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INSTITUTIONALISING MINERAL RESOURCE DISCLOSURE IN PAKISTAN: A CRIRSCO-ALIGNED REPORTING FRAMEWORK AND ITS RATIONALE

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Abstract

Pakistan has entered a renewed phase of mineral-sector reform and investment promotion, yet it still lacks a domestically administered reporting code for the public disclosure of Exploration Results, Mineral Resources and Mineral Reserves that is aligned with the Committee for Mineral Reserves International Reporting Standards (CRIRSCO). This paper argues that the gap is not merely procedural. In jurisdictions where mineral disclosure is weak, technical uncertainty can become capital-market risk, sovereign-risk exposure and reputational loss. The paper develops this argument through three connected lines of evidence. First, it revisits the Poseidon nickel boom in Australia and the Bre-X gold fraud in Canada as formative episodes that exposed the market consequences of unsupported or fraudulent mineral claims and helped shape the JORC Code, NI 43-101 and the wider CRIRSCO family. Second, it compares the institutional architecture of major CRIRSCO-aligned regimes, emphasising the common principles of Transparency, Materiality and Competence, the role of the Competent Person or Qualified Person, the link between resource classification and confidence, and the conversion of Mineral Resources to Mineral Reserves through Modifying Factors. Third, it examines Pakistan through the Reko Diq arbitration, the post-2022 reconstitution of the project, the 2025 National Minerals Harmonisation Framework, and the emergence of Pakistani corporate mineral exploration by National Resources Limited and Mari Energies/Mari Minerals. The analysis concludes that a Pakistan Reporting Code should be developed through a National Reporting Organisation with recognised professional organisations, enforceable ethics and discipline, a Table 1-style checklist, independent technical-review capacity, and explicit integration with Pakistan Stock Exchange and Securities and Exchange Commission of Pakistan disclosure requirements. Such a framework would not eliminate geological, commercial or political risk, but it would provide a transparent, internationally legible mechanism for the technical disclosure on which investment, licensing and project finance increasingly depend.

1. Introduction

The public reporting of Exploration Results, Mineral Resources and Mineral Reserves is a specialised form of technical disclosure. It converts geological observations, sampling data, estimation assumptions and mine-planning judgements into information that can be used by investors, lenders, regulators and governments. In capital-market settings, the reported resource or reserve is often treated as a central representation of mineral asset value. For this reason, the credibility of the reporting framework is as

important as the geological endowment itself. Without standard definitions, professional accountability and enforceable disclosure rules, mineral estimates may be misunderstood, overstated or used in a manner that does not fairly represent the underlying evidence (CRIRSCO, 2024a; JORC, 2012).

Pakistan illustrates this institutional problem. The country hosts important copper-gold, coal, chromite, industrial minerals, dimension-stone and gemstone potential, and the Chagai metallogenic belt is internationally significant as the eastern continuation of the Tethyan magmatic and metallogenic system. However, Pakistan has no national reporting code equivalent to JORC in Australasia, NI 43-101 in Canada, SAMREC in South Africa, PERC in Europe or the SME Guide/S-K 1300 framework in the United States. Technical reports for Pakistani mineral projects therefore tend to rely on foreign Competent Persons or Qualified Persons and foreign codes when international finance or listing credibility is required.

The institutional timing has become important. By June 2025, Pakistan had advanced the National Minerals Harmonisation Framework, held the Pakistan Minerals Investment Forum 2025, and seen increased domestic corporate participation in exploration through National Resources Limited, Mari Energies/Mari Minerals and other public and private entities (Ministry of Energy, 2025; Radio Pakistan, 2025; CCP, 2024; Mari Energies, 2025; NRL, 2025). Reko Diq had also moved from legal dispute and arbitration settlement into an updated feasibility-study and financing phase, with the project owned 50% by Barrick, 25% by federal state-owned enterprises and 25% by the Government of Balochistan (Barrick Gold Corporation, 2025a, 2025b). These developments make the absence of a domestic, credible and enforceable reporting framework more visible.

This paper redrafts and extends the case for a Pakistan Reporting Code aligned with CRIRSCO. It is not a mineral-resource estimate and does not express any opinion on the economic viability of specific deposits. Its objective is institutional: to explain why Pakistan needs a code, what principles and mechanisms such a code must contain, and how Pakistan may proceed toward eventual recognition through a CRIRSCO-compatible National Reporting Organisation. The evidence base is limited to information available up to 30 June 2025. Events, announcements and institutional changes after that date are deliberately excluded.

2. Method, Scope and Evidence Cut-off

The paper uses a policy-oriented doctrinal and comparative method. It synthesises reporting codes, regulatory instruments, arbitration records, listed-company disclosures and public-domain project announcements to identify the institutional elements that would be required for a Pakistan Reporting Code. The paper is organised around three questions: (i) why did modern reporting codes emerge; (ii) which institutional features are shared across CRIRSCO-aligned systems; and (iii) what Pakistan-specific legal, professional and market conditions must be addressed for a credible national code?

