

DOCUMENT CLASSIFICATION: EUDR DUE DILIGENCE COMPLIANCE DOSSIER
TECHNICAL EVIDENCE PACKAGE: DEFORESTATION-FREE (ART. 3a) & LEGALITY (ART. 3b)

1. POLYGON METADATA & PARCEL ATTRIBUTES

Operator / Declarant: EXAMPLE
Report Issue Timestamp: 2026-08-24 10:41:30 UTC
Temporal Baseline: Dec 31, 2020 (EUDR Cut-off)
Coordinate System: EPSG:4326 (WGS 84)
SHA-256 Data Signature: a57ffa067a27a796ca801b7cedf4df38a3c487b1831bcc2f791b95ba73b5a2db

Relevant Commodity: Coffee (HS 0901)
Total Parcel Area: 404,238.46 m2 (40.42 ha)
Centroid: 7.790121 deg S, 42.124269 deg W (WGS 84)
Bounding Box: [-42.126672, -7.793565, -42.121866, -7.786677]

2. FINAL EUDR REGULATORY VERDICT (ARTICLES 3a & 3b)

TECHNICAL COMPLIANCE: OPTICAL BASELINE ANOMALY REFUTED
Deterministic multi-sensor arbitration refutes baseline flag pursuant to Article 2(5) and cumulative FAO criteria.

3. MULTI-SENSOR & SOVEREIGN ARBITRATION MATRIX (EUDR BENCHMARKS)

Telemetry & Sensor Layer	Measured Value & Breakdown	FAO / Legal Benchmark	Physical Finding / Status
JRC EUDR Observatory 2020	100.0%	>10% Forest Cover	Anomalous Spectral Flag
Optical Consilium (Validation)	Hansen GFC: 88.44% MapBiomass: 100.0% ESA WorldCover: 0.0%	Cross-Sensor Consensus	Spectral Divergence Alert
12-Month Phenology Dynamics	EVI Delta: 0.399 SAR: 1.16 dB Clear S-2 Scenes: 12/12 (High Optical Confidence)	EVI >0.35 SAR >2.5 dB	Seasonal Deciduous Dynamics
NASA GEDI & S-1 C-Band	NASA GEDI (>5m): 0.0% ESA S-1 C-Band: 42.41%	GED1: >5m (FAO Height) S-1: Foliage (No Thresh)	Sub-5m Height (<5.0m FAO)
JAXA ALOS PALSAR (L-Band)	0.7%	Woody Biomass (>10%)	Absence of L-Band Woody Return
Adjacent Buffer (150m Ring)	JRC: 100.0%	Context (<10%)	Contiguous Shrubland Stand
Sovereign / WDPA Guard	Statutory Matrix (0 Overlaps)	Zero Overlap (0.0 ha)	Zero Statutory Overlap

Statutory Technical Due Diligence Findings (Articles 2, 3(a), 3(b), 9):

1. OPTICAL ANOMALY & CONSILIUM IDENTIFICATION:

Surface optical baseline registers elevated spectral reflectance from seasonal brush (JRC: 100.0%, UMD Hansen: 88.44%, ESA WorldCover: 0.0%, MapBiomass: 100.0%) across 12/12 clear Copernicus Sentinel-2 scenes (High Optical Confidence). Optical divergence is corroborated by independent consilium telemetry (ESA WorldCover: 0.0%).

2. DETERMINISTIC PHENOLOGICAL & STRUCTURAL ARBITRATION:

Temporal tracking exhibits natural seasonal leaf-shedding (EVI Delta: 0.399) alongside an undisturbed low structure (SAR Delta: 1.16 dB < 2.5 dB) and modest foliage scattering (ESA Sentinel-1: 42.41%). Direct physical telemetry proves failure of cumulative FAO forest criteria: sub-threshold arboreal tree height (NASA GEDI: 0.0% >5.0m) and absence of solid wooden trunks (ALOS PALSAR: 0.7% < 10%).

3. STATUTORY DETERMINATION (FAO & EUDR):

The parcel represents native shrubland, scrub, or wooded grassland (savanna/shrub biome). Telemetry proves non-forest status under FAO benchmarks, refuting the optical baseline as a false-positive pursuant to Article 2 (Definit.) of Regulation (EU) 2023/1115.

