



WORKSHOP

Coastal Brownfield Remediation



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PROJECT ASPECTS

01

ECOLOGY ASPECT

Soil, water and air tests

02

TECHNICAL ASPECT

3 phases

03

SOCIAL ASPECT

Activism as everyday life

04

ECONOMICAL ASPECT

Profit generation



01

ENVIROMENTAL TESTS



TESTS SO FAR

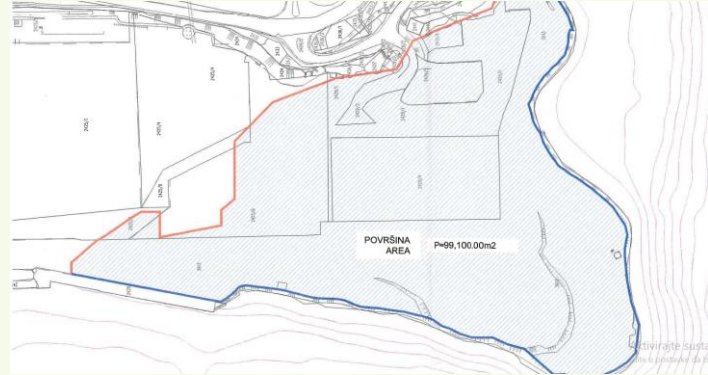
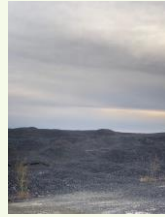
Date	2007.			November 2011.				May 2014.						2014.		2022.				
Type of sample	Sample from well			Surface sample (bigger fraction)		Surface sample (smaller fraction)		Surface sample, eluates						Surface sample (bigger fraction)	Surface sample (smaller fraction)	Surfice samples				
Sample number	2	3	4	1	2	3	4	1	2	3	4	5	6	1	2	1	2	3	4	5
As								<0,2	<0,2	<0,2	<0,2	<0,2	<0,2			12,5	5,41	8,99	70,8	78,4
Pb	39,25	51,68	19,87					<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	8,56	12,22	67	11,4	140	47,5	26
Cd	0,2	0,2	0,1											<0,5	<0,5	0,355	0,241	2,86	1,21	0,69
Hg								<0,2	<0,1	<0,1	<0,1	<0,1	<0,1	<0,02	<0,02	0,05	0,01	0,1	0,08	0,08
Cu														2,03	9,16	90	21,7	47,2	31	38,5
Zn	95,47	124,3	24,37											138,56	84,56	337	192	286	136	600
Cr (III)								<0,5	<0,5	<0,5	<0,5	<0,5	<0,5							
Cr (VI)								<0,5	<0,5	<0,5	<0,5	<0,5	1,29			1,65	0,54	0,47	1,03	12,3
Cr	365,2	398,3	48,34	0,57	0,47	0,83	0,55	<1	<1	<1	<1	<1	1,29	560,54	698,29					
Ni								<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	5,29	32,24	121	138	74	78	517
∑PCB ₇								<0,1	<0,1	<0,1	<0,1	<0,1	<0,1							
DDT																				
∑PAH ₁₆				1,02	1,56	6,42	8,12	<0,01	105,7	31,5	6,9	8,5	0,02	0,376	42,802	4,74	0,57	6,9	11,15	1,62
Benzo(a)piren														0,109	11,534					
Alifats C8-C10																				
Alifats >C10-C12																				
Alifats >C12-C35																				
DEHP																				
Dioksins/furans																				
Fenols																				
Benzen																				

Very good Good Moderatly Bad Very bad

LAND ANALYSIS

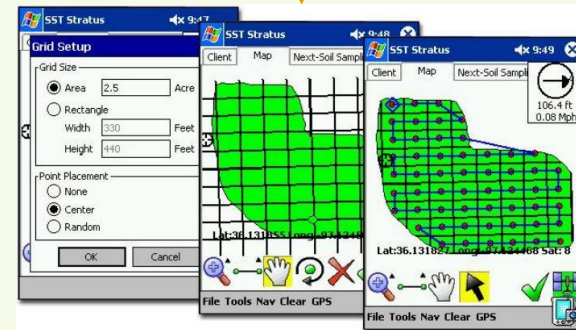


Whole area



Key area

“Spotting”;
grid setup



NUMBER OF ANALYSIS

Using Norwegian guidelines

Every 5000 m² → 8 samples



160 samples total



Hotspot identification
(grade 4 & 5)



