

Table A-20.A. Physical or hydraulic containment

Technology	Containment	Containment uses engineered barriers that either control horizontal migration of LNAPL, isolate LNAPL as a vapor or dissolved source, block physical access to the LNAPL body, or prevent recharge infiltration through the LNAPL body (vertical barrier).	
Remediation process	Physical mass recovery	Potential	Not primary intent, but hydraulic control measures (interception wells or trenches) implemented as a containment system may remove some LNAPL.
	Phase change	No	N/A
	In situ destruction	No	Physical or hydraulic containment does not typically involve in situ treatment.
	Stabilization/ binding	Yes	Halts LNAPL migration.
Objective applicability	LNAPL saturation	Yes	Halts LNAPL movement.
		Example performance metrics	No first LNAPL occurrence downgradient of LNAPL containment, LNAPL constituent meets standard at point of compliance, reduced vapor concentrations.
	LNAPL composition	Yes	N/A
		Example performance metrics	N/A
Applicable LNAPL type	All LNAPL types		
Geologic factors	Unsaturated zone	Permeability	Soil permeability a factor when determining the amount of amendments (e.g., bentonite or cement) needed to achieve the desired permeability or for determining necessary hydraulic removal rates.
		Grain size	For backfill activities, large gravels or cobbles (>6 inches in diameter) typically not used in barrier wall construction.
		Heterogeneity	Not a factor for trenches; needs to be considered for wells.
		Consolidation	Consolidated material may be easier to trench because of side wall stability; cemented or indurated material may be difficult to excavate.
	Saturated zone	Permeability	Soil permeability a factor when determining the amount of amendments (e.g., bentonite or cement) needed to achieve the desired permeability or for determining necessary hydraulic removal rates.
		Grain size	Not typically a factor, although during backfill activities, large gravels or cobbles (>6 inches in diameter) not typically used in barrier wall construction. Large cobbles and boulders will impede the emplacement of sheet piles. High permeability coupled with high mass flux adversely affects the emplacement of grout walls due to dilution effects.
		Heterogeneity	For keyed physical barriers, determine that a continuous aquitard or bedrock exists and determine its elevation along the alignment; barrier must intersect LNAPL vertical interval under all seasonal groundwater elevations.
		Consolidation	Consolidated material may be easier to trench because of side wall stability; cemented or indurated material may be difficult to excavate. Loose material is far more suited to sheet piling. Consolidation has little effect on the emplacement of grout curtains providing injection pressures do not exceed fracturing thresholds.