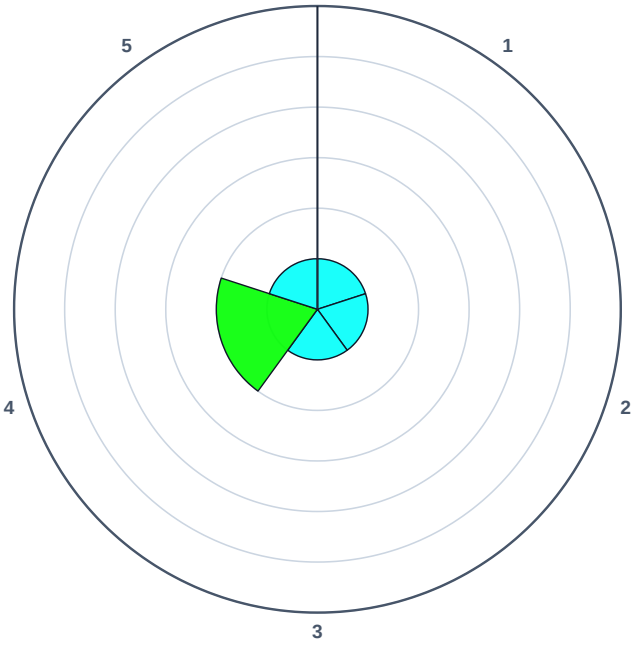
Ecotoxicology Analysis

During Remediation

Locality:	Alcalá de Henares, Spain, Municipal WW
Method:	Electro-Fenton treatment
Bioremediation method:	During Bioremediation
Sample type:	water
Collection date:	2026-03-09 – 2026-03-15



Electro-Fenton treatment

ORGANISMS

1. *Daphnids*
2. *A. fischeri 15*
3. *A. fischeri 30*
4. *Lettuce aquatic*
5. *Algae*

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: 80% **B: 20%**

Resulting category: **B** Low toxicity

Test Organisms by Type

Consumers:	*Daphnids*
Producers:	*Lettuce aquatic*, *Algae*
Destruent:	*A. fischeri 15*, *A. fischeri 30*

Most sensitive organism: Lettuce aquatic

Low toxicity — continued monitoring

Samples fall into category B. Inhibition in the undiluted sample is 20–50% and no test organism exceeded the threshold for a higher category.

- It is recommended to track toxicity trends in the following steps.

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

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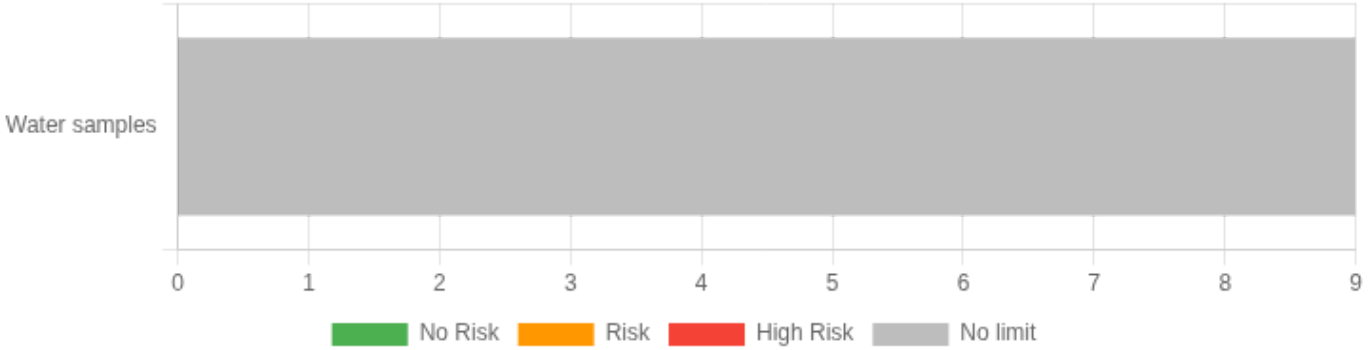
Collection date:	2026-03-09 – 2026-03-15

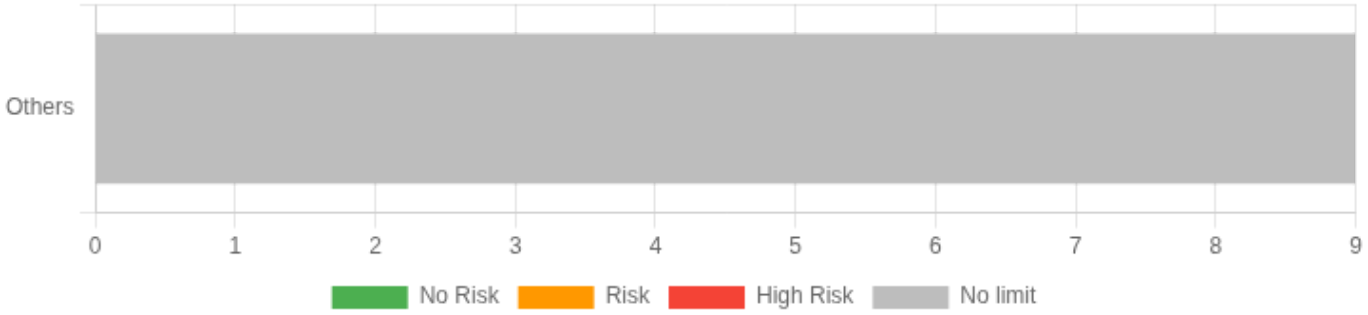
No Risk — at/below limit Risk — over limit (up to 50%) High Risk — more than 50% over limit

No limit — not defined

Risk distribution by sample type



Water samples



No risk 0% | Risk 0% | High risk 0% | No limit 100%

CLASS	NUMBER	OVER LIMIT	SUM CONCENTRATION
Others	9	0	165.2866 mg/L

SAMPLE	COMPOUND / ELEMENT	CLASS	MEASURED	UNIT
Electro-Fenton treatment	**Ammonium**	Others	**0.0884**	mg/L
Electro-Fenton treatment	**Calcium**	Others	**28.7895**	mg/L
Electro-Fenton treatment	**Chlordane**	Others	**47.8888**	mg/L
Electro-Fenton treatment	**Magnesium**	Others	**7.0418**	mg/L
Electro-Fenton treatment	**Nitrites**	Others	**25.0133**	mg/L
Electro-Fenton treatment	**Phosphate**	Others	**2.1311**	mg/L
Electro-Fenton treatment	**Potassium**	Others	**10.9344**	mg/L
Electro-Fenton treatment	**Sodium**	Others	**33.2202**	mg/L
Electro-Fenton treatment	**Sulfate**	Others	**10.1791**	mg/L

Supportive Methods

During Remediation

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Per-sample evaluation

Sample	Type	Diversity — Shannon (H')	Diversity — Simpson (1−D)	Nitrification	Respiration	Conformity
Electro-Fenton treatment	Water	— expected: Moderate or gradually increasing	— expected: Low to moderate	11.8% **Within ±20%** 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%.