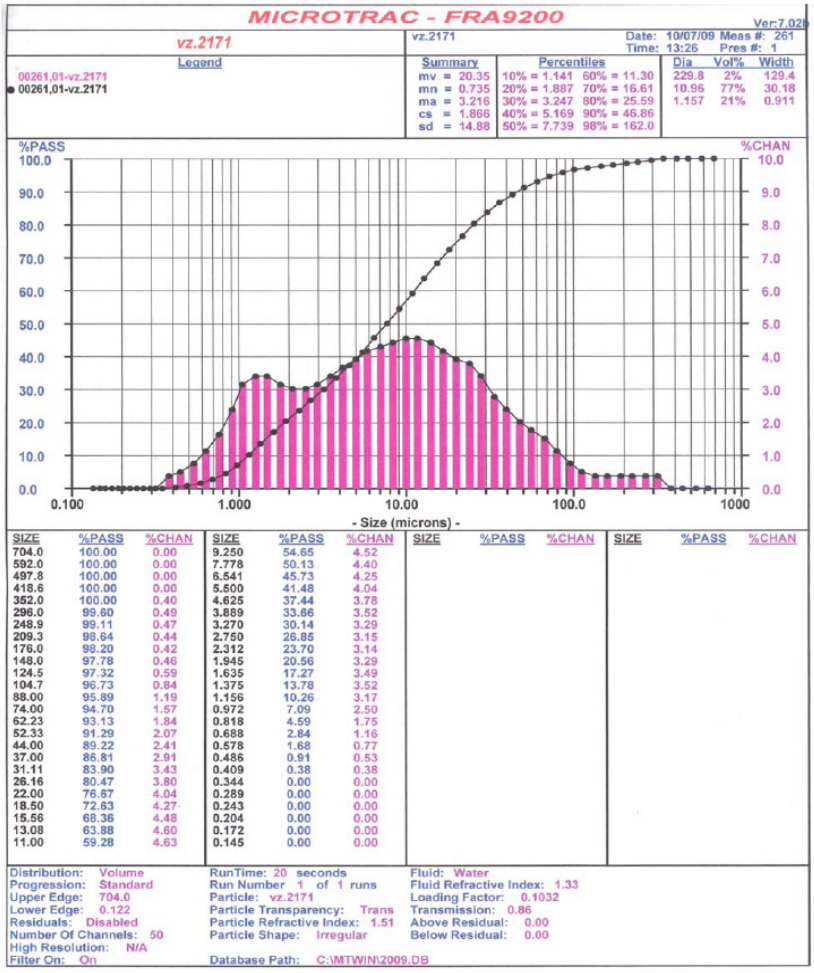
CHARACTERISATION OF PORT OF KOPER DREDGED MATERIAL

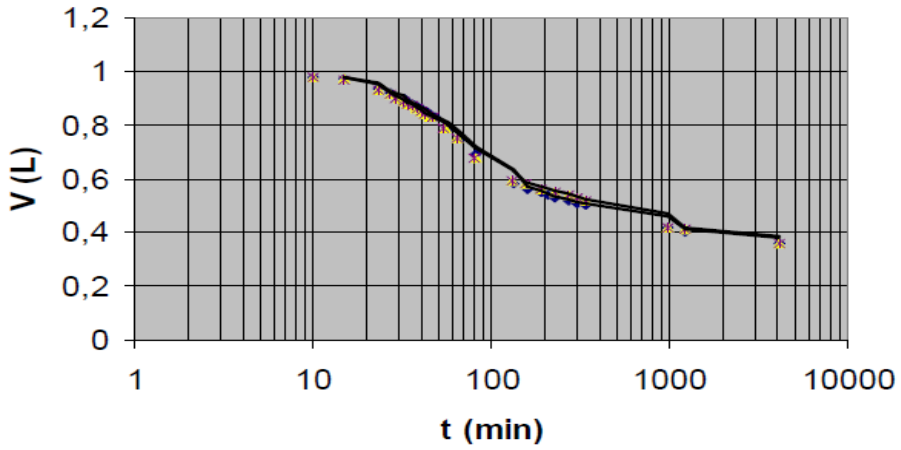
PHYSICAL PROPERTIES

PARAMETER	UNIT	RESULT	Comment
Density	g/l	1600-2000	mostly very homogeneous material - (clay silt blenders with medium consistency (MH-CH)
Hydraulic permeability	m/s	$5x10^{-9}$	
Dry matter	%	65	
Particle size	µm	1-100	75 % of particles are smaller than 20 um

