ASX Announcement | 18 September 2024

MAJOR MANGANESE, RARE EARTH AND BASE METALS POTENTIAL IDENTIFIED AT LUCY CREEK

Highlights

- Advanced remote sensing has identified potential target areas for exploration for major manganese, rare earth elements (REE) and base metals at Lucy Creek.
- Spectral analysis has identified mineral signatures indicative of manganese and base metal mineralisation, including psilomelane (Barium and manganese hydrous oxide) and rhodochrosite (manganese carbonate).
- A gas analysis technique has identified new areas of potential sub-surface manganese mineralisation.
- Analysis of imagery has pinpointed over 100 new exploration targets across both tenement packages of Lucy Creek, EL 33568 and ELA33888.
- These new findings have elevated the prospectivity of Lucy Creek, positioning Litchfield Minerals for accelerated exploration.

Litchfield Minerals Limited (**"Litchfield"** or the **"Company"**) **(ASX: LMS)**, a company with a strategic emphasis on critical minerals, is Litchfield Minerals is pleased to announce significant progress in our Lucy Creek project, located in the Northern Territory. Recent analysis of Sentinel-2 VNIR/SWIR and ALOS-1 AVNIR-2 imagery has revealed new manganese, rare earth elements (REE's) and base metal targets.

Managing Director and CEO, Matthew Pustahya, commented:

"We are extremely excited by these latest findings at Lucy Creek. The identification of target areas with a high-potential for manganese, rare earth elements and base metal mineralisation through advanced remote sensing underscores the immense geological promise of this project. With over 100 new exploration targets identified, we are confident that Lucy Creek has the potential to deliver substantial value. This is a pivotal step in advancing our exploration efforts and we look forward to further unlocking the region's mineral wealth in the coming months.

The latest exploration work with our drive to find a Bootu Creek -style of manganese mineralisation across Lucy Creek will play a pivotal role in confirming its potential and unlocking substantial shareholder value. This project offers the potential to transition from exploration to a resource definition phase, ultimately becoming a key player in Australia's critical mineral supply chain"

