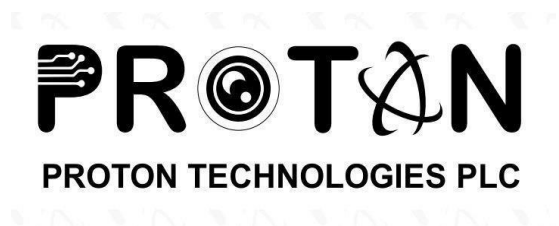


User Manual

For the Africa Strategic Transitional Critical Minerals (ASTCM) and REE Interactive and Dynamic Map



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SECTION ONE:

ACCEPTABLE USE POLICY (AUP) GUIDE

1 EXECUTIVE SUMMARY

The Africa Strategic, Transitional, and Critical Minerals (ASTCM) Interactive and Dynamic Map is a decisive, continent-endorsed platform designed to transform Africa's mineral wealth into a lever for economic sovereignty, integrated planning, and sustainable development, in direct support of Agenda 2063 and the Africa Mining Vision. This initiative moves beyond a simple map to establish a single, authoritative source of mineral intelligence, empowering Member States and Regional Economic Communities (RECs) to negotiate from a position of strength, attract responsible investment, and combat illicit financial flows. Its foundational principles are built on a robust governance framework where **data sovereignty** is paramount—Member States retain ownership of their national data while the African Union Commission (AUC-ETIM) acts as the supreme custodian, ensuring all outputs are validated, legitimate, and serve the continent's collective interest. The platform guarantees trust and utility through a multi-tiered **stewardship** model, enforcing rigorous data validation, tiered access controls to protect sensitive information, and a clear enforcement regime. Furthermore, it is engineered for **interoperability**, adhering to international standards to seamlessly connect with global data ecosystems and using harmonized scientific lexicons to enable meaningful cross-border analysis. The strategic benefits are clear: enhanced transboundary governance, integrated ESG and geohazard risk management, credible UNFC-aligned resource reporting for investors, and powerful analytics for policy and planning. This Manual provides the integrated governance, policy, and operational framework to ensure the ASTCM fulfills its promise as a trusted, enduring continental public good.

2 ACKNOWLEDGEMENTS

The African Union Commission (AUC) extends its profound gratitude to all partners and contributors whose expertise and support were instrumental in the successful development of this Manual and the accompanying Africa Strategic Transitional and Critical Minerals (ASTCM) Interactive and Dynamic Map.

Special recognition is accorded to:

- **Expertise France:** For providing generous financial and strategic support.

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- **Dr. Gebremedhin Tesfaye,** Addis Ababa University: For his indispensable role as GIS Expert in architecting the interactive and Dynamic map using advanced ArcGIS tools.
- **Mr. Biruk Tesfaye,** CEO of Proton Technology: For his ICT leadership in developing the interactive website and ensuring seamless online functionalities.
- **Professor Youssouf:** For his invaluable strategic advice and guidance throughout the project.

This initiative stands as a powerful example of the transformative outcomes achievable through collaboration between **continental governance**, **private sector innovation**, and **academic excellence**, all united in advancing Africa's strategic mineral interests for a prosperous and integrated future.

3 DEFINITIONS & ACRONYMS

This glossary provides definitions for key terms, acronyms, and technical language used in **Africa's Strategic Transitional Critical Minerals (ASTCM) Interactive and Dynamic Map** and its supporting documentation. It is designed to help both technical and non-technical users understand the concepts presented.

3.1. Acronyms

- ✓ **4IR:** Fourth Industrial Revolution
- ✓ **AKSP:** African Knowledge Sharing Platform
- ✓ **AMDC:** African Minerals Development Centre
- ✓ **ASTCM:** Africa Strategic, Transitional, and Critical Minerals
- ✓ **AU:** African Union
- ✓ **AUC:** African Union Commission
- ✓ **BFS:** Bankable Feasibility Study
- ✓ **CRIRSCO:** Committee for Mineral Reserves International Reporting Standards
- ✓ **CRS:** Coordinate Reference System
- ✓ **CSOs:** Civil Society Organizations
- ✓ **DFS:** Definitive Feasibility Study
- ✓ **ESG:** Environmental, Social, and Governance

- ✓ **ETTIM:** Economic Development, Trade, Tourism, Industry, and Minerals (Division of the AUC)
- ✓ **GIS:** Geographic Information System
- ✓ **GPS:** Global Positioning System
- ✓ **HMS:** Heavy-Mineral Sands
- ✓ **HREE:** Heavy Rare Earth Elements
- ✓ **IAC:** Ionic-Adsorption Clay
- ✓ **JORC:** Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves
- ✓ **LREE:** Light Rare Earth Elements
- ✓ **NI 43-101:** Canadian National Instrument for the Standards of Disclosure for Mineral Projects
- ✓ **OGC:** Open Geospatial Consortium
- ✓ **PEA:** Preliminary Economic Assessment
- ✓ **PFS:** Pre-Feasibility Study
- ✓ **REC:** Regional Economic Community
- ✓ **REEs:** Rare Earth Elements
- ✓ **REO:** Rare Earth Oxides
- ✓ **RFC 7946:** GeoJSON coordinate/order standard
- ✓ **SAMREC:** South African Code for the Reporting of Exploration Results, Mineral Resources, and Mineral Reserves
- ✓ **SDGs:** Sustainable Development Goals
- ✓ **SEC S-K 1300:** U.S. Securities and Exchange Commission mining disclosure framework
- ✓ **TNCs:** Transnational Corporations
- ✓ **TREO:** Total Rare Earth Oxides
- ✓ **UNFC:** United Nations Framework Classification for Resources
- ✓ **USGS:** U.S. Geological Survey
- ✓ **WGS84:** World Geodetic System 1984

3.2. Key Terms

Agenda 2063: The African Union's strategic framework for achieving inclusive and sustainable development across the continent.

Authoritative Outputs: Formally approved data products, maps, and analytics released by the AUC-ETTIM after full validation.

Basemap: A background map (e.g., satellite, topographic) that provides geographic context for overlying data layers.

Critical Minerals (CrMs): Minerals essential to modern technologies, economic security, and the clean energy transition, often with concentrated supply chains.

Custodianship: The ultimate responsibility held by AUC-ETTIM for the governance, ethical stewardship, and official releases of the ASTCM.

Data Sovereignty: The principle that Member States retain legal ownership of their national data, while granting the AUC custodial rights for continental integration.

Dynamic Map: An interactive and Dynamic map that updates automatically as new data becomes available.

Interoperability: The capacity of the ASTCM to seamlessly connect and exchange data with other AU and global systems using common standards.

Layer: A thematic dataset (e.g., mineral deposits, infrastructure) that can be visualized and analyzed on the Interactive and Dynamic Map.

Metallogenic Classification: A harmonized continental system for categorizing mineral deposit types to enable consistent mapping and comparison.

Mining 4.0: The modernization of mining through digital tools, automation, and smart technologies in line with Industry 4.0.

Normative Precedence: The established hierarchy where the ASTCM Manual is the single authoritative reference, taking priority over any conflicting guidance.

Pop-up: An interactive information box that appears when a user clicks on a map feature, displaying detailed attributes.

Provenance: The documented record of a dataset's origin, ownership, and transformation history, ensuring traceability and trust.

Strategic, Transitional, and Critical Minerals (STCMs): Minerals that are "Strategic" for Africa's development, "Transitional" for the global clean energy shift, and "Critical" due to economic importance and supply risk.

Technical Steward: The role of the AMDC, responsible for the platform's technical architecture, data pipelines, and operational maintenance.

Tiered Access Model: The security framework governing data access, comprising Public, Institutional, and administrative tiers.

UNFC-Aligned Reporting: The requirement for resource and reserve statements to conform to the United Nations Framework Classification for international credibility.

Validation Architecture: The multi-stage, risk-aware pipeline for ensuring data accuracy and legitimacy before official release.

4 GOVERNANCE & CUSTODIANSHIP

4.1. Custodianship: The Hierarchy of Authority

The governance of the Africa Strategic, Transitional, and Critical Minerals (ASTCM) Interactive and Dynamic Map is founded on a clear hierarchy of authority that ensures its integrity and legitimacy as a continental public good. The African Union Commission's Executive Technical Team on Integrated Minerals (AUC-ETTIM) serves as the **supreme custodian**, holding ultimate responsibility for policy, governance, and the ethical stewardship of the platform. AUC-ETTIM is the sole entity empowered to issue authoritative data releases and provide binding interpretations of this policy. The African Minerals Development Centre (AMDC) acts as the **technical steward**, tasked with implementing and maintaining the platform's architecture, managing data validation pipelines, and ensuring its operational continuity. Crucially, Member States and Regional Economic Communities (RECs) retain full legal ownership of their contributed source datasets. By submitting data, they grant the AUC custodial rights to integrate, harmonize, and publish this information as part of the authoritative ASTCM, with the explicit guarantee that all outputs will be accompanied by complete provenance metadata, preserving and highlighting national ownership.

4.2. Partner Posture: Mandate-Limited Engagement

All external partners, including donors, contractors, and vendors, operate under a strictly defined, non-custodial mandate to protect the sovereignty and authoritative voice of the ASTCM. Partner engagement is permitted only under an explicit African Union mandate and a formally documented Statement of Work. Partners are expressly prohibited from replicating, hosting, rebranding, or issuing any outputs that could be misconstrued as official ASTCM products without prior written authorization from AUC-ETTIM. This prevents the emergence of parallel data pipelines or competing versions that could undermine the platform's continental authority. While performing their scoped duties, partners must adhere to all platform security, provenance, and audit protocols, and all their deliverables are subject to rigorous validation gates by AMDC and final approval by AUC-ETTIM before any public release.

4.3. Normative Precedence: A Single Source of Truth

To ensure consistency and eliminate ambiguity, this Manual and Acceptable Use Policy is established as the single, authoritative operational reference for the ASTCM. It takes precedence over any conflicting guidance, donor-issued documentation, or unilateral reinterpretations. The binding hierarchy of authority is defined as follows: this Manual/AUP supersedes all other documents, followed by formal AU decisions and resolutions, then technical standards annexes, and finally, implementation guides and project-specific Statements of Work. To manage evolution systematically, the ASTCM employs semantic versioning for all policy and technical artifacts, with each release accompanied by a detailed changelog and migration guidance. The authority to issue binding interpretations of this Manual rests solely with AUC-ETTIM, informed by technical assessments from AMDC. All such interpretive decisions and dispute resolutions are formally recorded in a central registry to ensure consistent application across all stakeholders and over time.

5 LEGAL, STANDARDS & INTEROPERABILITY FRAMEWORK

5.1. Legal and Policy Anchors

The ASTCM Interactive and Dynamic Map is firmly anchored in established continental and international policy frameworks to ensure its legitimacy, strategic relevance, and regulatory defensibility. Its operational existence and governance are direct implementations of high-level African Union

strategies, including Agenda 2063, the Africa Mining Vision (2009), and the African Green Minerals Strategy (2024), and are governed in accordance with the AU Data Policy Framework. For mineral resource reporting, the platform mandates the use of the United Nations Framework Classification (UNFC), while requiring documented equivalences to CRIRSCO-based systems to ensure global credibility and comparability for investors. This robust legal anchoring is fundamental to reinforcing ASTCM's status as a continental public good and ensures that its outputs carry authoritative weight in both regional policy dialogues and international investment forums.

5.2. Standards for Quality and Interoperability

To guarantee data quality, discoverability, and machine-readable interoperability, ASTCM adheres to a rigorous set of internationally recognized standards. The platform implements Open Geospatial Consortium (OGC) service protocols and ISO 19115/19139 metadata standards, ensuring consistent documentation and exchange of spatial datasets. Embedded quality assurance practices—including provenance metadata, validation logs, and systematic version control—are applied to every published data layer. For mineral resource reporting, the platform operationalizes and maintains technical equivalences between UNFC and CRIRSCO conventions, with these mappings documented in the platform's technical annexes. Together, these standards and quality measures ensure that ASTCM outputs are transparent, reproducible, and technically suitable for integration into national, regional, and international data workflows.

5.3. Interoperability and Data Governance

The policy requires system-to-system conformance, enabling the ASTCM to function not as an isolated repository but as a connected node within broader AU infrastructures and global data ecosystems. This interoperability is achieved through standardized schemas, shared vocabularies, and mapping tables that support both syntactic and semantic alignment, allowing for meaningful cross-border comparisons and aggregated analytics while preserving source provenance. Practical commitments include the provision of APIs, documented data contracts, and conformance testing. This technical foundation is complemented by a robust data governance framework that mandates tiered access controls, clear licensing, risk assessments for sensitive geolocations, and incident response procedures. Furthermore, the framework requires investment in capacity building for Member States and RECs, ensuring they can

meet technical requirements and sustainably manage their data, thereby balancing transparency and utility with security, sovereignty, and ethical stewardship.

6 DATA SOVEREIGNTY & SECURITY

6.1. Sovereignty: A Dual Principle

The ASTCM Acceptable Use Policy is founded on the principle of dual sovereignty, which carefully balances national rights with continental integration. The African Union Commission (AUC) holds custodial responsibility for the integrated continental dataset and is empowered to designate authoritative outputs in line with AU policy frameworks. Concurrently, individual Member States retain unequivocal legal ownership and exclusive authority over their national and commercially sensitive data. This arrangement ensures that any integration, transformation, or public release of a national dataset into an AU-owned product occurs only with the explicit consent of the contributor, documented provenance, and formal custodial authorization from AUC-ETTIM. This dual model protects national prerogatives while enabling the collective action and legitimacy required for the ASTCM to function as a true continental public good.

6.2. Access Tiering: Balancing Transparency with Control

To practically manage the balance between open data and sensitive information security, ASTCM implements a mandatory three-tier access model. The **Public Tier** provides open access to non-sensitive display layers and summary analytics, supporting public awareness, research, and transparency. The **Institutional Tier** grants authorized AU bodies, Regional Economic Communities (RECs), and Member States access to full datasets and advanced analytics for internal policy formulation, planning, and regional coordination, governed by strict accreditation and role-based permissions. The **Administrative Tier** is restricted to the custodial and technical teams (AUC-ETTIM and AMDC), providing control over system governance, data ingestion pipelines, and core security settings to preserve the platform's integrity. Each tier is governed by documented access contracts, comprehensive activity logging, and periodic access reviews to ensure compliance with AU data governance principles.

6.3. Confidentiality: Protecting Sensitive Information

The policy enforces strict confidentiality controls to protect geostrategic, contractual, and commercially sensitive information from unauthorized access or disclosure. The release of any sensitive data requires formal authorization protocols, which include documented approvals, purpose-limited access, and robust audit trails. All access events to controlled information are logged and subject to independent audit, with any breaches triggering immediate incident response, remediation plans, and potential sanctions. Licensing terms and non-disclosure agreements (NDAs) accompany all controlled data releases, and systematic risk assessments guide decisions on whether sensitive data should be masked, aggregated, or withheld to protect national security, commercial confidentiality, and community rights. These measures align the ASTCM with continental data protection objectives and establish it as a responsible steward of Africa's most critical mineral intelligence.

7 DATA INTEGRITY & VALIDATION

7.1. Validation Architecture: A Multi-Tiered Assurance Pipeline

The integrity of the ASTCM is guaranteed by a multi-tiered, risk-aware validation architecture designed to ensure data accuracy, technical defensibility, and institutional legitimacy. This process begins at the **Source Tier**, where all incoming data submissions are automatically screened for completeness, schema conformance, and basic verifiability, with mandatory provenance fields required to advance. Qualifying data then progresses to the **Technical Review Tier**, where specialist geological and GIS teams from the AMDC and Member States perform rigorous domain-specific checks for spatial accuracy, topological consistency, and methodological soundness, combining automated quality controls with expert human review for anomalies or high-risk content. The final **Institutional Validation Tier** requires the African Union Commission, in coordination with the relevant REC or Member State, to conduct a formal acceptance review, confirming that all legal, policy, and sovereignty conditions are met before a dataset is granted authoritative status. Every step in this pipeline generates machine-readable logs, a human-readable validation report, and a changelog entry, creating a complete and auditable chain of custody from submission to release.

7.2. Update Regime: Structured Currency with Controlled Change

ASTCM follows a structured update regime that balances the need for current information with the imperative of custodial control. **Scheduled Updates** occur on published cadences (e.g., quarterly or semi-annually) and follow the full multi-tiered validation and authorization workflow; each scheduled release is accompanied by version identifiers, migration notes, and clear deprecation timelines for superseded assets. **Event-Driven Updates**, triggered by material geological discoveries, contractual changes, or urgent policy needs, are permitted but must pass the same rigorous validation gates and receive formal custodial sign-off from AUC-ETTIM before publication. All updates, regardless of type, are governed by a formal change-control board chaired by AUC-ETTIM and must include rollback procedures, impact assessments for dependent services, and stakeholder notifications to ensure stability and trust.

