Protocol level staking risk disclosure

I. Introduction

AMINA Bank AG ("**AMINA**") is a Swiss bank licensed by the Swiss Financial Market Supervisory Authority ("**FINMA**"). FINMA issued a guidance note on staking (called "FINMA Guidance 08/2023") on 20 December 2023 (the "**Circular**"). The Circular requires AMINA to transparently and clearly inform clients of all risks (including slashing, lock-up periods and risks relating to legal uncertainties in the event of bankruptcy) related to staking.

Staking cryptocurrencies can be a lucrative way to earn passive income, but it comes with its own set of risks. These risks vary depending on the protocol and the specific staking mechanics involved. This protocol level staking risk disclosure (the "**Protocol Risk Disclosure**") outlines the potential risks associated with staking across several major blockchain networks where staking services are supported by AMINA, including Ethereum (ETH), Solana (SOL), Cardano (ADA), Polkadot (DOT), Polygon (POL), The Open Network (TON), Cosmos (ATOM) and Tezos (XTZ).

This Protocol Risk Disclosure should be read in conjunction with AMINA's other risk disclosures and legal notices ("**Legal Notices**") as available on AMINA's website at https://aminagroup.com/legal-notices/ or as otherwise provided to you and acknowledged by you as part of your onboarding experience with AMINA. In particular, AMINA's Special risks of digital assets legal notice and Staking Terms and Conditions (that contains, at Article 9 (Risks in the event of an AMINA bankruptcy) information on risks relating to legal uncertainties in the event of bankruptcy of AMINA) should be understood to be incorporated by reference into this Protocol Risk Disclosure. Capitalised terms or definitions used but not defined in this Protocol Risk Disclosure shall have the same meanings given to them in the relevant Legal Notices.

Issuing, trading, transacting, investing and holding positions in Digital Assets entails special risks to the Client that are in addition to the types of risks associated with traditional assets, including technological, operational, market and systemic risks as well as legal, regulatory and tax risks that may differ from and/or apply in addition to those existing in relation to traditional assets including any traditional financial instruments or national and supranational currencies. In a worst-case scenario, the realization of such risks may result in a total loss of the Client's investment and potentially additional losses in excess of the original investment, depending on the type of Digital Asset and the specifics of the Client's investment activity and exposure.

No one should invest funds in Digital Assets which they are not in a position to lose entirely. Whether the Digital Asset market moves up or down, or whether it loses all or substantial value cannot be foreseen. Price volatility for Digital Assets can be more pronounced than for some traditional assets with extreme price fluctuations possible. Such price volatility in the market can lead to significant losses in a short period. Due to the relatively unregulated nature of Digital Assets (see Legal and regulatory risks below) prices can be influenced by market manipulation, adding unpredictability for investors.

Holders, traders or any participant to the market must be cautious when holding, trading or participating in Digital Assets.

II. Scope of this document

This Protocol Risk Disclosure provides information on certain special risks associated with Digital Assets as may be relevant to the Client from time to time in connection with its business relationship with AMINA.

This Protocol Risk Disclosure does not constitute nor purport to constitute exhaustive disclosure of all relevant risks or other relevant aspects in connection with Digital Assets or transactions in such assets, and may not serve, under any circumstances, as a substitute for professional advice by competent subject matter experts. In particular, because the decentralised protocols that serve as underlying technology of Digital Assets are still at an early stage of development and might be subject to fundamental changes in the future, the risks outlined herein, as well as the likelihood of their realisation, may evolve or change over time and new risks may arise. AMINA shall update this Digital Asset Risk Disclosure to take into account new developments in respect of the underlying protocols applicable to the staking services that AMINA provides.

This Protocol Risk Disclosure must be read in conjunction with AMINA's general terms and conditions (the "**GTC**"), custody regulations (the "**Custody Regulations**"), Staking Terms and Conditions and Special risks of digital assets, each as available under the Legal Notices section of the AMINA website and any other general or special terms of AMINA, as applicable. AMINA reserves the right to adjust and amend this Protocol Risk Disclosure at any time and to communicate such changes to the Client as it deems most practical, including in accordance with Article 9 of the GTC (Use of communications channels; delivery of communications).