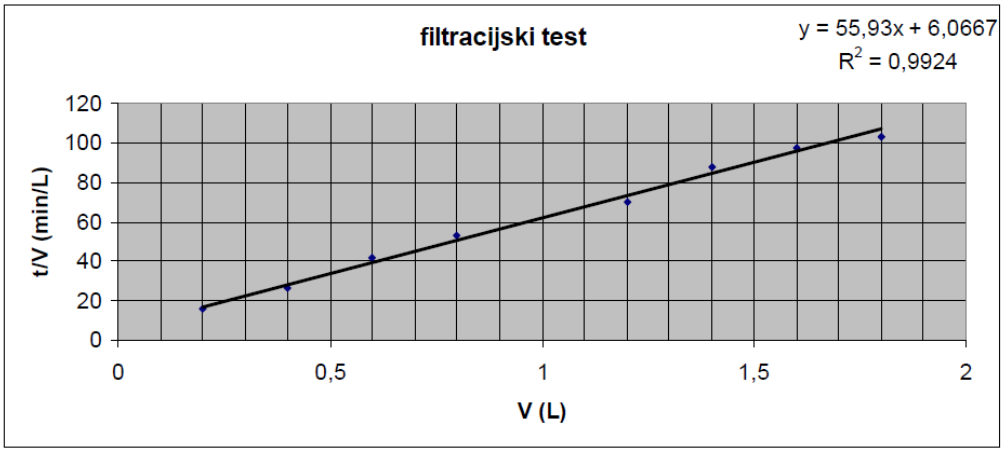
Picture: differential and cumulative size distribution



SEDIMENTATION PROCES, (performed in the lab)

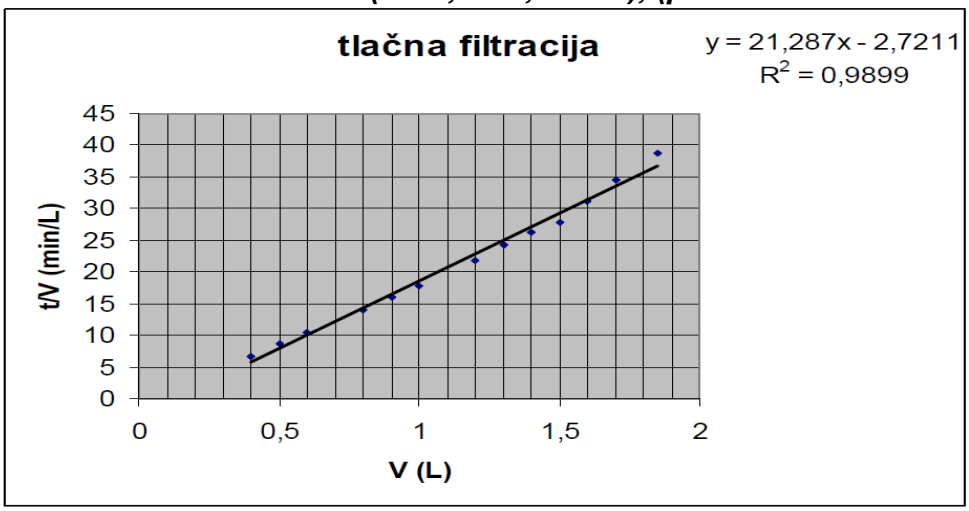


VACUUM FILTRATION (9mbar, A=0,049m^2), (performed in the lab)



After the vacuum filtration the material had 25-29% water content.

PRESSURE FILTRATION (5bar, A=0,071m^2), (performed in the lab)



After the pressure filtration the material had 26% water content.