7.3. Progressive Automation: Risk-Based Evolution

The introduction of automation into the validation and ingestion processes is managed through a disciplined, risk-based classification framework to preserve data integrity and Member State sovereignty. Low-risk, well-structured datasets are candidates for semi-automated processing, where predefined rules perform initial cleansing and flag exceptions for human expert review. Higher-risk or sensitive datasets remain subject to manual or hybrid

review until confidence metrics, operational audits, and demonstrated performance justify a carefully managed expansion of automation. All automated processes must implement immutable audit trails, anomaly detection, and exception-flagging mechanisms that route uncertain cases to human reviewers. Before any expansion of automation, the AMDC must demonstrate successful test results, acceptable error-rate thresholds, and robust remediation plans to AUC-ETTIM, ensuring that all automation rollouts are staged, closely monitored, and reversible.

8 SCIENTIFIC & TECHNICAL STANDARDS

8.1. Lexicons & Coding: A Common Continental Language

To ensure consistent description and interpretation of geological data across all Member States, the ASTCM mandates the adoption of standardized, harmonized lexicons and attribute coding. The platform requires the use of controlled vocabularies aligned with the Africa Minerals Development

Centre (AMDC) and the Organization of African Geological Surveys (OAGS) for core domains such as stratigraphy, lithology, and mineralization style. All data submissions must conform to these published coding schemes, with mandatory metadata fields recording the lexicon version and mapping any local terms to the continental standard. This enforcement of attribute normalization, supported by automated validation and a formal change-control process for updates, ensures scientific rigor and minimizes semantic drift. To sustain this consistency, the policy mandates ongoing capacity building and periodic refresher training for national geological survey teams.

8.2. Metallogenic Classification and Typology: Enabling Cross-Border Comparison

The platform implements a harmonized continental metallogenic deposit typology and belt delineation to provide a unified scientific framework for mapping and analysis. Deposit types and genetic models, defined in a dedicated technical annex, are applied consistently to all incoming datasets through a combination of automated classification rules and expert review. This standardized typology is fundamental for meaningful cross-country comparability, regional syntheses, and policy-relevant analytics, as it guarantees that geologically similar features are classified uniformly. To ensure defensibility, contributors must supply supporting evidence—such as geochemical signatures and structural context—for their deposit assignments, and where uncertainty exists, provide confidence scores and a documented rationale, which are then surfaced in the platform's metadata to inform risk-sensitive decision-making.

8.3. UNFC-Aligned Reporting: Ensuring Investor Credibility

To establish and maintain investor confidence, all resource and reserve reporting on the ASTCM must conform to the United Nations Framework Classification (UNFC) and include documented equivalences to CRIRSCO or other internationally recognized reporting codes. Each resource statement must be accompanied by comprehensive provenance metadata that records the reporting standard used, the responsible authority, and any crosswalks applied between classification systems. The platform will provide standardized templates for UNFC reporting and subject all resource declarations to its full validation and institutional acceptance workflow before granting them authoritative status. To further strengthen transparency, ASTCM will maintain a clear audit trail of revisions, require third-party

verification for high-value declarations where appropriate, and display versioned resource statements with clear indicators of their confidence level and authoritative status.

8.4. Scientific Governance and Continuous Improvement

The long-term scientific coherence of the ASTCM is sustained through a governance model that combines automated quality controls with structured peer review and institutional oversight. Technical working groups, comprising experts from AMDC, OAGS, Member State geological surveys, and independent bodies, are mandated to periodically review standards, typologies, and reporting templates; all recommended changes are processed through formal change-control and versioning procedures. To build continental capacity, the platform will publish technical guidance, validation checklists, and exemplar datasets, complemented by investments in training and helpdesk support. Finally, the ASTCM requires the transparent citation of source data and encourages the publication of underlying technical reports to foster scholarly review, ensure reproducibility, and solidify the platform's role as a scientifically robust foundation for Africa's sustainable mineral development.

9 ESG & RISK INTELLIGENCE

9.1. ESG Overlays: Integrating Sustainability into Decision-Making

The ASTCM will deploy spatially-enabled Environmental, Social, and Governance (ESG) overlays, transforming standalone indicators into actionable intelligence for planners and investors. These integrated map layers will consolidate critical data, including biodiversity and protected area buffers, water-stress indices, community land-use and cultural-heritage sensitivity, and governance metrics such as permitting status and compliance records. To ensure proper interpretation, all ESG layers will carry definitive provenance metadata, confidence scores, and recommended mitigation actions. This approach empowers users to conduct contextual risk screening and apply consistent ESG due diligence across project pipelines, thereby advancing sustainable and responsible mineral development aligned with continental sustainability goals.

9.2. Transboundary Governance: Enabling Regional Coordination

The platform is designed to proactively support the governance of shared environmental and mineral assets across national borders. It will enable the establishment of shared baselines and harmonized risk assessments for cross-border basins and mining corridors. Through standardized data contracts, joint dashboards for RECs and Member States, and coordinated notification workflows, the ASTCM will facilitate collaborative environmental impact assessments, joint monitoring initiatives, and effective dispute-resolution mechanisms. This functionality is critical for reducing administrative duplication, aligning mitigation measures across jurisdictions, and strengthening regional policy coherence for sustainable development.

9.3. Illicit and Conflict-Linked Mining Detection

To uphold governance and the rule of law, the ASTCM will incorporate specific indicators and analytical workflows to identify artisanal and small-scale mining (ASM) sites that exhibit patterns associated with illicit or conflict-linked extraction. This capability will leverage multi-source data, including earth observation (EO)-derived change detection, night-time lights anomalies, and supply-chain provenance flags, to enable targeted regulatory and enforcement responses. The platform will surface calculated risk scores and recommend pathways for enforcement or formalization, while strictly adhering to due-process safeguards and data-sovereignty controls to protect the rights of legitimate actors.

9.4. Earth Observation and Geohazard Risk Intelligence

The platform will systematically integrate high-resolution earth observation data and derived products to provide advanced geohazard intelligence for strategic planning and emergency response. This includes harmonized layers on land-cover change, erosion susceptibility, seismic hazards, and hydrological vulnerability, which are integrated with in-country datasets. Automated anomaly detection and time-series monitoring will support early warning systems for environmental risks. All such intelligence products will be subject to human expert review and institutional sign-off by relevant authorities to ensure their authoritative status for high-stakes decision-making, thereby safeguarding communities and investments.

10 COMMUNICATIONS, BRANDING & PARTNER ENGAGEMENT

10.1. Brand Discipline: Protecting Authoritative Standing

The ASTCM enforces strict brand discipline to protect the African Union's identity and the platform's authoritative standing as a continental public good. All public-facing materials, product names, logos, and metadata labels must utilize the AU's approved visual and verbal identity and be distributed exclusively through designated AU channels. Partners and third parties are expressly prohibited from rebranding, repackaging, or issuing derivative public interpretations of ASTCM data or materials without prior written authorization from AUC-ETTIM. Any permitted co-branded activities require explicit brand guidelines, a signed agreement, and final custodial sign-off. These controls are essential to preserve the platform's credibility, prevent mixed messaging, and ensure that all stakeholders consistently recognize the ASTCM as a mandated and trustworthy asset of the African Union.

10.2. Outreach Plan: Driving Adoption and Building Capacity

A strategic, multi-target outreach plan is mandated to drive platform adoption and build technical competence across all stakeholder levels. This plan will deliver tailored capacity-building, knowledge-sharing, and training programs to Member States, Regional Economic Communities (RECs), AU institutions, industry, civil society, and the research community. Communications will employ a blended approach, combining technical workshops, high-level policy briefings, multilingual user guides, online training modules, and targeted media engagement. All outreach materials must include clear statements on data provenance, usage rights, and the platform's authoritative status, and must be accessible in relevant AU languages and formats to maximize inclusivity and effectiveness. The performance of these outreach activities will be rigorously tracked through user uptake metrics, structured feedback loops, and periodic evaluations to continuously refine messaging and training priorities.

10.3. Partner Coordination: Ensuring Accountable Collaboration

The roles and responsibilities of all external partners are explicitly defined to prevent mandate overlap and ensure accountable, coherent collaboration. Every partner engagement must be governed by a documented Statement of Work, a data-sharing agreement, and a communications protocol that precisely specifies deliverables, attribution rules, approval workflows, and clear limits on public commentary. Crucially, any interpretive or explanatory communications about ASTCM outputs require

prior AU authorization and must pass through a documented review cycle; while partners may provide technical support or draft materials, they are forbidden from publishing or presenting ASTCM interpretations as authoritative without final custodial approval from AUC-ETTIM. Regular coordination forums, a maintained partner registry, and a single point of contact for public and media inquiries will be established to maintain strategic coherence and mitigate the risk of conflicting messages.

10.4. Communications Governance and Risk Management

A robust communications governance framework is embedded to manage reputational and operational risk effectively. This framework mandates pre-defined approval gates for all public releases, crisis response procedures for misinformation or data incidents, and clear media handling rules. AUC-ETTIM will maintain an approvals matrix, a rapid-response protocol, and a log of authorized spokespersons; any breach of these communications rules may trigger sanctions under this Acceptable Use Policy. The policy also comprehensively addresses intellectual property protection, data licensing, and adherence to accessibility standards, requiring periodic audits of all public materials to ensure unwavering compliance with AU policy, ethical standards, and strategic inclusivity objectives.

11 ENFORCEMENT & COMPLIANCE FRAMEWORK

11.1. Corrective Actions: A Graduated and Remedial Approach

The ASTCM enforcement framework is designed to be proportional, transparent, and focused on the preservation of data integrity and institutional trust. Actions prioritize corrective and restorative measures to remediate breaches while encouraging the continued participation of Member States and RECs. For minor or initial infractions, corrective actions are graduated and may include the mandatory re-validation of affected datasets, temporary quarantine or rollback of non-compliant assets, suspension of specific user or contributor privileges, and the implementation of a mandated remediation plan with clear milestones. For serious, repeated, or wilful breaches—such as unauthorized data disclosure, deliberate misrepresentation, or the creation of parallel systems—stronger measures will be applied. These may include full accreditation suspension, termination of partner contracts, and formal referral to relevant AU governance bodies for further action. All enforcement steps are systematically logged and are subject to a documented review and appeal process to ensure fairness.

11.2. Integrity Safeguards: Ensuring Due Process and Proportionality

The enforcement regime is underpinned by core integrity safeguards to ensure that all actions are conducted with due process, confidentiality, and proportionality. The principles of natural justice are strictly observed; any party subject to enforcement action will receive formal notification of the alleged breach, be provided with a full opportunity to respond, and have the case assessed against transparent, pre-defined criteria. The sanctions applied will be directly proportional to the nature, severity, and impact of the violation. Furthermore, the policy establishes clear and transparent criteria for the reinstatement of privileges or accreditation, contingent upon the successful completion of all mandated remediation actions and a period of probationary monitoring to ensure future compliance.

11.3. Operational Controls: Sustaining an Effective Enforcement Posture

To sustain an effective and responsive enforcement capability, the ASTCM governance structure implements a set of key operational controls. These include a comprehensive incident response playbook, a clear approvals matrix defining authority for enforcement decisions, and the maintenance of the interpretations registry to ensure consistent application of policy across all cases. The framework is further supported by a regime of regular internal audits and simulated exercises to test and refine enforcement procedures. This regime is complemented by a system of positive incentives—such as prioritized capacity support, formal recognition, and expedited processing for high-quality contributors—to proactively foster a cooperative culture of exemplary data stewardship and deter non-compliance.

12 IMPLEMENTATION ROADMAP & NEXT STEPS

12.1. Phases: A Staged and Milestone-Driven Rollout

The deployment of the ASTCM Interactive and Dynamic Map will follow a staged, milestone-driven implementation approach to ensure operational stability, foster institutional uptake, and progressively enhance continental capability. **Version 1.1 (2025) – Institutional Edition** will focus on consolidating existing national and regional datasets, formally establishing the custodial and governance arrangements outlined in this manual, publishing the core standards and metadata schemas, and delivering targeted training to accredited focal points. **Version 1.2 (2026)** will introduce semi-automated submission portals and streamlined validation workflows to improve efficiency, while expanding analytical

capabilities at the REC level to directly support sub-regional planning and corridor coordination. **Version 2.0 (2027)** will deliver advanced capabilities, including predictive analytics, market-trend forecasting, and integrated ESG analytics, subject to rigorous prior validation, security testing, and demonstrated readiness from Member States. Each phase will be governed by a published release plan, Key Performance Indicators (KPIs) for data quality and user uptake, a defined risk register, and clear mitigation measures to ensure disciplined execution.

12.2. Institutional Roles: Clear Division of Labor

The successful implementation of the ASTCM is predicated on a clear and unambiguous division of responsibilities among key institutions. The African Union Commission's Executive Technical Team on Integrated Minerals (AUC-ETTIM) provides overarching policy leadership, custodial oversight, and grants final approval for all authoritative releases. The African Minerals Development Centre (AMDC) is tasked with leading technical validation, maintaining standards, and executing capacity-building programs. Member States carry the responsibility for supplying, validating, and applying national data for their sovereign planning and regulatory use, while Regional Economic Communities (RECs) are pivotal in coordinating sub-regional harmonization and transboundary corridor strategies. The GIS Technical Team operates and secures the platform, implements release engineering, and provides user support. All engagements with external partners will be strictly governed by Statements of Work, Non-Disclosure Agreements, and defined approval workflows to protect AU sovereignty and prevent the emergence of conflicting authoritative outputs.

12.3. Validation Posture: Conditional and Collective Adoption

The adoption of each ASTCM release is conditional upon a rigorous, staged validation posture that combines procedural review, technical assurance, and collective endorsement. An initial internal review by the custodial and technical teams will confirm the integrity of the system architecture, governance protocols, and standards compliance. This will be followed by a comprehensive technical validation phase, verifying schema conformance, geospatial integrity, and UNFC-aligned reporting. Subsequently, multi-stakeholder validation workshops will convene AU leadership, RECs, Member States, subject matter experts, and civil society representatives to review findings, resolve interpretive issues, and collectively endorse the platform for institutional acceptance. Formal custodial sign-off by AUC-

ETTIM will only be granted following successful completion of these stages and the remediation of any identified issues. Post-deployment, periodic re-validation cycles, scheduled audits, and structured user feedback loops will be institutionalized to sustain quality and trust, while formal change-control procedures will govern all future upgrades and deprecations.

SECTION TWO: USER MANUAL & OPERATIONAL GUIDE

13 INTRODUCTION

The global transition to a clean energy and digital future is fundamentally reshaping the world's economic and geopolitical landscape. At the heart of this transformation lie Strategic, Transitional, and Critical Minerals (STCMs) and Rare Earth Elements (REEs)—resources that are indispensable for renewable energy systems, electric mobility, advanced computing, artificial intelligence, and national security technologies. These minerals are not merely commodities; they are the essential building blocks of the Fourth Industrial Revolution (4IR), and their secure, sustainable supply is a primary concern for nations worldwide.

Africa, endowed with a significant portion of the world's most sought-after mineral resources, stands at a pivotal juncture. For too long, the continent's mineral wealth has been extracted without yielding commensurate developmental benefits, often leaving behind a legacy of economic disparity and social and environmental challenges. The Africa Strategic Transitional Critical Minerals (ASTCM) Interactive and Dynamic Map is a transformative initiative by the African Union Commission (AUC) designed to fundamentally change this narrative.

This state-of-the-art digital platform is more than just a map; it is a comprehensive decision-support system and a powerful tool for asserting Africa's strategic agency. By leveraging cutting-edge Geographic Information Systems (GIS), dynamic data visualization, and robust, sovereign geospatial databases, the ASTCM Interactive and Dynamic Map provides an unprecedented, transparent, and real-time view of the continent's mineral endowment. It is built on the core principles of data sovereignty, ethical stewardship, and continental integration, ensuring that African institutions and Member States retain authority over their resources while enabling collaborative governance.

The platform is designed to serve a wide range of stakeholders by transforming complex geological, infrastructural, and socio-economic data into actionable intelligence. It empowers:

Informed Decision-Making:

The ASTCM Map is more than a tool; it is a strategic asset for a diverse range of stakeholders:

- ✓ **Governments & Policymakers** can design informed strategies, negotiate better terms, and monitor sustainable development.
- ✓ **Investors & Mining Companies** can identify new opportunities, assess infrastructure, and de-risk investments.

- ✓ **Researchers & Financial Institutions** can analyze market trends, conduct due diligence, and track development impacts.
- ✓ **Civil Society & Communities** can promote accountability, understand project footprints, and advocate for equitable benefits.

Key Features for Strategic Advantage:

- ✓ **Explore** detailed information on mineral deposits, filtered by type, country, size, and grade.
- ✓ **Analyze** overlays of key infrastructure, socio-economic data, and environmental constraints.
- ✓ **Monitor** access policy frameworks and market dynamics directly linked to specific projects.
- ✓ **Download** validated datasets for deeper, offline analysis and reporting.

Driving Africa's Strategic Goals:

By providing a foundation of transparent and accessible knowledge, the ASTCM Interactive and Dynamic Map is a cornerstone initiative for advancing:

1. **The AU Agenda 2063:** Accelerating continental integration, sustainable development, and socio-economic transformation.
2. **The African Mining Vision (AMV):** Ensuring mineral resources contribute to broad-based growth and industrialization.
3. **The African Union Commodity Strategy:** enabling countries to add value, extract higher rents from commodities, integrate into global value chains, promote diversification anchored in value addition and local content development.
4. **Africa's Green Minerals Strategy:** This strategy provides a roadmap for harnessing Africa's mineral wealth to drive value addition at source, regional industrialization, and climate resilience
5. **A Just Energy Transition:** Positioning Africa not just as a supplier of raw materials, but as a central player in global value chains, fostering local value addition and moving towards a knowledge-based economy.

