Supplementary Information for: **Reactive Laser Ablation in Liquids as a Promising Approach for Repurposing Effluents from Former Mining Sites**

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Additional data.

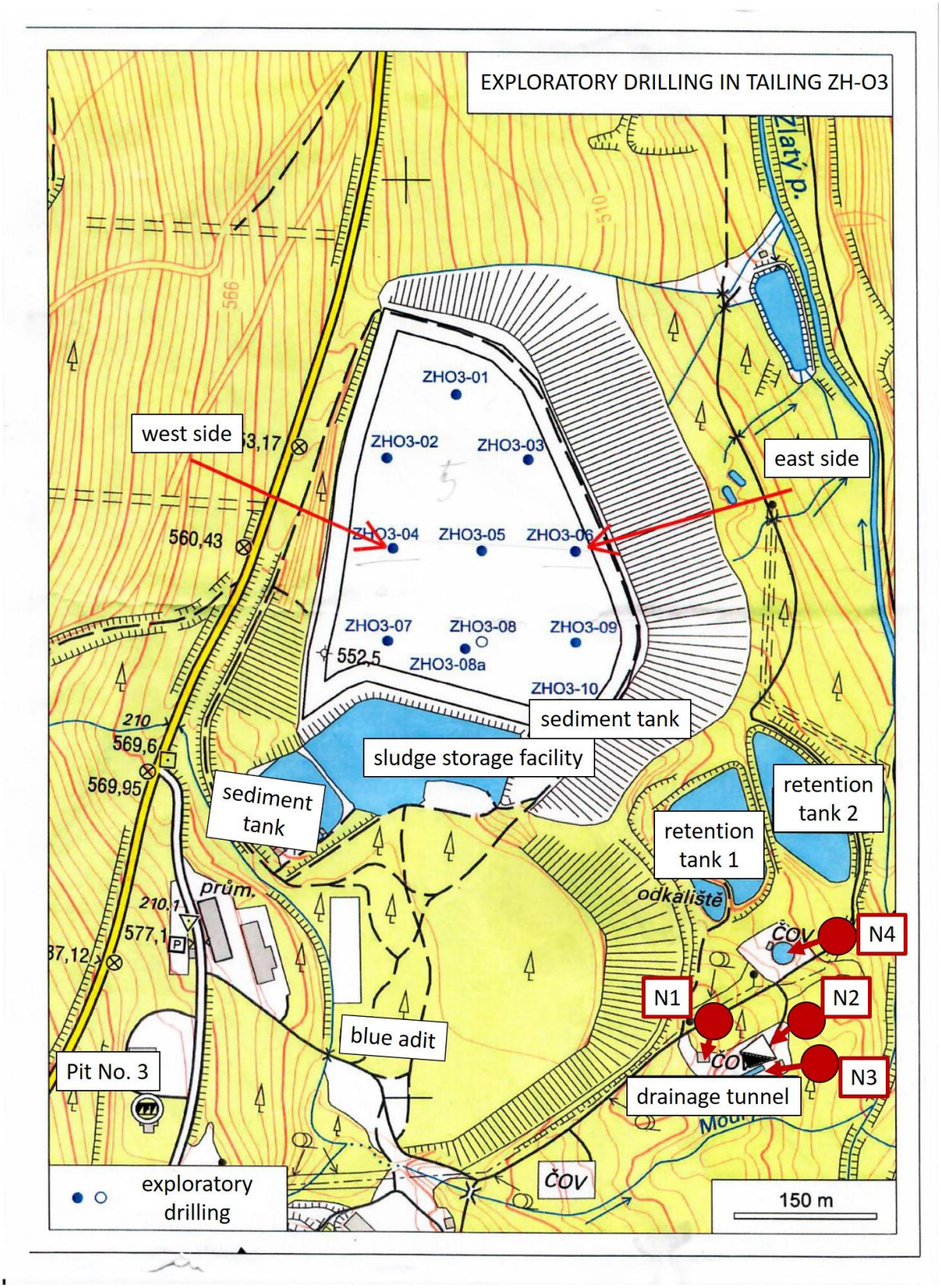

Figure S1. Map of the exterior of the former Zlate Hory mine, with red circles marking the sampling sites. All sites are drainage outputs from various locations within the mine, serving as representative effluents.

Figure S2. Diagram of the west side of the former Zlate Hory mine, with a red circle indicating the sampling site, being the most representative effluents zone. Note that sampling was conducted exclusively in areas accessible for research.

