

Continuous ambient air monitoring in the frame of HVOC impacted residues remediation



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Context & Problematics

Context

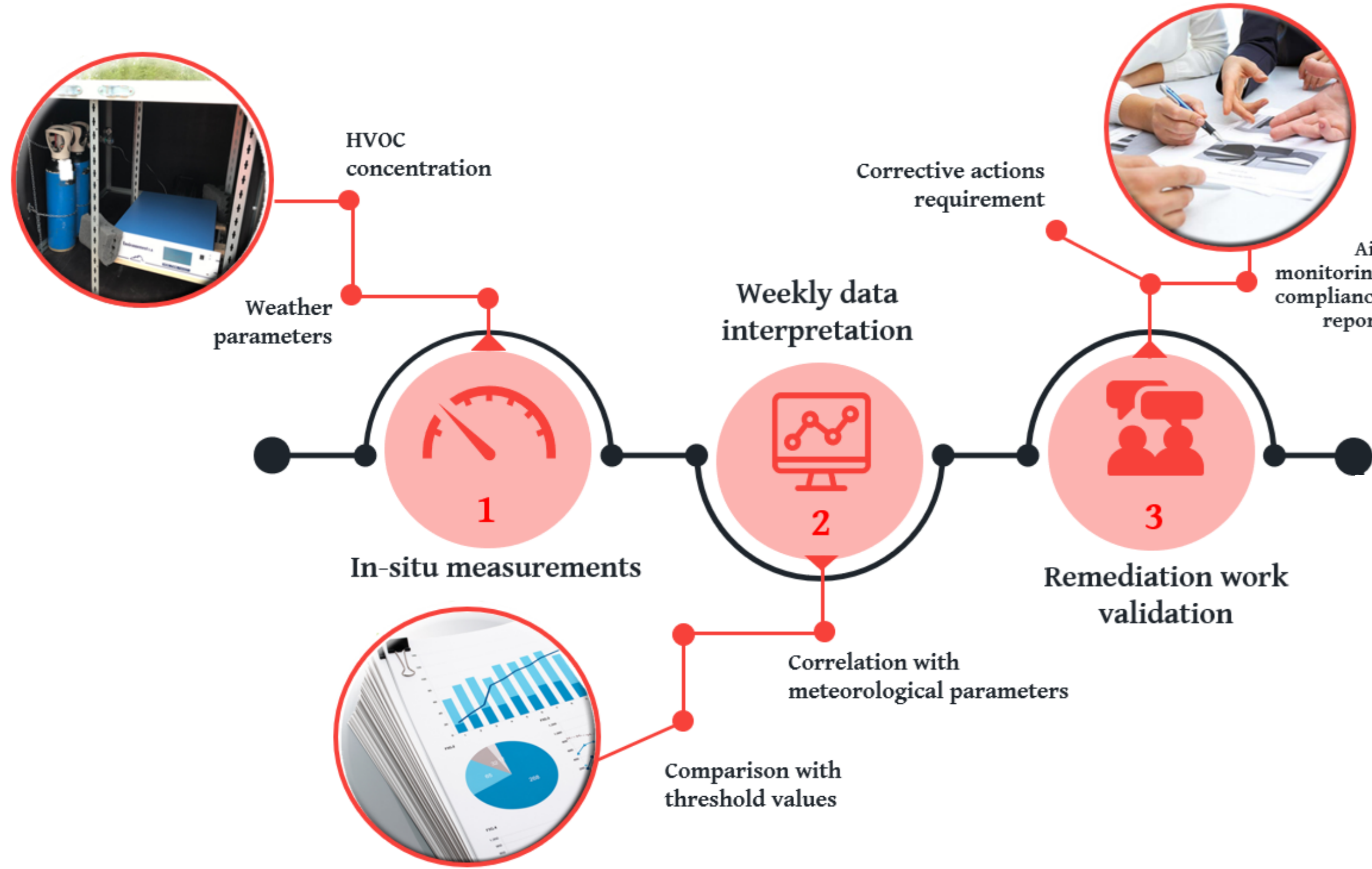
- On-site remediation by excavation & thermal treatment of industrial residues
- Residues : Former tailings (red muds) and Former pond (HVOC's residues impacted by HVOC)