This platform is a critical step towards ensuring that Africa's mineral wealth translates into lasting prosperity for its people, enabling the continent to strategically navigate and benefit from the global energy transition.

14 PURPOSE AND TARGET AUDIENCE

14.1. Purpose

- ✓ **Promote Africa's 4IR development** by showcasing key mineral resources essential for emerging clean technologies and digital industries.
- ✓ **Enhance data visibility and accessibility** to empower policymakers, investors, researchers, and industry stakeholders with reliable mineral resource information.
- ✓ **Facilitate smart decision-making** by enabling users to search, download, and visualize critical mineral datasets, encouraging sustainable development and investment.

14.2. Audience

The map will serve a diverse range of stakeholders, including:

- ✓ Government officials and policymakers working on mining, energy, and industrial development strategies.
- ✓ Mining and manufacturing investors seeking reliable resource data for project planning.
- ✓ Academic researchers and students studying geology, mining, economics, and industrial development.
- ✓ Environmental and social NGOs monitoring mining impacts and advocating responsible practices.
- ✓ Industry professionals in clean energy, advanced manufacturing, and supply chain management.

15 SYSTEM REQUIREMENTS

To fully benefit from the ASTCM Interactive and Dynamic Map's features, please ensure your setup meets the following specifications. These requirements guarantee optimal performance, accurate rendering of geospatial data, and seamless interaction.

15.1. Browser compatibility

The ASTCM Map is built on ArcGIS Online and requires a modern, standards-compliant browser with full HTML5, CSS3, and JavaScript support. For best results, use the latest version of one of the following:

- ✓ Google Chrome – Recommended for highest compatibility and performance
- ✓ Microsoft Edge – Fully supported and optimized

- ✓ Mozilla Firefox – Recommended for strong standards compliance
- ✓ Safari (macOS) – Supported for Mac users with the latest updates

Important: Internet Explorer is not supported due to its incompatibility with modern web mapping technologies. Please enable automatic browser updates to stay secure and up-to-date.

15.2. Internet speed recommendations

A stable, high-speed connection is essential, especially when loading multiple high-resolution layers or exporting large datasets:

- ✓ Minimum: 5 Mbps download speed – Basic navigation & simple filters
- ✓ Recommended: 10 Mbps+ – Advanced filtering, multi-layer rendering, data exports
- ✓ Mobile/Field: 4G LTE or 5G – Real-time data interaction on the go

Tip: If several users share your network, ensure sufficient bandwidth to avoid slowdowns.

15.3. Screen resolution & display

While the map adapts to most screen sizes, the following resolutions provide the best experience:

- ✓ Recommended: 1920 × 1080 pixels (Full HD) or higher for full visibility of toolbars, legends, and dashboards
- ✓ Minimum: 1366 × 768 pixels for basic desktop/laptop use
- ✓ Tablets & Smartphones: Supported, but complex tasks (e.g., data downloads, layer reordering) are easier on larger screens

15.4. Additional technical notes

- ✓ JavaScript: Must be enabled for map interactivity
- ✓ Cookies: Required to store your session settings and preferences
- ✓ VPN: May be necessary in regions with restricted ArcGIS Online access
- ✓ HTTPS: Use secure (https://) links to ensure encrypted data transmission

16 ACCESS INSTRUCTIONS

To ensure everyone can find and use the ASTCM Interactive and Dynamic Map, follow the guidelines below.

16.1. Public access

- ✓ Public URL
 - 🌐 <https://www.strategicmineralsafrica.org>
- ✓ Navigation Path

Once the site is live, access the map via:

- ✓ Home
- ✓ Resources
- ✓ Interactive and Dynamic Maps
- ✓ ASTCM Map

16.2. Access policy

1. Public Users

- ✓ No login required.
- ✓ Full read-only access to view the map, explore mineral layers, apply filters, and download public datasets.
- ✓ Free of charge—no subscription or registration needed.

2. Technical & Administrative Staff

Authorized personnel, African Union Commission

- ✓ Upload, validate, and manage data layers
- ✓ Configure map functionality and dashboards
- ✓ Perform quality control and updates

Access details:

- ✓ Credentials issued by the system administrator
- ✓ Two-Factor Authentication (2FA) is enabled for added security

C. Best Practices for Access

- ✓ Use a supported, up-to-date browser (Chrome, Edge, Firefox, Safari).
- ✓ Maintain a stable internet connection (minimum 5 Mbps; 10 Mbps+ recommended).
- ✓ For large downloads or advanced data work, access from a desktop or laptop.
- ✓ Bookmark the official URL for quick return visits.

17 ASTCM WEBSITE OVERVIEW

The ASTCM Interactive and Dynamic Map interface follows ArcGIS Online best practices to help both casual users and experts navigate, analyze, and customize geospatial data efficiently. Refer to the annotated screenshot in the full manual for visual guidance.

17.1. Navigation Bar

The navigation bar sits at the top of every map view, letting you switch between core sections without leaving the interface.

Menu Item, Verified Description, Purpose & Key Takeaway (For User)

- ✓ **Home:** The starting point for the website. Returns the user to the main welcome page.
- ✓ **About ASTCM:** Detailed information about the African Strategic Transitional Critical Minerals initiative, "Understand the project's mandate, partners, and goals."
- ✓ **Interactive and Dynamic Map:** "Directly launches the full, dynamic GIS platform.", This is the primary access point for geospatial data and analysis.
- ✓ **Services:** "Information on technical support, data provision, and collaboration opportunities. "Learn how to partner with the project or request specialized data assistance."
- ✓ **Contact:** Provides support information for technical and administrative inquiries. Find Helpdesk emails and technical support contacts.
- ✓ **Resources (Dropdown):** This is a key menu for accessing foundational documents and updates. "Access official reports, policy documents, and project news."
 - **Reports:** Opens the library of published technical reports and studies.,
 - **Policy:** "Accesses official policy frameworks (e.g., AU Agenda 2063, AMV) and regulatory documents".
 - **News and Updates:** "Displays current publications, news, and data updates.",
- ✓ **LOG IN / SIGN UP:** Allows technical or administrative staff to access the secure backend area., Public users do not need to log in. This is reserved for authorized data management and quality control.

Why it matters: You can instantly access documentation and resources while exploring the map, keeping your workflow seamless.



17.2. Home

- ✓ **Header Banner and Mission:**
 - Features the main title, "The AFRICAN Strategic and Critical Minerals."

- A foundational quote emphasizes the project's goal: **Driving Africa's industrialization and transition** into a knowledge-based economy through transparent mineral data.
 - Highlights the platform's core attributes: **DYNAMIC, INTERACTIVE, and USER-FRIENDLY.**
- ✓ **Pillars of ASTCM Platform:**
- Outlines the strategic rationale and foundational goals of the entire initiative.
 - Lists the four core pillars:
 - **Data Transparency & Governance:** Provides up-to-date data to enhance decision-making and support sustainable practices.
 - **Industrialization & 4IR:** Focuses on minerals critical for **Industry 4.0** (like REEs and Lithium) and facilitates Africa's transition to **Mining 4.0.**
 - **Data Exploration & Access:** Provides a dynamic GIS visualization platform where users can **download datasets** for policy planning and analysis.
 - **Stakeholder Empowerment & ESG:** Ensures data is accessible to all users (including communities and civil society) to promote **responsible mineral management** and **ESG Compliance.**
- ✓ **ASTCM Interactive and Dynamic Map (Call to Action):**
- Features a large visual representation of the map.
 - Lists the key functions available on the map, such as **Dynamic Map Legend, Geographic Filter, and Interactive Data Pop-Ups.**
 - Includes a prominent **"LAUNCH MAP"** button for direct access to the GIS platform.
- ✓ **Strategic Focus and Policy Alignment:**
- Sections like **"Beyond Borders"** and **"Standardized Data"** explain the data's utility for policy and investment.
 - Emphasizes that the data is built on principles of **data harmonization and governance**, aligning with frameworks like **AMREC** and the **African Mining Vision (AMV).**
 - Details how users can **Filter Resources, Assess Infrastructure,** and use data for **Informed Governance.**
- ✓ **Key Stakeholders:**
- Identifies the primary user and beneficiary groups, including:
 - **African Governments & Regional Bodies**
 - **Mining & Exploration Companies**
 - **Research Institutions & Academia**
- ✓ **Recent News and Updates:**
- Showcases recent news articles and policy insights relevant to Africa's critical minerals sector.
 - Each news story includes a **"Key Insight"** explaining its relevance to the ASTCM project's mission.

✓ **Footer:**

- Provides logos and links to the project's main partners: **Proton Technology**, the **African Union**, and **Expertise France**.



The AFRICAN Strategic and Critical Minerals

Driving Africa's industrialization and transition into a knowledge-based economy through transparent, accessible data on Critical Minerals for the Fourth Industrial Revolution (4IR).

[DYNAMIC](#) [INTERACTIVE](#) [USER FRIENDLY](#)



Pillars of ASTCM Platform

The 4 Pillar of the platform that are Content Focus (What we provide) and Strategic Rationale (Why it matters)



Data Transparency & Governance

Up-to-date and accessible information on critical mineral deposits, production, and grade.

Enhance decision-making, improve transparency, bolster governance, and support sustainable mining practices.



Industrialization & 4IR

Focus on minerals critical for Industry 4.0 technologies (e.g., Rare Earth Elements and Lithium).

Facilitate Africa's ability to capitalize on the growing demand for STCM and aid the continent's transition to Mining 4.0.



Data Exploration & Access

Dynamic and Interactive GIS visualization with search, filtering, and zoom capabilities.

Provides a platform for academia, financial institutions, and governments to download datasets for further analysis and policy planning.



Stakeholder Empowerment & ESG

Data accessibility for all users, including mining communities, civil society, and indigenous groups. Promotes responsible mineral resource management.

Empowers a wide range of users to create informed policies, ensures ESG Compliance, and contributes to sustainable and inclusive mining sectors in Africa.



About ASTCM

The African Strategic Transition Critical Minerals (ASTCM) initiative is dedicated to catalyzing sustainable industrialization across Africa by offering a robust platform for critical mineral data. Our mission directly supports the ambitious goals of AU Agenda 2063, providing accurate and accessible information crucial for the continent's development.

Get Started



Visualizing Africa's Critical Mineral Landscape



Beyond Borders: Dynamic GIS Data For Policy & Investment.

The ASTCM platform provides the necessary scientific and technical data infrastructure—from standardized resource classification (ASTCM) to GIS visualization—required by governments and investors to successfully implement the AGSM and build sustainable industrial economies.

Rare Resources: Instantly view deposits for Lithium, Cobalt, Nickel, and Rare Earth Elements (REEs) across the continent.

Access Infrastructure: Overlay maps showing existing power grids, transport corridors, and processing facilities.

Informed Governance: Download customizable datasets for use in national policy planning, licensing, and reporting.

Get Started

Standardized Data for Trust and Compliance.

The ASTCM platform is built on principles of data harmonization and governance. Our data undergoes rigorous vetting, aligning with international frameworks like the African Minerals and Energy Resource Classification and Management System (AMERCMS) and the African Mining Watch (AMW). We provide the reliable, verifiable information required for ESG compliance and transparent investment.



Recent Updates & Policy Insight

The launch of the African Green Minerals Strategy (AGMS) marks a watershed moment, adding the continent's first-ever mineral export to local processing, industrialization, and value chain integration. This strategic move ensures Africa maximizes the benefits of its critical mineral resources in the global energy transition.

[Technological Capacity Building](#)

[Standardized Data](#) (where ASTCM is essential)

[Regional Integration](#)



Key Stakeholders of The ASTCM

ASTCM serves as a vital bridge, connecting various national, international, public, and private entities that are directly or indirectly involved in Africa's critical minerals sector. Our primary stakeholders include:



V1.0 Version	480+ Critical mineral & REE	6+ Publications	40+ Types of datasets
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Get Latest News

Recent News and Updates

SOURCE: AFRICANEWS - OCT 9 2023

Congo Pushes Back Against U.S. Pressure On Critical Minerals

The DRC, home to 70% of the world's cobalt supply, is resisting external pressure and emphasizing local control over mineral exports and processing.

Key Insight: Reinforces ASTCM's advocacy for African data sovereignty and sovereignty in mineral governance.

Read Full Article



SOURCE: LONDON TIMES - OCT 31 2023

India Calls For A "Collaborative, Not Extractive" Partnership With Africa

India urges a new era of cooperation with Africa focused on joint ventures, technology transfer, and local beneficiation of critical minerals like graphite, lithium, and rare earths.

Key Insight: Model partnership ASTCM could promote—prioritizing value addition over raw export

Read Full Article



SOURCE: BERNARDINO MATTHEW - OCT 2023

Africa's Critical Minerals And The Fair Energy Transition

This analysis argues Africa must leverage its mineral endowment for a fair energy transition—through local refining, equitable trade, and green industrialization.

Key Insight: Aligns with ASTCM's advocacy for "African voice" in global energy-transition negotiations.

Read Full Article



Developed by Proton Technology in partnership with The African Union and Expertise France

Copyrighted Dashboard, Top 1

17.3. About ASTCM

The About ASTCM page offers users a deep dive into the project's strategy, technical components, and the wide-ranging stakeholders it aims to empower.

- ✓ **Core Mission Statement:**
 - The page reiterates the core mission: **Catalyzing sustainable industrialization across Africa** by offering a robust platform for critical mineral data.
 - The initiative directly supports the ambitious goals of **AU Agenda 2063**.
 - It emphasizes the use of cutting-edge technologies like **ArcGIS** for powerful geospatial mapping, a robust website, and **AI-driven analytics**.
- ✓ **Key Descriptors (Overview, Purpose, Features, Audience):**
 - **Overview:** The platform is a vital resource for mapping Africa's critical minerals, enhancing transparency and decision-making in the mining sector.
 - **Purpose:** To support sustainable industrialization in Africa by providing accurate mineral data, aligned with **AU Agenda 2063**.
 - **Features:** Includes dynamic updates, **advanced filtering options**, and **downloadable datasets** for comprehensive analysis.
 - **Target Audience:** Specifically designed for **governments, investors, and civil society** interested in mining and sustainable development.
- ✓ **Technical and Strategic Foundation:**
 - **Impact:** Aims to reduce investment risks and foster the **Fourth Industrial Revolution in Africa** by promoting data transparency.
 - **Technology:** Leverages **ArcGIS** for geospatial mapping, **robust website infrastructure**, and **AI-driven analytics** for deeper insights.
 - **Future Vision:** The goal is to become the **leading digital hub for African mineral intelligence**, driving innovation and responsible resource management.
- ✓ **Our Impact & Stakeholders (Detailed Empowerment):**
 - This section details how the platform benefits six specific stakeholder groups, serving as a catalyst for informed decision-making:
 - **African Governments & Regional Bodies:** Provides actionable data for evidence-based policy and attracting high-quality investment.
 - **International Investors & Financial Institutions:** Offers transparent risk assessments to facilitate responsible investment and enhance due diligence.
 - **Mining & Exploration Companies:** Aids in optimizing exploration strategies, navigating regulation, and fostering sustainable operational practices that meet **ESG standards**.
 - **Manufacturers & Technology Companies:** Enables better supply chain mapping and analysis for stable, diversified, and responsibly sourced critical mineral supplies.
 - **Research Institutions & Academia:** Serves as a robust data foundation for academic research and innovation.
 - **Civil Society Organizations (CSOs) & NGOs:** Empowers civil society with transparent data to advocate for environmental protection and accountable governance.
- ✓ **Sample of African Strategic Transition Critical Minerals (ASTCM):**

- The page concludes by highlighting four key minerals featured on the map: **Lithium, Cobalt, Rare Earth Elements, and Graphite.**
- Each mineral has a brief description emphasizing its strategic importance to the global energy transition and technological advancement.



The African Strategic Transition Critical Minerals (ASTCM) initiative is dedicated to catalyzing sustainable industrialization across Africa by offering a robust platform for critical mineral data. Our mission directly supports the ambitious goals of AU Agenda 2063, providing accurate and accessible information crucial for the continent's development. Leveraging cutting-edge technologies like ArcGIS for powerful geospatial mapping, a resilient website infrastructure, and AI-driven analytics, ASTCM delivers dynamic updates, advanced filtering, and downloadable datasets to empower comprehensive resource analysis. We specifically cater to governments, investors, and civil society stakeholders, fostering data transparency to mitigate investment risks and accelerate Africa's embrace of the Fourth Industrial Revolution.



Overview

The ASTCM platform serves as a vital resource for mapping Africa's critical minerals, enhancing transparency and decision-making in the mining sector.



Purpose

The ASTCM mission is to support sustainable industrialization in Africa by providing accurate data on mineral resources, aligning with AU Agenda 2063.



Features

The ASTCM Key features include dynamic updates, advanced filtering options, and downloadable datasets for comprehensive analysis of mineral resources.