Accordingly, the CRIRSCO membership status is presented as fifteen National Reporting Organisations as at 30 June 2025, with the Philippines as the most recent member admitted in October 2023 and with other candidate jurisdictions still in process during the cut-off period (CRIRSCO, 2024b; Sides, 2024; UNECE, 2025).

The paper uses the CRIRSCO term Mineral Reserve when describing the international template and most national codes, but it retains the term Ore Reserve where referring specifically to the JORC Code. The Pakistan code proposed here could use either Mineral Reserve or Ore Reserve, provided the definition is not materially different from the CRIRSCO standard definition and is consistently applied.

3. Why Mineral Reporting Codes Emerged: Market Failure, Fraud and Professional Accountability

3.1 Poseidon NL and the Australian nickel boom

The Poseidon episode remains the classic Australian example of how a speculative mineral discovery can detach from verified technical disclosure. In 1969, Poseidon NL announced nickel intersections at Windarra, Western Australia, during a period of tight nickel supply and high global prices. Poseidon shares rose from about A$0.80 in August 1969 to an intraday peak of about A$280 in February 1970, a roughly 350-fold increase in approximately six months (Firstlinks, 2019; Simon, 2003). The movement was not supported by a mature resource estimate, a feasibility study or a disclosure system comparable to contemporary codes. The boom spread to other mining and exploration securities before collapsing as nickel prices softened, geological expectations were revised and the commercial limitations of the project became clearer.

Poseidon did not by itself create the JORC Code, but it became a powerful reference point for Australian reforms. The Rae Committee and subsequent changes to securities regulation demonstrated that mining disclosure required technical controls that general corporate disclosure rules could not supply. The eventual JORC system linked public reporting to a named Competent Person, standard terminology, minimum disclosure criteria and stock-exchange rules (JORC, 2012; Kalaitzidis, 2013). The lesson for Pakistan is that a mineral asset can become a speculative financial instrument long before it becomes a technically mature project. A reporting code is designed to slow that transition by requiring transparent evidence and professional responsibility.

3.2 Bre-X and the Canadian response

Bre-X Minerals Ltd. represents a more severe disclosure failure because the underlying technical data were deliberately falsified. Bre-X promoted the Busang gold project in East Kalimantan, Indonesia, during the mid-1990s, with claimed resources rising to extraordinary levels. Its share price increased from a low junior-exploration base to a split-adjusted peak of about C$286.50 in 1996, with market capitalisation above C$6 billion, before the project collapsed in 1997 after due-diligence sampling indicated that core had been salted with external gold (Brown et al., 2000; Hall and Gunton, 2005; Nova Scotia Securities Commission, 2018).

The Canadian regulatory response was National Instrument 43-101. NI 43-101 requires scientific and technical disclosure on material mineral projects to be prepared by, or under the supervision of, a Qualified Person and prescribes detailed requirements for technical reports (CSA, 2011, as amended; CIM, 2014). The Bre-X experience is particularly relevant to Pakistan because it shows that even sophisticated markets can be misled when sample security, QA/QC, independent verification and professional accountability are weak. The resulting regulatory design did not rely only on the integrity of companies; it created an accountable professional gatekeeper and a disclosure format that regulators and investors could test.

3.3 Comparative quantitative summary

Table 1. Comparative summary of the Poseidon and Bre-X disclosure failures.

Parameter	Poseidon NL	Bre-X Minerals Ltd.
Commodity and claim	Nickel discovery at Windarra, Western Australia	Gold discovery at Busang, East Kalimantan, Indonesia
Indicative pre-boom price	About A$0.80 in August/September 1969	About C$5.90 at the October 1995 discovery disclosure, split-adjusted
Indicative peak price	About A$280 intraday in February 1970	About C$286.50 split-adjusted in May 1996

Parameter	Poseidon NL	Bre-X Minerals Ltd.
Approximate rise	About 350 times from the pre-boom price	About 48 times from the October 1995 level
Technical issue	Disclosure and expectation outran verified geological and economic evidence	Deliberate salting of samples and false gold assay evidence
Institutional legacy	Contributed to the reform climate leading to JORC-style reporting and Competent Person accountability	Direct catalyst for NI 43-101 and the Canadian Qualified Person regime

