# ASX RELEASE

**7 OCTOBER 2024**

WEST ARUNTA PROJECT

# INITIAL REFINING TESTWORK RESULTS

## Highlights

- **Excellent post-flotation process testwork delivers a clean concentrate:**

  **Refined concentrate (refining stage)** **66.9% $Nb_2O_5$ at 99.9% recovery**

- **The refining stage is the second of three stages in a conventional ferroniobium process flowsheet**
- **The refined concentrate produced by this testwork meets target specifications to proceed to the final stage of testing, being conversion to a ferroniobium end-product**
- **Initial drilling in 2024 delivered metallurgical samples which are being used in ongoing process optimisation and variability testing of the beneficiation stage, along with detailed assessment of the preferred ferroniobium process flowsheet**

WA1 Resources Ltd (ASX: WA1) (**WA1** or **the Company**) is pleased to announce initial results from further process testwork following previously reported beneficiation testwork (refer to ASX announcement dated 19 June 2024) at the 100% owned West Arunta Project in Western Australia.

**WA1's Managing Director, Paul Savich, commented:**

*"**In June we reported that beneficiation testwork successfully produced a high-grade niobium concentrate, primarily via flotation** – the first stage in a conventional ferroniobium process flowsheet.*

*"**These new results relate to intermediate refining which has been subsequently completed on the niobium concentrate that was produced from the initial beneficiation testwork** – the second stage in a conventional niobium process flowsheet.*

*"This refining testwork demonstrates the ability to produce a clean concentrate that will be utilised in upcoming conversion testwork, which will aim to produce a small quantity of ferroniobium end-product. We consider this another excellent outcome as we continue to progress our testwork programs.*

*"In parallel, variability and optimisation testwork of the beneficiation stage is ongoing with the aim of demonstrating mineralisation can be beneficiated from a portion of the Luni deposit to support detailed mine planning and other evaluations. This will support process flowsheet development and preliminary mass balances to support engineering assessments."*

### Niobium Industry Metallurgy Overview Integrated with Results from Luni

Niobium production at existing operations currently involves the beneficiation (stage 1) and further intermediate processing (refining – stage 2) of ore to produce a concentrate grading between ~50-60% $Nb_2O_5$[1]. This concentrate is then converted into a saleable end-product,

typically ferroniobium (FeNb, ~65% Nb), via a conventional aluminothermic conversion (stage 3). Refer to Figure 1.

At the three existing niobium operations, concentrate produced from beneficiation processes undergoes an intermediate hydrometallurgical step (one to two steps of leaching), or pyrometallurgical steps (electric arc furnace), to remove any remaining impurities and achieve a clean, high-grade concentrate to take forward into conversion.

Concentrate refining processes at existing operations differ depending on the quality of the concentrate and the nature of the impurities. A range of processes and process conditions exist to target different impurities. Niobium recoveries are generally very high in the hydrometallurgical steps as the niobium-bearing minerals are typically more resistant to chemical breakdown than the targeted impurity minerals.

In this testwork program, a number of sighter tests were conducted trialling both acid and caustic leach conditions and calcining. The aim was to produce a concentrate composition that would meet the envisaged conversion-feed grades required to achieve a commercial ferroniobium end-product. **Testwork of the conversion to ferroniobium step has not yet been undertaken on refined concentrates produced from Luni and is planned in future testwork programs.**

Figure 1 utilises publicly available information to present simplified niobium process flowsheets from the three existing niobium operations, integrated with Luni's previously released beneficiation results and current refining results.