Target Audience

ASTCM is Designed for governments, investors, and civil society, focusing on those interested in mining and sustainable development across Africa.



Impact

By promoting data transparency and informed decision-making, ASTCM aim to reduce investment risks and foster the Fourth Industrial Revolution in Africa.



Technology

ASTCM platform leverages cutting-edge technologies including **ArcGIS** for powerful geospatial mapping, robust **website infrastructure** for accessibility, and **AI-driven analytics** for deeper insights into mineral data.



Future Vision

ASTCM envision becoming the leading digital hub for African mineral intelligence, driving innovation and fostering responsible resource management for generations to come.



Get Involved

Join in ASTCM mission to enhance the mining sector's sustainability and transparency by utilizing our interactive mapping tools.

Sample of African Strategic Transition Critical Minerals (ASTCM)



Lithium

Explore data and insights on Africa's lithium resources, vital for the global electric vehicle revolution and energy storage.



Cobalt

Access detailed information on cobalt deposits and its essential role in electronics, aerospace, and advanced industrial applications.



Rare Earth Elements

Uncover data on Africa's rare earth potential, critical for renewable energy technologies and modern defense systems



Graphite

Discover comprehensive data on Africa's graphite reserves, crucial for next-generation battery technology, industrial lubricants, and other advanced material applications.

Our Impact & Stakeholders

ASTCM is designed to be a catalyst for informed decision-making across Africa's critical minerals ecosystem. Our impact resonates through a diverse network of stakeholders, empowering them to harness the continent's mineral wealth responsibly and strategically:

African Governments & Regional Bodies:

The ASTCM provide actionable data and insights to support evidence-based policy development, promote regional integration, and attract high-quality investment aligned with national development goals.



International Investors & Financial Institutions

By offering transparent risk assessments and comprehensive mineral data, The ASTCM facilitate responsible investment, enhance due diligence processes, and unlock new opportunities in Africa's rapidly growing critical minerals sector.

Mining & Exploration Companies:

The ASTCM platform aids in optimizing exploration strategies, navigating complex regulatory landscapes, and fostering sustainable operational practices that meet global ESG standards.



Manufacturers & Technology Companies:

The ASTCM enable better supply chain mapping and analysis, ensuring stable, diversified, and responsibly sourced critical mineral supplies essential for the global energy transition and technological advancement.

Research Institutions & Academia:

The ASTCM serves as a robust data foundation for academic research, fostering deeper understanding and innovation in geology, economics, and sustainable development related to critical minerals.



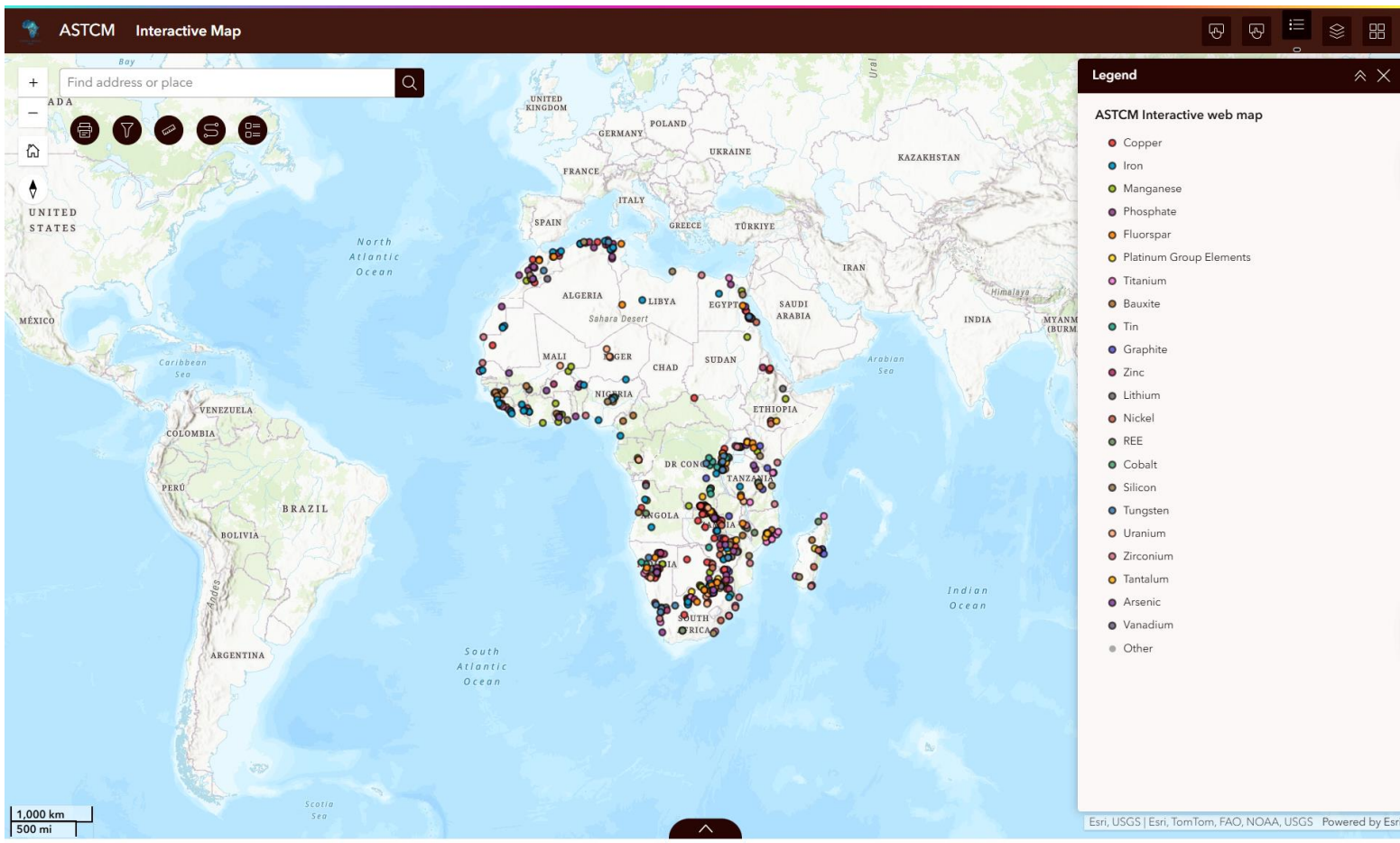
Civil Society Organizations (CSOs) & NGOs:

The ASTCM empower civil society with transparent data to advocate for environmental protection, social equity, and accountable governance within the mining sector.

17.4. Interactive and Dynamic Map

This section of your manual describes the main map interface itself, which is a dynamic Geographic Information System (GIS) tool designed for exploration and analysis of critical mineral resources.

- ✓ **Primary Purpose:**
 - To provide users with a dynamic, visual, and interactive environment to **explore, filter, and analyze** the geospatial data related to Strategic Transitional Critical Minerals (STCM) and Rare Earth Elements (REEs) across the African continent.
 - It links geological data, infrastructure, and socio-economic layers in one unified view.
- ✓ **Core Map Interface Components (as noted in your manual draft):**
 - **Map Window:** The primary canvas where geographical features and data layers are visualized.
 - **Toolbar (Top-Left):** Contains essential navigational and functional tools, including **Zoom Tools (+/-)**, **Home Button (Reset View)**, and **Measurement Tools**.
 - **Layer Controls (Top-Right):** Allows users to manage the visibility of different datasets (Layers), view the **Legend**, and switch the **Basemap** (background map).
 - **Search Box (Top-Center):** Used to locate specific **addresses, places, or geographic features** on the map.
- ✓ **Data Attribute Table (Key Feature on this Page):**
 - When accessing this URL, the interface often defaults to showing the **underlying attribute data** in a tabular view (as seen in the browse result).
 - This table allows users to interact with the raw data associated with the map features (e.g., mineral deposits).
 - Users can **sort** and **filter** the data based on various attributes:
 - **commodity** (e.g., Lithium, Cobalt)
 - **country**
 - **dep_name** (Deposit Name)
 - **dep_type** (Deposit Type)
 - **latitude/longitude** (Geographic Coordinates)
 - The table displays the **Total** number of records and the number of features currently under **Selection**.
- ✓ **User Benefit:**
 - This page is where researchers, investors, and policymakers perform their actual **analysis**.
 - The combination of the map visualization and the attribute table allows users to switch between visual (spatial) and quantitative (tabular) analysis of the mineral data.



17.5. Services

The Services page details the specialized offerings provided by the ASTCM team to transform raw data into actionable intelligence.

- **Page Introduction and Mission:** The page begins by stating that ASTCM offers **tailored data solutions and specialized expert consultations** that go beyond the free access provided by the Interactive and Dynamic Map.
 - The mission is to empower clients with **capacity building** and **advanced tools** to drive informed decision-making and foster sustainable industrialization.
 - A **"Launch Dashboard"** button is provided, likely for clients who have purchased customized services or API access.

1. Data Access and Customization Services: These services focus on providing direct, structured access to the underlying datasets.

- **Custom Dataset API Access:**
 - Offers **tiered, subscription-based access** to raw mineral, geological, and economic datasets via an **API (Application Programming Interface)**.
 - Target Audience: Fintech firms, global consulting groups, academic researchers, and large mining corporations.
- **Premium Data Downloads:**
 - Provides **highly detailed, filtered, and processed data packages** (e.g., quarterly reports, specific mineral grade maps) available via purchase or premium subscription.
 - Target Audience: Small to mid-size investment firms and specialized geological consultants.
- **GIS Visualization Integration:**
 - A service to help clients **integrate ASTCM map layers and data feeds** directly into their own internal GIS platforms or enterprise software.
 - Target Audience: Government geological surveys, national resource agencies, and large mining operations.

2. Advisory and Consulting Services: These are bespoke expert services delivering custom analytical reports and guidance.

- **Investment Risk Assessment:**
 - Provides **bespoke reports assessing geological, regulatory, ESG, and political risks** for specific projects or regions based on ASTCM data.
 - Target Audience: International investors, private equity, and development banks.
- **Supply Chain Mapping & Analysis:**
 - Consultative reports analyzing **bottlenecks, sustainability issues, and opportunities** within specific mineral supply chains (e.g., Lithium, Cobalt).
 - Target Audience: Automotive manufacturers, technology companies, and battery producers.
- **Policy & Regulatory Guidance:**
 - Offers analysis and recommendations to African governments or regional bodies on creating **policy frameworks** that align with ASTCM data for sustainable resource management.
 - Target Audience: African Union member states, regional economic communities, and NGOs.

3. Training and Capacity Building: Services designed to improve the user's ability to maximize the platform's value and adapt to new technology.

- **ASTCM Platform Training Workshops:**

- Organized workshops (virtual or in-person) teaching users how to utilize the **Interactive and Dynamic Map, advanced filters, and data export features.**
 - Target Audience: Government officials, university students, and internal corporate teams.
 - **Mining 4.0 Digital Skills Certification:**
 - A certified course covering the shift to **digital mining**, leveraging GIS, remote sensing, and data analytics.
 - Target Audience: Mining professionals seeking career advancement.
 - **ESG & Responsible Sourcing Seminars:**
 - Seminars focused on best practices, compliance, and leveraging ASTCM data to track and report on **Environmental, Social, and Governance (ESG)** metrics.
 - Target Audience: Mining company sustainability officers and international auditors.

What makes us sparkle

While the **AFRICAN Strategic Transition and Critical Minerals (ASTCM) Interactive Map** provides unparalleled free access to critical resource data, our services are designed to go much further. We offer **tailored data solutions** and specialized **expert consultations** that transform raw data into actionable insights for investors, governments, and industry. Our mission is to empower you not just with information, but also with **capacity building** and advanced tools to drive informed decision-making, manage risk, and foster sustainable industrialization across the continent.

[LAUNCH DASHBOARD](#)



Data Access and Customization Services



Custom Dataset API Access

Offer tiered, subscription-based access to the raw mineral, geological, and economic datasets via an Application Programming Interface (API).

Target: Fintech firms, global consulting groups, academic researchers, and large mining corporations.



Premium Data Downloads

Provide highly detailed, filtered, and processed data packages (e.g., quarterly reports, specific mineral grade maps, policy impact assessments) available for a one-time purchase or premium subscription.

Target: Small to mid-size investment firms and specialized geological consultants.



GIS Visualization Integration

Service to help clients integrate ASTCM map layers and data feeds directly into their own internal GIS platforms or enterprise software.

Target: Government geological surveys, national resource agencies, and large mining operations.

Advisory and Consulting Services



Investment Risk Assessment

Provide bespoke reports assessing geological, regulatory, ESG, and political risks for specific mineral projects or regions based on ASTCM data.

Target: International investors, private equity, and development banks.



Supply Chain Mapping & Analysis

Consultative reports analyzing the current and future bottlenecks, sustainability issues, and opportunities within specific mineral supply chains (e.g., Lithium, Cobalt, Rare Earth Elements).

Target: Automotive manufacturers, tech companies, and battery producers.



Policy & Regulatory Guidance

Offer analysis and recommendations to African governments or regional bodies on creating policy frameworks that align with ASTCM data for sustainable mining and resource management.

Target: African Union member states, regional economic communities, and NGOs.

Training and Capacity Building



ASTCM Platform Training Workshops

Organized workshops (virtual or in-person) teaching users how to utilize the Interactive Map, advanced filters, and data export features for maximum impact.

Target: Government officials, university students, and internal corporate teams.



Mining 4.0 Digital Skills Certification

A certified course covering the shift to digital mining, leveraging GIS, remote sensing, and data analytics relevant to the critical minerals sector.

Target: Mining professionals seeking career advancement.



ESG & Responsible Sourcing Seminars

Seminars focused on best practices, compliance, and leveraging ASTCM data to track and report on Environmental, Social, and Governance (ESG) metrics in African mining.

Target: Mining company sustainability officers and international auditors.

17.6. Contact

The Contact page is the central hub for users to seek assistance, provide feedback, or make specific inquiries related to the ASTCM project.

✓ **Primary Contact Goal:**

- The main heading encourages users to **"Reach Out for Inquiries and Support on Critical Minerals"** and **"Contact Our Team Now."**
- This section should be the user's first stop for both technical and policy-related questions not covered in the manual.

✓ **Team Members (Profiles):**

- This section features placeholder profiles (e.g., Noah Harrison, Charlotte Carter) with job titles like **Head Designer & Developer** and **Content Creator**.
- **Note for Manual:** If this content is placeholder, instruct the user to verify the final live page and replace the generic descriptions with the **actual ASTCM project leads, their roles, and their contact emails/forms**.

✓ **Frequently Asked Questions (FAQs):**

- The current FAQs are generic (e.g., changing event dates, cancellation policy) and appear to be placeholder content from a theme, not relevant to critical mineral data or GIS.
- **Note for Manual:** This section should be completely replaced with **ASTCM-specific FAQs and Troubleshooting** based on common user inquiries, such as:
 - How do I download data?
 - My map layer won't load—what should I do?
 - Who do I contact for partnership inquiries?
 - How can I report a data error?

✓ **General Assistance / Call to Action:**

- A prominent section labeled **"Need further assistance?"** encourages users to **"Engage in a chat"** or **"Get in Touch with Us Today."**

Reach Out For Inquiries And Support On Critical Minerals

GET STARTED TODAY >



Data & Technical Support

For questions regarding API access, premium data subscriptions, map errors, and technical integration.



Investment & Partnership

For bespoke consulting quotes, risk assessment reports, and private sector collaboration opportunities.



Policy & Government Relations

For official inquiries from government ministries, African Union member states, and policy-focused NGOs.



Portfolio

General Support Can't find the right contact section? Use this option for all **miscellaneous inquiries, comments, partnership exploration, or general communication**. We'll make sure your message gets to the right person quickly.

Frequently Asked Questions

1. Data Licensing: Can I use the data from the Interactive Map in my published research or commercial projects?

2. API Access: What are the different tiers for API access and how is usage calculated?

3. Data Sources: Where does the ASTCM platform source its geological and economic data?

4. Government Access: How can a government official request a custom data demonstration or specialized access?

5. How does ASTCM ensure data transparency and ESG compliance in its reporting?

6. What is ASTCM's role in driving Africa's industrialization and the Fourth Industrial Revolution (4IR)?

Professional Team



Yousuf Takane (Prof)
Lead Expert



Gebremedin Girmay(DIR)
GIS Specialist (Proton Technology)



Biruk Yohannes
Project manager (Proton Technology)



Jhon Magok
Representative (African Union)



Kervin Kumapley
Project coordinator (Expertise France)

17.7. Resources

The Resources page is intended to be the gateway to the project's documentation, policy context, and news updates. Currently, it serves as a summary of the platform's utility and a general FAQ section.

✓ Key Features of Our Platform (Summary):

1. This section summarizes the capabilities of the Interactive and Dynamic Map and the data it provides.
2. **Dynamic Updates:** Ensures users are informed with **real-time updates** on critical mineral resources.
3. **Advanced Search:** Highlights the ability to **download detailed mineral datasets** for in-depth analysis and research.
4. **Statistical Integration:** Promotes the use of advanced statistical tools to analyze mineral data effectively.

