Bankable Feasibility Study of Mining Projects:

A Bankable Feasibility Study (BFS) — sometimes called a Definitive Feasibility Study (DFS) — is the most detailed and comprehensive evaluation of a mining project before full-scale development and financing. It's the final step in the feasibility process (after Scoping Study → Pre-Feasibility Study → BFS) and forms the foundation for investment, financing, and project approval.

Here's a complete framework for preparing a Bankable Feasibility Study (BFS) for a Greenfield Mining Project:

🧭 1. Executive Summary

A concise overview covering:

Project name, location, and ownership

Commodity and key resource data

Summary of economic results (NPV, IRR, payback period)

Total capital and operating costs

Key risks and mitigation measures

Project timeline and expected life of mine (LOM)

🗺️ 2. Project Background

Introduction and history of the area

Exploration status (Greenfield — new discovery)

Legal and regulatory framework

Ownership, joint venture, or lease details

Project rationale and strategic fit

⛏️ 3. Geology and Mineral Resources

Regional and local geology

Orebody characteristics (geometry, grade distribution, continuity)

Drilling, sampling, and assay data

Resource estimation (compliant with JORC, NI 43-101, or SAMREC)

Resource classification (Measured, Indicated, Inferred)

⚙️ 4. Mining Methodology

Selection of mining method (open pit / underground)

Pit optimization or stope design

Mine planning and scheduling

Equipment selection (HEMM fleet)

Mine life estimation

Grade control and dilution recovery

Production rate and sequencing

🧪 5. Mineral Processing & Metallurgy

Metallurgical testwork results

Process flow sheet (crushing, grinding, beneficiation, concentration, etc.)

Tailings and waste management

Recovery rates and product quality

Plant design capacity and layout

Reagent and water consumption

🌍 6. Infrastructure and Logistics

Access roads, rail, and port facilities

Power supply and distribution

Water supply and management

Communications and IT systems

Accommodation, workshops, and mine offices

Logistics plan for concentrate/ore transport

🌱 7. Environmental and Social Impact Assessment (ESIA)

Baseline environmental studies

Land use and biodiversity

Air, water, noise, and waste management plans

Rehabilitation and mine closure plan

Community engagement and resettlement (if applicable)

ESG (Environmental, Social, Governance) compliance

Environmental Clearance (EC) and statutory approvals timeline

⚖️ 8. Legal, Permitting, and Regulatory Compliance

Mining lease / prospecting license status

Environmental clearances (MoEF&CC, SPCB)

Forest clearance (if applicable)

Water and land use permissions

Labour and safety compliance under DGMS

CSR and sustainability obligations

💰 9. Capital and Operating Cost Estimates

CAPEX (Capital Expenditure)

Mine development

Plant construction

Infrastructure

Pre-production costs

Contingencies

OPEX (Operating Expenditure)

Mining costs (Rs/tonne or $/tonne)

Processing costs

Power and fuel

Labour

Maintenance and consumable

Cost estimation accuracy should be within ±10–15%.

📉 10. Financial Analysis

Assumptions: commodity price, exchange rate, inflation, royalty, tax

Revenue forecast

Operating cash flow

Net Present Value (NPV)

Internal Rate of Return (IRR)

Payback period

Sensitivity analysis (price, grade, recovery, cost)

Scenario analysis (base case, optimistic, pessimistic)

⚠️ 11. Risk Assessment and Mitigation

Technical risks (grade, geotechnical, metallurgical)

Market risks (price volatility, demand fluctuations)

Environmental and social risks

Political and regulatory risks

Financial and operational risks

Mitigation strategies and contingency planning

🧩 12. Implementation Plan

Project development schedule (Gantt chart)

Procurement and construction sequence

EPC/EPCM contract strategy

Commissioning and ramp-up plan

Staffing and training programs

Mine closure and reclamation plan

📚 13. Appendices and Supporting Documents

Detailed drill logs and assays

Drawings and layouts

Cost breakdown spreadsheets

Permits and statutory correspondence

Consultant reports

Photographs and satellite imagery

🏗️ Typical Timeframe for BFS

Stage	Duration
Exploration & Resource Definition	2–3 years
Pre-Feasibility Study (PFS)	6–12 months
Bankable Feasibility Study (BFS)	9–18 months
Permitting & Approvals	Parallel 12–24 months
Construction & Commissioning	18–36 months

📄 Key Deliverables of BFS

- ✅ Detailed Mine Plan (Life of Mine)
- ✅ Process Flow Diagram & Plant Layout
- ✅ Infrastructure Layout
- ✅ Environmental and Social Management Plan
- ✅ Financial Model with NPV/IRR
- ✅ Risk and Sensitivity Matrix
- ✅ Implementation Schedule

✅ Bank-ready documentation for funding

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