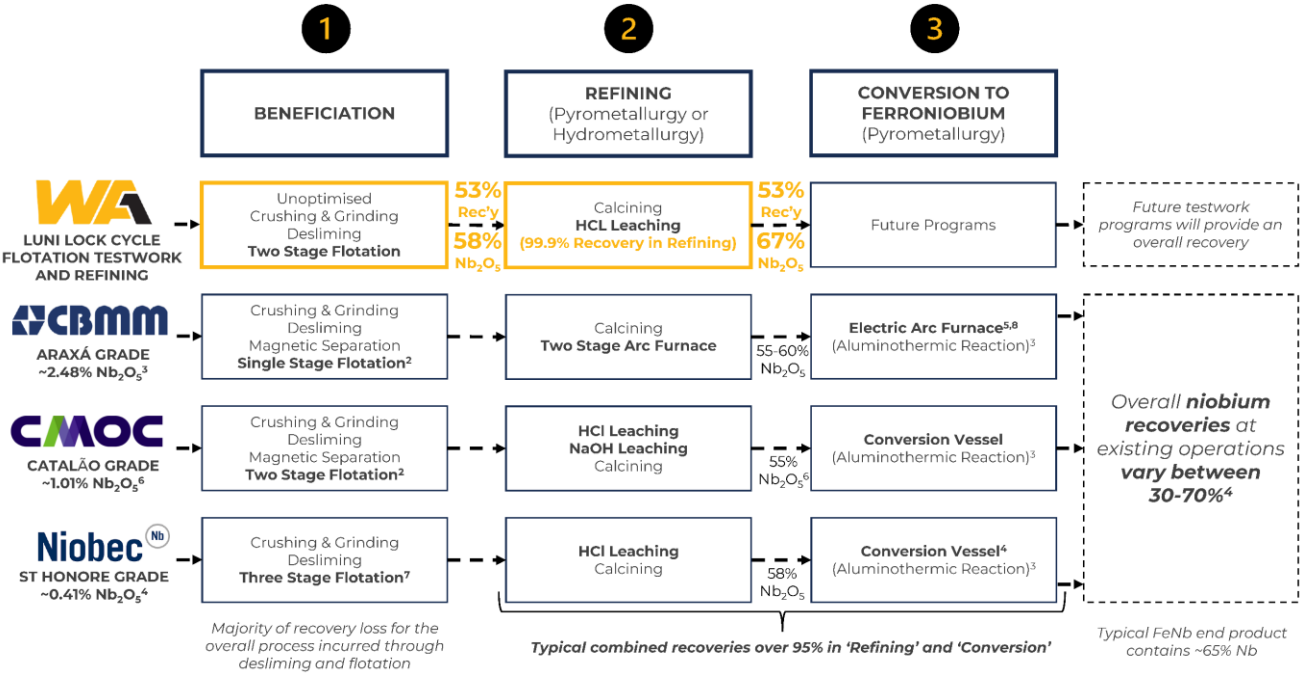


**Figure 1: Simplified adapted process flowsheets for the three existing niobium operations with unoptimised beneficiation and refining results from Luni integrated**

*Notes: See Table 3 for full details of source documents for the above information*

## Metallurgical Discussion - Luni Niobium Deposit

The Company completed the first phase of refining testwork utilising concentrate produced from beneficiation testwork completed at SGS Lakefield in Ontario, Canada. This refining testwork was

Note 1. Gibson. C.E., Kelebek. S, and Aghamirian.M: 'Niobium Oxide Mineral Flotation: A Review of Relevant Literature and the Current State of Industrial Operations' International Journal of Mineral Processing (2015)

undertaken at Nagrom laboratories in Perth, Western Australia (**Nagrom**), one of Australia's leading metallurgical laboratories.

The primary objective of this testwork was to identify potential refining steps required to remove impurities that remain in the flotation concentrate produced from initial beneficiation steps, and to enable the concentrate to be taken forward into the final ferroniobium conversion stage.

**Testwork Program**

A total of 1.2 kg of beneficiated concentrate, generated from a single drillhole located in the north-east of Luni (Table 2), was composited to ensure sufficient mass was available for the bench-scale refining testwork and potential subsequent downstream conversion to ferroniobium.

The concentrate was reanalysed to identify key impurity elements which require removal prior to ferroniobium conversion. The analysis of the feed concentrate used in the testwork is shown in Table 1. The key impurity identified was phosphorus with the testwork specifically designed to target removal of this element.

Refining testwork then trialled various conventional processing techniques utilised at existing niobium operations to enable assessment of the potential for the flotation concentrate to yield a feedstock suitable for conversion to ferroniobium.

A total of 10 hydrometallurgical tests were completed by Nagrom and assessed a combination of different process steps, including acid leaching, caustic leaching and calcining, under a range of differing conditions. The refined concentrate products have undergone chemical analyses to enable mass balancing and to determine niobium recovery and impurities removal.