III. Further relevant matters outside the scope of this document

This Digital Asset Risk Disclosure is separate from and in addition to the disclosure of risk factors by issuers, distributors, counterparties or other persons and financial services providers involved in the issuance, distribution, trading and other transactions relating to Digital Assets, as may in particular be contained in prospectuses, key information documents, white papers, fact sheets and other information sheets and which describe in more detail the risks associated with a particular Digital Asset or category of Digital Asset.

The Client is required to study any such additional documents, where applicable, prior to investing, trading or transacting in any Digital Asset and shall take into account the risk factors disclosed therein in its decision-making process, in addition to the risks described in this Protocol Risk Disclosure.

Furthermore, this Protocol Risk Disclosure does not discuss any matters of taxation or other legal or regulatory matters in any jurisdiction relating to investments and transactions in Digital Assets. The Client is advised to retain appropriate counsel in respect of legal, regulatory and tax matters.

IV. Protocol level staking risks

The below protocol level staking risks address fundamental protocol level risks associated with staking of the relevant individual Digital Assets (based on the facts in place as at the date of this Protocol Risk Disclosure). Other protocol level considerations may exist, but this Protocol Risk Disclosure focuses on bonding and unbonding periods (also described interchangeably as 'lock up periods') and slashing risks. NB the terms validators and bakers may be used interchangeably depending on the relevant terminology applicable to a specific Digital Asset.

Ethereum (ETH)

Lock up period:

Post-Pectra upgrade, after depositing anywhere between **32 ETH and 2,048 ETH,** a validator may face a delay which, in AMINA's experience and based on observed network behaviour, has historically ranged from **0 to 70 days for the bonding/activation period** and approximately **0 to 50 days for the unbonding/ exit period.**

These timelines may vary over time and are primarily driven by Ethereum protocol rules designed to maintain network stability and security.

Slashing:

Running a validator node on Ethereum requires technical expertise and continuous maintenance. Issues such as downtime, software bugs, or smart contract vulnerabilities can lead to missed rewards or even slashing penalties. Slashing is a penalty mechanism designed to deter and sanction validator misconduct.

Conditions for slashing: A validator may be subject to slashing penalties if any of the following occurs:

- Double Block Proposal: Proposing and signing two distinct blocks for the same slot.
- Contradictory Votes: Submitting votes that conflicts with prior attestations. (e.g. double voting or surrond voting)
- Invalid Block Proposals: Submitting invalid or malicious block proposals that break protocol rules.

Penalty structure:

Initial penalty:

Upon identification of a slashable offense, an immediate penalty of 1/4096 of the validator's effective balance (e.g., 0.008ETH for 32 ETH, up to 0.5ETH for 2,048 ETH) is imposed.

Exiting period penalties:

Validators designated as "slashed_exiting" are removed from the active set for approximately 36 days, cease earning rewards and incur penalties totaling around 0.057 ETH to 0.0827.

Correlation penalty:

Penalties increase based on the number of validators slashed within a short timeframe to deter coordinated attacks. Larger validators contribute heavily to penalty calculations post ETP-7251.

Inactivity penalties:

Standard network conditions: Validators that are offline incur penalties of approximately 0.0044 ETH to 0.005 ETH per day (for a 32 ETH Validator).

Network non-finality conditions: During periods of network non-finality (consensus difficulties), penalties scale quadratically and may increase to 0.4 ETH per day or more, depending on duration and validator balance.

Solana (SOL)

Lock-up period:

There is no fixed lock-up period for staked SOL, but tokens are locked for the duration of the current epoch, which lasts approximately 2-3 days.

Withdrawal process: When un-staking is initiated, staked SOL enters a "cool-down" phase lasting about 2-3 days. After the cool-down period, staked SOL can be withdrawn. During the cool-down period, staked SOL tokens are still staked and earning rewards.

Slashing:

For the time being, Solana does not implement automatic slashing.

Cardano (ADA)

Lock-up period:

Cardano does not have a protocol-level lock-up period. Staked ADA remains fully liquid and can be un-staked or transferred at any time.

There is, however, an initial delegation activation delay of approximately 15—20 days (3—4 epochs), after which staking rewards begin to accrue. This delay does not restrict the transferability or liquidity of the underlying ADA.

Slashing:

For the time being, Cardano (ADA) does not implement automatic slashing.