Objectives:

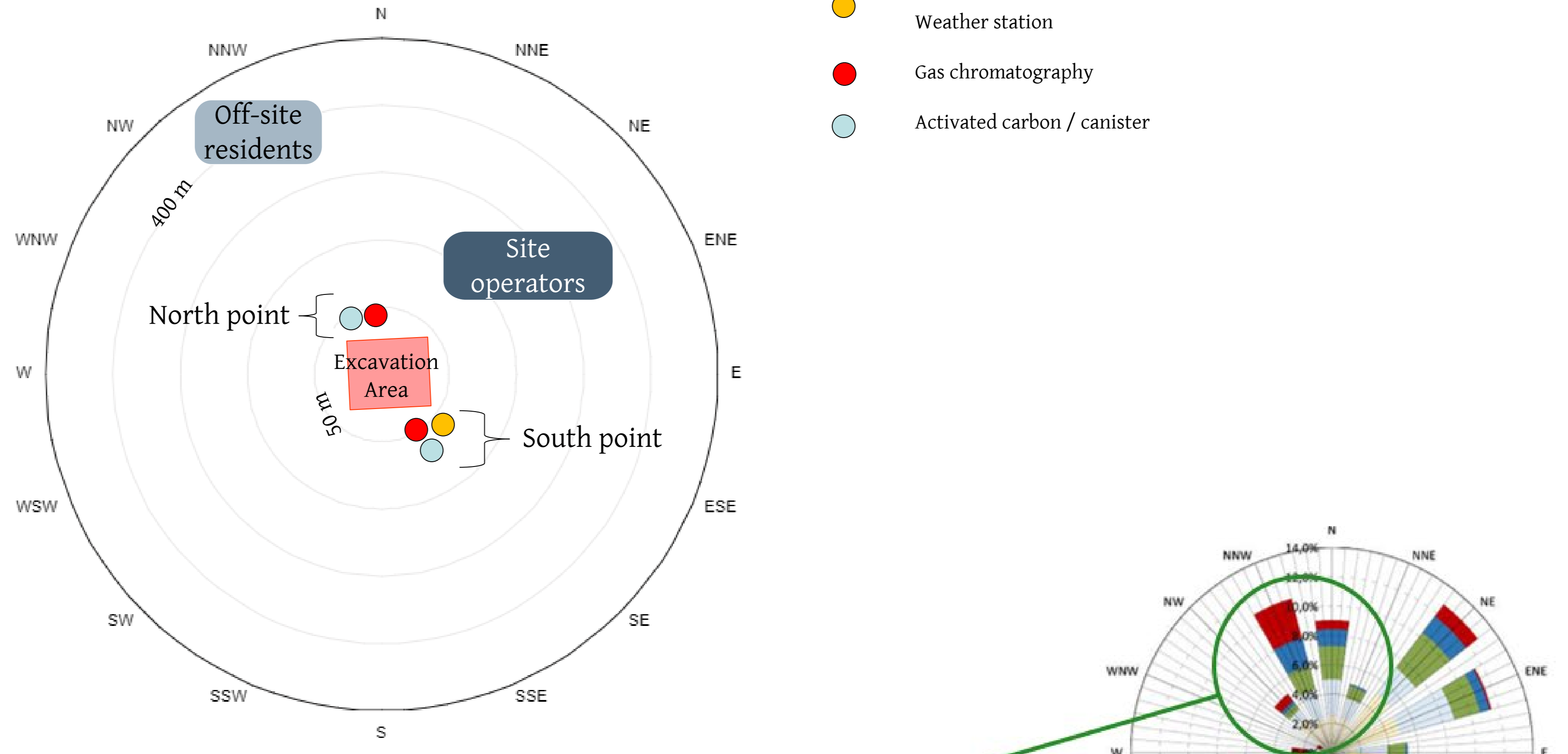
- Verification of the absence of gaseous emanations induced by the treatment process
- Application of a threshold not to exceed a value of 1 mg/m³ (Σ HVOCs)
- Verification of the workers' and off-site residents' exposure to HVOCs