**Testwork Results**

Results from the individual test presented herein were generated by calcining the feed concentrate with no additives. The feed was subsequently leached using a single stage dilute hydrochloric acid solution at ambient temperature.

The assays show the refined concentrate has an increased niobium grade of 66.9% $Nb_2O_5$ at 99.9% recovery for this step (Table 1).

**Table 1: Niobium concentrate assays for feed and refined concentrates**

| | $Nb_2O_5$ | $Fe_2O_3$ | Ta | $SiO_2$ | CaO | $Al_2O_3$ | $P_2O_5$ | SrO | U | Th | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (ppm) | (ppm) | (%) |
| **Feed Concentrate*** | 56.96 | 11.62 | 0.03 | 2.85 | 6.52 | 0.93 | 4.18 | 6.93 | 165 | 327 | 0.04 |
| **Refined Concentrate** | **66.90** | **13.81** | **0.04** | **2.76** | **2.20** | **0.62** | **0.18** | **6.43** | **181** | **383** | **0.09** |

** Feed Concentrate has been composited and re-analysed from earlier beneficiation testwork*

This test demonstrates that residual phosphorus can be sufficiently removed from the tested feed concentrate using conventional refining techniques, thereby creating a cleaner niobium concentrate with almost no niobium losses.

The chemical composition of this refined concentrate provides the Company with the confidence to proceed to testing the final process step, being conversion of the concentrate to ferroniobium.

**Forward Testwork Programs**

The Company is progressing with an initial program to test conversion of the refined concentrate to meet the specifications of a commercial ferroniobium product. This conversion is the final step in a conventional flowsheet.

Variability and optimisation testwork of the beneficiation stage is also continuing, utilising a significant number of diamond and sonic drillholes which have been drilled this year in the northeast of the Luni niobium deposit. This area has been selected as it is a zone where early resource drilling identified shallow, high-grade niobium mineralisation over broad intercepts which may potentially represent an ideal area for a start-up mining scenario and is the current focus of initial studies.

The Company is also undertaking other ongoing metallurgical-related testwork programs and studies, including:

- Mineralogy assessments;
- Comminution testing;
- Classification and desliming testing;
- Physical separation testing (to complement the beneficiation stage);
- Geometallurgical modelling;
- Bulk concentrate production for downstream testing; and
- Planning for the collection of bulk samples to support pilot-scale flowsheet testing.

Outcomes from this work will assist with considering and developing a flowsheet suitable for processing Luni's niobium mineralisation to a ferroniobium end-product to support initial mine planning and other potential evaluations and assessments.

**ENDS**

This Announcement has been authorised for market release by the Board of WA1 Resources Ltd.

For further information, please contact:


**Investors**
Paul Savich
Managing Director
T: +61 8 6478 7866
E: psavich@wa1.com.au

**Media**
Michael Vaughan
Fivemark Partners
T: +61 422 602 720
E: michael.vaughan@fivemark.com.au


Or visit our website at www.wa1.com.au

**Competent Person Statement**

The information in this announcement that relates to metallurgical testwork results is based on information compiled by Mr. Roy Gordon who is a Member of the Australian Institute of Mining and Metallurgy (AusIMM). Mr. Gordon is a full-time employee of WA1 Resources Ltd and has sufficient experience which is relevant to the information and activities under consideration to qualify as a competent person. Mr. Gordon consents to the inclusion in the announcement of the matters based on his information in the form and context in which it appears.

**About WA1**

WA1 Resources Ltd is an S&P/ASX 300 company based in Perth, Western Australia and trades under the code WA1.

WA1's objective is to discover and develop Tier 1 deposits, including the Luni niobium deposit, in Australia's underexplored regions and create value for all stakeholders. We believe we can have a positive impact on the remote communities within the lands on which we operate. We will execute our exploration using a proven leadership team which has a successful track record of exploring in WA's most remote regions.

**Forward-Looking Statements**


This ASX Release may contain certain "forward-looking statements" which may be based on forward-looking information that are subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. For a more detailed discussion of such risks and other factors, see the Company's Prospectus and Annual Reports, as well as the Company's other ASX Releases. Readers should not place undue reliance on forward-looking information. The Company does not undertake any obligation to release publicly any revisions to any forward-looking statement to reflect events or circumstances after the date of this ASX Release, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities laws.

