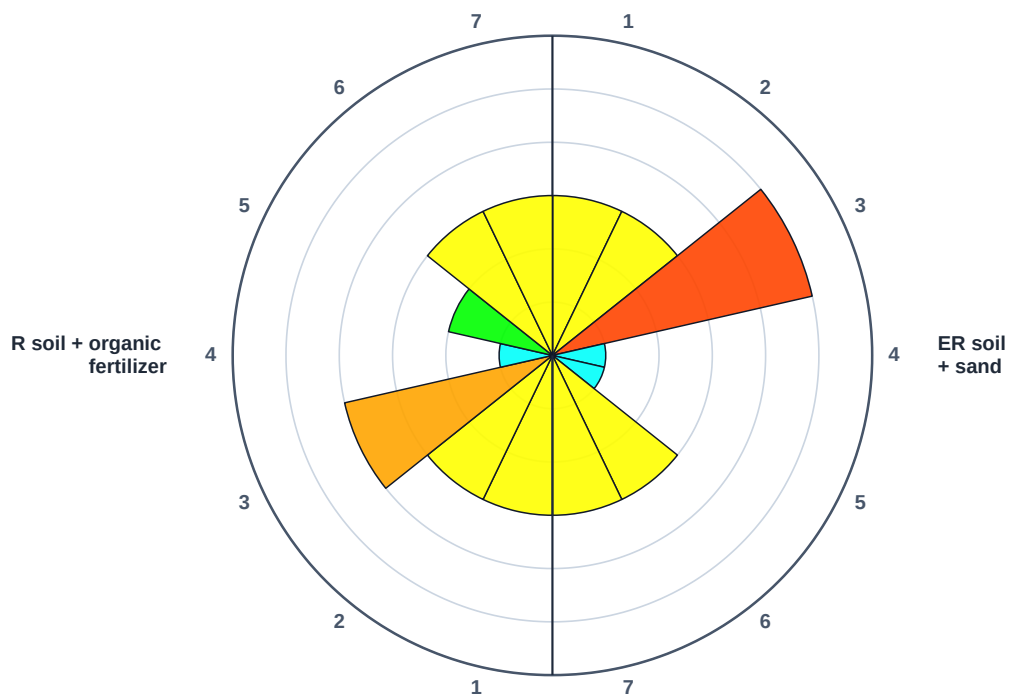


Ecotoxicology Analysis

During Remediation

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



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)

A: 22%

B: 7%

C: 57%

D: 7%

E: 7%

Resulting category: **E** Very 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

Critical ecotoxicological response recommended

Samples fall into category E. At 10% sample concentration inhibition is 51–100%, or EC50 is 1–10%. A severe toxic effect is present.

- It is recommended to implement immediate measures and conduct intensive monitoring.

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 (sunflower + bacteria) |
| Bioremediation method: | 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 (sunflower + bacteria)
Bioremediation method: During Bioremediation

Per-sample evaluation

| Sample | Type | Diversity — Shannon (H') | Diversity — Simpson (1-D) | Nitrification | Respiration | Conformity |
|------------------------------|------|---|--------------------------------|---------------|--|------------|
| ER soil + sand | Soil | — expected: Moderate or gradually increasing | — expected: Low to moderate | | QR 0.16 Acceptable — QR ≤ 0.5 Conforming | Conforming |
| ER soil + organic fertilizer | 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%.