Class VI UIC Area of Review and Corrective Action

This submission is for:

Project ID: R06-TX-0005

Project Name: Brown Pelican CCS

Current Project Phase: Pre-Injection Prior to Construction

Overview

Simulator Used for AoR delineation modeling: GEM

Version Used: 2020.10

Simulator Description/Documentation: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0201_Simulator_Description_Documentation_BRP.pdf

Total Simulation Time From Start of Injection: -999 days

Additional AoR Delineation Information: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0202_Add_AOR_Delineation_Info_BRP.pdf

Description of Information Submitted: N/A

Model Domain

Coordinate System: UTM

Horizontal Datum: NAD27

Coordinate System Units: ft

Vertical Datum: Reference Elevation

Describe Vertical Datum: NAD27

Zone: 4203

Mesh Type: Hexahedral Cartesian

Domain Size in Global Units Specified Above

Hexahedral Cartesian

Domain Coordinates File: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0301_Domain_Coordinates_File_BRP.pdf

Angle of Inclination in X Direction: 90 Dips in the Direction of: increasing x

Angle of Inclination in Y Direction: 0 Dips in the Direction of: increasing y

Grid Size

Number of Nodes in x: -999 y: -999 z: -999

Grid Spacing: Variable

Grid File Format: Eclipse Keyword File

Grid File Description: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0302_Grid_File_Description_BRP.pdf

Eclipse Keyword File: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/Grid_Eclipse_Keyword_BRP.txt

Faults Modeled: No

Caprock Modeled: Yes

Image File(s) for Model Domain Grid: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0304_Image_File_BRP.pdf

Processes Modeled by Simulator

Reservoir Conditions:

Supercritical CO2 Conditions

Phases Modeled:

Aqueous Supercritical CO2

Aqueous Phase:

Phase Compressibility: Compressible

Compressibility Value: -999 1/psi

Phase Composition: Compositional

Aqueous Phase Components:

CO2 Water

Supercritical CO2 Phase:

Phase Compressibility: Compressible

Phase Composition: Compositional

Supercritical CO2 Phase Components:

CO2

Equation of State Description Including Reference: Peng Robinson equation of state

File with EOS Reference or Documentation: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0401_File_with_EOS_BRP.pdf

Multifluid Flow Processes:

Buoyancy

Non-wetting Fluid Trapping Pore Compressibility

Thermal Conditions: Isothermal

Heat Transport Processes:

Geochemistry Modeled: No

Geomechanical/Structural Deformations Modeled: No

Rock Properties and Constitutive Relationships

Porosity/Permeability Model

Single Porosity

Porosity Distribution: Heterogeneous

Porosity included in Eclipse Keyword File: Yes

Porosity Variable Name in Eclipse Keyword File: POR

File Describing how Porosity was Determined and Assigned to Numerical Model: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0501_Porosity_Determined_Assigned_BRP.pdf

Image Files for Porosity Distributions: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0502_Image_Files_Porosity_Distribution_BRP.pdf

Permeability Distribution: Heterogeneous

Permeability included in Eclipse Keyword File: Yes

Permeability Variable Name in Eclipse Keyword File: PERMI

File Describing how Permeability was Determined and Assigned to Numerical Model: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0503_Permeability_Determined_Assigned_BRP.pdf

Image Files for Permeability Distributions: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0504_Image_Files_Permeability_Distribution_BRP.pdf

Number of Rock Types Modeled: -999

Description of Rock Type Selection and Assignment: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0505_Description_Rock_Type_BRP.pdf

Rock Type Distribution Data File: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0506_Rock_Type_Distribution_BRP.pdf

Image Files for Rock Type Distribution: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0507_Image_Files_Rock_Type_BRB.pdf

Rock Properties Comments: Test well will allow to gather additional data to incorporate capillary pressure for CO2 and water system

Boundary Conditions

Attach Boundary Conditions Description File: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0601_Boundary_Conditions_Description_BRP.pdf

Initial Conditions

Initial Phases in Domain: Aqueous

Initial Aqueous Pressure: Spatially Variable

Spatially Variable Initial Aqueous Pressure File: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0501_Initial_Conditions_Description_BRP.pdf

Initial Temperature: Spatially Constant

Initial Temperature: -999 F

Initial Salinity: Spatially Constant

Initial Salinity: -999 ppm

Operational Information

Number of Injection Wells: -999

Number of Production/Withdrawal Wells: -999

Model Output/Results

Provide file name and corresponding spatial location for each file: See below

Time-Series File: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0901_Time_Series_File_BRP.pdf

Provide file name and corresponding variable and time stamp for each file: See below

Snapshot File: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0902_Snapshot_File_BRP.pdf

Provide file name and corresponding description of surface for each file: See below

Surface Flux File: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/0903_Surface_Flux_File_BRP.pdf

AoR Pressure Front Delineation

Lowermost USDW:

Name of Lowermost USDW: Dockum

Water Density: 1000 kg/m^3 at Elevation: -999 ft

Location of Measurement for Density: ana;og

Temperature: 90 F at Elevation: -999 m

Location of Measurement: analog

Pressure: 13.2 psi at Elevation: -999 m

Location of Measurement: analog

Salinity: 7200 mg/L at Elevation: -999 m

Location of Measurement: analog

Elevation of bottom of USDW: -999 m

Injection Zone:

Name of Injection Zone: -999

Water Density: -999 kg/m^3 at Elevation: -999 m

Location of Measurement: -999

Temperature: -999 C at Elevation: -999 m

Location of Measurement: -999

Pressure: -999 MPa at Elevation: -999 m

Location of Measurement: -999

Salinity: -999 mg/L at Elevation: -999 m

Location of Measurement: -999

Elevation of top of Injection Zone: -999 m

Method of Estimating Critical Pressure: Dynamic Modeling

Describe Model Used: -999

File Describing Critical Pressure Estimation: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/1001_Critical_Pressure_Estimation_BRP.pdf

Estimated Critical Pressure: -999 psi

Delineated AoR:

Shapefile or KML File Showing Delineated AoR: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/1002_Shape_Delineated_AOR_BRP.docx

Corrective Action

Corrective Action Comments: Documents are attached in CBI folders

Area of Review and Corrective Action Plan [40 CFR 146.82(a)(13) and 146.84(b) or applicable state requirements]

Are you making an Area of Review and Corrective Action Plan submission at this time?: Yes

Reason for Project Plan Submission: Permit application submission

Project Plan Upload

Attach the Area of Review and Corrective Action Plan: https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/AOR--Summary_BRP_CCS1_r.pdf

https://gsdt.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-TX-0005/Phase1-PreConstruction/AoRModeling-01-31-2023-1511/AOR--Summary_BRP_CCS2_r.pdf

Appendices and Supporting Materials Upload

Area of Review Reevaluation [40 CFR 146.84(e) or applicable state requirements]

Minimum fixed frequency of AoR reevaluation: 5 Years

Are you making an Area of Review reevaluation submission at this time?: No

Reevaluation Background

Reevaluation Materials

Please upload your amended AoR and Corrective Action Plan on the previous tab.

Complete Submission

Authorized submission made by: Caroline Huet

For confirmation a read-only copy of your submission will be emailed to: caroline_huet@oxy.com