GRID DESCRIPTION

CTV VI

Model Domain

A static geological model developed with Schlumberger's Petrel software, commonly used in the petroleum industry for exploration and production, is the computational modeling input. It allows the user to incorporate seismic and well data to build reservoir models and visualize reservoir simulation results. Model domain information is summarized in **Table 1**.

The geo-cellular grid covers [redacted] with model dimensions of approximately 48.6 miles by 41.0 miles, ensuring that the computational model is large enough to account for boundary condition effects. In order to capture CO_2 storage mechanisms and properly resolve near-injection well effects, grid refinements are used in the project area and around the seven proposed injectors. In the 144-square-mile region around the project area, the grid cells were refined to a size of 1,056 feet by 1,056 feet. Near each injector, a 25.6-acre region was further refined such that the grid cell size was 105.6 feet by 105.6 feet. As we move farther away from the project area, the grid cell dimensions are larger, with a maximum cell size of 5,280 feet by 5,280 feet at the model edges. These grid dimensions are designed to allow for adequate resolution of plume development, injection pressure requirements, and pressure changes in the reservoir. The model grid is aligned southeast to northwest [redacted] Model boundaries were defined as open boundaries in the [redacted] (**Figure 1.**).

Preferential flow pathways are primarily caused by reservoir heterogeneity, especially for permeability. The current dynamic fluid flow model captures this heterogeneity by incorporating geologic property variability (facies, porosity, permeability) based on well logs. This variability is guided by realistic spatial trends (variograms) away from the wells. As a result, the model effectively captures preferential flow pathways within the reservoir.

The open-hole logs have a half-foot resolution and an average vertical cell height of 7.7 feet was used via proportional gridding over the model domain to generate grid layers as shown in **Figure 2**. This cell height provides the vertical resolution necessary to capture significant lithologic heterogeneity (sand versus shale), which helps to ensure accurate upscaling of log data and distribution of reservoir properties in the static model. **Figure 3** shows a comparison of open-hole log data and the associated upscaled logs for [redacted] well within the model boundary but just outside the AoR.

Table 1. Model domain information

Coordinate System	State Plane		
Horizontal Datum	North American Datum (NAD) 27		
Coordinate System Units	Feet		
Zone	Zone 2		
FIPSZONE	0402	ADSZONE	3301
Coordinate of X min	Claimed as PBI [redacted]	Coordinate of X max	Claimed as PBI [redacted]
Coordinate of Y min	Claimed as PBI [redacted]	Coordinate of Y max	Claimed as PBI [redacted]
Elevation of Bottom of Domain	Claimed as PBI [redacted]	Elevation of Top of Domain	Claimed [redacted]

Claimed as PBI

[redacted]

Figure 1. Plan view of the model boundary and geo-cellular grid used to define the CO_2 plume extent and associated AoR.

Claimed as PBI

[redacted]

Figure 2. Static model grid layering of the Injection Zones.

[redacted]

Figure 3. Well [redacted] upscaled logs versus open-hole logs.