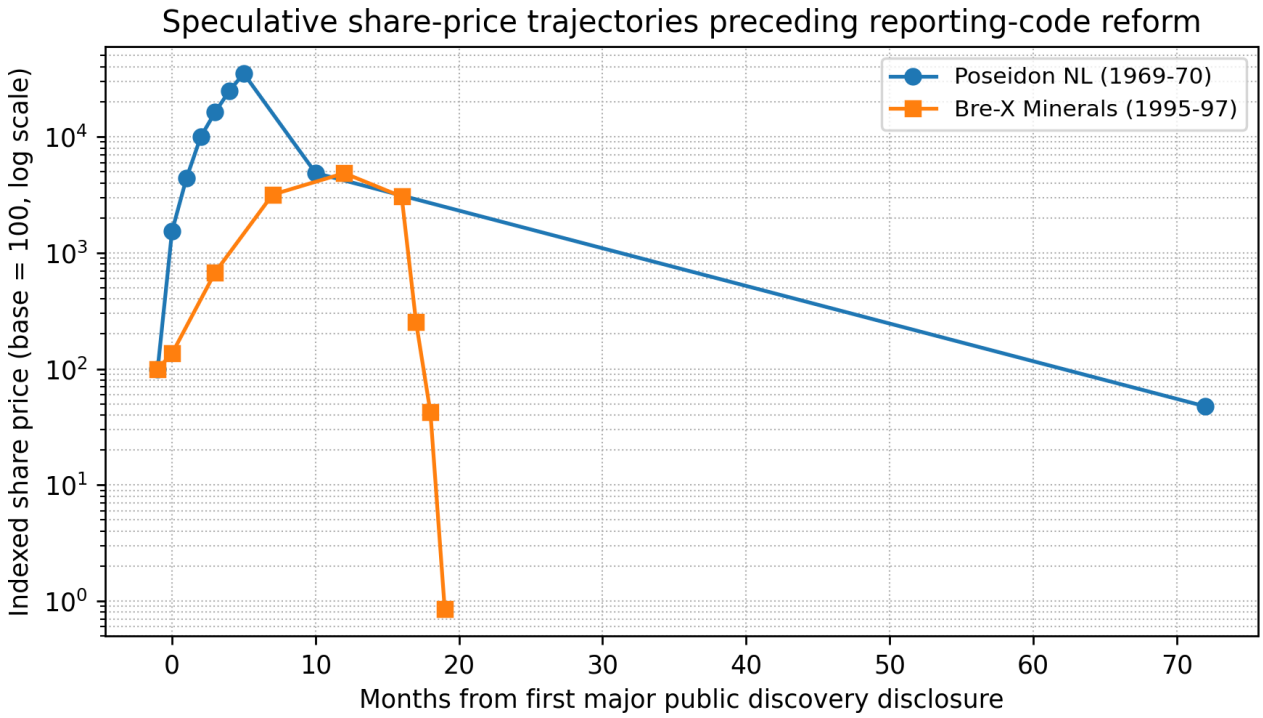

Figure 1. Indexed share-price trajectories of Poseidon NL and Bre-X Minerals Ltd., rebased to 100 at the start of the relevant discovery-disclosure period. The figure is illustrative and reconstructed from secondary historical sources; it is not a tick-by-tick price series.

4. The CRIRSCO Reporting System

4.1 Institutional origin and purpose

CRIRSCO was formed in 1994 under the Council of Mining and Metallurgical Institutions to harmonise international reporting definitions for Exploration Results, Mineral Resources and Mineral Reserves. The 1997 Denver Accord established common definitions for Mineral Resources, Mineral Reserves and their subcategories: Inferred, Indicated and Measured Mineral Resources, and Probable and Proved Mineral Reserves (CRIRSCO, 2024b; SAMCODES, 2025). The International Reporting Template provides a framework for jurisdictions developing or updating their own codes; it is not intended to prescribe estimation methodology, but rather to define the minimum content, terminology and accountability required for public reporting (CRIRSCO, 2024a).

As at 30 June 2025, CRIRSCO comprised fifteen National Reporting Organisations representing Australasia, Brazil, Canada, Chile, Colombia, Europe, India, Indonesia, Kazakhstan, Mongolia, the Philippines, Russia, South Africa, Turkey and

the United States. Together, these jurisdictions account for a dominant share of listed mining market capital and provide the reference architecture used by lenders, stock exchanges, institutional investors and technical consultants (Sides, 2024; UNECE, 2025). Pakistan was not a CRIRSCO member at that date and did not have a CRIRSCO-compatible National Reporting Organisation.

4.2 Principles: Transparency, Materiality and Competence

CRIRSCO-family codes are principles-based. The first principle, Transparency, requires that a public report contain sufficient information, presented clearly and without omission, so that a reasonable investor and professional adviser can understand the technical basis of the disclosure. The second, Materiality, requires disclosure of all information that could reasonably influence the judgement of investors, regulators or other users. The third, Competence, requires that the technical work be prepared by suitably qualified and experienced professionals who accept responsibility for the information (CRIRSCO, 2024a; JORC, 2012).

These principles are operationalised through a named Competent Person or Qualified Person, a defined professional-membership route, an enforceable code of ethics and a disciplinary process. In mature regimes, the company board remains responsible for public disclosure, but the technical content must be based on documentation prepared by or under the direction of a CP/QP. This dual responsibility is central: it prevents companies from treating the technical report as a marketing document while also preventing technical professionals from disclaiming responsibility for public use of their work.

