

31 January 2024

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EXECUTIVE SUMMARY:

Objective of the Report:

This report is independently prepared by Moore Blockchain and Digital Assets JHB (Pty) Ltd ("**Moore**") to perform agreed-upon procedures to report on the reserves held by Luno Group Holdings Limited entities ("**Luno**"). The objective of this engagement is to report factual findings on the sufficiency of Luno's digital assets to meet its customer liabilities, thereby reporting to Luno, and Luno customers on the findings of the sufficiency of the platform's reserves.

Methodology: Merkle Tree Proof of Reserves

Our procedures utilise the Merkle Tree proof of reserves method, a cryptographic technique used in validating the sufficiency of reserves held by a digital asset platform. It leverages the Merkle Tree structure for efficient and secure aggregation and verification of extensive datasets, presenting a detailed snapshot of the exchange's liabilities and assets at a specified point in time. Additionally, this method empowers customers to independently verify their claims on the platform.

Key Outcomes of the Assessment

1. **Integrity of Reserves:** Our factual findings report confirms that Luno possesses sufficient reserves to cover all customer liabilities, as verifiable using the Merkle Tree published by Moore.
2. **Data Accuracy:** No discrepancies were identified between the reported figures and the cryptographic verification conducted by Moore.
3. **Confidentiality:** Throughout the process, the confidentiality of individual account details was strictly maintained.

Conclusion

Moore's independent factual findings report concludes that Luno maintains a transparent and secure approach to managing customer assets. The factual findings of the procedures performed demonstrate that Luno holds reserves exceeding 100% of its customer liabilities.

Disclaimer

It is essential to acknowledge that this executive summary is a concise overview of the detailed findings outlined in the full report. The summary aims to be objective, clear, and unambiguous, avoiding any misleading interpretations. However, this summary should not be seen as a substitute for the comprehensive report. The complete agreed-upon procedures report, dated no earlier than the date on which the procedures were completed and findings determined, provides an exhaustive understanding of the results and methodologies used. This is in accordance with paragraph 32 of the ISRS standards, emphasising the necessity of referring to the full report for a comprehensive understanding of the findings.

Attention: Luno Group Holdings Limited Executive Leadership

AGREED-UPON PROCEDURES REPORT WITH REGARDS TO THE PROOF OF RESERVES PROCEDURES OF VARIOUS LUNO GROUP ENTITIES IN ACCORDANCE WITH ISRS 4400(REVISED).

Purpose of this Agreed-Upon Procedures Report

Moore Blockchain and Digital Assets JHB (Pty) Ltd¹ ("**Moore**") (together "**we**" or "**engagement team**") has been engaged by Luno Group Holdings Limited ("**LGHL**") to conduct a proof of reserves assessment (the "**Assessment**") in respect of the Luno group entities set out below, in accordance with the requirements of the Agreed-Upon Reporting Standards ISRS4400 (Revised) (the "**Standards**").

This report is in respect of the Assessment performed by Moore at 15:00 UTC on 31 January 2024 (the "**Snapshot Date**").

LGHL engaged Moore for and on behalf of the following LGHL operating entities, which were in-scope for purposes of the Assessment: Luno (Pty) Ltd, Luno Malaysia Sdn Bhd, Luno Australia (Pty) Ltd, PT Luno Indonesia Ltd, Luno Fintech Nigeria Limited, Luno Technology Uganda Limited and Luno France SASU. (collectively, the "**Luno Group Entities**"). Each of the Luno Group Entities custodies crypto assets² for and on behalf of its customers (collectively, "**Luno Customers**").

The Assessment, the outcome of which is set out in this report, was conducted in accordance with specific procedures agreed upon between LGHL (on behalf of each of the Luno Group Entities) and the engagement team ("**Agreed-Upon Procedures**"). The Assessment has been conducted on an aggregated basis across all Luno Group Entities and not individually per Luno Group Entity.

The Assessment, and this report, specifically excludes any assessments of LGHL's (or any Luno Group Entities') financial health or solvency.

