

Table A-19.B. Evaluation factors for phytotechnologies

Remedial timeframe	Concern	Moderate-high
	Discussion	Phytotechnologies generally take longer than other alternatives and are susceptible to seasonal and diurnal changes.
Safety	Concern	Low to moderate
	Discussion	The planting can involve use of heavy equipment. After planting, the monitoring and operation typically has fewer safety concerns than operation of conventional remediation.
Waste management	Concern	Low
	Discussion	Extensive samplings in the field show that minimal amounts of volatile contaminants are emitted from plants. According to the current research, there is little to no accumulation of volatile contaminants in plant roots, wood, stems, leaves or fruit.
Community concerns	Concern	Low
	Discussion	The community may view the plants as aesthetically pleasing versus conventional remediation equipment.
Carbon footprint/energy requirements	Concern	Low
	Discussion	It is considered a green technology. The system does not require supplemental energy, although monitoring equipment may. It improves air quality and sequesters greenhouse gases.
Site restrictions	Concern	Low to moderate
	Discussion	The plants may restrict access or use of the site for other operations or property uses.
LNAPL body size	Concern	High
	Discussion	The size of the LNAPL body directly affects the cost and extent of the plants. Phytotechnologies typically require larger tracts of land than many alternatives.
Other regulations	Concern	Low to moderate
	Discussion	If a phytotechnology project requires contaminated groundwater to be pumped to the surface as irrigation for the plants, a RCRA permit may be necessary. Many states require a permit or approval by the appropriate regulatory authority.
Cost	Concern	Low
	Discussion	Lower costs, labor requirements, and safer operations compared to more intensive and invasive conventional techniques. The various cost items that will need to be considered are: earthwork, labor, planting, stock, planting method, field equipment, medium to heavy machinery such as farm equipment, soil amendments, permits, water control infrastructure, utility infrastructure, fencing, security, etc.
Limitations	Concern	Moderate
	Discussion	Tests have shown the ability of grass and legume species and other plants, including willows and poplars, to grow in hydrocarbon-contaminated soil where the average TPH concentrations were as high as 40,000 mg/kg. Certain plants can tolerate much higher concentrations. The contamination must generally be shallow enough that plant roots can influence the zone of contamination, or contamination must be brought to the plant through natural (plant-based) or applied pumping and infiltration.