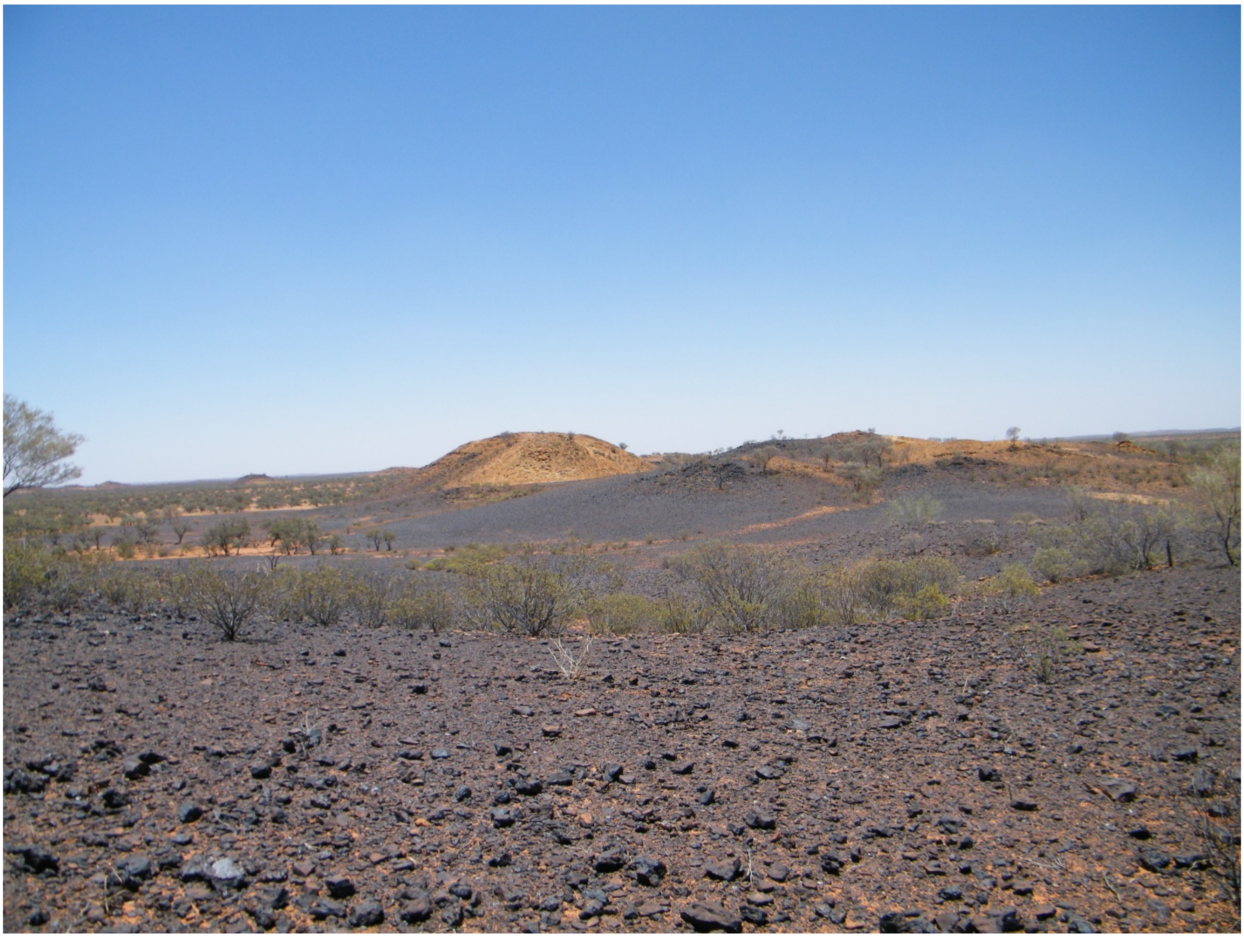

***Figure 1**. One area of manganese mineralisation within the Lucy Creek tenement package.*

Lucy Creek Tenement

The Lucy Creek Project (EL 33568 & ELA33888) presents an exciting opportunity for Litchfield Minerals, particularly with its rich geological setting and significant potential for manganese, rare earth elements and base metals. The project area lies within the Tomahawk Formation, which hosts multiple mineralised zones, including a 1 - 2m thick manganese horizon identified through historical drilling and surface sampling. The area has already produced several high-grade manganese rock chip assays, with samples up to 54.2% Mn (GB018, AUVEX RESOURCES, FUSION XRF78S).

Geological Potential:

The geological formations at Lucy Creek, particularly the dolomitic siltstone of the Tomahawk Formation, have been conducive to substantial manganese mineralisation. The project has demonstrated both stratabound and hydrothermal manganese deposits, with occurrences mapped across large areas. One of the key exploration areas is the Lucy Creek 2 prospect, where a thick manganese mineralised horizon has previously been identified over a **1km²** area.

- **Rock Chip Highlights**: Several historical samples have shown impressive results, such as:
    - Sample D066 from Auvex minerals: **50.5% Mn**, **0.44% Fe**, **0.06% P**.
    - Other assays showing manganese concentrations in the range of **41-52.9% Mn**.(GB015, GB024, GB039, GB025, GB009, AUVEX RESOURCES, FUSION XRF78S)
    - The average grade across the Auvex GB sample series is **27.4%Mn**[1]**.**

Figure 2. *One of several Manganese horizons within the Lucy Creek 2 area.*

[1] *AUVEX RESOURCES DATA 2009 - https://geoscience.nt.gov.au/gemis/ntgsjspui/handle/1/75777*

Additional Exploration Potential:

Given the scale of the manganese occurrences and the potential for extensions both along strike and at depth, Lucy Creek is well-positioned to identify and delineate a deposit that could become a major contributor to the growing demand for manganese. The project's strategic location within fault-controlled systems adds further confidence that additional mineralisation may exist in feeder systems or structurally complex zones. Furthermore, the area shows elevated concentrations of associated base metals, including lead, zinc, and silver, as well as the potential for rare earth elements.