The intended purpose of the Assessment is to demonstrate that, at the time of the performance of the Agreed-Upon Procedures, (i) the Luno Group Entities retained control over the crypto assets held in custody on behalf of their customers (collectively, the "**Customers Assets**"), and (ii) that these crypto assets are equal to or greater than the corresponding customer liabilities for the Luno Group Entities, as evidenced by Luno's records contained in its customer database (collectively, the "**Customer Liabilities**").

Our report is in respect of the Assessment as of the Snapshot Date only and is accordingly for the benefit of LGHL and the Luno Group Entities. The report does not extend to any information beyond subject matters on which the Agreed-Upon Procedures are performed and may not be suitable for any other purpose.

Responsibilities of the Engaging Party and the Responsible Party

LGHL has acknowledged that the Agreed-Upon Procedures are appropriate for and meet the intended purpose of the engagement. LGHL is responsible for the subject matter on which the Agreed-Upon Procedures are performed.

Practitioner's Responsibilities

We have conducted the Assessment in accordance with the Standards. We are required to report on the findings, which constitute the factual outcomes derived from executing the Agreed-Upon Procedures. We make no representation regarding the appropriateness of the Agreed-Upon Procedures.

This Assessment is not an assurance engagement. Accordingly, we do not express an opinion nor an assurance conclusion. Had we performed any additional procedures, other matters may have come to our attention that would have been reported on.

Professional Ethics and Quality Control

Our firm applies the International Standard on Quality Control (ISQC) 1, Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements, and accordingly, maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

Note: This report excludes certain crypto assets controlled by LGHL, as they are not connected to Customer Liabilities. Only Customer Assets and Customer Liabilities are relevant to the Assessment, as Luno Group Entities custodies crypto assets on a fully collateralised basis (i.e. a BTC 1 Customer Liability is collateralised by a BTC 1 Customer Asset). (the "**Custody Policy**")

1: Moore Blockchain and Digital Assets JHB (Pty) Ltd is a subsidiary within the Moore Johannesburg group structure.

2: Where this report makes use of the general term "crypto assets", it contemplates the definition assigned to that term in the Financial Advisory and Intermediary Services Act, 2002 (Act 37 of 2002) of South Africa.

PROCEDURES AND FINDINGS

For the purpose of this section of the report, where reference is made to “LGHL” or “Moore” performing any procedure or other action or providing information or documentation, such reference is to an authorised representative of the relevant Party.

We have performed the Assessment in accordance with the Agreed-Upon Procedures described below, as outlined in the signed Engagement Letter.

THE AGREED-UPON PROCEDURES: The Procedures outlined below are applicable throughout the Engagement:

Phase 1: General	
Procedure 1	Findings
<p>Obtain a list and description of the LGHL-operated crypto asset products (“Products”) in-scope for the Assessment from LGHL.</p>	<p>As of the Snapshot Date, Moore obtained a specific list of Products provided to customers by Luno Group Entities. Some of the Products listed below may not be available in certain markets in which the Luno Group Entities operate, as a result of the regulatory requirements which apply in those markets.</p> <p>Only the Products listed below were included within the scope of the Assessment.</p> <ol style="list-style-type: none"> Luno Spot Exchange: The Luno Spot Exchange is a conventional digital order book exchange where Luno customers buy and sell crypto assets on the exchange platform. Luno Bundles: Luno’s Large Cap Bundle is a product which enables customers to purchase a basket of different crypto assets in a single transaction. The customer directly owns each of the constituent crypto assets forming part of their Bundle purchase. Luno Staking: Luno’s Staking Service enables customers to earn rewards by committing their crypto assets to a validator, which in turn validates transactions on the relevant blockchain. The process of validating transactions generates rewards, which are passed back to customers. Luno Instant Buy and Sell: This product allows customers to buy or sell crypto assets directly from or to Luno.
Procedure 2	Findings
<p>Obtain from LGHL a list of Customer Liabilities and Customer Assets, which represent the related collateralised crypto assets (in line with the “Custody Policy”) for the Assessment.</p>	<p>On the Snapshot Date, Moore obtained from LGHL a complete and accurate list of (i) the crypto assets held by the Luno Group Entities for and on behalf of the Luno Customers, and (ii) the Customer Liabilities.</p> <p>The following crypto assets, constituting all current Customer Assets and Customer Liabilities, were in scope for the Assessment:</p> <ol style="list-style-type: none"> Cardano (ADA), including Cardano staking; Avalanche (AVAX); Cosmos (ATOM); Bitcoin Cash (BCH); Polkadot (DOT); Ethereum (ETH), including Ethereum staking; Chainlink (LINK); Litecoin (LTC); Polygon (MATIC); Solana (SOL); Uniswap (UNI); USD Coin (USDC); Tether (USDT); Bitcoin (BTC); and Ripple (XRP). <p>In accordance with the Custody Policy, the Customer Liabilities and Customer Assets are identical as presented in the list above.</p>