Adjacent buffer baseline (100.0%) reflects contiguous shrubland / scrub matrix, corroborating optical sensor overestimation.

4. SOVEREIGN TENURE, INDIGENOUS RIGHTS & SANCTIONS CLEARANCE (Articles 3(b) & 9):

Direct geospatial cross-referencing against statutory registers confirms zero spatial overlap (0.00 ha) with designated Indigenous Territories (FUNAI), Conservation Units (ICMBio), and active state environmental embargo ledgers (IBAMA / SEMA / SEMAS).

LEGAL & TELEMETRY BASIS: This forensic audit provides deterministic, non-predictive evidentiary documentation sourced from the National Aeronautics and Space Administration (NASA GEDI LIDAR), European Space Agency (ESA Sentinel-1/2), and Japan Aerospace Exploration Agency (JAXA ALOS-2), combined with PostGIS-indexed statutory public registers. Target geometries are evaluated strictly against statutory definitions in Regulation (EU) 2023/1115 Articles 2, 3(a), 3(b) and cumulative FAO parameters (>0.5 ha contiguous area, >5.0m canopy height, >10% canopy density).

FINAL TECHNICAL EVALUATION: The empirical evidence conclusively substantiates that the parcel satisfies the statutory criteria of Article 3(a) (zero deforestation relative to the Dec 31, 2020 cut-off) and Article 3(b) (statutory legality and unencumbered territorial title as of the audit date) pursuant to Regulation (EU) 2023/1115.

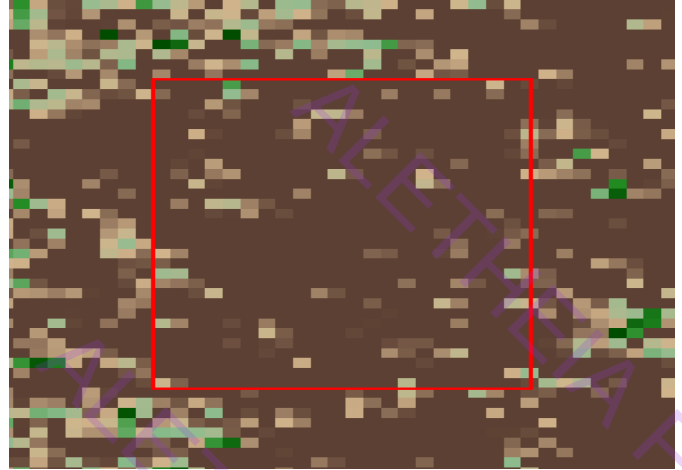
4. SATELLITE TELEMETRIC EVIDENCE REPOSITORY (2020 BASELINE)

Copernicus Sentinel-2 Cloud-Free RGB (Q4 2020)



Visual surface reflection showing parcel perimeter in red.