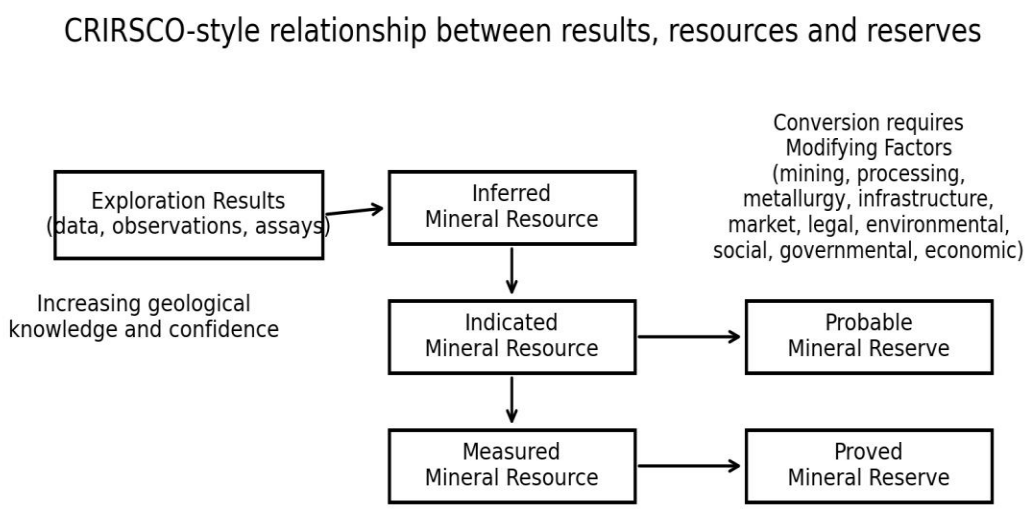

Figure 2. Simplified CRIRSCO-style relationship between Exploration Results, Mineral Resources and Mineral Reserves. Mineral Reserves are not merely higher-confidence resources; they are the economically mineable part of Measured and/or Indicated Resources after the application and evaluation of Modifying Factors.

4.3 From data to resources and reserves

A CRIRSCO-style report is not limited to a tonnage-grade number. It requires the Competent Person to explain the geological setting, sampling methods, drilling and logging procedures, sample preparation, analytical methods, QA/QC performance, database integrity, geological interpretation, estimation method, cut-off assumptions, bulk density, classification criteria and prospects for eventual economic extraction. When Mineral Reserves are reported, the report must also address the Modifying Factors, including mining method, geotechnical and hydrogeological conditions, processing and metallurgical recovery, infrastructure, marketing, legal tenure, environmental and social factors, governmental approvals, capital and operating costs, and economic analysis (CRIRSCO, 2024a; JORC, 2012; CIM, 2014).

This structure is directly relevant for Pakistan. Many domestic reports still emphasise mineral occurrences, visible mineralisation, isolated assay values, historical estimates or broad tonnage narratives. These may be useful at early exploration stage, but they are not equivalent to Mineral Resources or Mineral Reserves. A Pakistan Reporting Code would therefore have to discipline language: Exploration Results should not be promoted as resources; Inferred Resources should not be treated as reserves; and production targets or feasibility claims should not be made unless the supporting technical work is at the appropriate level.

5. Comparative Institutional Architecture of Major Reporting Regimes

Table 2. Selected CRIRSCO-aligned or CRIRSCO-compatible reporting frameworks relevant to a Pakistan code design.

Code / framework	Jurisdiction	Administrative base	Legal or market mechanism	Professional gatekeeper	Design relevance for Pakistan
JORC Code	Australasia	Joint Ore Reserves Committee; supported by AusIMM, AIG and Minerals Council of Australia	Incorporated into ASX/NZX listing rules for relevant public reports	Competent Person	Appendix 5A / JORC Table 1, strong exchange linkage, "if not, why not" disclosure logic
NI 43-101 and CIM Definition Standards	Canada	Canadian Securities Administrators with CIM definition standards and best-practice guidance	Provincial and territorial securities regulation	Qualified Person	Mandatory technical reports for material mineral projects; strong legal disclosure regime
SAMREC Code	South Africa	SAMCODES Standards Committee	JSE Listings Requirements	Competent Person	Competent Persons Reports and JSE Readers Panel support market review
PERC Reporting Standard	Europe	Pan-European Reserves and Resources Reporting Committee	Used across a multi-jurisdictional professional and market environment	Competent Person through Recognised Professional Organisations	Useful model for jurisdictions needing a regional/professional rather than single-exchange approach
SME Guide / S-K 1300	United States	SME professional guidance; SEC Subpart 1300 disclosure rules	SEC Regulation S-K Subpart 1300 for registrants with material mining operations	Qualified Person	Modernised US disclosure rules align resource/reserve definitions more closely with CRIRSCO practice

Despite differences in law and professional organisation, the major reporting regimes share four common elements. First, they define the technical categories of results, resources and reserves in a way that is not materially different from the CRIRSCO standard definitions. Second, they require the work to be prepared by or under the supervision of a CP/QP with relevant experience. Third, they connect public reporting to either stock-exchange rules, securities law or both. Fourth, they provide a pathway for professional discipline when the responsible person fails to meet professional standards.

