SAMPLE REPORT. Test area drawn around a known rare-earth occurrence to show the report format. Targets have not been field-verified. Not a customer deliverable.

Sample test area · Kızılçaören, Eskişehir

AREA	DEPOSIT MODEL	REPORT DATE	SATELLITE SCENE
3,598.8 ha	Carbonatite / alkaline REE	2026-10-17	2026-09-10

! NOT YET REVIEWED by a geologist. Draft for internal use; do not send to a customer.

> Targets are places to check in the field; they are not resources or reserves (UMREK, JORC, NI 43-101). Areas without usable data are excluded and reported as such. Every target should be verified in the field before any decision.

Summary

10 field targets in the top 5% of the licence for the Carbonatite / alkaline REE evidence model. Data from Sentinel-2 (2026-09-10) and the Copernicus 30 m elevation model; 100% of the licence had usable pixels.

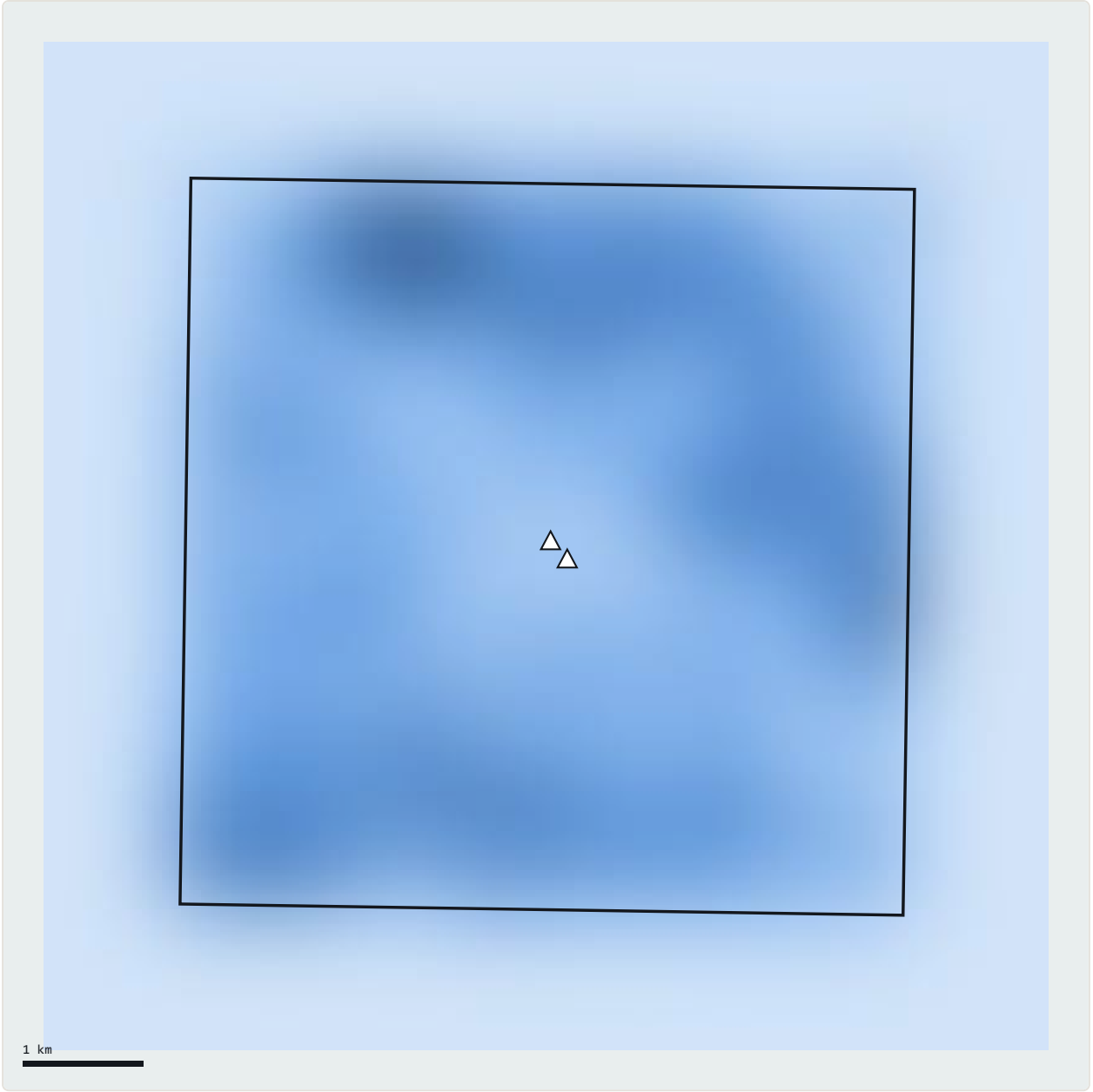
Ranked field targets

Target coordinates, target positions and the score map are hidden in this public sample. A customer report shows them in full.

