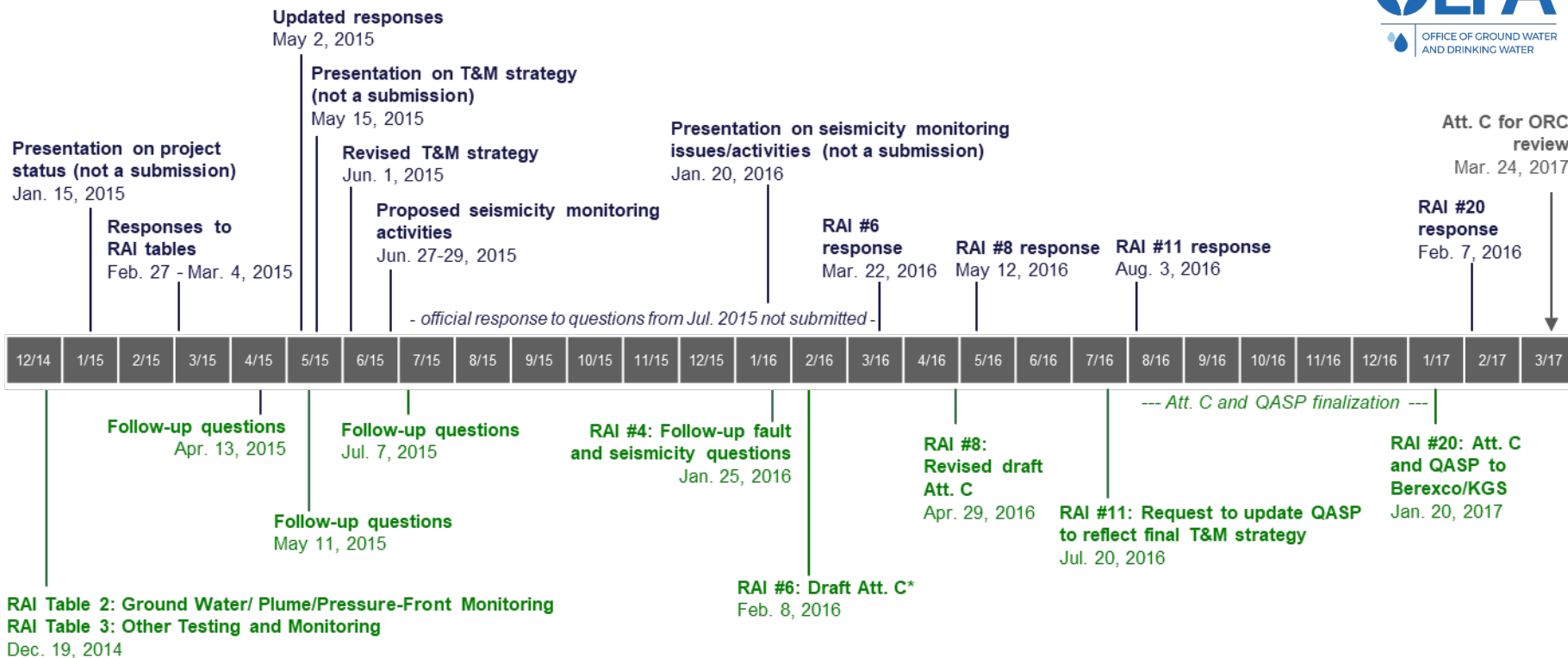
Wellington/ Berexco GS Project Generalized Timeline Continued

- Draft of the C6 permit application provided by KGS to DOE and Berexco for review (10/10/2013)
- EPA questions KGS about status of project and if they will be submitting an application (02/20/2014)
- Permit application sent to EPA (06/10/2014)
- Initial review of application by EPA and face-to-face meetings/conference calls/emails between EPA and KGS/Berexco to correct deficiencies in application (07/14/2014 through 07/25/2017)
- DOE pulls funding (09/04/2017)
- Request to EPA from KGS/Berexco to withdrawal permit application (03/20/2018)
- Withdrawal request approved by EPA (03/21/2018)

