

Assessing Environmental Sustainability of Phytoremediation to Remove Copper from Contaminated Soils

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Table S1: Inventory data of Case 1 referred to the FU (1 ha of treated soil).

Item	<i>Brassica juncea</i>	<i>Medicago sativa</i>	Rotatory crop
<i>Cultivation and harvesting</i>			
Area (hm ²)	2	1	4
Seeds (kg)	20	40	80
Sowing (hm ²)	2	1	4
Tillage (hm ²)	2	1	4
Harvesting (hm ²)	2	1	4
Haying (hm ²)	2	1	4
Ammonium nitrate (kg)	-	238	-
Triple superphosphate (kg)	300	149.4	400.8
Potassium chloride (kg)	200	151.3	302.2
Urea (kg)	400	-	335.4
Borax (kg)	-	7.76	5.24
Compost (kg)	1507	-	1507
Manure (kg)	-	650	1500
EDTA (kg)	5611.1	-	5611.1
Irrigation drip (m ³)	-	1784.8	2793.5
<i>Conditioning and transport</i>			
Produced biomass (DM)* (kg)	11208	19400	24304
Electricity (kWh)	31.2	25	82.4
Diesel for transport (kg)	46	74.48	101.0
<i>Biomass use</i>			

<i>a) Landfill deposition</i>			
Contaminated biomass (kg)	11208	19400	24304
<i>b) Cogeneration</i>			
Biomass formula	C ₇ H ₁₂ O ₆	C ₈ H ₁₃ O ₆	-
Compressed air (Nm ³)	37360.0	68240.0	87840.0
Heat (kWh)	19056.0	33460.0	43820.0
Electricity (kWh)	13339.2	23422.0	30674.0
CO ₂ emissions (kg)	12683.4	22633.8	29436.8
Ash (kg)	11.6	19.7	36.2
Diesel transport for ash disposal (kg)	0.043	0.074	0.136

*DM: Dry mass

Table S2: Inventory data of Case 2 referred to the FU (1 ha of decontaminated soil).

Item	Value
<i>Excavation and soil transport</i>	
Excavator (m ³)	2000
Mini skid steer (m ³)	2000
Diesel for transport (kg)	11968
<i>Pretreatment and washing</i>	
Hopper (kWh)	1500
Vibrating screen (kWh)	18370
Centrifugation (kWh)	367
Hydrocyclone (kWh)	2376
Hydrochloric acid (20 wt% solution) (kg)	5899
Washing tank (0.2 N HCl solution) (kWh)	1670
Centrifugation (kWh)	559
<i>Wastewater treatment</i>	
Sodium hydroxide (kg)	1294
Neutralization tank (0.2 N NaOH) (kWh)	2358
Thickening (kWh)	135
Clarification (kWh)	232
Centrifugation (kWh)	182
<i>Landfill deposition</i>	
Disposal, hazardous waste (ton)	880
Diesel for transport (kg)	4899.4
<i>Soil refilling</i>	
Raw sand (kg)	880

Diesel for transport (kg)	8452.4
Mini skid steer (m ³)	2000

Table S3: Inventory data for Case study 3 referred to the FU (1 ha of decontaminated soil).

Item	Value
<i>Excavation</i>	
Excavator (m ³)	2000
Mini skid steer (m ³)	2000
<i>Soil disposal</i>	
Diesel for transport (kg)	11968
Disposal, hazardous waste to underground deposit (ton)	3200
<i>Soil filling</i>	
Raw sand (kg)	3200
Diesel for transport (kg)	11968
Excavator (m ³)	2000
Mini skid steer (m ³)	2000