**Table 2: Collar location of drillhole (metallurgical sample)**

| Hole ID | Drill Type | Easting | Northing | RL | Dip | Azimuth | Depth |
|---|---|---|---|---|---|---|---|
| | | | | (m) | (Degrees) | (Degrees) | (m) |
| LUDD23030 | DD | 437496 | 7540710 | 382 | -60 | 180 | 126.2 |

**Table 3: Sources for the internally generated schematic in Figure 1 above**

| Note | Source |
|---|---|
| 1 | Henrique. P: 'Production of niobium: Overview of processes from the mine to products' Journal of Mining and Metallurgy. (2022) |
| 2 | Gibson, C.E: 'Niobium Oxide Mineral Flotation: A Review of Relevant Literature and the Current State of Industrial Operations' International Journal of Mineral Processing. (2015) |
| 3 | Shikik. A: 'A review on extractive metallurgy of tantalum and niobium' Journal of Metallurgy. (2020) |
| 4 | IAMGOLD Corporation, NI 43-101 Technical Report, Update on Niobec Expansion. (2013) |
| 5 | CBMM Infographic, viewed at <https://cbmm.com/assets/infographic/en/index.html> on 13/2/2024 |
| 6 | China Molybdenum Co., Ltd. 'Major Transaction Acquisition of Angle America PLC's Niobium and Phosphates Businesses'. (2016) |
| 7 | One of Niobec's flotation steps is completed after HCl leaching |
| 8 | Does not include niobium pentoxide production steps, outputs or recoveries |

**Table 4: Grade of key niobium producers**

| | Deposit Size | $Nb_2O_5$ | Contained $Nb_2O_5$ |
|---|---|---|---|
| **CBMM (Araxa)** | **(Mt)** | **(%)** | **(kt)** |
| Measured | Unknown* | Unknown* | Unknown* |
| Indicated | Unknown* | Unknown* | Unknown* |
| Inferred | Unknown* | Unknown* | Unknown* |
| **Total** | **462** | **2.48%** | **11,458** |
| *Source: US Geological Survey published 2017 available at <https://pubs.usgs.gov/pp/1802/m/pp1802m.pdf>* | | | |
| **Measured, Indicated and Inferred resource not publicly available to due CBMM private ownership* | | | |
| **Magris Resources (Niobec)** | **(Mt)** | **(%)** | **(kt)** |
| Measured | 286 | 0.44% | 1,252 |
| Indicated | 344 | 0.40% | 1,379 |
| Inferred | 68 | 0.37% | 252 |
| **Total** | **698** | **0.41%** | **2,883** |
| *Source: IAMGOLD NI 43-101 Report available at <https://www.miningdataonline.com/reports/Niobec_12102013_TR.pdf>* | | | |
| *Resource as at 31 December 2012 (NI 43-101 Compliant)* | | | |
| **CMOC (Catalao II)** | **(Mt)** | **(%)** | **(kt)** |
| **Oxide** | | | |
| Measured | 0.3 | 0.86% | 2 |
| Indicated | 0.1 | 0.74% | 1 |
| Inferred | 1.3 | 0.83% | 11 |
| **Total** | **1.7** | **0.83%** | **14** |
| **Fresh Rock (Open Pit)** | | | |
| Measured | 0 | 0.00% | 0 |
| Indicated | 27 | 0.95% | 258 |
| Inferred | 13 | 1.06% | 138 |
| **Total** | **40** | **0.99%** | **396** |
| **Fresh Rock (Underground)** | | | |
| Measured | 0.0 | 0.00% | 0 |
| Indicated | 0.2 | 0.89% | 2 |
| Inferred | 6.3 | 1.24% | 78 |
| **Total** | **6.5** | **1.23%** | **80** |
| **Total (All)** | **48.4** | **1.01%** | **490** |
| *Source: China Molybdenum Co. Ltd: Major Transaction Acquisition of Anglo American PLC's Niobium and Phosphate Businesses available at <https://www1.hkexnews.hk/listedco/listconews/sehk/2016/0908/ltn20160908840.pdf>* | | | |
| *Resource as at 30 June 2016 (JORC 2012 Compliant)* | | | |