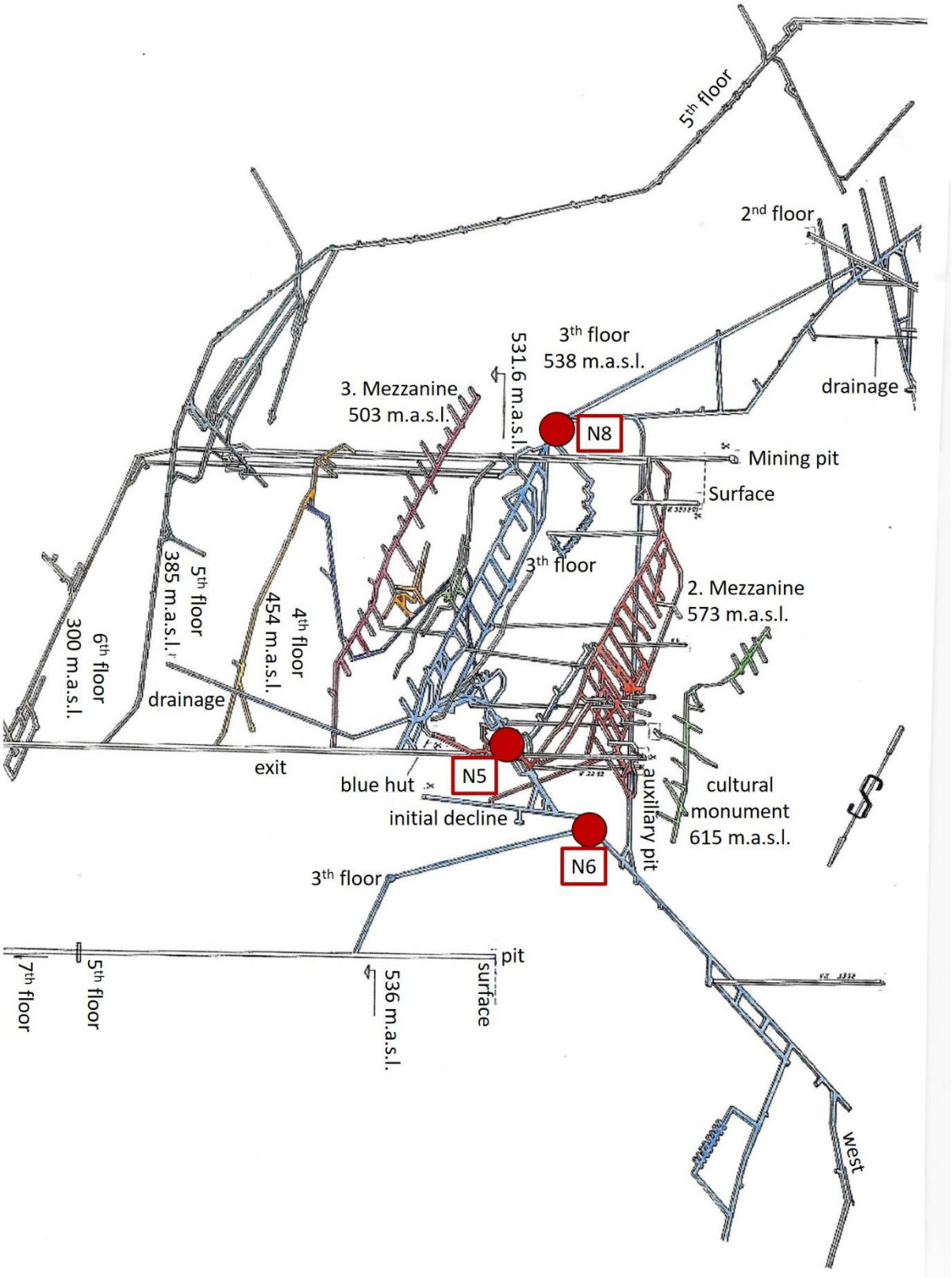

Figure S3. Diagram of the east side of the former Zlate Hory mine, with red circles indicating the sampling sites, being the most representative effluents zones. Note that sampling was conducted exclusively in areas accessible for research.

Table S1. Comprehensive data table of elements, extracted from Ref. 37 in the main manuscript. Au and Fe are highlighted with a gray background, as these elements are used as solid targets in RLAL.

