|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **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 Temperature gradients are the driving force for heat transport. Thermal conductivity and heat capacity are temperature dependent. | Excavation/operation | Check that local deposition sequence-dependant pre-heating effects can be ignored and evaluate potential effects of tunnel ventilation (see Section 2.1.7). | Yes | Excavation/operation | Heat transport neglected (see Section 2.1.7). |
| Temperate | Site-specific temperature and thermal properties. Dependence of thermal properties on T accounted for in dimensioning calculations. Otherwise thermal properties for constant T. | Temperate | Output from calculations. |
| Periglacial | See Temperate above and Climate report. | Periglacial | Output from calculations, see also Section 2.2 Freezing and Climate report. |
| Glacial | Glacial |
| Groundwater flow | Yes | Excavation/operation | Heat transport neglected (see Section 2.1.7). | No But indirectly through temperature | Excavation/operation | See Section 3.1 Groundwater flow. |
| Temperate | Influence of convection neglected; little significance. | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Groundwater pressure | Yes | Excavation/operation | Heat transport neglected (see Section 2.1.7). | No But indirectly through temperature | Excavation/operation | See Section 3.1 Groundwater flow. |
| Temperate | Influence neglected; little significance. | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Gas phase flow | Yes | Excavation/operation | Heat transport neglected (see Section 2.1.7). | No But indirectly through temperature | Excavation/operation | See Section 3.2 Gas flow/dissolution. |
| Temperate | Influence neglected; little significance. | Temperate |
| Periglacial | See Temperate above and Climate report. | Periglacial |
| Glacial | Glacial |
| Repository geometry | Yes Affects heat flux from repository. Canister spacing particularly important in the near field. | Excavation/operation | Check that local deposition sequence-dependant pre-heating effects can be ignored and evaluate potential effects of tunnel ventilation (see Section 2.1.7). | No | Excavation/operation | — |
| Temperate | Included in model. | Temperate |
| Periglacial | Included in permafrost model (Climate report). | Periglacial |
| Glacial | Glacial |
| Fracture geometry | Yes | Excavation/operation | Heat transport neglected (see Section 2.1.7). | No But indirectly through rock stresses and temperature. | Excavation/operation | See mechanical processes in Chapter 4. |
| Temperate | Influence neglected; little significance. | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Rock stresses | No | Excavation/operation | — | No But indirectly through temperature. | Excavation/operation | See mechanical processes in Chapter 4. |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Matrix minerals | Yes Determines thermal properties. | Excavation/operation | Heat transport neglected (see Section 2.1.7). | No | Excavation/operation | — |
| Temperate | Use of site-specific thermal properties. | Temperate |
| Periglacial | Use of site-specific thermal properties in permafrost model, Climate report. | Periglacial |
| Glacial | Glacial |
| Fracture minerals | Yes Marginally and locally. | Excavation/operation | Heat transport neglected (see Section 2.1.7). | No But indirectly through temperature and groundwater composition. | Excavation/operation | See chemical processes in Chapter 5. |
| Temperate | Influence neglected; little significance. | Temperate |
| Periglacial | Influence neglected; little significance, Climate report. | Periglacial |
| Glacial | Glacial |
| Groundwater composition | No | Excavation/operation | — | No But indirectly through temperature. | Excavation/operation | See chemical processes in Chapter 5. |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Gas composition | No | Excavation/operation | — | No | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Structural and stray materials | No | Excavation/operation | — | No | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Saturation | Yes Affects scope and extent of convective heat transport. | Excavation/operation | Check that local deposition sequence-dependant pre-heating effects can be ignored and evaluate potential effects of tunnel ventilation (see Section 2.1.7). | No But, indirectly through temperature. | Excavation/operation | — |
| Temperate | Influence neglected; little significance. | Temperate |
| Periglacial | See Temperate above and Climate report. | Periglacial |
| Glacial | Glacial |