# JORC Code, 2012 Edition – Table 1

**Section 1 Sampling Techniques and Data**

| CRITERIA | COMMENTARY |
|---|---|
| ***Sampling techniques*** | ▪ Geological information and metallurgical testwork samples referred to in this ASX Announcement were derived from diamond drilling programs.<br>▪ Core samples were collected with a diamond drill rig and were mainly PQ core diameter.<br>▪ The core was logged and photographed onsite and then transported to Bureau Veritas in Perth for cutting and sampling. Whole core was sampled for metallurgical testwork in its entirety to preserve sample integrity and maximise sample mass.<br>▪ At Bureau Veritas, the core was selected and composited based on assays from RC twin samples, pXRF analysis of intervals and geological logging to identify mineralised zones and domains. Mineralised core was composited in its entirety within the selected domains. |
| ***Drilling techniques*** | ▪ Diamond holes were drilled with PQ3 (83mm) rods. PQ core was triple tubed to improve core recovery. |
| ***Drill sample recovery*** | ▪ The composite for the metallurgical testwork program reported covered an interval from 48 to 75.8m depth. Over this interval, 6.7m of core loss was reported.<br>▪ Additional laboratory assays were undertaken on the samples submitted for the testwork and showed good alignments to the drill assays. |
| ***Logging*** | ▪ All samples used for the metallurgical testwork were geologically logged to a detail level that supported the metallurgical studies.<br>▪ The samples were logged qualitatively and quantitatively in nature for geology, alteration, and mineralisation by the Company's geological personnel. Drill logs were recorded digitally and have been verified.<br>▪ Detailed logging of the diamond core was completed onsite. |
| ***Sub-sampling techniques and sample preparation*** | ▪ At Bureau Veritas, the entire core composite was stage crushed to P100 3.35mm, blended and homogenised, and subsequently split into charges for various testwork programs. Approximately 130kg was dispatched to SGS Lakefield for this testwork program.<br>▪ Stage crushing was undertaken to minimise fines generation that may affect metallurgical testwork, whilst reducing top size which enabled representative sub-sampling to occur.<br>▪ Flotation concentrate samples were received by Nagrom and composited in their entirety to provide approximately 1.2kg feedstock for the refining testwork. The concentrate composite was homogenised and subsampled into charges for head assay, and calcine/leach testwork.<br>▪ After testing, leach residues were submitted in their entirety for analysis, whilst solutions were subsampled for analysis. |
| ***Quality of assay data and laboratory tests*** | ▪ Unless otherwise noted, all assays reported are those conducted by Nagrom, using a combination fused-bead XRF, Leco and ICP-MS for solid samples, and ICP-OES and ICP-MS for solution samples<br>▪ Standard laboratory QAQC was undertaken and monitored by the |

| CRITERIA | COMMENTARY |
|---|---|
| | laboratory and mass balances for each test reported by Nagrom were reconciled against the feed grade. This is subsequently reviewed by WA1 upon receipt of results. |
| ***Verification of sampling and assaying*** | ▪ Mineralised intersections have been verified against the downhole geology and pXRF analysis.<br>▪ Logging and sampling data was recorded digitally in the field. |
| ***Location of data points*** | ▪ Drillhole collars were initially surveyed and recorded using a handheld GPS. Drill collars are then surveyed with DGPS system at appropriate stages of the program.<br>▪ All co-ordinates are provided in the MGA94 UTM Zone 52 co-ordinate system with an estimated horizontal accuracy of ±0.008m and an estimated vertical accuracy of ±0.015m for the DGPS system.<br>▪ Azimuth and dip of the drillholes is recorded after completion of the hole using a gyro. A reading is taken every 30m with an assumed accuracy of ±1 degree azimuth and ±0.3 degree dip. |
| ***Data spacing and distribution*** | ▪ See drillhole table for hole position and details. |
| ***Orientation of data in relation to geological structure*** | ▪ The orientation of the oxide-enriched mineralisation is interpreted to be sub-horizontal and derived from weathering of primary mineralisation. The orientation of primary mineralisation is poorly constrained due to the limited number of drillholes that have penetrated to depth.<br>▪ See drillhole table for hole details and the text of this announcement for discussion regarding the orientation of holes.<br>▪ Drillholes were designed based on interpretation from modelled geophysical data and results from drilling to date.<br>▪ Oxide mineralisation is currently interpreted as a sub horizontal unit. |
| ***Sample security*** | ▪ Sample security is not considered a significant risk with WA1 staff present during collection.<br>▪ All geochemical samples were collected and logged by WA1 staff, and delivered to ALS Laboratories in Perth or Adelaide. |
| ***Audits or reviews*** | ▪ The program and data is reviewed on an ongoing basis by senior WA1 personnel. |