Additional analysis



Approximately 200
samples



Continuously analyzing
throughout the whole
process

Accredited and the most sophisticated methods

<p>Otpadna, površinska, podzemna voda, eluat otpada i tlo *</p> <p><i>Waste water, surface water, ground water, waste eluate and soil</i></p>	<p>Određivanje kroma (VI) Spektrometrijska metoda s 1,5-difenilkarbazidom <i>Determination of chromium (VI) - Spectrometric method using 1,5 - diphenylcarbazide</i></p> <p>Granica kvantifikacije/<i>Quantification limit</i> 0,025 mg/L</p>	<p>HRN ISO 11083:1998 <i>(ISO 11083:1994)</i></p>
<p>Tlo, mulj, kompost, digestat</p> <p><i>Soil, sludge, digestate, compost</i></p>	<p>Određivanje elemenata (As, Ba, Ca, Cd, Co, Cr, Cu, Hg, K, Mg, Mo, Mn, Ni, Pb, Sb, Se, Fe, V, Zn) (ICP-MS) <i>Determination of elements (As, Ba, Ca, Cd, Co, Cr, Cu, Hg, K, Mg, Mo, Mn, Ni, Pb, Sb, Se, Fe, V, Zn) (ICP-MS)</i></p> <p>Granica kvantifikacije/<i>Quantification limit</i> 0,010 mg/kg</p>	<p>Vlastita metoda/ <i>In-house method</i> RU-OTV-166 izdanje/<i>edition</i> 3 01.05.2021.</p>

Materijali/Proizvodi <i>Materials/Products</i>	Vrsta ispitivanja/Svojstvo <i>Type of test/Property</i> <i>Raspon/Range</i>	Metoda ispitivanja <i>Test method</i>	
Tlo i sediment <i>Soil and sediment</i>	<p>Određivanje policikličkih aromatskih ugljikovodika (PAH) (GC-MS) <i>Determination of polycyclic aromatic hydrocarbons (PAH) (GC-MS)</i></p> <p>Granica kvantifikacije/<i>Quantification limit</i></p>	<p>Vlastita metoda/ <i>In-house method</i> RU-OTV-160 izdanje/<i>edition</i> 1 21.10.2019.</p> <p>modificirana/<i>modified</i> HRN ISO 18287:2011 <i>(ISO 18287:2006)</i></p>	
	Naftalen/ <i>Naphtalene</i>		0,01 mg/kg
	Acenaftilen/ <i>Acenaphthylene</i>		0,01 mg/kg
	Acenaften/ <i>Acenaphthene</i>		0,01 mg/kg
	Fluoren/ <i>Fluorene</i>		0,01 mg/kg
	Fenantren/ <i>Phenantrene</i>		0,01 mg/kg
	Antracen/ <i>Anthracene</i>		0,01 mg/kg
	Fluoranten/ <i>Fluoranthene</i>		0,01 mg/kg
	Piren/ <i>Pyrene</i>		0,01 mg/kg
	Benzo(a)antracen/ <i>Benzo(a)anthracene</i>		0,01 mg/kg
	Krizen/ <i>Chrysene</i>		0,01 mg/kg
	Benzo(b)fluoranten/ <i>Benzo(b)fluoranthene</i>		0,01 mg/kg
	Benzo(k)fluoranten/ <i>Benzo(k)fluoranthene</i>		0,01 mg/kg
	Benzo(a)piren/ <i>Benzo(a)pyrene</i>		0,01 mg/kg
	Indeno(1,2,3-cd)piren/ <i>Indeno(1,2,3-cd)pyrene</i>		0,01 mg/kg
	Benzo(g,h,i)perilen/ <i>Benzo(g,h,i)perylene</i>		0,01 mg/kg

ADDITIONAL ANALYSIS

Seawater (biocenosis)



Sea cyanobacteria



Mussels



Sea mud

Air



AQI Values	Air Quality Descriptor	Health Concerns*	
		PM _{2.5}	PM ₁₀
0 - 50	Good	None	None
51 - 100**	Moderate	None	None
101 - 150	Unhealthy for Sensitive Groups	People with respiratory or heart disease, the elderly, and children should limit prolonged exertion.	People with respiratory disease, such as asthma, should limit outdoor exertion.
151 - 200	Unhealthy	People with respiratory or heart disease, the elderly, and children should avoid prolonged exertion; everyone else should limit prolonged exertion.	People with respiratory disease, such as asthma, should avoid outdoor exertion; everyone else, especially the elderly and children, should limit prolonged outdoor exertion.
201 - 300	Very Unhealthy	People with respiratory or heart disease, the elderly, and children should avoid any outdoor activity; everyone else should avoid prolonged exertion.	People with respiratory disease, such as asthma, should avoid any outdoor activity; everyone else, especially the elderly and children, should limit outdoor exertion.
301 - 500	Hazardous	Everyone should avoid any outdoor exertion; people with respiratory or heart disease, the elderly, and children should remain indoors.	Everyone should avoid any outdoor exertion; people with respiratory disease, such as asthma, should remain indoors.