Air monitoring methodology

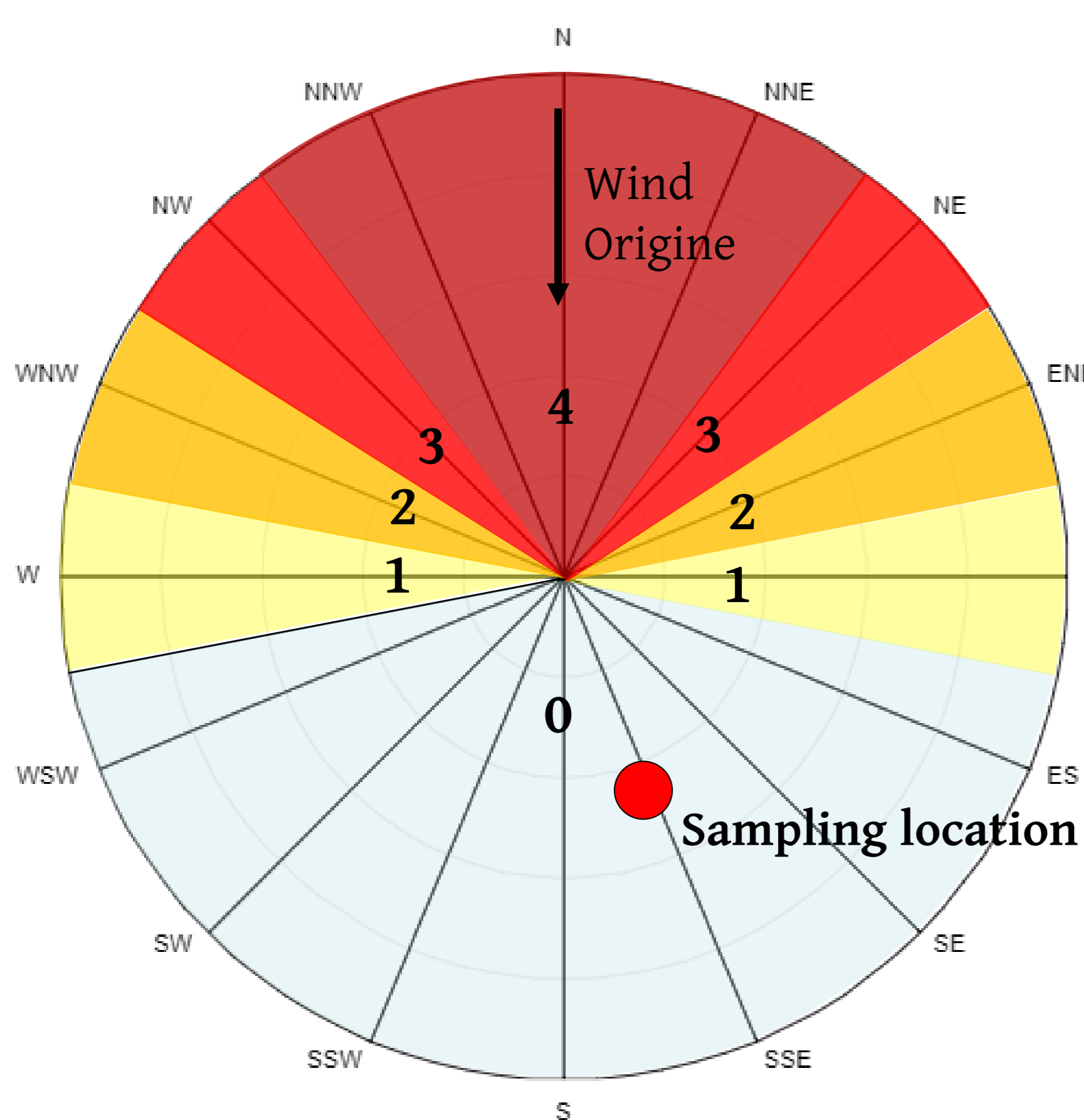
Strategy



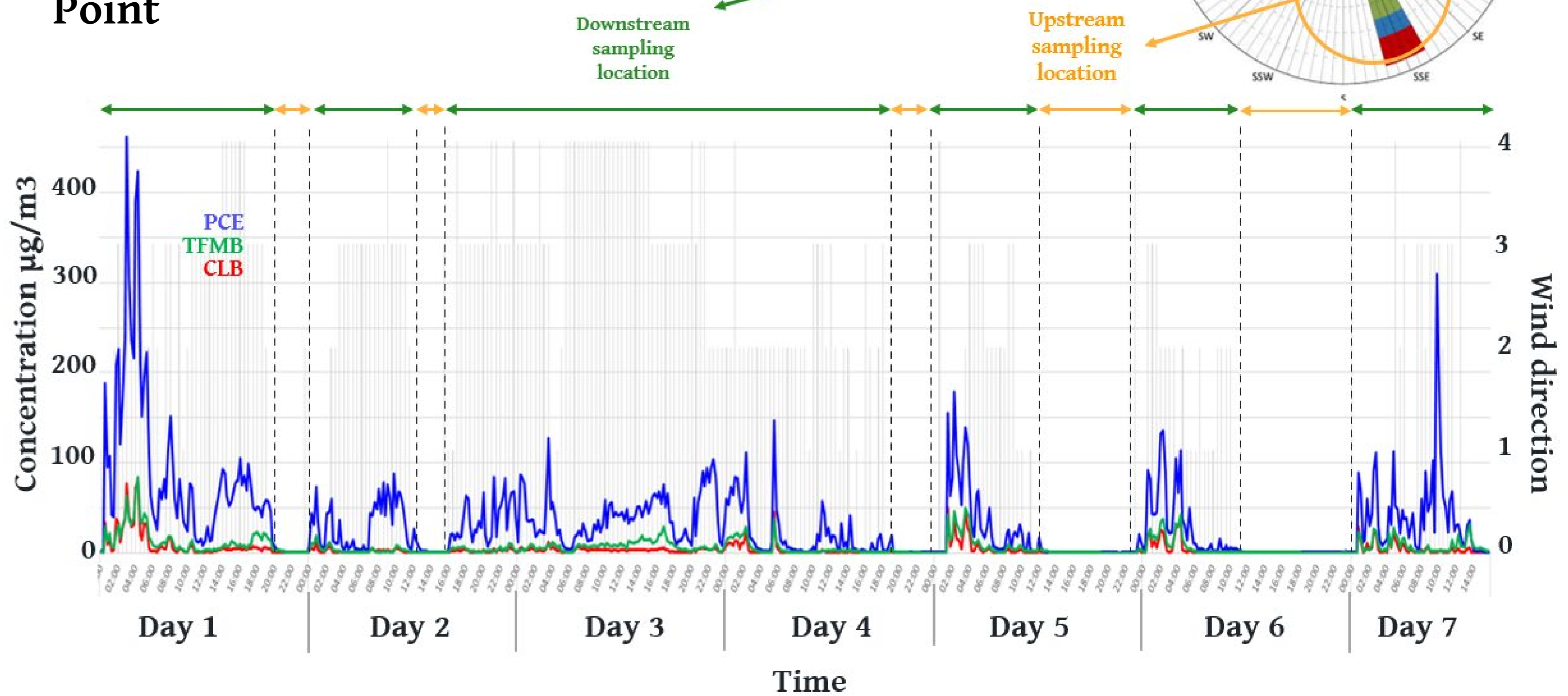
Sampling location



Wind correlation, South Point example

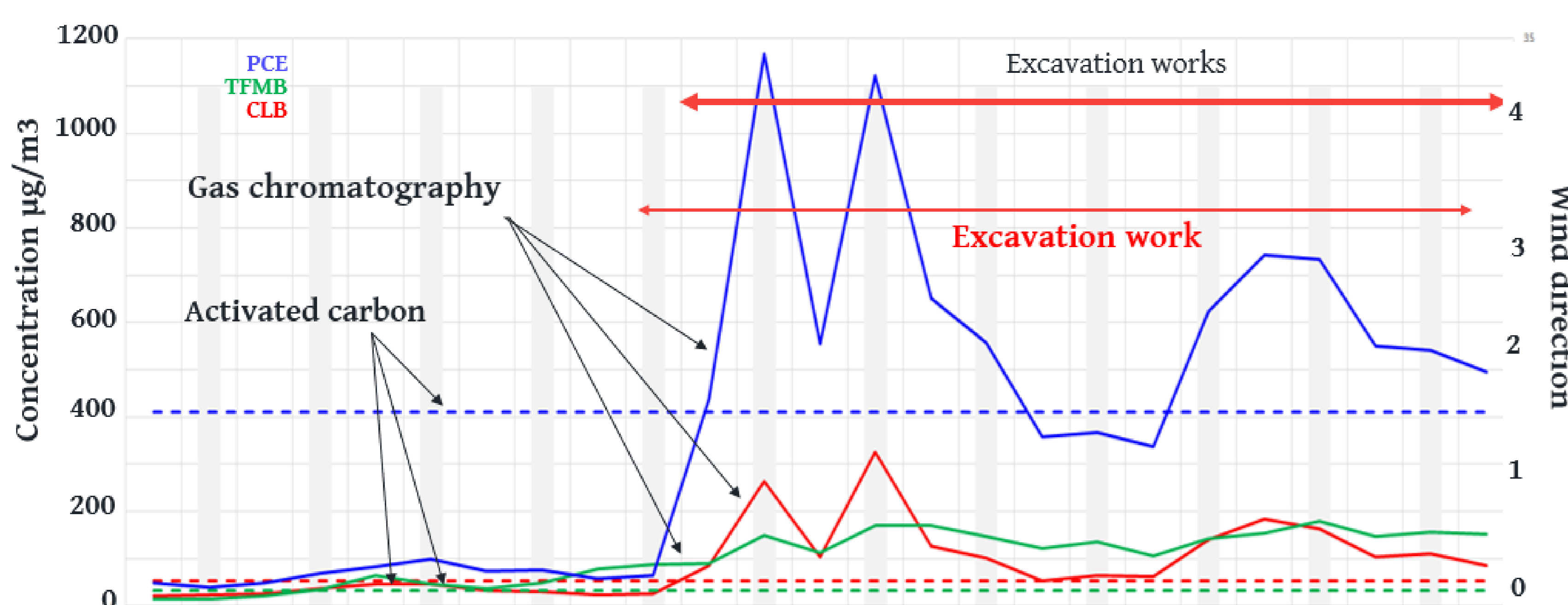


Data interpretation example, South Point



Gas chromatography validation

Gas chromatography measurement versus activated carbon on 1 excavation day monitoring



Activated carbon measurement versus Canister measurement on different samplings

mg/m ³	T1		T2		T3		T4		T5	
	Canister	Activated carbon	Canister	Activated carbon	Canister	Activated carbon	Canister	Activated carbon	Canister	Activated carbon
CLB	<0,00047	<0,0017	<0,00047	<0,0017	<0,00047	<0,0008	<0,00047	<0,0008	1,6	1,61