Element	Atomic radii	Principal crystal structure	Electronegativity	Valency
Au	1.46 Å	FCC	2.54	I, III
Fe	1.26 Å	BCC	1.83	II, III
Al	1.43 Å	FCC	1.61	III
Ca	1.97 Å	FCC	1.00	II
Cu	1.28 Å	FCC	1.90	I, II
Fe	1.26 Å	BCC	1.83	II, III
K	2.35 Å	BCC	0.82	I
Mg	1.60 Å	HCP	1.31	II
Mn	1.61 Å	BCC	1.55	II, IV, VII
Na	1.86 Å	BCC	0.93	I
Zn	1.38 Å	HCP	1.65	II

Table S2. ICP-MS analysis of the original elemental concentrations in the effluents before their use in NPs synthesis via RLAL (highlighted with a gray background), as well as in the liquid collected after cleaning the synthesized NPs. The displayed retrieval efficiency of RLAL was then calculated based on these measurements. Note that these retrieval values provide only a rough estimate of the total retrieval efficiency achieved by RLAL. This is because the incorporation of elements into increasingly smaller NPs can introduce errors due to the technical limitations of precipitating these NPs by centrifuging during the NPs cleaning process, potentially leaving some in the liquid collected after NPs cleaning.

Solid plate	Al	Fe	Zn	Retrieved		
				Al	Fe	Zn
	(mg/L)			(%)		
None	11.20	14.20	16.70	-	-	-
Au	10.33	1.76	-	7.72	87.60	-
Fe	1.45	-	16.02	87.04	-	4.05

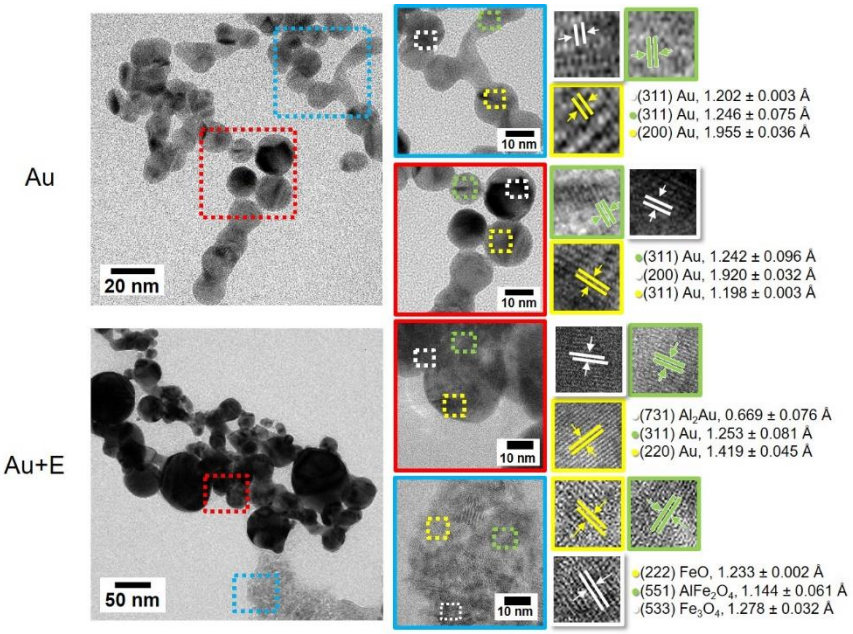

Figure S4. HRTEM micrographs of samples produced using Au as the solid plate, including the measured interplanar distances, assigned Miller indices, and corresponding crystal phases. For reference, the corresponding ICDD file numbers can be found in Fig. 2 in the main manuscript.

