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| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Variable influence on process** | | | **Process influence on variables** | | |
| **Influence present? (Yes/No Description)** | **Time period/Climate domain** | **Handling of influence (How/If not - Why)** | **Influence present? (Yes/No Description)** | **Time period/Climate domain** | **Handling of influence (How/If not - Why)** |
| Temperature in bedrock | Yes | Excavation/operation | Air flow down into the region where the water table is drawn down and subsequent flow back is not modelled explicitly but taken into account through models in which the water table is treated as a free surface. No repository generated gas is included. Effect of the gas phase taken into account explicitly in resaturation calculations using a simplified model of gas and water phase flow. | Yes | Excavation/operation | Neglected because very small and gas flow minor process. |
| Temperate | Properties at constant temperature. | Temperate |
| Periglacial | Gas flow neglected; minor process. | Periglacial |
| Glacial | Glacial |
| Groundwater flow | Yes | Excavation/operation | Gas flow not modelled explicitly (see row Temperature above) except for resaturation phase. No repository generated gas. | Yes | Excavation/operation | Minor process, see Section 3.1 Groundwater flow. |
| Temperate | Considered in estimates of the capability of the geosphere to transport gas (Hartley et al. 2006). | Temperate | Effect of gas bubble flow on the water flow (by entrainment of water) is taken into account in scoping calculations of gas flow (Hartley et al. 2006). |
| Periglacial | Neglected; minor process. | Periglacial | Neglected; minor process. |
| Glacial | Glacial |
| Groundwater pressure | Yes | Excavation/operation | Gas flow not modelled explicitly (see row Temperature above) except for resaturation phase. No repository generated gas. | Yes | Excavation/operation | Gas flow neglected; minor process (see row Groundwater flow above). |
| Temperate | Considered in estimates of the capability of the geosphere to transport gas (Hartley et al. 2006). | Temperate | Effect of gas bubble flow on the water flow (by entrainment of water) is taken into account in scoping calculations of gas flow (Hartley et al. 2006). |
| Periglacial | Neglected; minor process. | Periglacial | Neglected; minor process. |
| Glacial | Glacial |
| Gas phase flow | Yes | Excavation/operation | — | Yes | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Repository geometry | Yes | Excavation/operation | Gas flow not modelled explicitly (see row Temperature above) except for resaturation phase. No repository generated gas. | No | Excavation/operation | — |
| Temperate | Deposition tunnel geometry considered in estimates of the capability of the geosphere to transport gas (Hartley et al. 2006). | Temperate |
| Periglacial | Neglected; minor process. | Periglacial |
| Glacial | Glacial |
| Fracture geometry | Yes | Excavation/operation | Gas flow not modelled explicitly (see row Temperature above). No repository generated gas. | Yes | Excavation/operation | Gas flow neglected; minor process. |
| Temperate | Site-specific DFN model in estimates of the capability of the geosphere to transport gas (Hartley et al. 2006). | Temperate | Neglected; scoping calculations show that gas can be transported away from the repository without requiring a larger overpressure (Hartley et al. 2006). |
| Periglacial | Neglected; minor process. | Periglacial | Neglected; minor process. |
| Glacial | Glacial |
| Rock stresses | No | Excavation/operation | — | Yes | Excavation/operation | Gas flow neglected; minor process. |
| Temperate | Temperate | Neglected; scoping calculations show that gas can be transported away from the repository without requiring a larger overpressure (Hartley et al. 2006). |
| Periglacial | Periglacial | Neglected; minor process. |
| Glacial | Glacial |
| Matrix minerals | No | Excavation/operation | — | No | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Fracture minerals | No | Excavation/operation | — | No | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Groundwater composition | Yes | Excavation/operation | Gas flow not modelled explicitly (see row Temperature above) except for resaturation phase. No repository generated gas. | Yes | Excavation/operation | Gas flow neglected; minor process (see also Section 5.10). |
| Temperate | Neglected; minor process. | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Gas composition | Yes | Excavation/operation | Gas flow not modelled explicitly (see row Temperature above) except for resaturation phase. No repository generated gas. | Yes | Excavation/operation | Gas flow neglected; minor process. |
| Temperate | Neglected; main gas generated is hydrogen. | Temperate | Neglected; main gas generated is hydrogen. |
| Periglacial | Neglected; minor process. | Periglacial | Neglected; minor process. |
| Glacial | Glacial |
| Structural and stray materials | Yes | Excavation/operation | Neglected; gas flow is a minor process. | No | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Saturation | Yes | Excavation/operation | Gas flow not modelled explicitly (see row Temperature above). No repository generated gas. | Yes | Excavation/operation | Process neglected in calculations of inflow to tunnels. |
| Temperate | Considered in estimates of the capability of the geosphere to transport gas (Hartley et al. 2006). | Temperate | Not made explicit in scoping calculations of gas transport (Hartley et al. 2006). |
| Periglacial | Neglected; minor process. | Periglacial | Neglected; minor process. |
| Glacial | Glacial |