Procedure 3	Findings
<p>Obtain a list of the following accounts, as identified, and provided by LGHL:</p> <p>a) LGHL Corporate Accounts</p>	<p>Moore observed and inspected LGHL’s process for identifying internal corporate crypto asset accounts holding non-customer Assets (which are accordingly excluded from Customer Liabilities) (“Corporate Accounts”).</p> <p>Moore observed the LGHL’s engineering team’s generation and data extraction of all LGHL’s Corporate Accounts and obtained the output files from LGHL. Additionally, Moore ensured the data’s accuracy through reconciliation and an independent finance department confirmation. All Corporate Accounts were inspected and cross-checked against the final Customer Liability extract file to confirm their exclusion.</p> <p>No discrepancies were noted.</p>

Phase 2: Proving Client Account Balance Liabilities on Luno’s Trading Platform

Procedure 4	Findings
<p>Inspect the tables and scripts used by LGHL to pull LGHL Customer balances and data from the underlying database(s).</p> <p>These tables and scripts are designed to pull a complete and accurate listing of Customer Liabilities with the Customer Assets, as represented by LGHL.</p>	<p>Moore’s inquiry with LGHL focused on the accuracy of the Customers Liability extract, a file which contained the complete and accurate list of Customer Liabilities (“Extract List”), as represented by LGHL. Moore obtained and inspected an architecture diagram from LGHL. Additionally, LGHL described the data management processes relevant to the Extract List and proof of reserves reports, detailing the database structures, including the queries used for calculating the total Customer liabilities on a per crypto asset basis, the code for report generation, and Extract List creation while excluding Corporate Accounts. Moore then inspected the scripts used to extract data from the observed input tables to generate the Extract List.</p> <p>Moore observed the following key logic used in the script to generate the Extract List:</p> <ul style="list-style-type: none"> a) Numerical Formatting: A script to format the output balances to adhere to the appropriate numerical formatting for ingestion into the Merkle Tree Generator. b) Exclude Corporate Accounts: A script to exclude Corporate Accounts. c) Filter applied for Product Type: A script to filter for each Product in-scope for this Assessment. d) User Type: A script to include only user types relevant to this Assessment, being Luno Group Entity Customers only. e) Apply a Hashed User ID* to Each Record: A script to assign a Hashed User ID to each Luno Group Entity Customer record.

*: “Hashed User ID” is a unique identifier for each customer included in the Proof of Reserves Assessment, in order to maintain user confidentiality and privacy.

