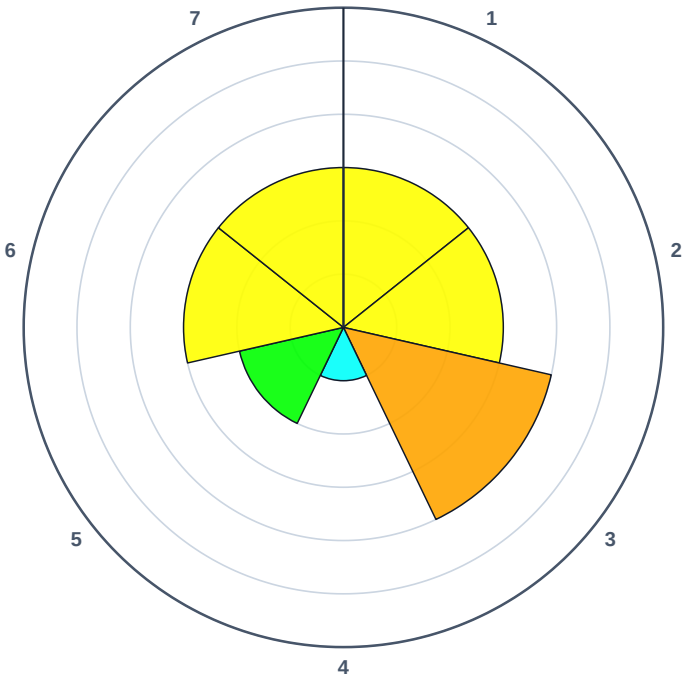
Ecotoxicology Analysis

During Remediation

Locality:	Ferrara, Italy, ER-site
Method:	Rhizodegradation (fertilizer + sunflower + bacteria 1)
Bioremediation methods:	During Bioremediation
Sample type:	soil
Collection date:	2025-10-29



ER soil with fertilizer + plant + bacteria 1

ORGANISMS

1. *A. fischeri 15*
2. *A. fischeri 30*
3. *Daphnids*
4. *Algae*
5. *Lettuce terrestrial*
6. *A. fischeri kinetic 15*
7. *A. fischeri kinetic 30*

CATEGORIES

- **A** Non-toxic
- **B** Low toxicity
- **C** Medium toxicity
- **D** High toxicity
- **E** Very high toxicity
- **F** Extreme toxicity

Category Distribution (% of organism readings) — most recent sampling: 29.10.2025

A: 15% | B: 14% | C: 57% | D: 14%

Resulting category (current): D High toxicity

Test Organisms by Type

Consumers: *Daphnids*

Producers: *Algae*, *Lettuce terrestrial*

Destruent: *A. fischeri 15*, *A. fischeri 30*, *A. fischeri kinetic 15*, *A. fischeri kinetic 30*

Most sensitive organism: Daphnids

Active ecotoxicity management recommended

Samples fall into category D. At 10% sample concentration inhibition is 20–50%, or EC50 is 10–50%. A significant toxic impact is observed.

- It is recommended to apply further environmental remediation, new sampling, new tests and find the main contaminant.

Ecotoxicity Assessment Criteria

CATEGORY	DESCRIPTION	CRITERIA (ACTIVE RULES)
A	Non-toxic	Undiluted sample: inhibition / stimulation -19.99% – 19.99%
B	Low toxicity	Undiluted sample: stimulation 20% – 50%, or Undiluted sample: inhibition 20% – 50%
C	Medium toxicity	Undiluted sample: stimulation 51% – 90%, or Undiluted sample: inhibition 51% – 90%
D	High toxicity	At 10% sample concentration: inhibition / stimulation -50.99% – 50.99%, or EC50 10% – 50%
E	Very high toxicity	At 10% sample concentration: inhibition 51% – 100%, or EC50 1% – 10%
F	Extreme toxicity	At 1% sample concentration: inhibition 10.01% – 100%, or EC50 0% – 0.99%

Notes: A sample's category is the worst (most toxic) grade reached by any single test organism. Determination of EC50 takes precedence over the inhibition value. In a luminescence bacterial test, an undiluted sample corresponds to a sample concentration of 500 mL/L.

Chemical Risk Assessment

During Remediation

Locality:	Ferrara, Italy, ER-site
Method:	Rhizodegradation (fertilizer + sunflower + bacteria 1)
Bioremediation methods:	During Bioremediation
Sample type:	soil
Collection date:	2025-10-29

No chemistry data recorded for this phase.

Supportive Methods

During Remediation

Locality: Ferrara, Italy, ER-site
Method: Rhizodegradation (fertilizer + sunflower + bacteria 1)
Bioremediation methods: During Bioremediation

Per-sample evaluation

Sample	Type	Diversity — Shannon (H')	Diversity — Simpson (1−D)	Nitrification	Respiration	Conformity
ER soil with fertilizer + plant + bacteria 1	Soil	— expected: Moderate or gradually increasing	— expected: Low to moderate		QR 0.14 **Acceptable — QR ≤ 0.5** **Conforming**	**Conforming**

Diversity (Shannon / Simpson): read as a trend across the before / during / after phases (rising = recovery), compared with the expected level per phase. **Respiration:** QR ≤ 0.5 acceptable; above that the AHB count is checked (≥ 1000 CFU/g = not suitable, below = not suitable without microbial augmentation). **Nitrification:** inhibition / stimulation within ±20%.