CHEMICAL PROPERTIES

PARAMETER	UNIT	RESULT	COMMENT
Ignition loss residual	%	86-96 (550°C) 81-86 (900 °C)	
Total organic matter (TOC)	%	1,1-1,5	
Total inorganic matter (TIC)	%	1,8-2,1	
SiO_2	%	60	Also present: Muscovite (K2O.2MgO.Al2O3.8SiO2.2H2O), Magnesium Silicate (MgSiO3), Barium Manganese Oxide Hydrate (Ba2Mn14O27 xH2O). Under 10%
CaCO3	%	10	
Microelements			
Al	$\%_{s.s.}$	0,9-1,9	Determined in mixture of concentrated hydrochloric (HCl) and nitric acid (HNO3) in a 3:1 ratio with ICP-AES.
As	$mg/kg_{s.s.}$	<1	
Ba	$mg/kg_{s.s.}$	24-33	
Ca	$\%_{s.s}$	8,9-9,7	
Cd	$mg/kg_{s.s.}$	<1	
Cr	$mg/kg_{s.s.}$	54-81	
Cu	$mg/kg_{s.s.}$	30	
Fe	$\%_{s.s}$	2-2,9	
Hg	$mg/kg_{s.s.}$	<0,1	
K	$\%_{s.s}$	0,4-0,5	
Mg	$\%_{s.s}$	0,9-1,0	
Mn	$mg/kg_{s.s.}$	380-438	
Mo	$mg/kg_{s.s.}$	14-31	
Na	$\%_{s.s}$	0,97-1,1	
Ni	$mg/kg_{s.s.}$	60-71	
Pb	$mg/kg_{s.s.}$	18-28	
Sb	$mg/kg_{s.s.}$	<1	
Si	$mg/kg_{s.s.}$	790-7290	
Se	$mg/kg_{s.s.}$	<1	
Zn	$mg/kg_{s.s.}$	73-102	
Cl	$\%_{s.s}$	1,50-1,65	
F	$mg/kg_{s.s.}$	67-460	
SO4	$\%_{s.s}$	0,8-1,5	
P	$mg/kg_{s.s.}$	365-2242	
Organic components			
Mineral oils	$mg/kg_{s.s.}$	<10-24	
Polycyclic aromatic hydrocarbons (PAH)	$mg/kg_{s.s.}$	<1	
PCBs	$mg/kg_{s.s.}$	<0,1	
BTX	$mg/kg_{s.s.}$	<1	

Parameters after leaching test (EN 12457-4)			
pH		7,3-8,4	
el. conductivity	µS/cm	1205-3880	
Al	mg/kg$_{s.s.}$	<1	
As	mg/kg$_{s.s.}$	0,047-0,065	
Ba	mg/kg$_{s.s.}$	<0,8-6,1	
Cd	mg/kg$_{s.s.}$	<0,005	
Cr	mg/kg$_{s.s.}$	0,013-0,068	
Cu	mg/kg$_{s.s.}$	<0,07-0,076	
Hg	mg/kg$_{s.s.}$	<0,01	
Mo	mg/kg$_{s.s.}$	0,05-0,69	
Ni	mg/kg$_{s.s.}$	0,01-0,29	
Pb	mg/kg$_{s.s.}$	<0,05	
Sb	mg/kg$_{s.s.}$	0,027-0,073	
Se	mg/kg$_{s.s.}$	0,039-0,18	
Zn	mg/kg$_{s.s.}$	<0,1-1,8	
Cl	mg/kg$_{s.s.}$	2410-19900	
F	mg/kg$_{s.s.}$	<10	
SO4	mg/kg$_{s.s.}$	640-4000	
Dissolved organic carbon (DOC)	mg/kg$_{s.s.}$	68-118	
Mineral oil	mg/kg$_{s.s.}$	<5	
AOX	mg/kg$_{s.s.}$	<0,3-0,33	

LEGISLATIVE NORMATIVES- national Decree on burdening of soil with waste spreading

		maximum values in the excavated material intended for recultivation of soil, for filling land for **non** agricultural land	
		Parameters after leaching test (EN 12457-4)	*Parameters in soil*
As	mg/kg$_{s.s.}$	0,3	30
Cd	mg/kg$_{s.s.}$	0,03	1,1
Cr	mg/kg$_{s.s.}$	0,3	90
Cu	mg/kg$_{s.s.}$	0,6	90
Hg	mg/kg$_{s.s.}$	0,01	0,7
Ni	mg/kg$_{s.s.}$	0,6	55
Pb	mg/kg$_{s.s.}$	0,3	100
Zn	mg/kg$_{s.s.}$	18	450
AOX	mg/kg Cl$_{s.s}$	0,3	

Mineral oil	$mg/kg_{s.s.}$	5	50 (if TOC<0,5%) 100 (if 0,5%< TOC≤2%) 200 (if TOC>2%)
Polycyclic aromatic hydrocarbons (PAH)	$mg/kg_{s.s}$		2
PCBs (28,52,101,138,153,180)	$mg/kg_{s.s.}$		0,1
BTX	$mg/kg_{s.s}$		1
TOC	$‰_{s.s}$	100 mg/kg_{ss}	2
pH		6,5-8	6,5-8
El. conductivity	µS/cm	600	600
Tot. P	$‰_{s.s}$		0,1
Tot. N	$‰_{s.s}$		0,1
Stones, > 2 mm	$‰_{s.s}$		0-70
Stones, > 200 mm	$‰_{s.s}$		0-10

Also: the excavated material must not have more than five volume percent of components that are normally present in the soil where is intended to put.