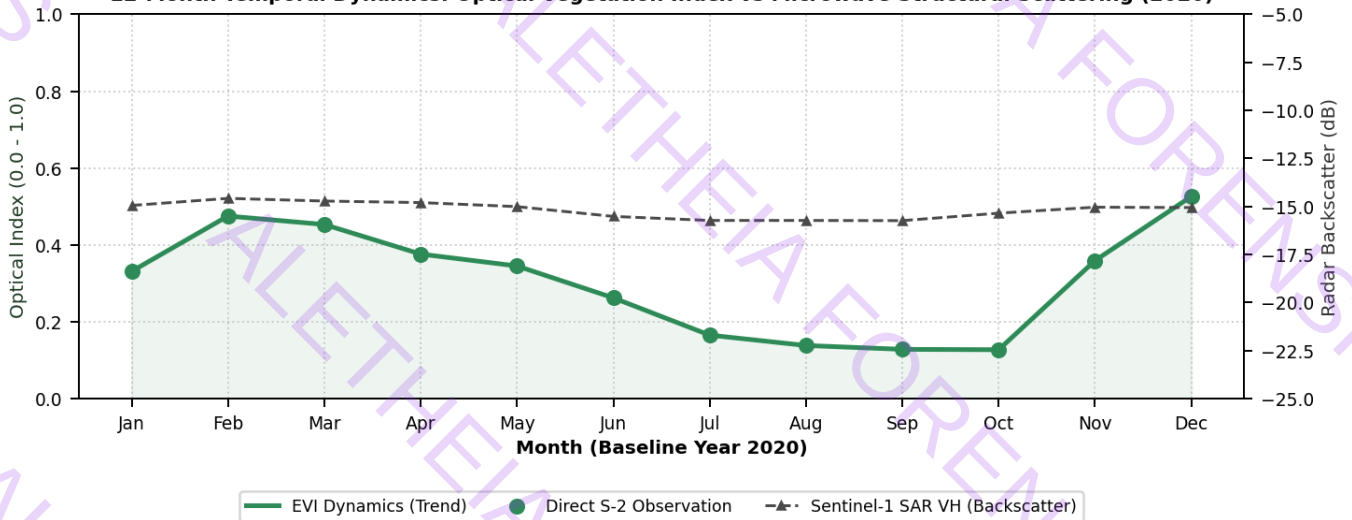
JAXA ALOS-2 L-Band SAR Biomass Heatmap



L-band microwave penetration (Brown = Low Biomass, Green = Forest).

12-Month Phenological Dynamics & Structural Tilling Signature (Sentinel-2 EVI vs Sentinel-1 SAR)

12-Month Temporal Dynamics: Optical Vegetation Index vs Microwave Structural Scattering (2020)



SPACEBORNE SENSOR ACQUISITION & SCENE REGISTRY (100% REPRODUCIBLE AUDIT TRAIL):

Copernicus Sentinel-2 Granule: L2A_T23MRM_A018468_20200918T131244

JAXA ALOS-2 SAR Tile: 2020

NASA GEDI / LiDAR Asset: NASA_GEDI_ETH_Lang2020_10m_v1

Acquisition: 2020-09-18 13:14:20 UTC | Sun Elev: 61.8°

ESA Sentinel-1 Scene: S1A_IW_GRDH_1SDV_20201001T082638_20201

Engine: Google Earth Engine Cloud Core + PostGIS GIST

5. APPENDIX: SCIENTIFIC METHODOLOGY & TELEMETRY SOURCES

LEVEL 1: Sovereign Land Tenure, Indigenous Rights & Environmental Sanctions (PostGIS Native GiST)

- Brazil Statutory Registers: FUNAI (Terra Indigena), ICMBio (Unidades de Conservacao), IBAMA & SEMA (Embargoed Deforestation Areas).
- Colombia & Peru Registers: ANT (Resguardos Indigenas / Afro-Colombian Lands), RUNAP (Parques Nacionales), SERNANP (Servicio Nacional de Areas Naturales Protegidas - Peru), SICNA/MINCULT (Sistema de Informacion sobre Comunidades Nativas / Ministerio de Cultura - Peru).
- Global Protected Areas: UNEP-WCMC WDPA (World Database on Protected Areas) pursuant to EUDR Article 3(b) legality mandates.

LEVEL 2: Multi-Spectral Surface Reflectance (Chlorophyll & Green Biomass)

- JRC EUDR Observatory 2020: Primary EC optical baseline. URL: <https://forest-observatory.ec.europa.eu>
- UMD Hansen GFC 2020: Global Forest Change v1.8. URL: <https://glad.umd.edu/dataset/global-2020-tree-cover-and-tree-cover-loss>
- MapBiomass Tropical Collection & ESA WorldCover: Optical spatial consensus. URLs: <https://mapbiomas.org> | <https://esa-worldcover.org>

LEVEL 3: 12-Month Phenological Dynamics (Sentinel-2 EVI & Sentinel-1 SAR Backscatter)

- Copernicus Sentinel-2 (L2A) & Sentinel-1 (GRD) 2020: Evaluates 12-month vegetative amplitude. Separates cyclical agriculture and seasonal deciduous leaf-drop from permanent forest canopy, supporting non-forest exclusions under FAO definitions (Article 2(5)).