Polkadot (DOT)

Lock-up period

The unbonding period is approximately 24—48 hours after which the un-staked coins become transferable.

Slashing:

Offenses leading to slashing: Validators may be slashed for offenses such as:

- Backing invalid blocks: Endorsing invalid blocks for inclusion.
- Equivocation: Producing conflicting statements or blocks, such as signing multiple votes in the same round on different chains (GRANDPA and BEEFY equivocation) or producing multiple blocks in the same time slot (BABE equivocation)

Penalty structure: Slashing penalties are proportionate to the severity of the offense and the number of validators involved. The penalty is calculated using the formula: Penalty = min ((3 * x / n)^2, 1).

Where x is the number of offending validators, and n is the total number of active validators. This means that as more validators misbehave simultaneously, the penalty increases exponentially.

Delegators (nominators) are not subject to slashing. Slashing penalties are applied to validator self-stake.

Polygon (POL)

Lock-up period:

The unbonding period on Polygon is c. 3 — 4 days. During the unbonding period, tokens remain locked and do not earn rewards.

Slashing:

For the time being, Polygon does not implement automatic slashing.

Tezos (XTZ)

Lock-up period:

The Rio Protocol Upgrade (May 2025) introduced flexible staking cycles (~1 day), improving liquidity and removing the prior 21+15 day schedule.

Following subsequent protocol upgrades, unstaking (unfreezing) period is approximately 4 days.

The Open Network (TON)

Lock-up period:

Staking operates on ~18h epochs. Withdrawal requests complete after ~27h (18h epoch + 9h additional unbonding).

Slashing:

TON enforces fixed-amount penalties:

- Downtime: slashed c. 101 TON.
- Double-signing: subject to direct slashing.

Cosmos (ATOM)

Lock-up period:

The unbonding period on the Cosmos Hub is c. 21 days, after which the un-staked ATOM becomes transferable. During the unbonding period, the relevant ATOM remain exposed to slashing for validator misconduct committed before the unbonding process started.

Slashing:

Offenses leading to slashing: Validators may be slashed for offenses such as:

- Double-signing: signing conflicting blocks at the same block height.
- Downtime / liveness failures: missing too many (5%) required signatures within the protocol signing window.

Penalty structure:

- Double-signing: currently results in a 5% slash of the validator's bonded stake and typically leads to the validator being tombstoned/banished, meaning it cannot re-enter the validator set with the same consensus identity.
- Downtime: currently results in a 0.01% slash of bonded stake and temporary jailing (ten minute suspension) of the validator.

Sui (SUI)

Lock-up period:

Sui operates on epochs of approximately 24 hours. Sui does not impose a protocol-level unbonding period on staked SUI: a withdrawal request unwraps the stake and returns the principal together with accrued rewards to the staker, without a cool-down or waiting period.

There is, however, a bonding/activation delay. A staking request takes effect only from the start of the following epoch, and rewards accrue solely in respect of epochs for which the stake was active for the entire epoch. A staker therefore earns no rewards for the epoch during which the stake is made, nor for the epoch during which it is withdrawn, with the result that up to c. 24 hours of reward accrual may be foregone at each of entry and exit.

The minimum amount that can be staked is 1 SUI. Changes to stake take effect at epoch boundaries only.

Slashing:

For the time being, Sui does not implement automatic slashing of staked principal.

Sui instead applies a reward-based penalty mechanism, known as the tallying rule, under which validators observe and evaluate the performance of their peers throughout each epoch. At the end of the epoch, a stake reward multiplier is applied to each validator derived from the stake-weighted median of those evaluations. A validator assessed as not having operated performantly receives reduced stake rewards, and a staker delegated to such a validator does not receive that epoch's rewards on withdrawal.

The Client should note that the absence of slashing reflects the protocol as currently implemented and may be altered by a future protocol upgrade.

Chainlink (LINK)

Nature of the staking arrangement:

Unlike the other Digital Assets addressed in this Protocol Risk Disclosure, LINK staking is not a consensus-layer proof-of-stake mechanism. Chainlink Staking v0.2 consists of a set of non-custodial smart contracts deployed on Ethereum mainnet, under which stakers commit LINK to back performance guarantees in respect of specified Chainlink oracle services. Staking LINK accordingly carries smart contract risk in addition to the lock-up and slashing risks set out below. Chainlink describes Staking v0.2 as remaining in "beta".

