

6. THERMAL PROCESSES

Delivery of Thermal energy to subsurface:

1. CROW (Contaminant Recovery of Oily Wastes) - Hot water/low quality steam
2. SEE (In situ Steam Enhanced Extraction) - High quality steam
3. Radiofrequency heating - microwaves &
4. In situ vitrification - electrical energy

Heats fluids & porous medium $\left\{ \begin{array}{l} \text{Vaporize contaminants} \\ \text{Reduce viscosity} \\ \text{Reduce surface tension} \end{array} \right\}$ Fluid/fluid displacement

- Issues:
1. Heat transfer and heat adsorption by aquifer materials.
large blocks
 2. Heterogeneities and short circuiting
 3. Influence of buoyancy forces (over-ride)

CROW & SEE from EOR industry

In situ Vitrification - Radionuclide containment
Incorporate as a glass.