

Plan revision number: 4

Plan revision date: 6/26/2025

## **PRE-OPERATIONS TESTING PLAN, APPENDIX C: AOR BASELINE**

### **Brown Pelican CO<sub>2</sub> Sequestration Project**

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## **1.0 Facility Information**

Facility name: Brown Pelican CO<sub>2</sub> Sequestration Project  
BRP CCS1, CCS2 and CCS3 Wells

Facility contact: 

Well location: Penwell, Texas

BRP CCS1	31.76481926	-102.72891895
BRP CCS2	31.76994887	-102.73320589
BRP CCS3	31.76024766	-102.71013484

## **2.0 Introduction**

This report describes a comparison of the Area of Review (AoR) for the Brown Pelican CO<sub>2</sub> Sequestration Project (BRP Project or Project) that was modeled using data collected in the Shoe Bar 1 and Shoe Bar 1AZ stratigraphic test wells vs. data collected in the BRP CCS1, BRP CCS2, and BRP CCS3 UIC Class VI injection wells. OLCV concludes that the revised operational limits do not result in an update to the AoR.

Pursuant to 40 CFR 146.82(a)(3)(iv) OLCV obtained information on rock strength during logging and testing of the Shoe Bar 1 and Shoe Bar 1AZ stratigraphic test wells. Pursuant to 40 CFR 146.87(d)(1) OLCV obtained updated geomechanical information during logging and testing of the BRP CCS1, BRP CCS2, and BRP CCS3 UIC Class VI wells. Based on these new data, OLCV updated the determination of fracture pressure and resultant operational limits, pursuant to 40 CFR 146.88(a).

The proposed updates to the operational limits do not result in changes to the Area of Review (AoR) that is defined by the critical pressure threshold at which an increase in pore pressure is high enough to overcome the hydraulic head of the fluid in a hypothetical wellbore and enter the Underground Source of Drinking Water (USDW). At the BRP project site, the AoR represents the maximum extent of pressure from three injection wells at the end of 12 years of CO<sub>2</sub> injection and the maximum extent of the CO<sub>2</sub> plume 50 years after injection ceases.

## **3.0 Updates to Operational Limits**

OLCV used the fracture propagation pressure estimates obtained from mini-frac tests in the BRP CCS1, BRP CCS2, and BRP CCS3 to calculate a maximum bottomhole injection pressure that is 90% of fracture opening pressure, pursuant to 40 CFR 146.88(a). A calculation of bottomhole pressure is shown in the Operations Plan document for BRP CCS1, BRP CCS2, and BRP CCS3.

Well injectivity is related to bottomhole pressure therefore, the injection rate increased in response to an increase in bottomhole pressure. In addition, the injection rate is dependent on the capture and transport capacity from the Stratos Direct Air Capture facility. OLCV modified the average injection rate according to the new bottomhole pressure calculations.

See Table 151 in Appendix B Baseline Report to the Pre-Operations Plan for a list of the updated operating values.

## **4.0 Updates to Modelling of the AoR**

### **4.1 No updates to geocellular model inputs**

Pursuant to 40 CFR 146.82(c)(1), OLCV reviewed the data obtained during logging and testing of the BRP CCS1, BRP CCS2, and BRP CCS3 and concludes that no updates are required to the AoR for the BRP Project. OLCV observed little variation in the recently acquired BRP CCS1, BRP CCS2, and BRP CCS3 wells compared with the well and seismic data available during construction of the geocellular and dynamic simulation models presented in the Area of Review and Corrective Action Plan that was submitted as part of the UIC Class VI application for the BRP Project. OLCV determined the following:

- No changes to the geologic structure or hydrogeologic properties of the Injection Zone or Upper or Lower Confining Zones [40 CFR 146.82(c)(2)].
- No changes to the compatibility of the CO<sub>2</sub> injectate stream with fluids in the Injection Zone or minerals in the Injection or Confining Zones [40 CFR 146.82(c)(3)].
- No changes resulting from the formation testing program [40 CFR 146.82(c)(4)].
- Corrective action was executed, as planned, and no additional wells requiring corrective action were identified [40 CFR 146.82(c)(6)].
- All available logging and testing results have been considered [40 CFR 146.82(c)(7)].