✓ Explore Our Interactive and Dynamic Map (Call to Action):

1. A prominent call-to-action button, "**Explore Now**" or "**Get Started Now**," redirects the user back to the main Interactive and Dynamic Map page.
- ✓ **What Are Critical Minerals? (Educational FAQ):**
 1. Defines **critical minerals**, explaining their importance for modern technologies, renewable energy, and defense.
 2. This is a crucial educational element for users who are new to the sector.
 - ✓ **Platform Functionality FAQs (Technical Overview):**
 1. This section answers high-level questions about the platform's usage and beneficiaries:
 - **How does the interactive and Dynamic map work?** Explains the use of **GIS technology** to visualize resources and the ability to filter data by mineral type and country.
 - **Who can benefit from this platform?** Reaffirms that **Governments, investors, and civil society** are the primary beneficiaries, emphasizing the platform's role in promoting data transparency and reducing investment risk.
 - **What features does the platform offer?** Recaps the main tools: dynamic updates, advanced search, statistical integration, and data downloads.
 - **How can I access the mineral datasets?** Instructs users to navigate to the **download section** of the platform (which would likely be within the map or a specific sub-resource page).
 - ✓ **Relationship to Navigation Menu:**
 1. **Important Note for Users:** While this main Resources page contains general information, the **actual resource libraries** are found under the dropdown menu items: **Reports, Policy, and News and Updates**. Users seeking specific documents or articles should use those sub-menus.

CRITICAL MINERALS

“Mineral criticality refers to the relative importance and vulnerability of certain minerals whose availability and responsible, sustainable use are fundamental to advancing national and regional industrialization, enabling the green and digital transitions, and ensuring that Africa’s mineral wealth contributes to long-term development and equitable local benefits.”



Prioritizing these 23 minerals including Rare Earth Elements is justified for several reasons:

- **Managing supply risk** – Because production of several critical minerals is highly concentrated in a few countries, mapping Africa’s resources helps diversify global supply chains and strengthens the continent’s bargaining position.
- **Alignment with global transitions** – Many of the selected minerals, such as cobalt, lithium, rare earth elements, graphite, and nickel, are vital to batteries, renewable energy systems, and digital infrastructure, making them cornerstones of the global green and digital transitions.
- **Economic diversification and industrialization** – A clear understanding of the distribution of these minerals enables governments to design industrial strategies that move beyond raw material exports toward local processing, value addition, and job creation.
- **Regional integration** – No single African country holds all 23 minerals in abundance. A continental approach to mapping highlights complementarities, encouraging cross-border cooperation under the African Continental Free Trade Area (AfCFTA).
- **Sustainability and governance** – By mapping these minerals comprehensively, Africa can embed environmental and social safeguards from the outset, positioning itself as a responsible supplier in global markets that increasingly demand transparent and ethical sourcing.

African Critical Minerals Dataset

1. Cobalt	▼
2. Lithium	▼
3. Platinum Group Metals (PGMs)	▼
4. Manganese	▼
5. Graphite	▼
6. Copper	▼
7. Nickel	▼
8. Bauxite	▼
9. Vanadium	▼
10. Chromium	▼
11. Uranium	▼
12. Tantalum (Coltan)	▼
13. Iron Ore	▼
14. Titanium (Ilmenite & Rutile)	▼
15. Zirconium	▼
16. Tin	▼
17. Zinc	▼
18. Phosphate	▼
19. Fluorspar (Fluorite)	▼
20. Tungsten	▼
21. Silicon	▼
22. Arsenic	▼

Rare Earth Elements

Rare Earth Elements (REEs)—grouped into light and heavy categories—have emerged as indispensable enablers of clean-energy technologies, advanced industrial applications, defense capabilities, and medical innovations central to the Fourth Industrial Revolution. While often described as “rare,” their strategic importance stems less from absolute scarcity than from the uneven distribution of economically viable deposits and the complex, resource-intensive processes required for their extraction and separation.



Rare Earth Elements (REEs) are a family of seventeen metallic elements conventionally divided into two categories:

- Light Rare Earth Elements (LREEs)—such as lanthanum, cerium, and neodymium
- Heavy Rare Earth Elements (HREEs)—such as dysprosium, terbium, and yttrium.

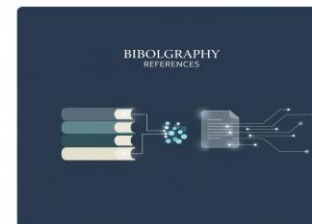
This classification reflects key differences in geological occurrence, processing complexity, and strategic economic value, with HREEs generally rarer, harder to extract, and more geopolitically sensitive.

Rare Earth Elements Datasets

1. Scandium (Sc, Z = 21, REE-associated)	▼
2. Lanthanum (La, Z = 57, LREE)	▼
3. Cerium (Ce, Z = 58, LREE)	▼
4. Praseodymium (Pr, Z = 59, LREE)	▼
5. Neodymium (Nd, Z = 60, LREE)	▼
6. Promethium (Pm, Z = 61, LREE)	▼
7. Samarium (Sm, Z = 62, LREE)	▼
8. Europium (Eu, Z = 63, LREE)+	▼
9. Gadolinium (Gd, Z = 64, HREE)	▼
10. Terbium (Tb, Z = 65, HREE)	▼
12. Holmium (Ho, Z = 67, HREE)	▼
13. Erbium (Er, Z = 68, HREE)	▼
14. Thulium (Tm, Z = 69, HREE)	▼
15. Ytterbium (Yb, Z = 70, HREE)	▼
16. Lutetium (Lu, Z = 71, HREE)	▼
17. Yttrium (Y, Z = 39, HREE-affiliated)	▼

References and Bibliography

*Africa’s Strategic, Transitional, and Critical Minerals (ASTCM) Interactive and Dynamic Map
(Data Compilation & Curation; Ingestion; and Operational Deployment)*



I. Data Compilation — Global & African Datasets, Surveys, and Portals	▼
II. Curation — Reserves, Production, Classification Codes, and Core Methods	▼
III. Ingestion — Operational Maps, Geographic Information System (GIS) Tools, Earth Observation, and Applied Sector Reports	▼
IV. Deployment — African Union Frameworks, Policy, Trade, Digital/Infrastructure Enablement	▼
V. African Geological Surveys and Regional Institutions (Consolidated; retains brief subject lines)	▼
VI. Global Outlooks, Geopolitics, Trade & Competitiveness	▼

17.8. Reports

The Reports page compiles essential third-party and institutional publications, offering users in-depth analysis on the geological, strategic, and economic context of Africa's critical mineral sector.

✓ **Primary Content Goal:**

- To provide access to high-level documents, studies, and maps from reputable institutions (e.g., OAGS, UNCTAD, Wilson Center, Mo Ibrahim Foundation).
- The reports cover topics such as: **geoscience coordination, mineral distribution, supply chain dynamics, and policy and governance frameworks.**

✓ **Key Publications and Themes:**

- **Pan-African Geoscience Coordination:** Features documents on the work of the **Organization of African Geological Surveys (OAGS)** in strengthening data coordination and institutional capacity for critical-mineral development.
- **Global Distribution Maps:** Links to visual resources (like **ArcGIS Story Maps** and **Wilson Center maps**) that illustrate the global concentration of minerals like cobalt, lithium, and rare-earth elements, providing context for Africa's role.
- **Policy and Economic Analysis:** Includes reports from organizations like **UNCTAD, German watch, and the Mo Ibrahim Foundation.** These reports address key strategic issues:
 - The **"resource curse"** and the need for strong governance.
 - The importance of **adding local value** (refining and processing) to African raw materials trade.
 - Opportunities and risks for developing countries in the **critical minerals boom** driven by the global energy transition.
- **Geospatial Data Sources:** Features links to the original datasets and map services from partners like the **Regional Centre for Mapping of Resources for Development (RCMRD)**, providing access to geospatial data on major mineral deposits.

✓ **User Benefit:**

- This page is essential for researchers, policymakers, and investors seeking to **validate, contextualize, or deepen their understanding** of the data they see on the Interactive and Dynamic Map.
- Each entry typically includes a brief summary, the publishing institution, and a direct link to the full document or external website.

Reports And Publications

Pan-African Geoscience Coordination On Critical Minerals (2019–2025)

The Organisation of African Geological Surveys (OAGS) plays a leading role in supporting Africa's capacity to identify, assess, and manage **critical minerals** that are essential for renewable energy technologies and strategic industries.

From 2019 to 2025, OAGS has focused on strengthening **data coordination and institutional capacity** for critical-mineral development across the continent. Working with African national surveys and international partners, the organisation ensures that high-quality geological information underpins Africa's participation in the global energy-transition economy.

Strategic Importance

By coordinating geoscientific data and expertise across Africa, OAGS enables the continent to take a leading role in the **global critical-minerals supply chain**. Its work reduces exploration risk, improves investment confidence, and strengthens Africa's ability to manage these strategic resources sustainably—ensuring long-term economic growth and technological independence.

[VISIT WEBSITE](#)



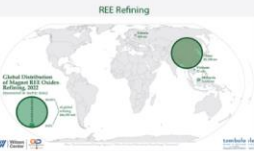
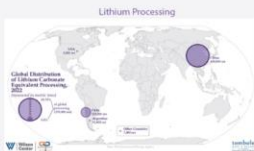
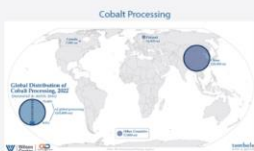
Highlight of Critical Minerals in Africa (By Country)

The map published by AMSD presents a continental overview of Africa's confirmed endowment of **critical minerals**—including lithium, cobalt, copper, nickel, manganese, graphite and rare-earth elements (REEs).



Mapping Global Distribution of Critical Minerals

*Explore this ArcGIS StoryMap of global critical- and rare-earth-mineral distribution. It highlights continents, countries and deposits of lithium, cobalt, nickel, manganese, graphite and rare earth elements (REEs). For ASCTM this visual offers a compelling backdrop to Africa's mineral endowment—supporting our mandate of data-sharing, national-survey capacity building and value-chain



Major Minerals deposit in Africa (By Country)

The "Africa Major Mineral Deposits Dataset" published by the Regional Centre for Mapping of Resources for Development (RCMRD) provides geospatial data on the known locations and geological settings of major non-fuel mineral commodities across Africa.



UNCTAD report cover on critical minerals boom and developing countries

"This UNCTAD commentary explores how the accelerating global energy transition is driving surging demand for critical minerals—including lithium, cobalt, nickel and rare earth elements—and outlines the opportunities for developing countries (especially in Africa) to capture value and avoid the pitfalls of raw-material dependency. The report highlights the need for robust governance, downstream processing, transparent contracts and capacity building."



Adding Local Value to African Countries' Critical Raw Materials Trade" (August 2024)

The Germanwatch factsheet examines how Africa's critical raw materials—including lithium, cobalt, nickel and rare-earth elements—can deliver sustainable development when value-creation, refining and manufacturing happen locally. It highlights that Africa holds ~30 % of proven critical-mineral reserves yet captures minimal downstream value. The publication also addresses obstacles to achieving the Africa Mining Vision and presents regional cooperation and the Lobito Corridor as a case study of building African-led supply chains.



UN WESP 2025: harnessing critical minerals for sustainable development.

The *World Economic Situation and Prospects 2025* report highlights how the global transition to clean energy is reshaping mineral demand and trade. A special section, *Harnessing the Potential of Critical Minerals for Sustainable Development*, underscores that developing regions—particularly Africa—can achieve inclusive growth if they strengthen governance, invest in refining capacity and ensure fair participation in the critical- and rare-earth-minerals value chain.



Mo Ibrahim Foundation: Africa's Critical Minerals

Africa holds a substantial share of the world's critical- and rare-earth mineral reserves which are essential for the global energy transition. The report from the Mo Ibrahim Foundation argues that without strong governance, transparent institutions and value-chain development, these mineral resources risk becoming a burden rather than a benefit for the continent. Key challenges highlighted include the "resource curse", unstable revenues, environmental damage, weak institutional development and insufficient downstream processing.

Wilson Center Maps Show Global Concentrations Of Cobalt, Lithium, Nickel And Rare-Earth Elements In 2024

This edition presents a set of maps by the Wilson Center illustrating how critical-minerals reserves and processing—especially of cobalt, copper, lithium, nickel and rare-earth-elements—are geographically concentrated across the globe. The report highlights how supply-chain bottlenecks and regional imbalances affect energy-transition and investment-risk dynamics."

[VIEW FULL ARTICLE](#)

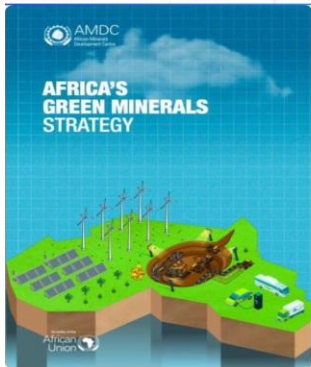
17.9. Policy

The Policy page provides direct access to the high-level continental policy frameworks and technical standards that govern Africa’s critical minerals sector, providing the strategic and official mandate for the ASTCM platform.

- **Primary Goal:** To link the ASTCM technical data directly to the official policies and mandates of the African Union and other continental bodies.
- **Key Policy Documents and Their Relevance to ASTCM:**
 - ✓ **Africa’s Green Minerals Strategy (AGMS) – African Union:**
 - **Summary:** This is the current, high-level strategy mandating a shift from raw mineral export to **local beneficiation, industrialization, and full value-chain integration** (e.g., battery manufacturing).
 - **ASTCM Relevance:** The AGMS directly calls for the creation of new technological capabilities, research, and skills, making the ASTCM platform's technical support and data a core component of its implementation.
 - ✓ **African Mining Vision (AMV) – African Union:**
 - **Summary:** The foundational, long-term policy (adopted 2009) promotes the “**transparent, equitable and optimal exploitation**” of minerals as a catalyst for sustainable economic and social development.
 - **ASTCM Relevance:** Provides the core philosophical context (governance, diversification, local linkages) to which all ASTCM technical programs must adhere.
 - ✓ **African Minerals and Energy Resources Classification and Management System (AMREC) – African Union:**
 - **Summary:** A comprehensive continental standard for classifying, reporting, and managing mineral and energy resources, based on the UN Framework Classification (UNFC). It promotes **transparency and harmonization**.
 - **ASTCM Relevance:** This is the **technical standard** that governs the data used on the ASTCM Interactive and Dynamic Map, ensuring data quality, accountability, and harmonization across national reports.

- ✓ **Science, Technology and Innovation Strategy for Africa (STISA-2024) – African Union:**
 - **Summary:** The AU mandate for advancing scientific and technological capacity across key sectors, including mining.
 - **ASTCM Relevance:** This provides the direct policy mandate for ASTCM's existence and its core **Scientific & Technical function** within the continent's strategic goals.
- ✓ **Critical Minerals Information and Knowledge Hub (C-MINK):**
 - **Summary:** A new initiative designed to empower African governments with **strategic knowledge and real-time market intelligence** to strengthen their negotiating power in global markets.
 - **ASTCM Relevance:** ASTCM serves as a key partner by translating C-MINK's high-level knowledge into applied technical programs and geospatial capacity building for member states.
- ✓ **Regional Local Content Policies & Value Addition Directives:**
 - **Summary:** Policies from Regional Economic Communities (RECs) and national governments requiring value addition and local supply.
 - **ASTCM Relevance:** These policies create a demand for ASTCM's technical services, data, and training to help local suppliers meet standards and facilitate regional mineral value chains.
- **User Benefit:**
 - ✓ This page is essential for users to understand the high-level **"Why"** behind the data. It ensures policymakers can frame their technical work within official mandates, and investors can understand the long-term regulatory direction of the African mining sector.

POLICY REGARDING ASTCM



Africa's Green Minerals Strategy (AGMS) – African Union (Launched/Adopted 2024/2025)

Summary: This is the current, high-level continental strategy. It positions Africa to capitalize on its vast reserves of **critical and green minerals** (lithium, cobalt, nickel, etc.) by mandating a fundamental shift from raw mineral export to local **benefit, industrialization**, and full value-chain integration into the global energy transition.

Key Points :

- ASTCM Alignment: Directly calls for the creation of new **technological capabilities**, research centers, and skills—the core mandate of ASTCM.
- Strategic Direction: Provides the ultimate strategic goal: ensuring Africa moves up the value chain from extraction to battery manufacturing/processing.
- Pillars for Action: Its key pillars (Advancing Mineral Development, Developing Human and Technological Capabilities, Building Strategic Value Chains) offer specific policy areas where ASTCM can frame its technical projects.

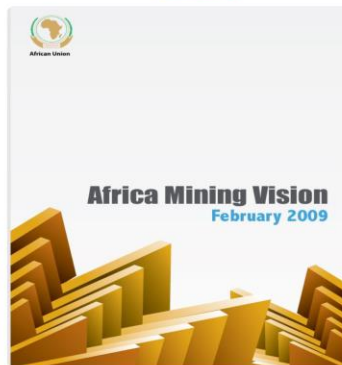
[VISIT POLICY](#)

African Mining Vision (AMV) – African Union (Adopted 2009; Reaffirmed Ongoing)

Summary: The AMV is the long-term, foundational policy for Africa's mining sector. It promotes the **"transparent, equitable and optimal exploitation"** of minerals, ensuring mining becomes a catalyst for **broad-based sustainable economic and social development** and industrial diversification, not just a commodity export business.