The Australian and South African systems illustrate the importance of stock-exchange incorporation. ASX Listing Rule 5.6 requires

relevant public reports by listed mining entities to be prepared in accordance with the JORC Code, and the JSE requires mineral companies to report in accordance with the SAMREC and SAMVAL codes (ASX, 2025; SAMCODES, 2025). The Canadian and United States systems demonstrate that securities regulators can directly prescribe technical-disclosure requirements. NI 43-101 governs mineral-project disclosure in Canada, whereas the SEC replaced Industry Guide 7 with Regulation S-K Subpart 1300 to require disclosure of mineral resources, mineral reserves and material exploration results for registrants with material mining operations (CSA, 2011, as amended; SEC, 2018; 17 CFR 229.1300).

Pakistan can draw from both models. A purely professional code would not be sufficient unless PSX and SECP make compliance a condition for mining-related public offers, listed-company announcements and resource-backed fundraising. Conversely, a purely governmental code would be weak unless supported by an independent professional register and enforceable ethics. A blended model is therefore more appropriate.

6. Pakistan: Governance Need, Market Demand and Technical Context

6.1 Reko Diq as a governance and disclosure case study

The Reko Diq dispute is the most visible example of how mineral-project governance can create sovereign-risk exposure. The Chagai Hills Exploration Joint Venture Agreement was signed in 1993 between the Balochistan Development Authority and BHP Minerals. Through corporate succession, Tethyan Copper Company (TCC), jointly owned by Barrick Gold and Antofagasta, became the project vehicle. After TCC invested in exploration and feasibility work, the Government of Balochistan declined the mining lease application in 2011. TCC pursued arbitration under the Australia-Pakistan bilateral investment treaty. In July 2019, the ICSID tribunal awarded damages of US$4.087 billion plus US$1.869 billion in interest, a total of approximately US$5.976 billion (ICSID, 2019; IISD, 2019).

A reporting code would not, by itself, have resolved the legal and constitutional issues in Reko Diq. However, the case demonstrates why transparent technical records, independent expert documentation and consistent decision pathways matter in large mineral projects. Where geological evidence, feasibility assumptions, licensing decisions and state communications are not organised within an internationally legible technical framework, the state is more exposed to allegations of arbitrariness and inconsistent treatment. A Pakistan Reporting Code would not replace mining legislation, but it would create an auditable technical layer within which public resource statements, feasibility reports and licensing submissions can be assessed.

After settlement and restructuring, Reko Diq was reconstituted in 2022 with Barrick as operator and with Pakistani federal and Balochistan stakeholders collectively holding 50% of the project. By April 2025, joint-venture shareholders had approved the updated feasibility study and conditionally approved Phase 1 development capital, subject to limited-recourse project financing, with major works to advance in 2025 and first production targeted by the end of 2028 (Barrick Gold Corporation, 2022, 2025b). The project is therefore no longer only a historical legal dispute; it is also a current benchmark for how Pakistan's largest mineral projects will be evaluated by international financiers.

6.2 National Minerals Harmonisation Framework and provincial legislation

In March-April 2025, Pakistan moved toward the National Minerals Harmonisation Framework with support from the Special Investment Facilitation Council. Public announcements described the framework as an attempt to create a uniform regulatory structure across the federation, provinces, Azad Jammu and Kashmir, and Gilgit-Baltistan, with compatible laws, investment facilitation, safety, environmental protection, fast-track licensing and dispute-resolution mechanisms (Ministry of Energy, 2025; Radio Pakistan, 2025). The Pakistan Minerals Investment Forum 2025 provided a high-profile platform for this reform agenda.

The harmonisation agenda also exposed the constitutional complexity of mining governance. Mineral ownership and administration are closely connected to provincial authority after the Eighteenth Amendment. By June 2025, Balochistan had proceeded with a Mines and Minerals Act 2025, whereas debate around a Khyber Pakhtunkhwa Mines and Minerals Bill 2025 remained politically sensitive (Government of Balochistan, 2025; Provincial Assembly of Khyber Pakhtunkhwa, 2025; Norton Rose Fulbright, 2025). These developments reinforce the need for a professional reporting code that can operate uniformly across provinces without displacing provincial authority over mineral tenure.

The Pakistan Stock Exchange Listing Guide of February 2025 sets out general listing criteria and compliance obligations but does not provide a mining-specific reporting appendix equivalent to ASX Chapter 5/JORC or JSE Section 12/SAMREC (PSX, 2025; ASX, 2025; SAMCODES, 2025). That gap will become more consequential if mineral exploration entities or listed industrial groups seek to raise capital on the basis of exploration results, mineral resources or project-development studies.

6.3 Emerging domestic corporate demand for code-compliant disclosure

Domestic demand for mineral reporting standards is no longer hypothetical. In February 2024, the Competition Commission of Pakistan approved Lucky Cement Limited and Fatima Fertilizer Company Limited to acquire a cumulative 66.66% shareholding in National Resources (Private) Limited, a company engaged in exploration, survey, extraction and mining activities in Balochistan (CCP, 2024). NRL subsequently reported significant porphyry-style copper-gold mineralisation at Tang Kaur in Chagai. By April 2025, NRL had completed 13 diamond drill holes totalling 3,517 m; the first six holes reportedly returned near-surface intervals of 48-148 m using a 0.2% Cu cut-off, with average grades of 0.23-0.48% Cu, 0.09-0.14 g/t Au and 1.30-6.21 g/t Ag, equivalent to 0.28-0.56% CuEq (NRL, 2025; Arab News, 2025). NRL also publicly indicated that an NI 43-101 technical report would be prepared by international consultants.