Wastewater



PROCESS

Property legal relations



Waste analysis



“Rulebook on waste disposal methods and conditions, categories and operating conditions for waste disposal sites” (NN 114/2015)

&

“Rulebook on the abolition of waste status” (NN 55/2023)

Categories 1,2 & 3



Using for further constructions
(approximately 90%)

Categories 4 & 5



Transportation to the hazardous
waste disposal site
(approximately 10%)



02

TECHNICAL ASPECT



3 PHASES

PHASE I

Marine

PHASE 2

Hotel

PHASE 3

Park



M A R I N E

VISION

- Nautical tourist marine with operational shoreline and boat docks (max boat length 21 m)



H O T E L

P A R K



- Hotel
- Restaurant / Bar
- Casino
- Pool
- Parking
- Shopping
- Start-up offices

H O T E L

P A R K



VISION

- Playground for children
- Tree lined promenade
- Sport fields (mini golf, tennis...)
- Park for dogs
- Outdoor cinema
- Parking

M A R I N E

- For res and
- Fin for lo
- For fre n st
- For poc loc





03

SOCIAL ASPECT



Activism as everyday life



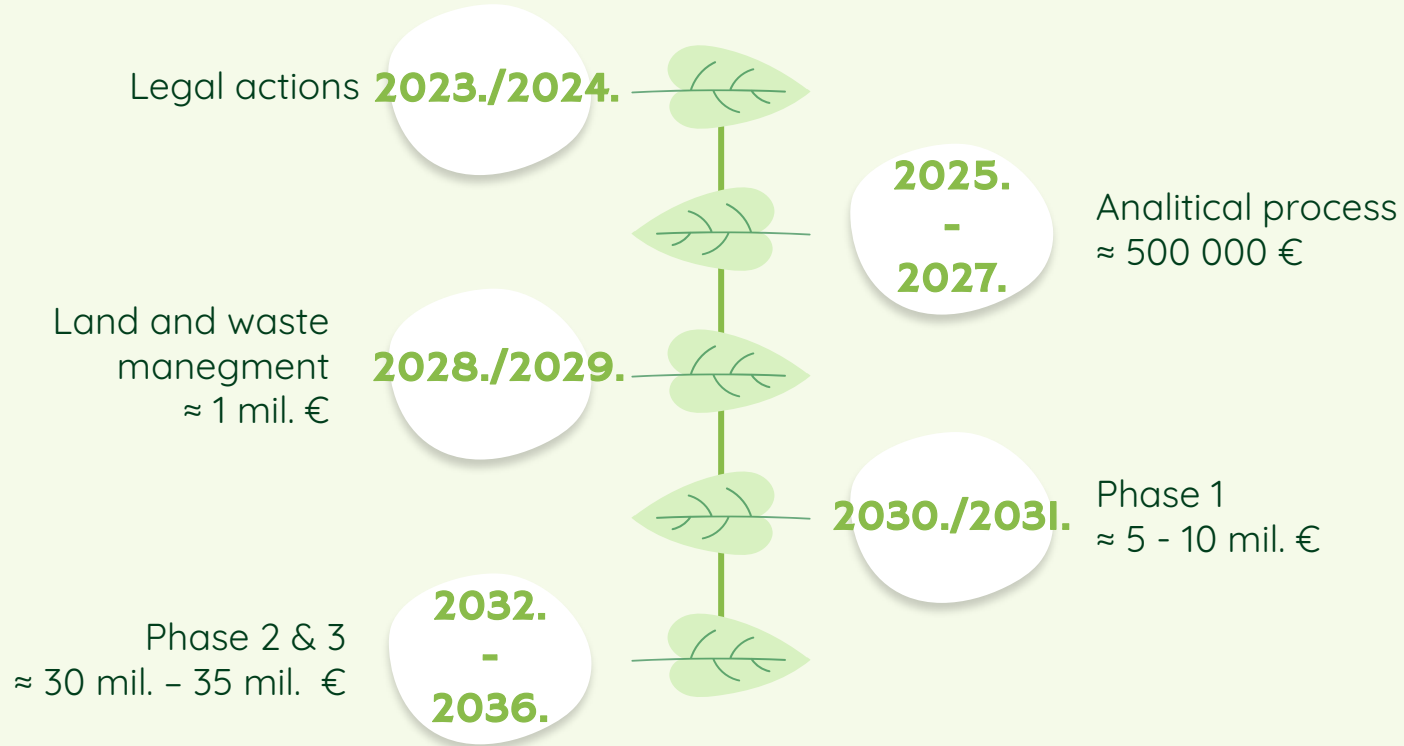


04

ECONOMICAL ASPECT



TIMELINE AND EXPENSES



PROFIT

Profit from hotel complex (conference room lease, start-up offices, casino...)

Outdoor activities (oper-air cinema, concerts, festivals...)



Solar panels



Profit from nautical marine (boat service, dry dock, berth lease, luxury yachts lease...)



Selling slack for construction

Thank you for attention!