DCM	0,0022	0,0026	0,00086	<0,0017	0,012	0,006	0,0019	0,0019	0,25	0,604
PCE	0,0018	<0,0017	0,028	<0,0017	0,0028	<0,0008	<0,00057	<0,0008	8,4	5,368
TCE	<0,00047	<0,0017	0,0082	<0,0017	<0,00047	<0,0008	<0,00047	<0,0008	0,0094	0,009
Benzene	0,00044	<0,0017	<0,00042	<0,0017	0,0021	<0,0008	0,0004	<0,0008	0,0024	<0,0072
Toluene	0,00066	<0,0017	0,00083	<0,0017	0,035	0,0031	<0,00032	<0,0008	0,049	0,068

Conclusion and limitation

Criteria	Activated Carbon	Canister	Gas Chromatography
Advantages	<ul style="list-style-type: none"> Sampling time perfectly controllable oftenly used method 	<ul style="list-style-type: none"> Very low quantification limits Implementation on site very easy 	<ul style="list-style-type: none"> Low quantification limits direct data visualization 15min time step analysis (real time monitoring) Correlation with wind direction and speed
disadvantages	<ul style="list-style-type: none"> Implementation requires calibration and flow verification Difficulty to measure DCM Lower PCE concentrations compared to Canister measurement 	<ul style="list-style-type: none"> Sampling time Variable (preset by the laboratory) 	<ul style="list-style-type: none"> Analysis of DCM not possible Implementation Requires calibration for each compound Requires thermal insulation and regular on-site maintenance, equipment non-resistant to high temperatures
method used for the monitoring	X (8h weekly sampling)		X (continuous monitoring)