**Section 2 Reporting of Exploration Results**
(Criteria listed in the preceding section also apply to this section.)

| CRITERIA | COMMENTARY |
|---|---|
| ***Mineral tenement and land tenure status*** | ▪ All work completed and reported in this ASX Announcement was completed on E80/5173 which is 100% owned by WA1 Resources Ltd.<br>▪ The Company also currently holds four further granted Exploration Licences and three Exploration Licence Applications within the area of the West Arunta Project. |
| ***Exploration done by other parties*** | ▪ The West Arunta Project has had limited historic work completed within the Project area, with the broader area having exploration focused on gold, base metals, diamonds and potash.<br>▪ Significant previous explorers of the Project area include Beadell Resources and Meteoric Resources. Only one drill hole (RDD01) had been completed within the tenement area by Meteoric in 2009 |

| CRITERIA | COMMENTARY |
|---|---|
| | (located approximately 17km southwest of the Luni deposit), and more recently additional drilling nearby the Project has been completed by Encounter Resources Ltd.<br>▪ Most of the historic work was focused on the Urmia and Sambhar Prospects with historic exploration (other than RDD01) being limited to geophysical surveys and surface sampling.<br>▪ Historical exploration reports are referenced within the WA1 Resources Ltd Prospectus dated 29 November 2021 which was released by ASX on 4 February 2022.<br>▪ Encounter Resources are actively exploring on neighbouring tenements and have reported intersecting similar geology, including carbonatite rocks. |
| ***Geology*** | ▪ The West Arunta Project is located within the West Arunta Orogen, representing the western-most part of the Arunta Orogen which straddles the Western Australia-Northern Territory border.<br>▪ Outcrop in the area is generally poor, with bedrock largely covered by Tertiary sand dunes and spinifex country of the Gibson Desert. As a result, geological studies in the area have been limited, and a broader understanding of the geological setting is interpreted from early mapping as presented on the MacDonald (Wells, 1968) and Webb (Blake, 1977 (First Edition) and Spaggiari et al., 2016 (Second Edition)) 1:250k scale geological map sheets.<br>▪ The West Arunta Orogen is considered to be the portion of the Arunta Orogen commencing at, and west of, the Western Australia-Northern Territory border. It is characterised by the dominant west-north-west trending Central Australian Suture, which defines the boundary between the Aileron Province to the north and the Warumpi Province to the south.<br>▪ The broader Arunta Orogen itself includes both basement and overlying basin sequences, with a complex stratigraphic, structural and metamorphic history extending from the Paleoproterozoic to the Paleozoic (Joly et al., 2013). |
| ***Drill hole Information*** | ▪ Refer to Table 2 for drill hole details. |
| ***Data aggregation methods*** | ▪ Not applicable as drilling results are not being reported in this announcement.<br>▪ No metal equivalents have been reported. |
| ***Relationship between mineralisation widths and intercept lengths*** | ▪ Not applicable as drilling results are not being reported in this announcement. |
| ***Diagrams*** | ▪ Refer to figures provided within this ASX announcement. |
| ***Balanced reporting*** | ▪ All relevant information has been included and provides an appropriate and balanced representation of the results. |
| ***Other substantive exploration data*** | ▪ All meaningful data and information considered material and relevant has been reported. |
| ***Further work*** | ▪ Further interpretation of drill data and assay results will be |

| CRITERIA | COMMENTARY |
| --- | --- |
| | completed over the coming months, including ongoing petrographic and mineralogical analysis.<br>▪ Planning and implementation of further drilling is in progress and analysis of existing drill samples is ongoing.<br>▪ Further metallurgical studies are in progress and engineering factors are under consideration.<br>▪ Work on the project is ongoing on multiple fronts. |