Mari Energies also moved into minerals before the June 2025 cut-off. Its 30 June 2025 corporate briefing presented Mari Minerals as a wholly owned subsidiary and identified mineral diversification initiatives including three own licences in Chagai, Balochistan (EL-186, EL-322 and EL-323), ongoing surveys followed by drilling, and joint-venture arrangements involving EL-302 and EL-303, Koh-e-Sultan and Sanjrani Mining (Mari Energies, 2025). Public reporting in February 2025 also indicated Mari Minerals participation in Chagai exploration ventures with IRH Mining, Balochistan Mineral Resources Limited and the Government of Balochistan, subject to required approvals (Business Recorder, 2025).

These examples show why Pakistan cannot treat reporting-code development as a distant academic exercise. Pakistani capital is entering early-stage mineral exploration, and some of this capital is linked to listed companies. As exploration moves toward resource estimation, pre-feasibility studies, feasibility studies, project finance and possible public offerings, technical disclosure will need to meet lender and investor expectations. If Pakistan does not build its own code, domestic projects will continue to depend on foreign CP/QP systems even when the assets, promoters, regulators and affected communities are Pakistani.

6.4 Technical implications for Pakistani reporting practice

A Pakistan Reporting Code should be designed for Pakistan's deposit spectrum. In Chagai, porphyry copper-gold systems require attention to intrusive phases, alteration domains, structural controls, sulphide distribution, supergene enrichment, density, recoverability, deleterious elements and metallurgical variability. In Thar and other coalfields, reporting must address seam correlation, moisture basis, ash, sulphur, calorific value, partings, stripping ratio, hydrogeology and geotechnical constraints. For industrial minerals, quality specifications and marketability may be

more important than metal grade. For dimension stone, block size, recovery, colour, texture, fracture spacing and quarryability may dominate technical value. A code must be flexible enough to handle these different commodities while still requiring consistent evidence and professional accountability.

The code should also require modern data-governance expectations: chain of custody, sample security, certified reference materials, blanks, field and laboratory duplicates, umpire-laboratory checks, downhole survey control, collar survey accuracy, density protocols, database validation, independent verification and transparent treatment of historical data. These requirements are not bureaucratic additions. They are the technical controls that directly address the failure modes exposed by Poseidon, Bre-X and later market disputes.

7. Major Criteria for a Pakistan Reporting Code

Table 3. Institutional criteria for a CRIRSCO-aligned Pakistan Reporting Code.

Criterion	Core requirement	Pakistan-specific implication
National Reporting Organisation (NRO)	Create an independent or semi-independent body responsible for maintaining the Pakistan Reporting Code.	Must include professional, regulatory, academic and industry credibility; should not be controlled by a project promoter.
Recognised Professional Organisations (RPOs)	Define which Pakistani and foreign professional bodies can support CP/QP eligibility.	Pakistan Engineering Council, geological/mining societies and international RPOs may be recognised through defined criteria.
Competent Person / Qualified Person definition	Require at least five years of relevant experience in the deposit style and activity being reported, professional membership and enforceable discipline.	Experience must be relevant to the commodity, deposit type, estimation task and study level.
Ethics and discipline	Create complaint, investigation, sanction, suspension and appeal mechanisms.	Without enforceable discipline, the CP/QP title will not carry international credibility.
Table 1-style checklist	Require systematic disclosure of sampling, data, geology, estimation, classification and Modifying Factors.	Use an "if not, why not" approach for material items.
Stock-exchange and SECP linkage	Integrate the code into PSX listing requirements, public-offering documents and continuous disclosure obligations.	This is essential for market impact and investor protection.
Provincial-federal compatibility	Ensure the code supports provincial mineral administration while providing a uniform national disclosure standard.	Professional disclosure standard should be distinct from mineral-title ownership and licensing authority.
Technical audit and peer review	Create independent review panels for major public reports, IPOs, resource-backed financings and large licensing decisions.	A review panel can reduce the risk of poor-quality or promotional reports entering the market.

Criterion	Core requirement	Pakistan-specific implication
Capacity building	Integrate reporting-code training into mining engineering, geology and continuing professional development programmes.	The code will fail if Pakistan lacks a pipeline of trained CP/QP candidates.

The first requirement is a National Reporting Organisation. CRIRSCO membership is based on National Reporting Organisations, not on governments alone. The NRO must be responsible for developing, maintaining and updating the national reporting standard. It must also be able to demonstrate compatibility with the CRIRSCO Template, public support from relevant professional organisations, and effective disciplinary processes (CRIRSCO, 2017; CRIRSCO, 2024a).