Procedure 5	Findings
<p>Observe representatives of LGHL access the database(s) used to generate Extract List.</p> <p>Additionally, observe representatives of LGHL execute the scripts from Procedure 4 to extract the data from the database(s) and observe the total balance of Customer Liabilities from the executed scripts.</p>	<p>Moore observed and inspected the interaction by LGHL with the relevant database(s) for generating the Extract List, including script execution and data summation, to ensure accurate and complete Customer Liabilities data representation on the Snapshot Date.</p> <p>On the Snapshot Date, Moore observed LGHL extract Customer Liabilities data, including Hashed User IDs and account balances, for Customer Liabilities as observed within phase 2 (by execution of the tables and scripts from Procedure 4).</p> <p>Additionally, Moore observed the data’s conversion to a CSV file, and its secure upload, and confirmed the record count and asset balances matched those observed in the database (via database query).</p>

Procedure 6	Findings
<p>Reconcile the total balance of the Customer Liabilities (per the file received from LGHL) and the total number of records observed in the Extract List to the total balance and the total number of records observed in Procedure 5.</p>	<p>Moore performed a reconciliation process for the Extract List observed in Procedure 5. Moore summed the total record count and total asset balances from the Extract List received from LGHL and confirmed the totals reconciled to the total record count and total asset balances observed in the database during the extraction observation with LGHL as outlined in Procedure 5.</p> <p>No discrepancies were identified.</p>

Procedure 7	Findings
<p>Confirm Corporate Accounts identified in Procedure 3 were not included within the Extract List.</p>	<p>Moore observed an LGHL data engineer generate a list of all Corporate Accounts as noted in Procedure 3. Moore then received two independent lists and a verification confirmation from LGHL's Finance Department. Additionally, Moore reconciled the list of Corporate Accounts generated by LGHL from the identified tables and scripts to the Corporate Accounts list approved by LGHL's Finance Department and performed a full search of all these accounts in the Extract List to verify that none of these accounts were included in the Extract List.</p> <p>No discrepancies were identified.</p>

Phase 3: Utilising the Merkle Tree Generator and Verifier

Procedure 8	Findings
<p>Utilise the Merkle Tree Generator to aggregate Luno Group Entities Customer data from the Extract List and determine the Merkle Root Hash.</p>	<p>Moore utilised a Merkle Tree Generator for Luno Group Entities Customer data aggregation and to determine the Merkle Root Hash. Moore obtained the Extract Report, as observed in Procedure 5, and input this file into the Merkle Tree Generator. Moore observed the generation of the Merkle Tree, which computed the Merkle Root Hash. Moore ensured that the Merkle Tree's outputs, such as record count and asset balances, reconciled with the Extract List.</p> <p>Moore confirmed, as per the procedure, the Merkle Root Hash, illustrated below:</p> <ul style="list-style-type: none"> 8f51aacd415cb8d3645c5fdcc4a67e1fa08dee851c7cdb375bb11641b2864c4e

Note: To protect Luno Group Entities Customer confidentiality and create a symmetrical Merkle Tree, additional supplemental records were added as "padding" to the raw Extract List during the Merkle Tree generation process in order to protect the total record count from being deduced from the Merkle Tree structure. All supplemental "padding" records had no balances and did not contribute to the total balance of Customer Liabilities.

Procedure 9	Findings
<p>Randomly select a sample of 1000 Hashed User IDs.</p> <p>For each sample, cryptographically test whether the Hashed User IDs are included within the Merkle Tree.</p> <p>In addition, cryptographically test 10 sample 'dummy' accounts to confirm only valid Hashed User IDs are included within the Merkle Tree.</p>	<p>Randomly selected sample: Moore used a cryptographic attestation process involving a sample of genuine Luno Group Entities Customer Hashed User IDs and a sample of fictitious "dummy" User IDs in the Merkle Tree.</p> <p>Cryptographic Testing of Genuine Hashes: Moore performed Merkle Proof tests on the randomly selected sample of 1000 Hashed User IDs, comparing them with the Merkle Tree's root to confirm their authenticity. Moore utilised the Verifier Tool to cryptographically confirm the Hashed User IDs and the balances were included within the Merkle Generator Output. Moore input the Hashed User IDs and the relevant balance of Customer Liabilities into the Merkle Verifier and confirmed that all 1000 samples were found within the Merkle Tree.</p> <p>Cryptographic Testing of Dummy Hashes: Moore created 10 'dummy' account hashes not in the original dataset and tested them, by inputting these details into the verifier tool, to confirm the Merkle Tree's ability to exclude invalid hashes. All dummy hashes were confirmed not to be found in the Merkle Tree.</p>

Phase 4: Proving Asset Ownership (Excluding staked ETH and staked ADA)

Where the term “ownership” is used in Phase 4 and 5 of this report, it refers to ownership of the custodial accounts in which the Luno Group Entities custody Customer Assets for and on behalf of Luno Customers (collectively “Custodial Accounts”).