- Historical Context:** Shows the continuity of policy: the AGMS (Green Minerals) is the application of the AMV's (Mining Vision) principles to the modern energy transition challenge.
- Core Philosophy:** Underlines governance, diversification, and local/regional linkages—the philosophical core that ASTCM's technical programs must adhere to.

[VISIT POLICY](#)



Critical Minerals Information And Knowledge Hub (C-MINK) – UNECA/AU/UNU-INRA Initiative (Launched 2025)

Summary: C-MINK is a new, demand-driven knowledge platform led by African institutions. Its mission is to empower African governments with **strategic knowledge, policy support, and real-time market intelligence** on critical minerals to strengthen Africa's negotiating and bargaining power in global markets.

Key Points

- Market & Policy Intelligence:** Directly supports ASTCM's need to ground its technical advice in robust, real-time economic data and strategic foresight.
- Knowledge Ecosystem:** Positions ASTCM as a key partner in translating C-MINK's high-level knowledge outputs into applied technical programs and capacity building for member states.

[VISIT POLICY](#)



Regional Local Content Policies & Value Addition Directives (Various RECs/National)

Key Points:

- Translating Policy to Action:** This is where ASTCM's technical services are **most relevant**, as LCPs create demand for local suppliers, technical standards, skills training, and domestic manufacturing capacity.gn pattern library
- Regional Integration:** Highlights the need for ASTCM to coordinate technical support across RECs to facilitate regional mineral value chains (a key goal of the AGMS).

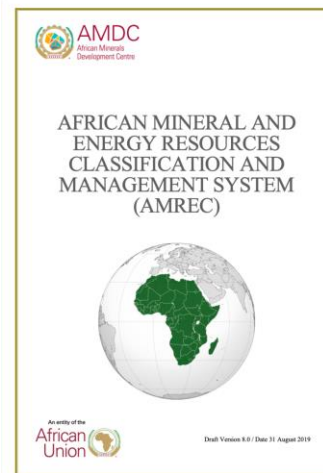
[VISIT POLICY](#)

COMMON MARKET FOR EASTERN
AND SOUTHERN AFRICA



Date:
LIMITED
C/ST/INSTR/1
December 2018
Original: ENGLISH

COMESA REGIONAL LOCAL CONTENT POLICY GUIDELINES: ENHANCING REGIONAL BENEFITS FROM INDUSTRIALISATION



African Minerals And Energy Resources Classification And Management System (AMREC) – African Union (Established 2024)

Summary: AMREC is a comprehensive continental framework, based on the UN Framework Classification for Resources (UNFC), designed to standardize the classification, reporting, and sustainable management of Africa's mineral and energy resources. It aims to promote **transparency, accountability, and harmonization** across national resource management policies.

Key Points:

- Data & Technical Standard:** Directly addresses the **technical need for standardized geological data** and public reporting, a key area for ASTCM's scientific support.
- Governance & Investment:** A harmonized system reduces investor risk and improves governance, which is vital for attracting the capital needed to build the value chains promoted by AGMS.

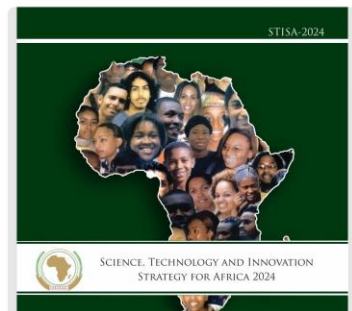
[VISIT POLICY](#)

Science, Technology And Innovation Strategy For Africa (STISA-2024) – African Union (Adopted 2014)

Key Points:

- The Technical Foundation:** This is the direct policy mandate for **ASTCM's Scientific & Technical** function, demonstrating that the organization's existence is rooted in a core AU strategy.
- Cross-Sectoral Role:** Reinforces the need for STI to impact critical sectors like energy, environment, infrastructure, and **mining**, justifying ASTCM's broad technical scope.
- The Next Phase:** Use this to frame the transition to the forthcoming **STISA-2034** as a major ongoing technical opportunity.

[VISIT POLICY](#)



17.10. News and Updates

The News and Updates page acts as the project's blog and news feed, curating relevant articles from external sources to provide context and real-time market/policy intelligence for users.

• Primary Content Goal:

- ✓ To provide users with the latest information on critical minerals and Rare Earth Elements (REEs), sourced from major international news organizations (e.g., Reuters, Africanews, World Economic Forum, Atlantic Council).

- ✓ Each news item is presented with a link to the **Source** and **Date**.
- **Key Themes and Insights:**
 - ✓ The articles are selected based on their alignment with ASTCM's core mandate (governance, value addition, industrialization). Key themes include:
 - **Investment Risk and Disputes:** Highlighting issues like investor-state conflicts over mineral rights and the need for clear, transparent frameworks.
 - **Value Addition and Partnership:** Featuring articles that call for **"Collaborative, Not Extractive"** partnerships with Africa and the transition from raw export to local beneficiation.
 - **Sovereignty and Policy Pushback:** Showcasing how African nations (like the DRC) are resisting external pressure and emphasizing **local control and data ownership** over their mineral resources.
 - **Strategic Investment:** Focusing on the critical need for investment in regional mineral reserves (e.g., Southern Africa) to achieve the energy transition goals.
 - **Governance Models:** Presenting calls for stronger governance models, sovereign wealth funds, and regional value chains to ensure mineral wealth benefits African citizens.
- **"Key Insight" Feature:**
 - ✓ **Crucial for Users:** Each news summary includes a **"Key Insight"** written by the ASTCM team. This insight explains **why the article is relevant to the ASTCM platform or its mission** (e.g., "Supports ASCTM's advocacy for African data ownership"). This helps users understand the context and the project's strategic viewpoint.
- **User Benefit:**
 - ✓ Users can quickly track the political, economic, and social developments that affect the data on the map, allowing them to make more timely and informed decisions regarding policy, investment, and research.

Get The Latest News About Critical Minerals And REE

SOURCE: REUTERS – NOV 3 2025

Resource Disputes Between Investors And States Hit 10- Year High

Investor-state conflicts over mining and critical-mineral rights have surged globally, reflecting the strategic importance of lithium, cobalt, and rare-earth reserves—many in Africa.

Key Insight: ASCTM can highlight how legal clarity and transparent frameworks can prevent such disputes.

[READ FULL ARTICLE](#)



SOURCE: LOKMAT TIMES – OCT 31 2025

India Calls For A “Collaborative, Not Extractive” Partnership With Africa

India urges a new era of cooperation with Africa focused on joint ventures, technology transfer, and local beneficiation of critical minerals like graphite, lithium, and rare earths.

Key Insight: Model partnership ASCTM could promote—prioritizing value addition over raw export

[READ FULL ARTICLE](#)



SOURCE: AFRICANEWS – OCT 9 2025

Congo Pushes Back Against U.S. Pressure On Critical Minerals

The DRC, home to 70% of the world's cobalt supply, is resisting external pressure and emphasizing local control over mineral exports and processing.

Key Insight: Reinforces ASCTM's advocacy for African data ownership and sovereignty in mineral governance.

[READ FULL ARTICLE](#)



SOURCE: WORLD ECONOMIC FORUM – SEPT 2025

Investing In Southern Africa's Critical Minerals Vital To Energy Transition

Southern Africa holds around 30% of global reserves for critical minerals used in EVs and renewables—but receives under 10% of global exploration investment.

Key Insight: ASCTM should emphasize investment readiness and regional exploration data access.

[READ FULL ARTICLE](#)

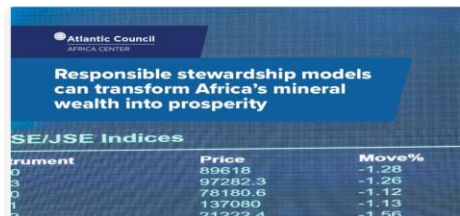
SOURCE: ATLANTIC COUNCIL – OCT 2025

Responsible Stewardship Models Can Transform Africa's Mineral Wealth

Experts call for stronger governance models, sovereign wealth funds, and regional value-chains to ensure mineral wealth benefits African citizens.

Key Insight: Supports ASCTM's approach to capacity building, policy harmonization, and sustainable industrialization.

[READ FULL ARTICLE](#)



SOURCE: RENEWABLE MATTER – OCT 2025

Africa's Critical Minerals And The Fair Energy Transition

This analysis argues Africa must leverage its mineral endowment for a fair energy transition—through local refining, equitable trade, and green industrialization.

Key Insight: Aligns with ASCTM's advocacy for "Africa's voice" in global energy-transition negotiations.

[READ FULL ARTICLE](#)

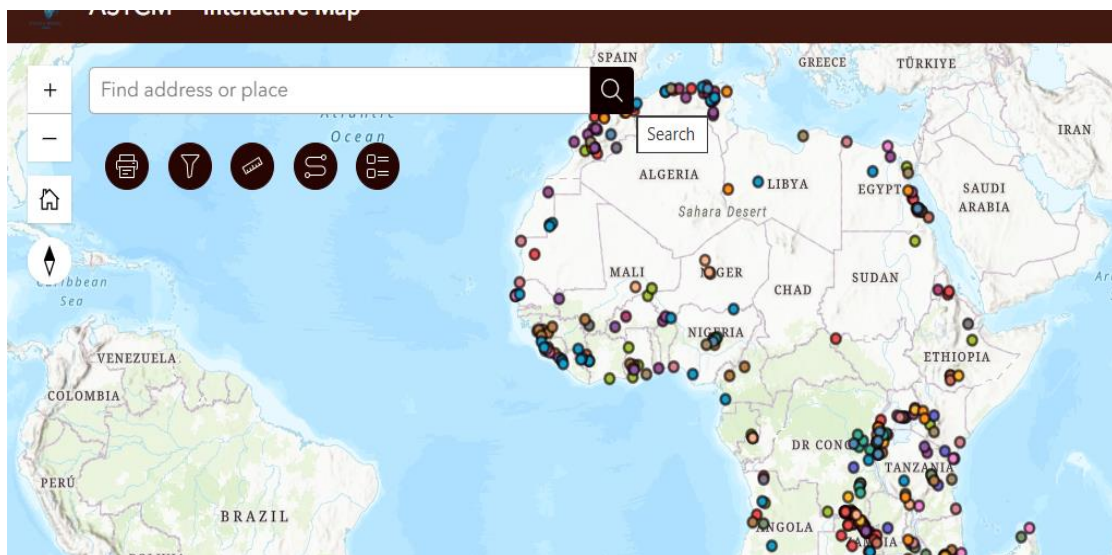
18 INTERACTIVE AND DYNAMIC MAP FUNCTIONALITIES

18.1. Search Box

Located in the top-right corner, the search box speeds up location and dataset lookup.

- ✓ Geographic Name Search
Find countries, cities, provinces, or specific mining sites
- ✓ Coordinate Search
Enter latitude/longitude in decimal or degree format
- ✓ Autocomplete
Receive suggested matches as you type

Why it matters: Quickly zoom to points of interest without manual panning, saving time for policy reviews, field planning, or data validation.



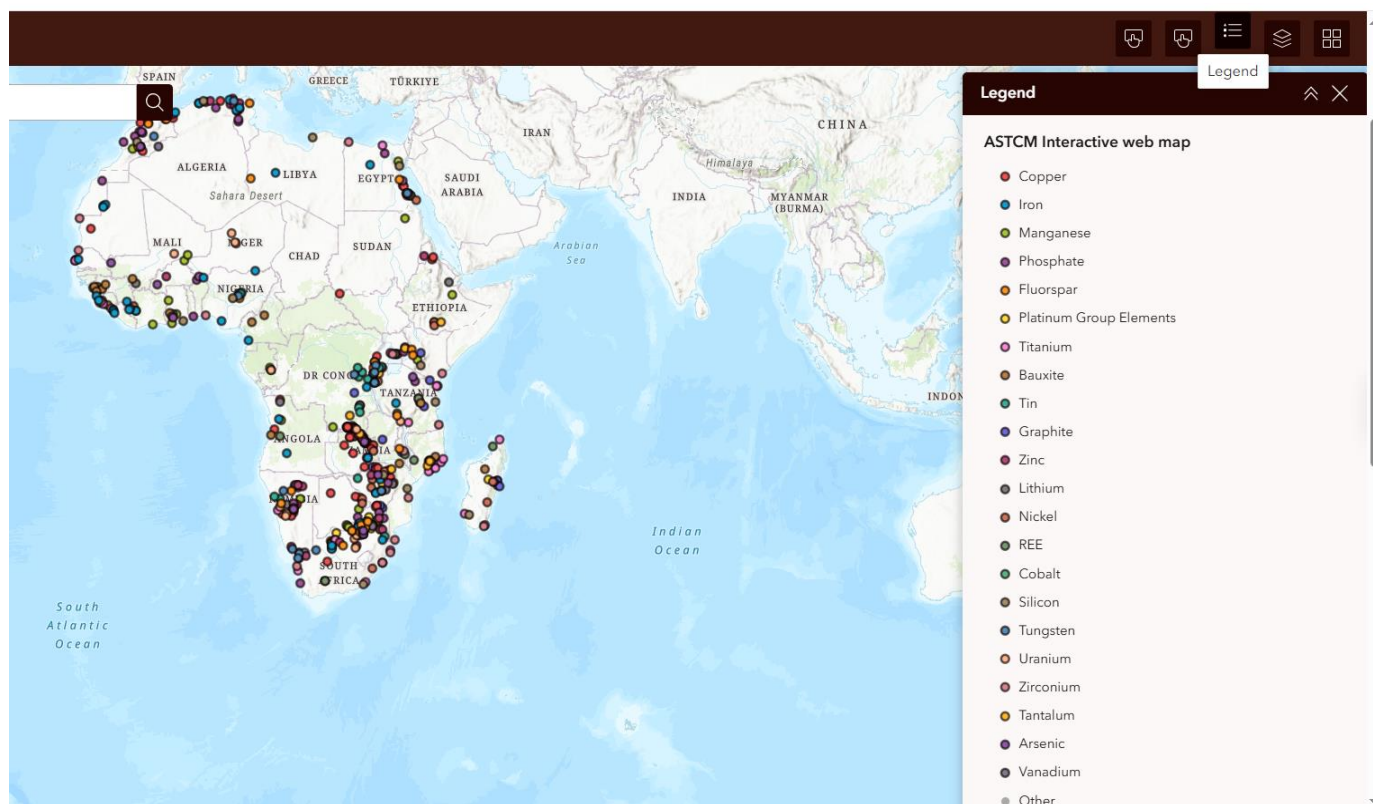
18.2. Legend

Found in a right-side panel or as a toggle, the legend decodes symbols, colors, and line styles.

- ✓ Dynamic Updates
Automatically reflects the active layers
- ✓ Example Symbols

- ✓ Blue circles = Lithium deposits
- ✓ Green triangles = Cobalt mines
- ✓ Dashed red lines = Railway corridors
- ✓ Solid black lines = Major roads

Why it matters: A clear legend ensures accurate interpretation when multiple mineral and infrastructure layers overlap.



18.3. Filter

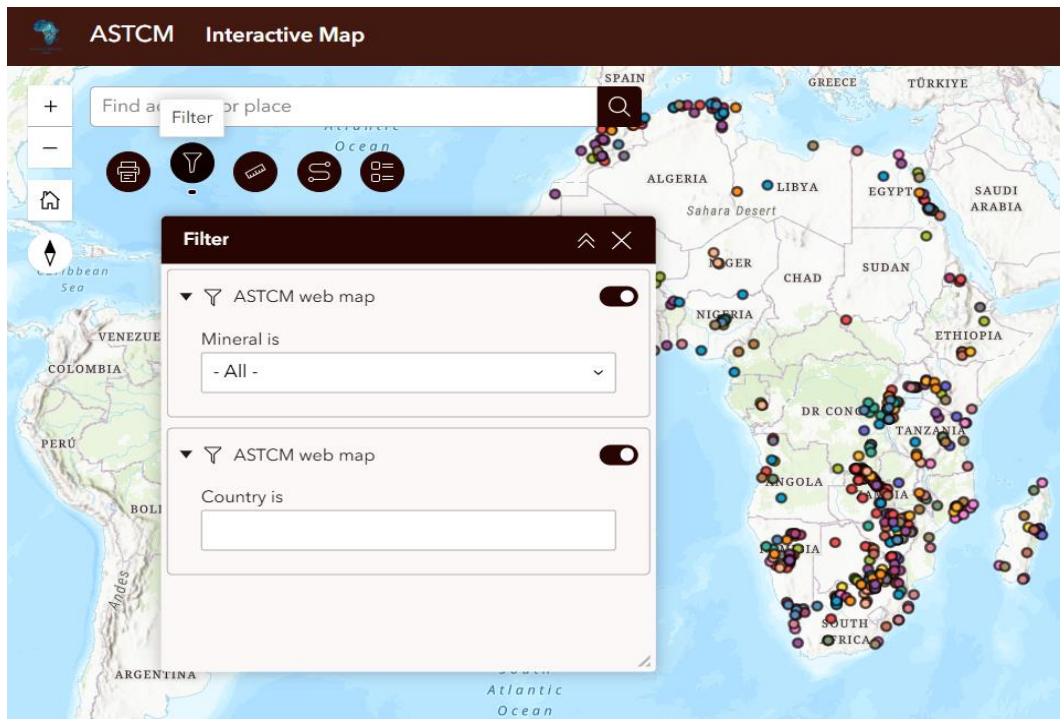
✓ By Mineral Type

Select specific Strategic Transitional Critical Minerals (STCM): Lithium, Cobalt, Graphite, Others (as available in the dataset)

Purpose: Focus on a single commodity or compare across types.