The second requirement is a credible CP/QP pathway. Pakistan already has professional engineering registration through the Pakistan Engineering Council, and it has experienced mining engineers, geologists and mineral-sector consultants. However, PEC registration alone is not equivalent to the CRIRSCO CP/QP role unless it is linked to commodity-specific competence, relevant experience, continuing professional development, ethical obligations and disciplinary consequences. A Pakistan code should therefore define categories of competence by activity, such as exploration reporting, resource estimation, reserve estimation, geotechnical assessment, metallurgical assessment and mineral-asset valuation.

The third requirement is market linkage. The PSX and SECP should require code-compliant technical reports when an issuer raises capital, makes a material announcement or publishes investor information that includes Exploration Results, Mineral Resources or Mineral Reserves. Listed companies that are not primarily mining companies but hold substantial mineral assets should also be covered where the mineral asset is material to the company. This approach mirrors the logic of mature markets while recognising Pakistan's current corporate structure, where mineral exposure may arise through cement, fertiliser, energy or state-owned enterprise groups rather than standalone junior explorers.

8. Proposed Institutional Framework and Adoption Pathway

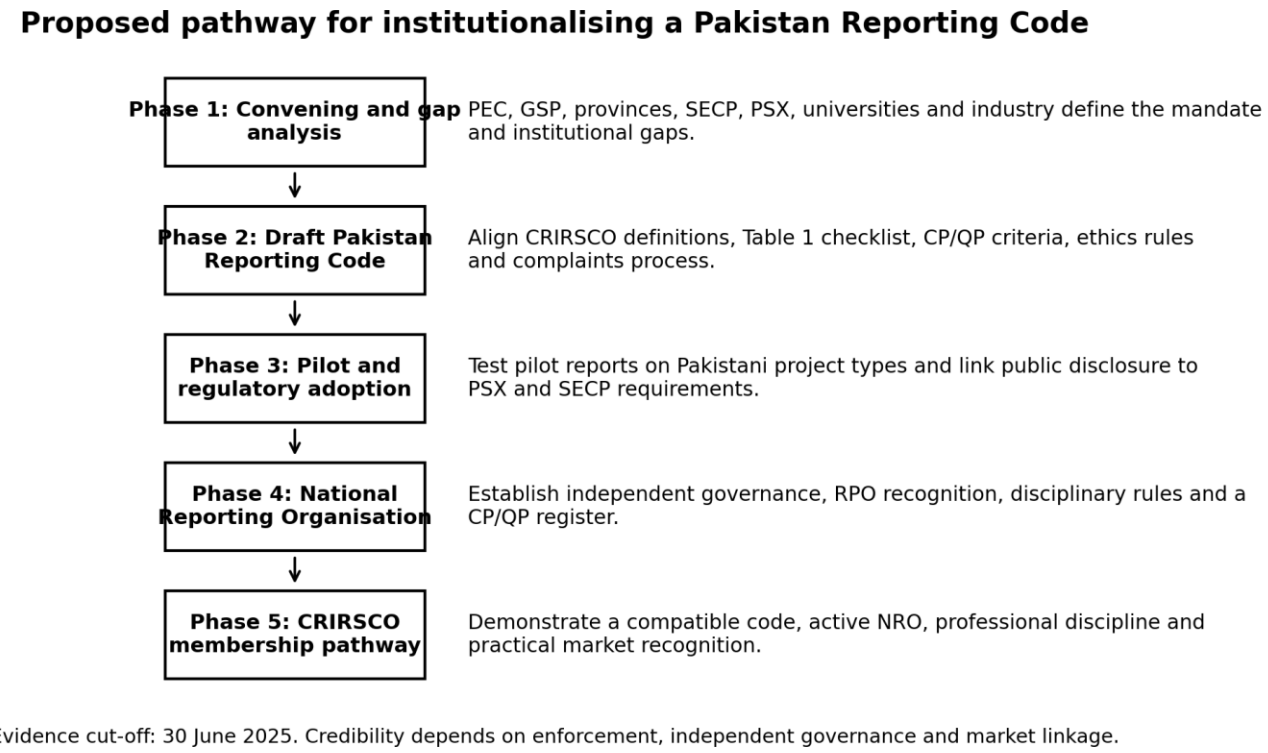

Figure 3. Proposed pathway for developing and institutionalising a Pakistan Reporting Code. The sequence can be phased, but the code will not be credible without professional discipline, independent governance and explicit disclosure linkage.

8.1 Phase 1: Convening and gap analysis

The first phase should establish a national working group with representation from the Pakistan Engineering Council, Geological Survey of Pakistan, provincial mines and minerals departments, SECP, PSX, universities, state-owned mineral companies, private-sector exploration companies and Pakistani professionals already qualified under JORC, NI 43-101, SAMREC, PERC or S-K 1300. The working group should map existing Pakistani laws, professional registration routes, corporate disclosure rules and university curricula against CRIRSCO membership criteria.

A critical early deliverable should be a gap-analysis report. This report should identify which institutions can host or support the NRO, which professional bodies can act as RPOs, where disciplinary powers already exist, and what legal amendments or regulatory circulars may be necessary for PSX and SECP adoption.