Staking v0.2 is capped in size at 45,000,000 LINK in aggregate, comprising 40,875,000 LINK allocated to Community Stakers and the remainder to Node Operator Stakers servicing Chainlink Data Feeds. Community Stakers may stake between 1 LINK and 15,000 LINK on a per-address basis. Where the community allotment is full, further LINK can be staked only once an existing staker completes an unstake and space becomes available. A Client who unstakes should therefore not assume that re-entry into the staking protocol will be possible.

Lock-up period:

An unstaking request commences a 28-day cooldown period, followed by a seven-day claim window during which all or part of the staked LINK may be unstaked. Staked LINK that is not unstaked within the claim window automatically re-enters Staking v0.2, and a further 28-day cooldown must be completed before withdrawal is again possible.

Staked LINK continues to accrue rewards during both the cooldown period and the claim window, up to the point at which it is unstaked.

Unstaking may nevertheless result in the loss of accrued rewards. Rewards attributed to a staker comprise Claimable Rewards and Locked Rewards, the latter converting into Claimable Rewards over a 90-day ramp-up period tracked individually for each staker. Completing an unstake of any amount resets the ramp-up period to 0% and causes Locked Rewards not yet converted to be forfeited and redistributed among other stakers in the same category. Staking additional LINK to an address that is already staking likewise resets the ramp-up period, although in that case Locked Rewards are not forfeited.

Slashing:

Slashing under Staking v0.2 applies to Node Operator Stakers only. Community Stakers are not currently exposed to slashing of their staked LINK; Chainlink has indicated that any change in this respect would require a migration to a new version of Staking.

Conditions for slashing: a Node Operator Staker may be slashed where a valid alert is raised in respect of an oracle service secured by Staking. In respect of the ETH/USD Data Feed on Ethereum:

- Alerting condition: more than three hours have elapsed since the last valid oracle report was published on-chain for that feed.
- Priority period: Node Operator Stakers have a 20-minute priority window in which to raise the alert, after which Community Stakers may do so.

Penalty structure:

Node Operator Stakers servicing the relevant feed are each slashed 700 LINK where a valid alerting condition is met. The party raising the valid alert is rewarded 7,000 LINK.

The oracle services within scope of Staking, the alerting conditions and the applicable slashing amounts are expected to evolve over time. Changes to security-critical configuration, including the modification of slashing conditions, are subject to a timelock contract, with the delay applicable to critical changes exceeding the length of the unbonding period.

NEAR Protocol (NEAR)

Lock-up period:

NEAR operates on epochs of 43,200 blocks, equating to approximately 12 hours under normal network conditions. An epoch may be extended where finality is delayed. Delegated NEAR begins to earn rewards from the start of the following epoch.

On un-delegation, the relevant NEAR enters an unbonding period of four epochs before it may be withdrawn. In practice this equates to approximately 48 to 65 hours (c. 2—3 days), depending on the point within the epoch at which the request is made and on prevailing network conditions. During the unbonding period the NEAR is neither transferable nor reward-bearing.

There is no protocol-level minimum stake for delegators. The minimum stake required for a validator to hold a seat (the seat price) is determined by auction at each epoch and varies over time.

Slashing:

For the time being, NEAR does not implement automatic slashing of staked principal. Slashing in respect of equivocation (double-signing) and invalid state transitions forms part of the NEAR protocol design and is described in NEAR's documentation, but is not currently active on mainnet. It may be activated by a future protocol upgrade.

Validators are nonetheless subject to reward-based penalties and to removal from the active validator set:

- Reduced rewards: epoch rewards are adjusted in proportion to the validator's measured uptime, calculated by reference to the number of blocks and chunks produced against those expected. A reduction in a validator's rewards is borne proportionately by those delegated to it.
- Kick-out: a validator producing less than 90% of its expected blocks or chunks in an epoch is removed from the active validator set. A validator so removed, and those delegated to it, earn no rewards until it re-enters the active set, which takes a minimum of two epochs.

The Client should note that the absence of slashing reflects the protocol as currently implemented. Should slashing be activated in a future protocol upgrade, staked principal delegated to a validator committing a slashable offence would be at risk.