LEVEL 4: Structural Noise & Height Validators (LiDAR Altimetry & Foliage Scattering)

- NASA GEDI Spaceborne LiDAR / ETH Zurich Canopy Height 2020: Laser altimetry identifying vegetation >5m. URL: <https://langnico.github.io/globalcanopyheight>
- ESA Sentinel-1 SAR Q4 2020 (C-Band, 5.6cm): Measures surface volume scattering (leaves/crops); blind to wood. URL: <https://dataspace.copernicus.eu>

LEVEL 5: Primary Physical Biomass Arbiter (CEOS Biomass Protocol & Woody Core Veto)

- JAXA ALOS PALSAR 2020 (L-Band SAR, 23cm, HV > -14.5 dB): Governed by CEOS (Committee on Earth Observation Satellites) Aboveground Biomass Protocols. Cross-polarized (HV) microwaves penetrate non-lignified canopy volume, reflecting exclusively off solid wooden trunks to arbitrate statutory FAO tree criteria. URL: https://www.eorc.jaxa.jp/ALOS/en/dataset/fnf_e.htm

PHYSICS OF REMOTE SENSING & BIOMASS ARBITRATION (ARTICLE 3(a))

OPTICAL SENSING LIMITATIONS: Passive optical sensors (JRC Observatory, Hansen GFC) measure multi-spectral surface chlorophyll reflectance. They are vulnerable to atmospheric interference and botanical blindness, frequently misclassifying seasonal agricultural crop cycles, high-biomass grass, or cloud shadows as deforestation.

CUMULATIVE STATUTORY PHYSICS (FAO FRA 2020 & CEOS STANDARDS): Under EUDR Art. 2(4), forest classification requires the cumulative coexistence of canopy density (>10%), statutory height (>5m), and arborescent woody stems (FAO-defined trees). Active spaceborne physics resolves these criteria deterministically:

- NASA GEDI Spaceborne LiDAR (1064 nm): Photon time-of-flight laser altimetry measures vertical canopy height profiles to objectively verify the statutory FAO 5m height threshold.
- ESA Sentinel-1 C-Band SAR (5.6 cm): Volume scattering off surface foliage tracks 12-month phenological dynamics, isolating agricultural harvesting from permanent tree stands.
- JAXA ALOS PALSAR L-Band SAR (23 cm): Operating under the CEOS Biomass Protocol, 23cm microwaves penetrate non-lignified foliage. Absence of L-band dielectric return mathematically refutes the presence of solid wooden trunks, legally disqualifying non-woody biomass from the statutory forest definition.

JURISDICTIONAL TOPOLOGY & SOVEREIGN LAND ARBITRATION (ARTICLE 3(b) & 9)

STATUTORY LEGALITY FRAMEWORK: Regulation (EU) 2023/1115 Article 3(b) mandates that commodities must be produced in compliance with local land-tenure legislation, customary indigenous land rights, and statutory environmental conservation laws.

DETERMINISTIC SPATIAL TOPOLOGY (POSTGIS ENGINE): The target polygon undergoes native geometric intersection (PostGIS Native GiST Index, EPSG:4326/geography) against authoritative public ledgers across two decoupled jurisdictions:

- Global Conservation Matrix (UNEP-WCMC / WDPA): Cross-matches parcel geometry against the global registry of >290,000 UN-designated protected areas and IUCN conservation categories (I-VI), verifying international territorial clearance for all global origins.
- Sovereign LatAm Cadastral & Sanction Ledgers: For high-risk tropical origins, geometries undergo deep-audit cross-matching against statutory state registries: Brazil (FUNAI Indigenous Lands, ICMBio Conservation Units, IBAMA / SEMA environmental embargoes), Colombia (ANT Resguardos & Afro-Colombian titles, RUNAP National Parks), and Peru (MINCULT/SICNA Native Communities, SERNANP Protected Areas).

DETERMINISTIC FORENSIC INTEGRITY (ISO 19115 / ZERO AI HALLUCINATIONS)

Aletheia Forensics strictly avoids predictive machine learning models, probabilistic neural networks, or unverified land-cover interpolations. Arbitration relies exclusively on empirical electromagnetic physics (laser photon time-of-flight and microwave dielectric backscatter) adhering to ISO 19115 / ISO 19157 geographic data quality standards, producing immutable physical evidence that cannot be spoofed.

6. LEGAL DISCLAIMER & EVIDENTIARY STANDARD

This Forensic Dossier constitutes an independent Open-Source Intelligence (OSINT) analytical package generated by Aletheia Forensics. It provides deterministic technical evidence to support the Operator's statutory Due Diligence Statement (DDS) under Article 10, mitigating enforcement exposure under Articles 14-16 of Regulation (EU) 2023/1115. Final regulatory clearance determinations rest solely with the competent authorities of EU Member States. Spaceborne telemetry objectively measures biophysical structure but does not substitute for local cadastral title deeds.