8.2 Phase 2: Drafting the Pakistan Reporting Code

The draft code should follow the CRIRSCO International Reporting Template closely, with minimal deviation from standard definitions. It should include a Pakistan-adapted Table 1 checklist; CP/QP eligibility rules; consent wording for public reports; requirements for first-time disclosure and material-change disclosure; rules for exploration targets and exploration results; prohibitions on misleading contained-metal statements; requirements for reporting resources exclusive or inclusive of reserves; and provisions for historical estimates.

The code should include commodity-specific guidance notes for coal, industrial minerals,

aggregates, dimension stone, gemstones, evaporites and metallic deposits. These notes should not dilute the standard definitions but should help Pakistani practitioners apply the code to domestic deposit styles.

8.3 Phase 3: Pilot reporting and regulatory linkage

Before full legal adoption, Pakistan should run pilot reports. Suitable pilots may include a porphyry copper-gold exploration project, a coal resource/reserve statement, an industrial-mineral project and a dimension-stone quarry. Each pilot should be prepared by a qualified team, independently reviewed and used to test the clarity of the code, Table 1 checklist and CP/QP consent requirements.

In parallel, PSX and SECP should draft listing-rule and public-offering amendments requiring compliance with the Pakistan Reporting Code, or with a recognised foreign CRIRSCO-family code during a transition period. This transitional recognition is important because early Pakistani CP/QP capacity will be limited.

8.4 Phase 4: Establishing the NRO and CP/QP register

The NRO should be formalised with a governing board, technical committee, ethics and disciplinary committee, RPO-recognition committee, code-review committee and stakeholder advisory panel. It should maintain a public register of Pakistani CP/QP professionals, including their discipline, commodity experience, professional memberships, CPD status and any disciplinary restrictions.

The NRO must remain technically independent. Government representation is necessary because mineral licensing is public law, but the code should not become a political or promotional instrument. Independence is especially important where the state is a shareholder, licensor and regulator in the same project.

8.5 Phase 5: CRIRSCO membership pathway

CRIRSCO membership should be pursued only after Pakistan has an operational code, a functioning NRO, disciplinary mechanisms, recognised professional organisations, and a record of compliant public reports. Premature application would risk rejection or nominal compliance. The aim should be substantive compatibility: definitions, professional accountability and market recognition must operate in practice, not only on paper.

During the transition, Pakistani projects should be permitted and encouraged to report under recognised foreign codes, especially where international finance is involved. However, those reports should also be mapped against the Pakistan code once adopted, so that domestic regulators, universities and professionals build internal capacity rather than outsourcing credibility indefinitely.

9. Discussion: Why the Code Matters Beyond Investor Protection

The obvious purpose of a reporting code is investor protection. However, for Pakistan, the benefits are broader. A credible code can improve licensing decisions by giving provincial departments a structured basis for evaluating exploration results, resource statements and feasibility submissions. It can strengthen project finance by making technical due diligence more familiar to lenders. It can support mineral-sector education by defining professional expectations for resource geologists, mining engineers, metallurgists and geotechnical specialists. It can also improve public trust because communities and provincial governments can see which technical assumptions support a project.

A code can also discipline government communication. Mineral wealth estimates expressed in trillions of dollars can attract public attention, but they may also create unrealistic expectations if not connected to resources, reserves, recoveries, costs, infrastructure, environmental constraints and market conditions. CRIRSCO-style terminology helps separate mineral potential from economically mineable reserves. This distinction is essential for responsible public policy.

Finally, the code would help Pakistan avoid a recurring problem in mineral governance: treating every technical disagreement as a

political dispute. When sampling protocols, resource classifications, reserve assumptions and Modifying Factors are documented under an accepted code, disagreements can be reviewed technically. This does not remove politics from mining, but it provides a defensible evidence base.

10. Conclusion

The case for a Pakistan Reporting Code is now strong. Historical experience from Poseidon and Bre-X shows that weak mineral disclosure can produce large capital-market distortions and long-lasting regulatory consequences. The CRIRSCO family demonstrates that the solution is not simply more data, but a structured disclosure system built around standard definitions, professional competence, material disclosure, transparent reporting and enforceable accountability. Pakistan's own experience, especially Reko Diq, shows that the cost of weak governance and technical opacity can be measured in sovereign-risk exposure as well as investor uncertainty.

By 30 June 2025, Pakistan's mineral sector had reached a point at which a domestic reporting code was both necessary and feasible. The National Minerals Harmonisation Framework, Reko Diq's restructured financing trajectory, and domestic corporate entry into exploration by NRL and Mari Minerals all point toward increased demand for reliable technical disclosure. The next step should be institutional: Pakistan should convene a national working group, draft a CRIRSCO-aligned Pakistan Reporting Code, establish a National Reporting Organisation, create a CP/QP register and disciplinary process, pilot the code on selected projects, and integrate compliance into PSX and SECP disclosure rules.

A reporting code will not guarantee successful mines. It will not remove geological uncertainty, commodity-price volatility, political risk, environmental constraints or community concerns. What it can do is ensure that mineral information is reported in a manner that is transparent, material, competent and internationally legible. For a country seeking to convert mineral potential into responsible investment, that is a necessary foundation.

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