Further support for the exploration potential is that the underlying geology has many fault-controlled structures, which enhance the potential for high-grade discoveries. The geological setting of Lucy Creek presents a unique opportunity which has the potential to identify and delineate a highly sought-after resource, positioning this project as a potential cornerstone for Litchfield Minerals' future success.

Remote sensing results.

Litchfield Minerals engaged Neil Pendock, an independent expert in Sentinel and remote sensing, whose expertise encompasses production, modeling, and interpretation. The summary below is a representation of his analysis.

Remote sensing data specifically, the Sentinel-2 VNIR/SWIR imagery and ALOS-1 UV imagery was used to help map manganese occurrences, including psilomelane and rhodochrosite mineralisation across the project area. These remote sensing tools allowed for the detection of specific mineral signatures that correlate with known manganese deposits in the region, leading to the identification of 100 new exploration targets.

How Remote Sensing Data Has Defined Potential Manganese Targets:

1. **Spectral Unmixing**: Remote sensing techniques like spectral unmixing were applied to the VNIR/SWIR data, helping isolate specific spectral signatures of manganese minerals, such as psilomelane and rhodochrosite. These spectral signatures are linked to known manganese occurrences in the Tomahawk Formation, which hosts a 1 - 2m thick manganese horizon.
2. **Gas Mapping**: Remote sensing has also allowed the mapping of gases like helium (He), radon (Rn), carbon dioxide (CO_2) and methane (CH_4), which percolate from underground through cracks and fractures. These gases are strongly correlated with buried manganese deposits, especially where manganese is found in dolomitic siltstone. This technique enabled the identification of anomalies associated with manganese deposits under cover, beyond what can be detected by direct surface observation and what was the focus of all historic exploration efforts by others.
3. **UV Fluorescence**: The presence of manganese impurities in dolomite increases its fluorescence under UV light. UV imagery at a 10-meter spatial resolution has been useful for mapping manganese-bearing dolomitic siltstone, further enhancing the detection of manganese occurrences in the project area.