Ownership rights of the underlying Customer Assets remains at all times with Luno Customers, custody of these assets is fully managed and controlled by LGHL. LGHL maintains the following types of Custodial Accounts:

1. Third-Party Custodial Partners; and
2. Directly (LGHL) controlled Addresses (“Signature Addresses”).

For the purpose of proving asset ownership, the various custodial arrangements have been clearly outlined. This is relevant as the method for proving ownership of the crypto assets differs based on the specific type of custodial arrangement in place.

Ownership Verification:

For ownership verification, Moore obtained evidence dependent on the asset and custodial arrangement, and appropriate procedures that confirm and prove LGHL’s ownership rights over the Custodial Accounts.

- a. For any in-kind assets in-scope which are held in Third-Party Custodial Accounts:
 - i. Inspect and obtain the asset balances, including the appropriate evidence required to execute the procedure).
 - ii. Perform a test transaction: where Moore observed LGHL move a small amount of value from a sample Custodial Account. Moore then inspected the transaction hash on-chain on Moore’s own nodes to verify the execution of the instruction provided.
- b. For any in-kind assets in-scope which are held in Signature Addresses, execute one of the following methods:
 - i. Digital Signature: Moore obtained a corresponding digital signature generated by LGHL with a Moore-provided custom message. Subsequently, Moore confirmed each digital signature was signed by the private key associated with a public address on the listing provided by LGHL.
 - ii. Perform a test transaction: Moore provided LGHL with a specific instruction to execute a “send-to-self” transaction. Moore then inspected the transaction hash, as provided by LGHL, on-chain on Moore’s own nodes to verify the execution of the instruction provided.

Procedure 10	Findings
Obtain from LGHL a complete list of all spot accounts and addresses holding related Customer Assets for the Assessment.	Moore obtained from LGHL a complete and accurate list of all relevant asset addresses and accounts representing Customer Assets. For the purposes of proving asset ownership, and the method to do so, Moore confirmed with LGHL the specific type of Custodial Account, and corresponding address, holding each relevant crypto asset in the provided list.

Procedure 11	Findings
Verify that LGHL has control and ownership of Custodial Accounts, listed in procedure 10.	<p>As part of its Custodial Account infrastructure, Luno engages with Third-party crypto asset custody infrastructure providers (the “Custody Partners”)*</p> <p>Third-Party Custody Partners: At the Snapshot Date, Moore performed a walkthrough observation of representatives of LGHL accessing LGHL’s accounts held with the Custody Partners, confirming their credentials, including two-factor authentication. Moore inspected the asset balances displayed and captured these details through time-stamped screenshots for documentation.</p> <p>For each Custody Partner workspace: Moore provided LGHL with a specific amount of crypto asset to execute a “send-to-self” transaction. After receiving the transaction hash, Moore inspected the transaction details on the corresponding blockchain, noting the amount, timestamp, and “Sending” addresses matched the specific parameters communicated.</p> <p>Signature Addresses: For each in-scope Signature Address, Moore either:</p> <ol style="list-style-type: none"> a. Obtained a corresponding digital signature generated by LGHL using a custom message provided by Moore. Moore confirmed that each digital signature was signed by the private key associated with a public address on LGHL’s listing.