AoR and Corrective Action Milestones - Berexco/KGS Class VI Permit Application



Testing & Monitoring Milestones - Berexco/KGS Class VI Permit Application



Legend:
Blue text = Berexco/KGS actions
Green text = EPA actions

* The draft plan included placeholders and clarifying questions for items that had not yet been addressed by Berexco/KGS

Lessons Learned

- Read the guidance documents related to GS projects that EPA has created
- As an applicant, give yourself an adequate lead time in your project for permit processing and expect the process to be no shorter than one year from the time an application is submitted to a final determination (think in terms of Class I HW and not Class II D)
- Communication is key - As an applicant, talk with EPA prior to working on the permit submission or drilling a well and EPA should be talking with the applicant both prior to and during the course of the permitting process
- Don't assume, ask
- Providing draft portions of the application for EPA to review and comment on prior to formal submission of the complete final application would have made the final permitting process go smoother and faster

Lessons Learned Continued

- The GS Data Tool improved on the process but a checklist of what needs to be included in a complete permit application would be a good thing to have
- Documentation of conclusions reached by the applicant is essential (just trust me doesn't work when going out for public notification)
- Having the State Geological Survey partnered with the applicant made validation of statements related to the geology/hydrology more time consuming and difficult
- Bottom line is that this is more than likely a learning process for both the EPA Region and the applicant, patience on both sides is key

First Step in a GS Project

- If you plan on pursuing a GS project, talk to EPA or the delegated program manager **before** either submitting an application or drilling a well!

Roadblocks to Project Success

- Financial responsibility requirements
- Pore space ownership/competition
- Induced Seismicity
- Disposal versus storage
- Easements/Right of way/Eminent domain
- Long term ownership of the CO₂ and liability after the project is done
- Public Perception (**Not Under My Back Yard**)



FUTURE OF CLASS VI PERMITTING

Removing Barriers



- Increase timeliness
- Improve processes
- Enhance transparency
- Facilitate coordination
- Manage resources responsibly

Proactive responses
Modern systems
Streamlined approaches
Efficient resource use



EPA TRAINING AND DATA TOOLS TO ASSIST
REGIONS AND STATES FOR CLASS VI PROGRAMS

EPA UIC Program Training Assistance

- As mentioned in the Monday presentation we are in the process of developing training modules in Captivate format to provide UIC program background and program implementation information
- Both EPA and the States are seeing senior staff leaving due to retirements so there needs to be a way to consolidate program expertise, document it, and store it in an accessible format for training new staff as they come into the program
- The first three modules developed in 2019 should be posted in FEDTALENT by late February/early March with more modules to follow throughout the year

Underground Injection Control

Introduction to UIC Permitting

Reviewing Local Geologic Data



- Key terms
- General Information on UIC permitting
- Geological data submitted
- Links between geology and USDW protection



EPA Assistance on Financial Assurance

- Prompted by discussions with EPA Regional Program managers, OGWDW engaged with OA/OP/OFA to enlist contractor support to prepare training related to Class II and Class VI FR
- FR Captivate training being developed between OGWDW and OFA with the support of IEC, Inc., known for its past FR experience working with the UIC Program
- Potential release of this module in FY 2020 should help expedite Class VI permitting

The GS Data Tool (GSDT)

- GSDT: A centralized, web-based data system which receives, stores, and manages Class VI data. GSDT was originally designed for UIC Class VI Direct Implementation Programs
- The GSDT satisfies the Class VI rule requirement at 40 CFR 146.91(e) indicating that the o/o of Class VI wells must submit GS project data directly to EPA in an electronic format approved by EPA
- Requirement applies whether a project is in a Class VI DI or Primacy State; GSDT is the only electronic system that has been designed for Class VI and GS projects (so far)
- Class VI well permit applications are made through the GSDT

GSDT Continued

- Independently, EPA is updating the GSDT to potentially accommodate State Class VI programs by making the system less EPA-centric
- EPA is working closely with Pacific Northwest National Lab who originally developed this system for GS pilot project information gathering
- The revised GSDT may be made available as early as this year and in absence of other electronic reporting systems will be available to all who wish to adopt this system for their Class VI programs
- Website: [Epa.gov/class-vi-wells-used-geologic-sequestration-co2#GSDT](https://www.epa.gov/class-vi-wells-used-geologic-sequestration-co2#GSDT)



THANK YOU!