### **4.2 Modeling the CO<sub>2</sub> plume and pressure front at site closure [40 CFR §146.93(a)(2)(ii)]**

OLCV conducted a dynamic simulation using the updated bottomhole pressure and injection rates shown in Table 1. Modeling indicates the modeled AoRs are essentially the same when comparing previous bottomhole pressure and injection rates versus the updated values. Figure 1 below shows the comparison between the original permit AoR, delineated in yellow line, and the updated permit AoR, delineated in light blue.

Because the injection zones targeted by the BRP CCS1 and BRP CCS2 are vertically stacked, the overall impact of increased or decreased rates is negligible. The small decrease in the western extent of the AoR is due to a minor decrease in the injection rate for the BRP CCS2. A small

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increase on the northeastern extent of the AoR is due to a small increase on the injection rate of BRP CCS1.

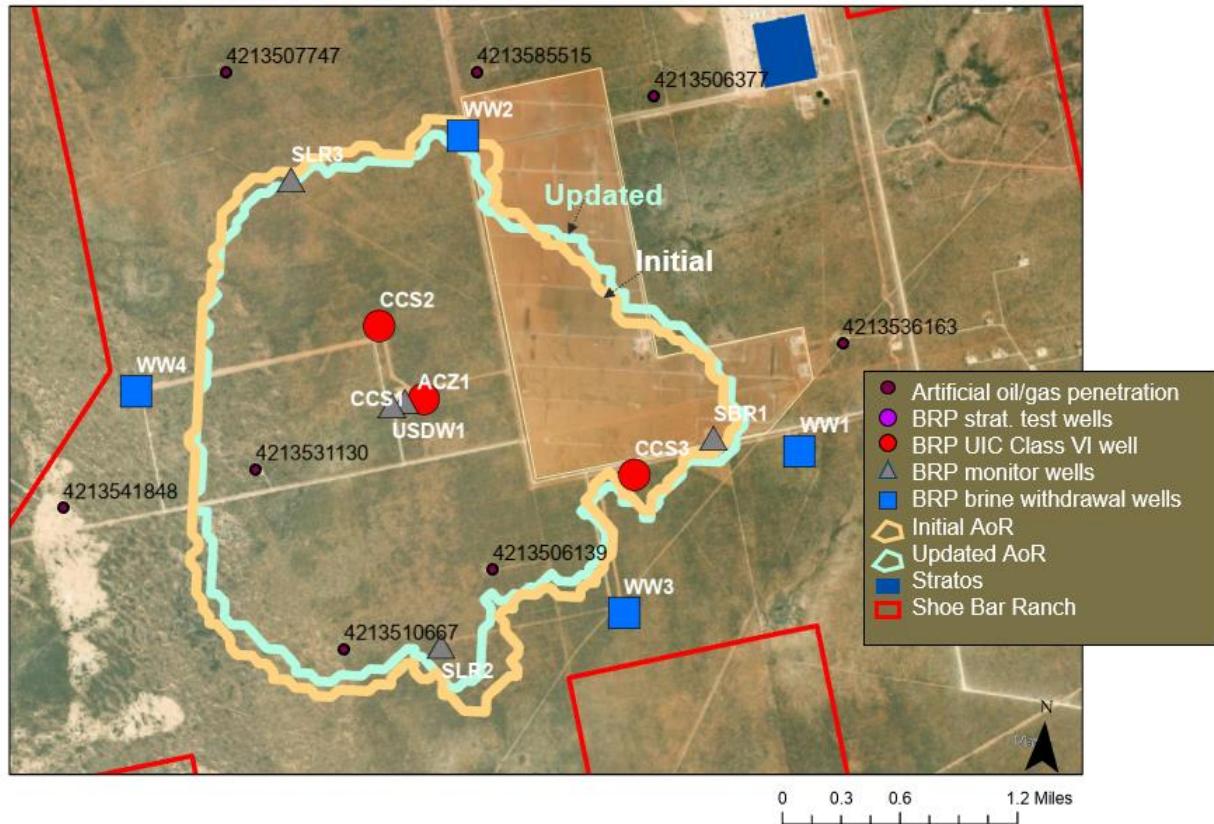


Figure 1. Map of the BRP Project showing the initial and updated AoR.