	<p>b. Moore provided LGHL with a specific amount of a crypto asset to execute a “send-to-self” transaction. After receiving the transaction hash, Moore inspected the transaction details on the corresponding blockchain, noting the amount, timestamp, and “Sending” addresses matched the specific parameters communicated.</p> <p>Moore confirmed no discrepancies in the verification process of the above procedures.</p>
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* The names of the Custody Partners are kept confidential for security reasons

Phase 5: Proving Asset Ownership of Staked ETH and Staked ADA

Procedure 12	Findings
<p>Obtain an overview from LGHL and document the results of LGHL's staking features for ETH and ADA (including the mechanics and associated validator and withdrawal key pairs).</p>	<p>LGHL confirmed that certain of the Luno Group Entities provide staking services for Cardano (ADA) and Ethereum (ETH), as indicated in Procedure 1.</p> <p>Moore's procedures revealed that LGHL manages an ADA staking key which staked ADA is delegated to and two withdrawal credentials for staked ETH.</p>

Procedure 13	Findings
<p>Proving ownership for staked Cardano (ADA) and Ethereum (ETH) relevant to Customer Assets (including the mechanics and associated validator and withdrawal key pairs).</p>	<p>Staked ADA: Moore observed LGHL access a Cardano staking key holding staked ADA. Additionally, Moore queried the ADA staked balances held in with that staking key custodied within the relevant LGHL Custodial Account type.</p> <p>Staked ETH: Moore inspected LGHL access the relevant account(s) and observed LGHL's two custodied withdrawal credentials related to staked Ether. Moore obtained a list of ETH validators from LGHL. Moore then queried the Ethereum blockchain and noted all validators distributed to either of the two withdrawal credentials. Moore then summed the total Staked ETH balance for all ETH validators.</p> <p>All validators were linked to these credentials, with total balances confirmed on the blockchain.</p>

Please note, for privacy and security reasons, LGHL requested that the exact balances not be disclosed.

Phase 5: Proof of Reserves Assessment

Procedure 14	Findings
<p>Query all Customer Assets, per the Custody Policy.</p>	<p>Query Asset Balances: For each Custodial Account, identified by LGHL, as per Phases 4 and 5. Moore performed a query of all of the asset balances at the Snapshot Date and compared them to the balances of Customer Assets. Additionally, Moore retrieved from the respective blockchains the balances of all Custodial Accounts tested in the procedures above.</p> <p>No discrepancies were noted.</p>

Procedure 15	Findings
<p>For each Custodial Account, per phases 4 and 5, perform a sum of the aggregate crypto asset balances (in line with the Custodial Arrangements and Custody Policy) as at the Snapshot Date.</p>	<p>Balance Aggregation: Moore calculated the aggregate sum of the balances of all of the Custodial Accounts. This sum represented the total holdings of crypto assets owned, controlled, and held in custody by the Luno Group Entities at the Snapshot Date.</p>

Procedure 16	Findings
<p>Compare the aggregate Customer Liabilities from the Extract List obtained in Phase 2 to the sum of the balances of each of the Custodial Accounts as at the Snapshot Date, as calculated in Procedure 15, to calculate the collateralisation ratio of Customer Assets to Customer Liabilities. (In line with the Custody Policy)</p>	<p>Based on the data obtained by following the procedures above, Moore performed a comparison of the Customer Liabilities, per the Extract List to the sum of all crypto assets held in the Custodial Accounts (per the Custody Policy) in order to determine the collateralisation ratio for each crypto asset in scope for the Assessment (the “Collateralisation Ratio”).</p> <p>The Collateralisation Ratio is set out in the table below.</p>

The Collateralisation Ratio results, as of the Snapshot Date is documented in the table below:

	Collateralisation Ratio
BTC	102%
BCH	103%
XRP	100%
LTC	101%
ETH	101%
USDC	109%
LINK	104%
USDT	154%
MATIC	108%
UNI	108%
SOL	104%
ADA	106%
AVAX	107%
DOT	135%
ATOM	154%
ETH Staking	113%
ADA Staking	127%

Yours sincerely,

Moore Blockchain & Digital Assets JHB

MOORE BLOCKCHAIN AND DIGITAL ASSETS JHB (PTY) LTD
 Gauteng, South Africa
 Date: 8 February 2024