

EPA Region 6 Modeling Strategy for UIC No Migration Petitions

April 29, 2016

Included with the site geologic strategy and characterization the operator should submit a short “plain language” site modeling strategy which addresses modeling inputs driven by the site geologic review outcome. The intent from the geologic review is to use as simplistic a model setup as possible to bound both pressure buildup and long term plume movements for the no migration demonstration based on a technically acceptable site geologic assessment. Keeping the model simple should make model setup and EPA review quicker and expedite the process. In cases where more than one interval is requested, the model inputs should be specified for each interval.

1. The site modeling strategy should be limited to no more than 1 to 2 pages and specify, in simple language, the following demonstration modeling input parameters and conditions along with their geologically justifiable basis:
2. The structural dips to be used in the pressure buildup (if applicable) and low and high density waste plume models along with basis for the values chosen. If the dip input is identified as variable for any modeling cases, a short specific explanation should be provided as to why variable dip is necessary.
3. The net thickness, h , to be used in both the pressure buildup and long term plume modeling cases. Note that the demonstration modeling net thickness value may also be impacted by historical results from radioactive tracer surveys and temperature logs compared to site electrical logs (wellbore fill), so these results may need to be briefly noted as part of the justification as well. If the net thickness input is identified as variable for any modeling cases, a short specific explanation should be provide as to why variable thickness is necessary.
4. The porosity value(s), ϕ , selected for each of the pressure buildup and plume models should be specified along with their basis (i.e. core data, logs).
5. The permeability values, k , selected for each of the pressure buildup and plume models should be specified along with their basis (i.e. core data, falloff and injectivity testing).
6. Site horizontal boundary conditions identified from the site geologic review such as salt domes, faults, and pinchouts should be specified as to how and why they will be addressed in the model inputs. If some area faults are assumed to be non-sealing due to limited throw and extent then it should be noted which of these will not be included in the model boundaries and why. Note that if the demonstration involves more than one interval, a summary should be provided for each interval.
7. Site reservoir flow anomalies such as extended natural or hydraulic fractures should also be noted as to how these will be addressed or discounted for the modeling and why, including grid block property modifications (i.e., permeability modifications).
8. Site vertical boundary conditions identified from the site geologic review including faults and fractures and how and why these will be incorporated or discounted for modeling considerations.
9. List any possible modeling sensitivity concerns as a result of the geological assessment and what additional model cases will be needed and why.