Rank	Coordinates (WGS84, lat, lon)	Size	Data support	Why this place
1	[illegible]	68.1 ha	good	**Local relief (strong)**; Slope (moderate); Ferrous iron (Fe^{2+}) (weak)
2	[illegible]	17.0 ha	good	**Local relief (strong)**; Slope (weak); Ferrous iron (Fe^{2+}) (weak)
3	[illegible]	1.1 ha	partial	Local relief (moderate); Slope (moderate); Ferrous iron (Fe^{2+}) (moderate)
4	[illegible]	17.7 ha	good	Local relief (moderate); Slope (moderate); Ferrous iron (Fe^{2+}) (weak)
5	[illegible]	9.3 ha	good	**Local relief (strong)**; Ferrous iron (Fe^{2+}) (weak); Slope (weak)
6	[illegible]	2.0 ha	good	Local relief (moderate); Ferrous iron (Fe^{2+}) (moderate); Slope (moderate)
7	[illegible]	1.4 ha	partial	Ferrous iron (Fe^{2+}) (moderate); Bare soil / rock (moderate); Local relief (weak)
8	[illegible]	3.0 ha	good	**Local relief (strong)**; Slope (moderate)
9	[illegible]	8.5 ha	good	**Local relief (strong)**; Slope (weak); Ferrous iron (Fe^{2+}) (weak)
10	[illegible]	10.8 ha	good	**Local relief (strong)**; Slope (weak); Ferrous iron (Fe^{2+}) (weak)

Data support describes how much usable satellite data lies under the target (clear pixels and target size). It is not a probability that minerals are present.

Map



Screening score within this licence: low high

Numbers: targets. Triangles: catalogued occurrences. Line: licence boundary.

Known occurrences within 5 km (public catalogue)

Occurrence	Commodity	Status (catalogue)	Location	Nearest target
Kizilcaoren USGS_MRDS	Fluorite	Producer	inside licence	#10 · 1.67 km
Kizilçaören USGS_REE_OF02-189	Rare earths · carbonatite	Potential resource	inside licence	#7 · 1.75 km

Context check: the nearest target to the catalogued Kizilçaören occurrence (rare earths) is #7, 1.75 km away. Catalogue positions can be off by up to about 2 km.

> Reading this sample: the known occurrence is used as a fair check, not hidden. This Sentinel-2 evidence model ranks exposed ridges highest; the catalogued occurrence lies 1.75 km from the nearest target (#7). This matches our published blind test (not yet better than chance) and is why we recommend adding a hyperspectral analysis here, where 6 clear EnMAP scenes exist, before field work.

Satellite archive coverage

EMIT hyperspectral scenes (clear / all)	1 / 11
EnMAP hyperspectral scenes (clear / all)	6 / 7
ASTER SWIR scenes, 2000–2008 archive	61
Clear Sentinel-2 scenes, last 12 months	160
Clear Landsat 8/9 scenes, last 12 months	24
Sentinel-1 radar scenes, last 12 months	103

This report uses Sentinel-2 and the elevation model only. Hyperspectral and ASTER data, where available, are listed to show what a deeper analysis could add; they are not yet used in the scoring.

Method

- Each layer is compared with the rest of the licence (robust z-score against the licence median), so a target means "unusual within this licence", not unusual worldwide.
- Layers are combined with the deposit-model weights below. The top 5% of the smoothed score is grouped into clusters; each cluster is a target.
- "Why this place" lists the layers that raise the score most at the target: strong (z ≥ 2), moderate (1–2) or weak (< 1).
- Weights were set by geologists and adjusted after a correlation study on 433 known REE deposits. The method has not yet been validated in blind field tests (see the Validation page).

EVIDENCE LAYERS AND WEIGHTS

Layer	Weight	What it indicates
Local relief	+1.00	Local relief: elevation range within 420 m; high where rock is exposed on ridges and knolls
Slope	+0.50	Slope: steeper ground usually means thinner soil and more outcrop
Ferrous iron (Fe^{2+})	+0.50	Ferrous iron (Sentinel-2 B12/B8A): iron-bearing silicates and carbonates
Bare soil / rock	+0.50	Bare soil / rock index: little vegetation, ground visible to the sensor
Clay / carbonate (Al-OH, CO3)	-0.25	Clay / carbonate (B11/B12): Al-OH clays and carbonates; Sentinel-2 cannot separate the two
Vegetation (NDVI)	-0.25	Vegetation (NDVI): used with negative weight; vegetation hides the ground signal

Sentinel-2 scene	S2C_MSIL2A_20260910T084601_R107_T36SUJ_20260910T153114 (2026-09-10, 0.0% cloud)
Usable pixels in licence	99.9%
Resolution	20 m
Elevation model	Copernicus DEM GLO-30
Method version	0.2.0

Limitations

- Relief and slope point to exposed rock, which is where alteration can be seen; they are not mineral signatures by themselves.
- Sentinel-2 cannot separate clays from carbonates, and cannot see rare-earth absorption features. Hyperspectral data is needed for that.
- Vegetation, snow and cloud shadows reduce what the sensor sees; such areas get poor data support.
- Catalogue positions of known occurrences can be off by up to about 2 km.
- Targets are not ranked by grade or tonnage, and no economic statement is made.

Recommended next steps

1. Field visit to the top 5 targets with the REE / alteration protocol: lithology, alteration, structure, photos, GPS.
2. Portable XRF or handheld spectrometer readings at each target, and 2–3 rock samples for laboratory assay.
3. Add a hyperspectral analysis where clear EMIT or EnMAP scenes exist.
4. Record results in the workspace; they become training data and sharpen the next screen.

Automated checks

10 of 10 automated checks passed.

✓	`targets_present`	10 targets
✓	`targets_inside_licence`	all inside
✓	`coordinates_valid`	WGS84 ranges
✓	`ranking_consistent`	ranks sequential, scores descending
✓	`reasons_positive`	every target has a positive reason
✓	`scene_recent`	scene 2026-09-10 (37 days old)
✓	`usable_pixels`	100% usable pixels
✓	`model_known`	model carbonatite_ree
✓	`no_overclaiming`	no overclaiming phrases
✓	`disclaimer_present`	disclaimer present

OreRank · Method version 0.2.0 · Contains modified Copernicus Sentinel data and Copernicus DEM. Occurrence catalogue: USGS (REE OF02-189, MRDS).