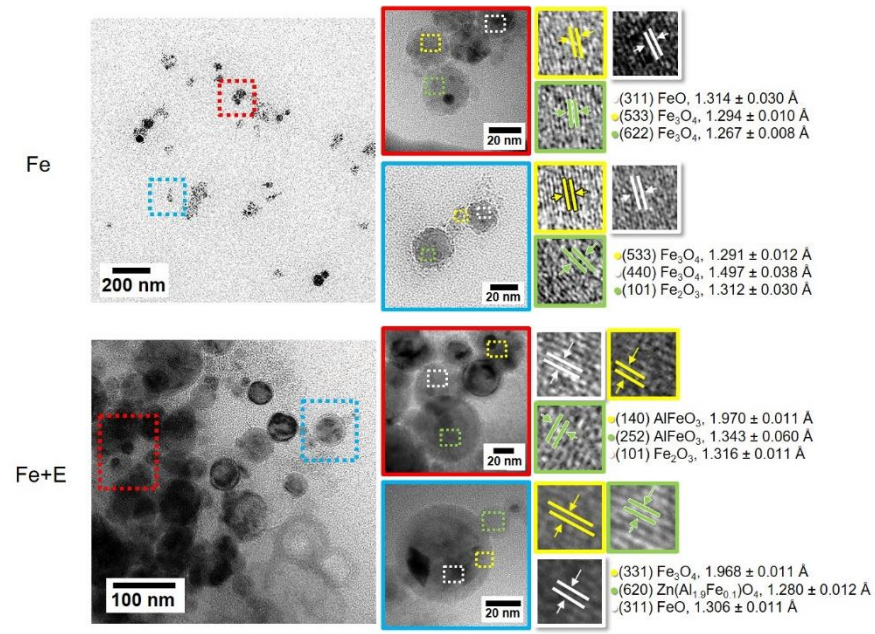

Figure S5. HRTEM micrographs of samples produced using Fe as the solid plate, including the measured interplanar distances, assigned Miller indices, and corresponding crystal phases. For reference, the corresponding ICDD file numbers can be found in Fig. 2 in the main manuscript.

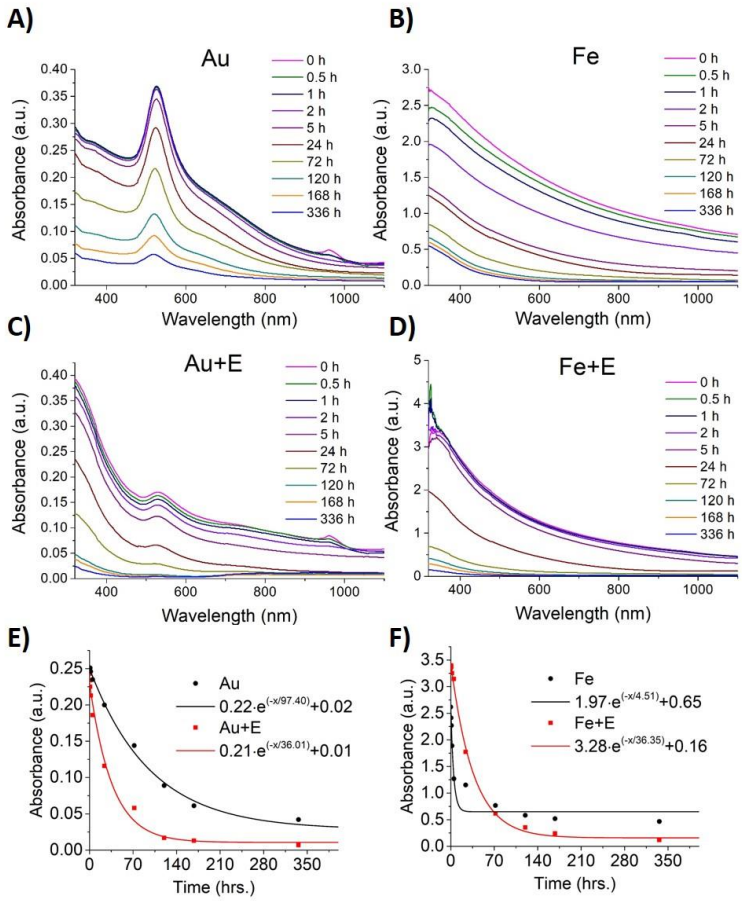

Figure S6. UV-Vis spectroscopy analysis performed over a two-week period for the following samples: A) NPs synthesized using the Au solid target in pure water, B) NPs synthesized using the Fe solid target in pure water, C) NPs synthesized using the Au solid target in the effluent, D) NPs synthesized using the Fe solid target in the effluent. E) shows the absorbance values at 400 nm for samples produced using the Au solid target, along with their corresponding fitting curves, and F) absorbance values at 348 nm with fitting curves for samples produced using the Fe solid target. The decreasing exponential fitting curves suggest that, although none of the samples will experience complete sedimentation (as evidenced by a non-zero value when extrapolated to infinite time), they cannot be considered hydrodynamically stable in the long term, principally due to the first hours' sediment behavior.