✓ By Country

Filter results to a single country or group of countries. Useful for: National-level reporting, Regional investment analysis, Country-focused exploration

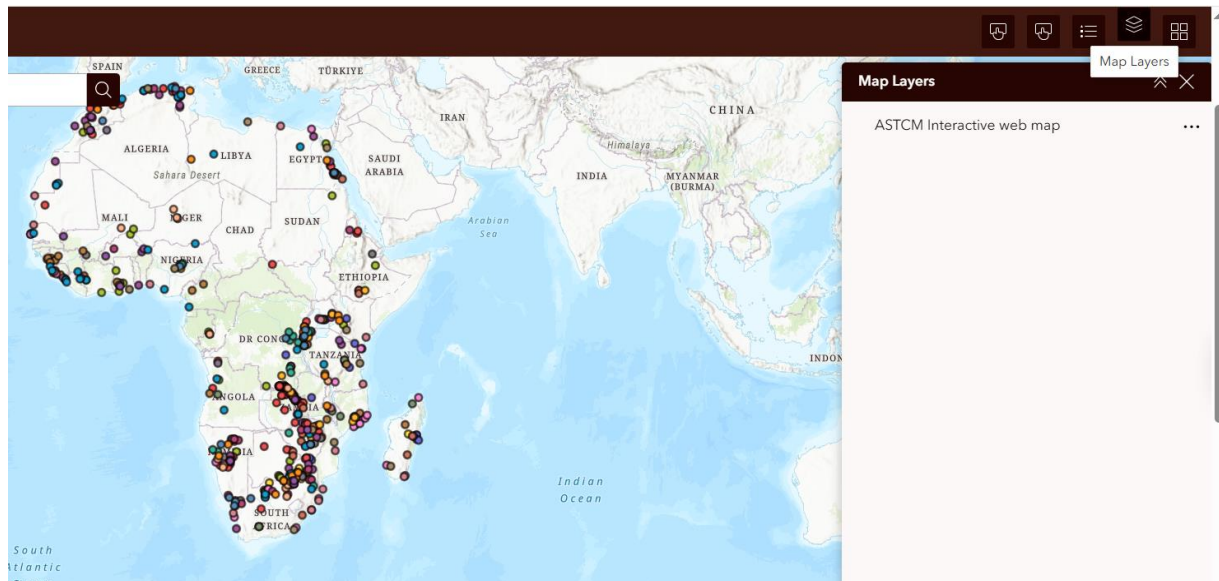


18.4. Layer Control

Accessible via the right-side panel or a top-left menu button, layer control lets you tailor the map display.

- ✓ Mineral Deposits
 - Toggle by type (Lithium, Cobalt, Rare Earth Elements)
- ✓ Infrastructure
 - Transport corridors, ports, processing plants, power lines
- ✓ Socio-Economic Data
 - Demographics, employment statistics, and development zones
- ✓ Environmental Data
 - Protected areas, water resources, and sensitivity zones
- ✓ Advanced Options
 - Adjust transparency, reorder layers, and view metadata

Why it matters: Customize your view to compare datasets or focus on specific themes without clutter.

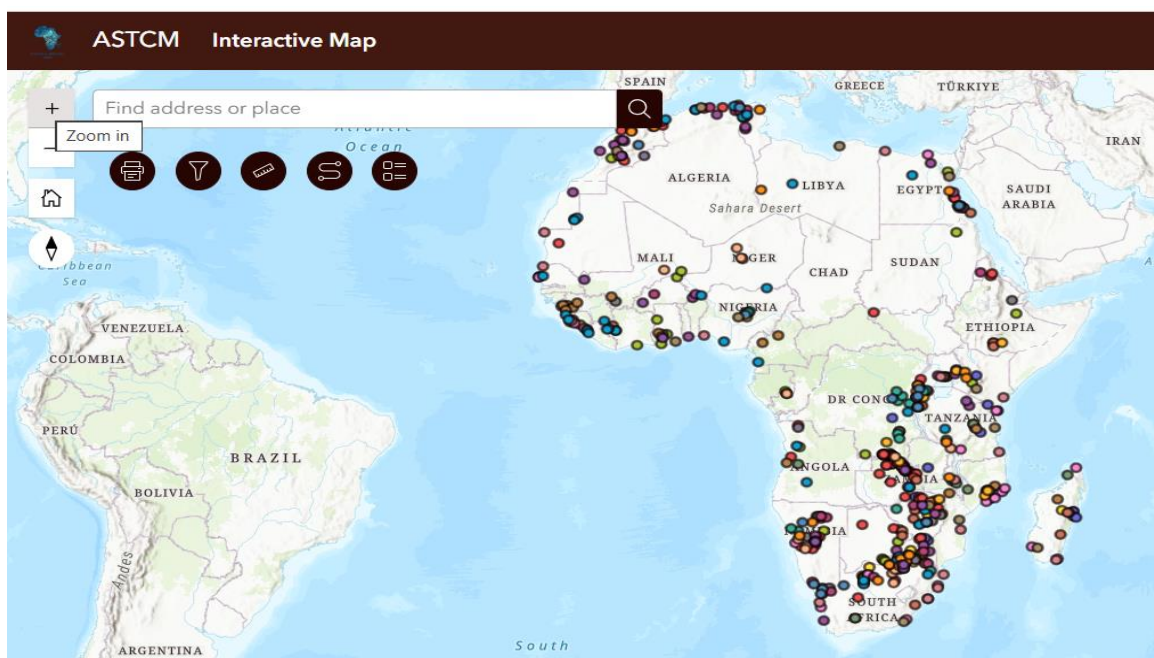


18.5. Zoom Tools

Located in the bottom-right corner, these controls let you change the map scale precisely.

- ✓ Zoom In (+)
- ✓ Zoom Out (−)
- ✓ Mouse Scroll Wheel

Why it matters: Seamlessly switch between continental overviews and site-level detail.



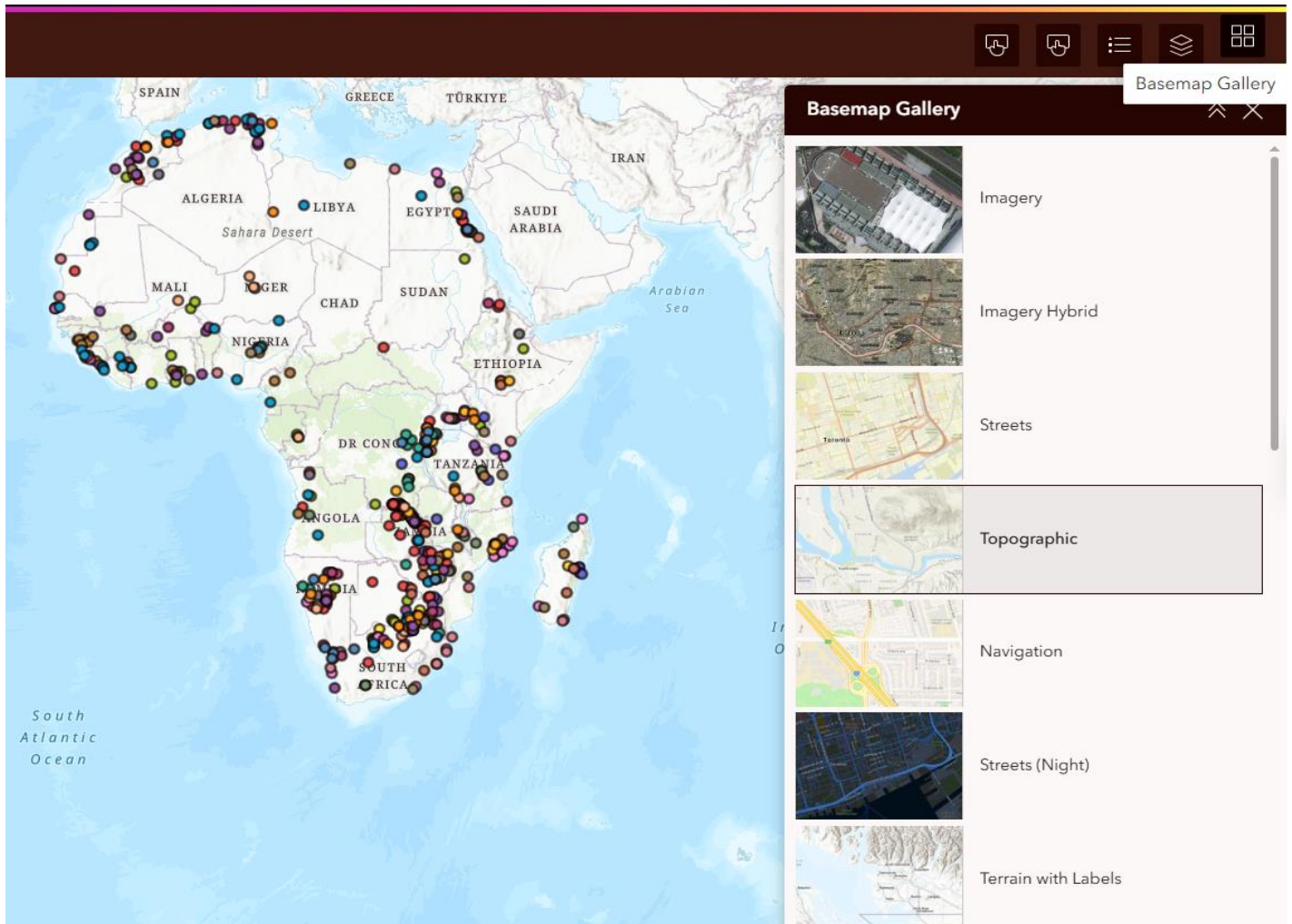
18.6. Base map Gallery

The Basemap Gallery is accessed in the top-right corner, allowing rapid switching of the foundational map background to support varied analysis needs.

Example of available base maps: Available Basemap Options

- ✓ **Imagery (Satellite):**
 - **Purpose:** Shows detailed land cover, infrastructure, and geographical features.
 - **Benefit:** Ideal for assessing physical site characteristics and land use/environmental impact.
- ✓ **Imagery Hybrid:**
 - **Purpose:** Satellite imagery overlaid with critical geographical labels and boundaries.
 - **Benefit:** Combines high-resolution views with essential political and place-name context.
- ✓ **Topographic:**
 - **Purpose:** Displays elevation data, contour lines, and physical terrain features.
 - **Benefit:** Crucial for geological analysis and understanding physiographic constraints.
- ✓ **Streets:**
 - **Purpose:** Provides a clear visualization of the road network and urban centers.
 - **Benefit:** Used for logistical planning, accessibility analysis, and infrastructure assessment.
- ✓ **Light Gray Canvas:**
 - **Purpose:** A neutral, minimalist background with no distracting geographic details.
 - **Benefit:** Best for thematic visualization where the sole focus is on the mineral data points.
- ✓ **Dark Gray Canvas / Streets (Night):**
 - **Purpose:** Uses a dark color palette.
 - **Benefit:** Reduces eye strain and optimizes viewing in low-light environments or for large screen projection.

Why it matters: Choose the context that best supports your analysis or presentation needs.



18.7. Measurement Tools

Available on the top toolbar or as a floating widget, measurement tools let you calculate distances and areas.

- ✓ **Distance Measurement**

Click two points for straight-line or path distance

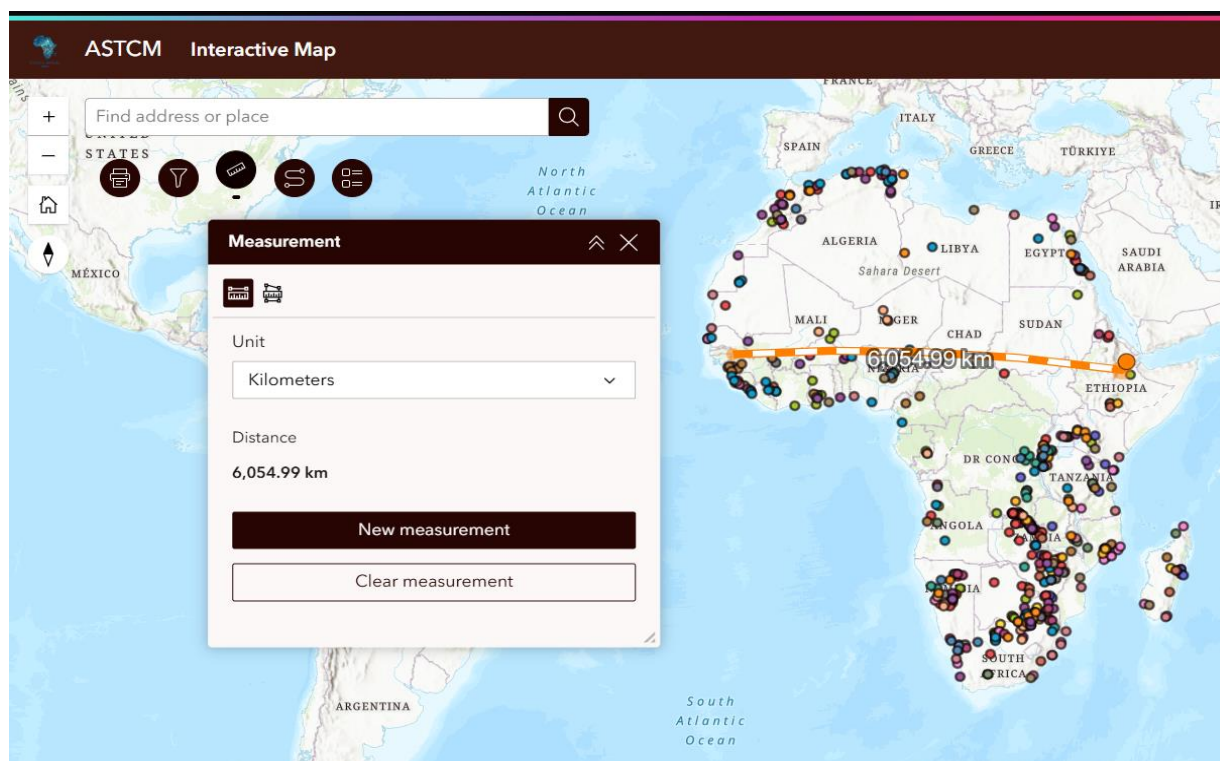
- ✓ **Area Measurement**

Draw a polygon to compute the surface area

- ✓ **Units**

Kilometers, miles, meters, or feet

Why it matters: Estimate haul routes, mining site extents, or proximity to infrastructure directly on the map.



18.8. Print

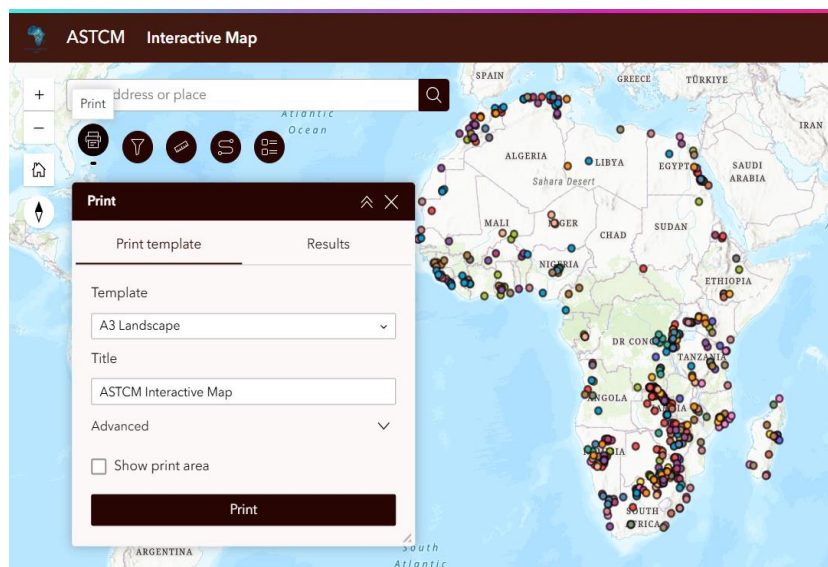
✓ Exporting Map Images

Use the Export/Print tool to capture the current map view. Formats: PNG, JPEG, PDF.

✓ Exporting Data Files (if enabled)

Formats: Shapefile (.shp), CSV (.csv), GeoJSON. Accessible via Layer List → Download Data → Select format. Public users may have limited access; technical staff have full access.

✓ Printing Maps with Scale and Title. Include professional cartographic elements: Title, Legend (symbols, colors), Scale Bar, North Arrow, Date of Export, Page sizes: A4, A3, Letter.



19 NAVIGATION INSTRUCTIONS

The ASTCM Interactive and Dynamic Map provides an easy-to-use interface with intuitive navigation tools that help users explore Africa's mineral resources, infrastructure, and related data seamlessly. Whether you want to zoom into a specific mine site or pan across the continent, these controls are designed to ensure smooth and efficient navigation.

19.1. Panning (moving the map)

Panning allows you to move the map view horizontally or vertically to explore different areas without changing your current zoom level.

How to Pan:

- ✓ Using a Mouse: Click and hold the left mouse button anywhere on the map and drag in the direction you want to move.
- ✓ Using a Touchscreen Device: Press your finger on the map, hold briefly, then slide your finger in the desired direction.

Tip:

Use panning to explore nearby regions or shift your view to locations just outside your current focus without zooming in or out.

19.2. Zooming (Changing the Map Scale)

Zooming lets you adjust the map's scale to see either more detailed local information or a broader overview of geographic features.

How to Zoom In and Out:

Mouse Scroll Wheel:

- ✓ Scroll up to zoom in and view finer details, such as individual mineral deposits or mine sites.
- ✓ Scroll down to zoom out for a more extensive, regional or continental perspective.

Zoom Buttons:

Click the (+) button to zoom in or the (–) button to zoom out. These buttons are typically located on the bottom-right side of the map interface.

Double-Click Zoom:

Double-click on any point on the map to zoom directly into that location.

Touchscreen Devices:

- ✓ Pinch two fingers together on the screen to zoom out.
- ✓ Spread two fingers apart on the screen to zoom in.

Tip:

Zoom in for detailed site-level data, such as attribute information on mineral deposits. Zoom out to get an overview of mineral distribution across larger regions or the entire continent.

19.3. Accessing the Full Map View

This function is essential for maximizing the workspace, allowing you to switch from the embedded web map to the full, dedicated application view.

How to Change Views:

- **Launch Panel Access:**
 - Click the **Web Map/Full Map** button or icon (usually located on the far right of the top toolbar, next to the layer controls).
 - This action reveals a persistent right-hand panel showing the current view title (e.g., "Full Map" or "Web Map").

- **Launch Button:**

- Within this open panel, click the prominent "**Launch Full Map**" button.

Result: The full map application will open in a new browser tab, granting maximum screen real estate for detailed analysis, querying, and presentation of the GIS data without the distraction of the surrounding website interface.

Best Practice for Efficient Navigation:

- ✓ Use **panning** for lateral movement without changing scale.
- ✓ Combine **zoom in/out** with panning to focus on areas of interest.
- ✓ Regularly **reset to the default extent** to reorient yourself during long exploration sessions.

20 USING LAYERS

Layers are the key to unlocking the power of the ASTCM Interactive and Dynamic Map. Each layer represents a different dataset—like mineral deposits, roads, or population density. By managing layers, you can combine information to perform your own analysis and create a map view tailored to your specific interest.

Quick Access: Find the Layer List (also called "Contents" or "Legend") by clicking the Layers icon (☰) on the map toolbar.

20.1. Showing Or Hiding a Layer

Control which information is visible on the map to reduce clutter and focus on what matters.

- ✓ How to: In the Layer List, check the box next to a layer's name to show it. Uncheck the box to hide it.
- ✓ Pro Tip: For better map performance, especially on slow connections, keep only the essential layers turned on.

20.2. Adjusting Layer Transparency (Opacity)

See through a layer to view how it relates to the information underneath. This is essential for analyzing overlaps.

How to:

Find the slider (● — — ●) or percentage field next to the layer. Slide left (or lower the %) to make the layer more transparent. Slide right (or increase the %) to make it solid.

Example: Make the "Mineral Deposits" layer 50% transparent to see them on top of the satellite imagery basemap.

20.3. Changing Layer Draw Order (If enabled)

The order of layers in the list controls which ones appear on top. You can drag layers to change this order.

- ✓ **How to:** Simply **click, hold, and drag** a layer's name up or down in the Layer List. Layers at the top of the list draw on top of those below.
- ✓ **Note:** This advanced feature may be restricted in the public version of the map.

Note: Not all public versions of the ASTCM map will allow reordering—this feature may be restricted to technical staff in the backend environment.

20.4. Layer Categories in The ASTCM Map

The ASTCM Interactive and Dynamic Map organizes layers into thematic categories to make them easier to navigate. Based on the ASTCM Map's objectives, common categories include:

- ✓ **Mineral Deposits:** Locations and attributes of Strategic Transitional Critical Minerals (e.g., lithium, cobalt, rare earth elements), including type, grade, and size.
- ✓ **Mining Infrastructure:** Transportation corridors (railways, roads, ports), processing facilities, power plants, and other supporting infrastructure.
- ✓ **Socio-Economic Data:** Population density, employment statistics, and community development areas near mining regions.
- ✓ **Environmental & Policy Layers:** Protected areas, water resources, environmental sensitivity zones, and links to AU or global mining policy frameworks.
- ✓ **Reference Layers:** Basemaps, administrative boundaries, and geospatial reference grids to provide context.

Best Practices for Layer Use: Start with a **Reference** layer, add your primary data (e.g., **Mineral Deposits**), and then overlay **Context** layers (e.g., **Infrastructure** or **Environment**) to complete your analysis. Use the **show/hide** and **transparency** tools to clean up the view.

21 USING SEARCH & FILTER

The ASTCM Interactive and dynamic Map features advanced search and filtering tools designed to help users quickly locate specific areas of interest and narrow down datasets for focused and efficient analysis. These functionalities are especially valuable when managing extensive spatial data, such as numerous mineral deposits, infrastructure sites, and policy zones across Africa.

21.1. Searching Data

The search function enables you to find specific locations or assets without the need for manual map navigation, saving time and effort.

Search by Location Name

- ✓ Enter the name of a country, province, city, or mining site in the search bar, typically found in the top-right corner of the map interface.
- ✓ The map will zoom directly to that location and highlight it for easy identification.
- ✓ Example: Typing “Kolwezi” zooms in on the cobalt mining area in the Democratic Republic of Congo

Search by Coordinates

- ✓ Input latitude and longitude values in either decimal format (e.g., -6.134, 23.589) or degree format (e.g., 6°08'02"S, 23°35'21"E).
- ✓ The map will center precisely on the specified coordinates.
- ✓ **Example:** Useful for pinpointing newly surveyed sites or assets not yet labeled with names.

Search by Asset ID or Attribute

- ✓ Input latitude and longitude values in either decimal format (e.g., -6.134, 23.589) or degree format (e.g., 6°08'02"S, 23°35'21"E).
- ✓ The map will center precisely on the specified coordinates.
- ✓ **Example:** Useful for pinpointing newly surveyed sites or assets not yet labeled with names.

21.2. Filtering Data

Filters help refine which data is visible on the map, allowing you to concentrate on the most relevant information for your analysis.

Filtering by period

- ✓ Select a date range to view only assets that were active, discovered, or updated within that timeframe.
- ✓ Useful for tracking exploration activity, operational mines, or policy changes over time.

Filtering by Region

- ✓ Use drop-down menus or map selection tools to limit results to a **specific country, region, or administrative boundary**.
- ✓ This is ideal for regional studies, national reports, or targeted investment analysis.

Filtering by Type of Site

- Limit results based on site category:
 - ✓ **Mine** – Active or inactive extraction sites.
 - ✓ **Processing Plant** – Facilities for refining or smelting minerals.
 - ✓ **Port** – Export hubs for mineral products.
 - ✓ **Other Infrastructure** – Power plants, transport depots, or rail terminals supporting mining.

Example: Filtering for “Processing Plants” in Southern Africa will display only the relevant industrial facilities, excluding mines and ports.

21.3. Best practices for search & filter

- ✓ **Combine search and filter** for pinpoint accuracy (e.g., filter by “Lithium Mines” in “Mozambique” and then search by site name).
- ✓ Reset filters before starting a new query to avoid missing results.
- ✓ Use attribute searches for technical analysis and public name searches for general exploration.

22 POP-UPS & DETAILED DATA

ASTCM Interactive and Dynamic Map provides interactive **pop-ups** that display detailed information when you click on a feature (such as a mine, processing plant, or transport corridor). Pop-

ups are a core feature of ArcGIS-based maps and allow users to access **site-specific data, documents, and media** directly within the map interface.

22.1. Accessing A Pop-Up

- ✓ **Click** on any feature (e.g., mineral deposit symbol, infrastructure site, or policy zone) to open a pop-up window.
- ✓ The pop-up will appear **above or beside the selected feature**, showing structured information.
- ✓ If multiple features overlap at the same location, use the **arrow buttons** within the pop-up to scroll through each one.

22.2. Information Available in Pop-Ups

Pop-ups provide several types of information depending on the feature selected:

1. Basic Information

- ✓ **Name of site/asset** (e.g., mine, plant, or port).
- ✓ **Location details** (country, region, coordinates).
- ✓ **Mineral type** and deposit size/grade, where available.
- ✓ **Operational status** (exploration, active, inactive, or closed).

2. Photos and Media

- ✓ Embedded images of mine sites, infrastructure, or surrounding areas.
- ✓ Maps or diagrams uploaded as part of project documentation.

3. Links to Reports and Resources

- ✓ Direct links to relevant reports, AU policies, or global mining strategies.
- ✓ Downloadable documents such as geological surveys, feasibility studies, or sustainability reports.
- ✓ External resources (e.g., African Union, Expertise France, or partner research institutions).

22.3. Closing a pop-up

- ✓ Click the **“X” button** in the top-right corner of the pop-up window.
- ✓ Alternatively, click on an **empty area of the map** to close the pop-up and return to the full view.
- ✓ On mobile devices, swipe the pop-up down or tap outside the box.



22.4. Best Practices for Using Pop-ups

- ✓ Always review the **attribute table** or links provided for deeper analysis.
- ✓ Use pop-ups in combination with **filters** (e.g., view all lithium mines in one country, then click individual sites for details).
- ✓ If multiple features overlap, carefully use the **scroll arrows** to ensure you do not miss hidden data.
- ✓ Save or bookmark report links if you need to reference them later.

23 PRINTING & EXPORTING

The **Africa's Strategic Transitional Critical Minerals (ASTCM) Interactive and Dynamic Map** provides options for **exporting maps and data** to support offline use in reports, presentations, policy briefs, and technical analyses. Depending on your access level (public user vs. technical staff), you may export images, data files, or full map layouts with titles and scales.

23.1. Exporting map images

- ✓ Use the **Export/Print tool** in the map toolbar to capture the current view of the map.
- ✓ Choose your preferred file format (**PNG, JPEG, or PDF**).
- ✓ Images can be used in presentations, publications, or for sharing insights with stakeholders.

Example: Export a zoomed-in image of cobalt deposits in Central Africa for inclusion in a policy briefing.

23.2. Exporting data files (if enabled)

The ASTCM Map allows users with the proper permissions to **download datasets** for further analysis in GIS or statistical tools.

Available formats may include:

- ✓ **Shapefiles (.shp):** For use in GIS software (ArcGIS, QGIS).
- ✓ **CSV files (.csv):** For spreadsheets or statistical analysis.
- ✓ **GeoJSON:** For developers and web-based mapping tools.

How to:

1. Open the **Layer List** and select the dataset you want to export.

2. Click **Download Data**.
3. Choose your file format.
4. Save the file to your device.

Note: Public users may have access only to selected datasets, while **technical staff** (via login) can download full-resolution or restricted datasets.

23.3. Printing maps with scale and title

For professional reporting, you can generate a printable version of the map that includes key cartographic elements:

- ✓ **Title:** Add a map title (e.g., “Lithium Deposits in Southern Africa”).
- ✓ **Legend:** Include the legend to explain map symbols and colors.
- ✓ **Scale Bar:** Automatically generated to indicate distance.
- ✓ **North Arrow:** Ensures proper orientation.
- ✓ **Date of Export:** Useful for record-keeping.

How to:

1. Open the **Print/Export tool** in the toolbar.
2. Select the **Print with Layout** option.
3. Customize title, scale, and page size (A4, A3, Letter, etc.).
4. Save or print the document as a **PDF** or a **hard copy**.

Example: Print an official map showing “Rare Earth Elements in East Africa” with title, scale, and legend for inclusion in a government report.

23.4. Best practices for exporting and printing

- ✓ Use **exported shapefiles/CSVs** for technical analysis in GIS or statistical software.
- ✓ Export **map images** for quick sharing with colleagues or in presentations.
- ✓ Always include **scale and legend** when printing maps for official reports to maintain context.
- ✓ For large datasets, ensure you have a stable internet connection before exporting to avoid incomplete downloads.

24 TROUBLESHOOTING & FAQs

While the **Africa’s Strategic Transitional Critical Minerals (ASTCM) Interactive and dynamic Map** is designed for reliability and ease of use, users may occasionally encounter issues. The following troubleshooting steps and frequently asked questions will help resolve the most common problems.

24.1. Map not loading

Possible Causes:

- ✓ Browser cache or cookies are interfering with the map.
- ✓ Outdated browser version.
- ✓ Slow or unstable internet connection.

Solutions:

- ✓ Clear your **browser cache and cookies**.
- ✓ Refresh the page (**Ctrl + R** or **F5**).
- ✓ Ensure you are using a **supported browser** (latest version of Chrome, Edge, Firefox, or Safari).
- ✓ Check that your internet connection meets the recommended speed (**5 Mbps minimum; 10 Mbps preferred**).

24.2. Layers not Showing

Possible Causes:

- ✓ Zoom level is too broad or too detailed for the layer to display.
- ✓ Internet speed is too slow to load large datasets.
- ✓ The layer is not toggled on in the **Layer Control panel**.

Solutions:

- ✓ Zoom in or out until the layer appears (some layers are scale-dependent).
- ✓ Verify that the layer checkbox is **ticked on** in the Layer List.
- ✓ Test your internet speed; if slow, reduce the number of active layers to improve performance.

24.3. Symbols look strange or out of place

Possible Causes:

- ✓ Temporary rendering issue in the browser.
- ✓ Cached symbols not updating properly.

Solutions:

- ✓ Refresh the page.
- ✓ Clear browser cache and reload the map.

- ✓ Switch to another supported browser if the issue persists.

24.4. Pop-ups not displaying information

Possible Causes:

- ✓ Feature not fully loaded due to connectivity issues.
- ✓ Pop-up disabled for that layer.

Solutions:

- ✓ Wait a few seconds to allow the data to load.
- ✓ Check if the layer supports pop-ups by reviewing the legend or metadata.
- ✓ Refresh the page if the pop-up remains blank.

24.5. Downloads not working

Possible Causes:

- ✓ Attempting to download restricted datasets without proper login.
- ✓ Large dataset exceeding browser memory.

Solutions:

- ✓ Ensure you have the right **permissions** (technical staff may need login access).
- ✓ Try downloading smaller portions of data.
- ✓ Contact the technical support team if the issue persists.

24.6. General FAQs

Q1: Do I need a login to use the map?

- ✓ **No** for public users. All public datasets and visualization tools are open-access.
- ✓ **Yes** for technical staff who manage and upload datasets.

Q2: Can I use the map on mobile devices?

- ✓ Yes. The ASTCM Interactive Map is mobile-compatible, but for full functionality (e.g., data downloads, advanced filtering), a desktop or laptop is recommended.

Q3: How often is the map updated?

- ✓ Data is updated regularly based on **geological surveys, AU reports, academic research, and industry submissions**, as defined in the ATCM Interactive and Dynamic Map's objectives.

25 CONTACT & SUPPORT

For assistance with **Africa's Strategic Transitional Critical Minerals (ASTCM) Interactive and DynamicMap**, users can contact the project's dedicated support channels. These contacts are available to address technical issues, user questions, and data-related inquiries.

25.1. Technical support for users

If you encounter issues such as the map not loading, problems with data layers, or challenges with downloads and printing:

- ✓ **Helpdesk Email:**
✉ support@strategicmineralsafrica.org (RECOMMENDED PRIMARY CONTACT)
- ✓ **Helpdesk Portal (if enabled):**
🌐 Visit the **Help / Support** section on strategicmineralsafrica.org for FAQs, troubleshooting guides, and ticket submission.

25.2. Project coordination & administration

For project-level inquiries or permissions (e.g., requesting technical staff login credentials, contributing new datasets, or clarifying policy alignment):

- ✓ **African Union Commission (AUC), ETTIM Division**
✉ mineralsupport@au.int
- ✓ **Expertise France AU Facility – Project Coordination**
✉ kervin.kumapley@expertisefrance.fr (as listed in the TOR)
- ✓ **Proton Technology PLC (System Developer & Technical Lead)**
✉ techsupport@protontplc.com

25.3. Response times

- ✓ **General inquiries:** Within 3–5 business days.
- ✓ **Technical troubleshooting:** Within 1–2 business days.
- ✓ **Data updates or permissions:** As per the AU Commission validation schedule.

25.4. Best practice before contacting support

- ✓ Review the **Troubleshooting & FAQs** section of this manual.
- ✓ Note your **browser type, version, and internet speed** when reporting an issue.
- ✓ Provide a **screenshot** if possible, to help the support team resolve the problem quickly.

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