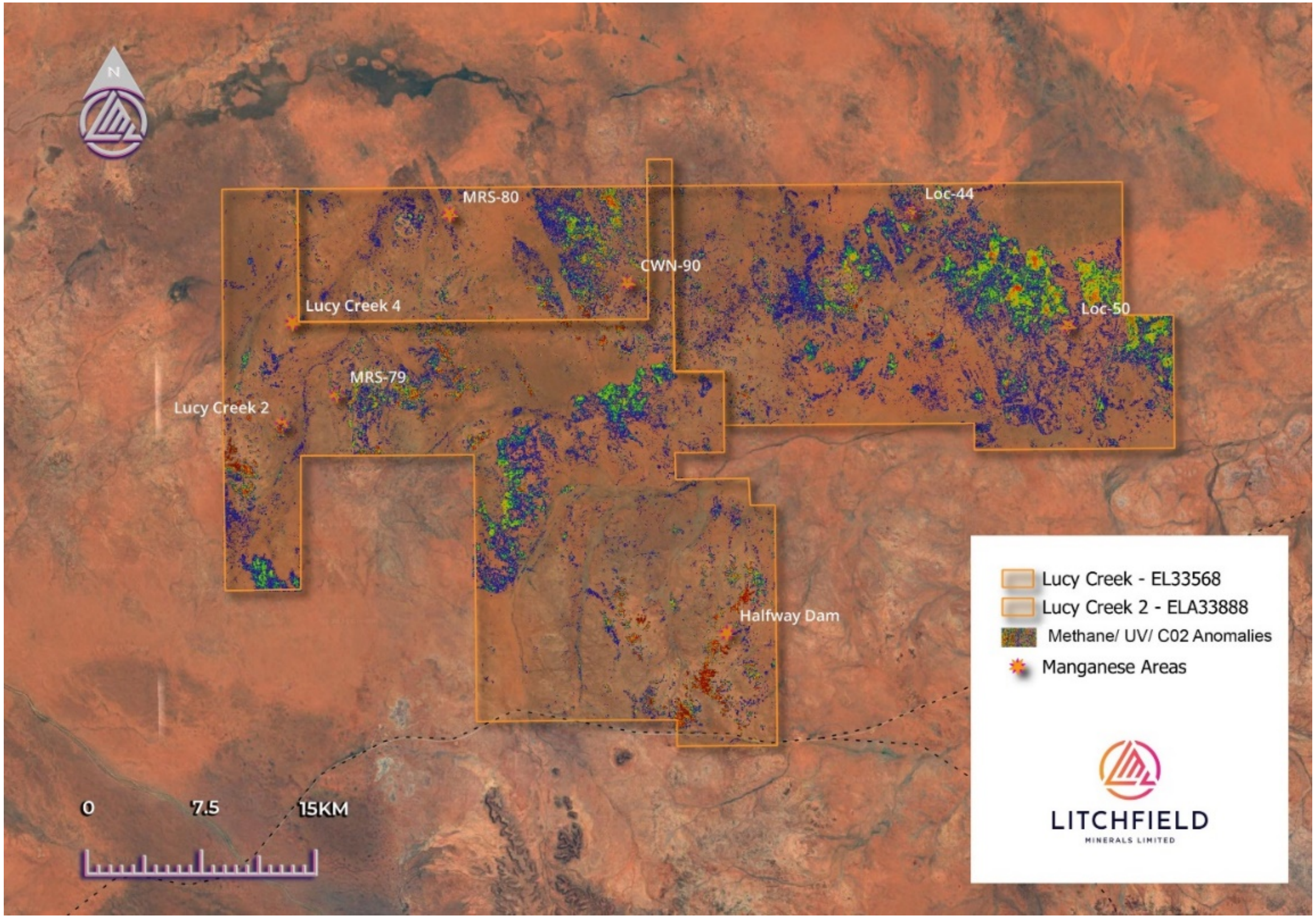

***Figure 3**. Remote sensing data showing New potential areas of Manganese utilising Methane, C02 and UV data.*

Why Methane, CO_2, and Helium Anomalies Help Define Potential Manganese Areas:

1. **Methane (CH_4)**: Methane is often produced through the breakdown of organic matter within sedimentary rocks, particularly in carbonate-rich environments like those containing **rhodochrosite**, a manganese carbonate mineral. The presence of CH_4 can indicate the weathering or breakdown of rhodochrosite, suggesting the proximity of manganese mineralisation. At Lucy Creek, CH_4 anomalies appear to be closely associated with manganese occurrences.
2. **Carbon Dioxide (CO_2)**: CO_2 is another gas commonly released during the weathering of carbonate minerals, such as **$MnCO_3$ (rhodochrosite)**. Elevated CO_2 levels detected through remote sensing are a strong indicator of manganese carbonate deposits, as rhodochrosite is a primary source of manganese in the region.
3. **Helium (He) and Radon (Rn)**: These gases are commonly associated with uranium-bearing dolomites. Dolomitic rocks in the **Tomahawk Formation** contain trace amounts of uranium, which decays to produce radon and helium. The correlation between He and manganese suggests that the dolomitic rocks in Lucy Creek host manganese as the presence of helium anomalies can be a reliable marker for these manganese-rich horizons.

Base Metals

Helium (He) and Radon (Rn) at Lucy Creek are also highly significant because they point to potential zones of sulphide mineralisation and suggest the possibility of MVT-style deposits. These gas anomalies can be associated with the **dolomitic siltstone** of the **Tomahawk Formation**, which is a favourable geological setting for both sulphide deposits and MVT-style mineralisation. Given the strong correlation between these gas anomalies and known mineralised structures, they provide an excellent vector for future exploration targeting base metals such as **lead**, **zinc** and **silver** within the Lucy Creek Project tenements.

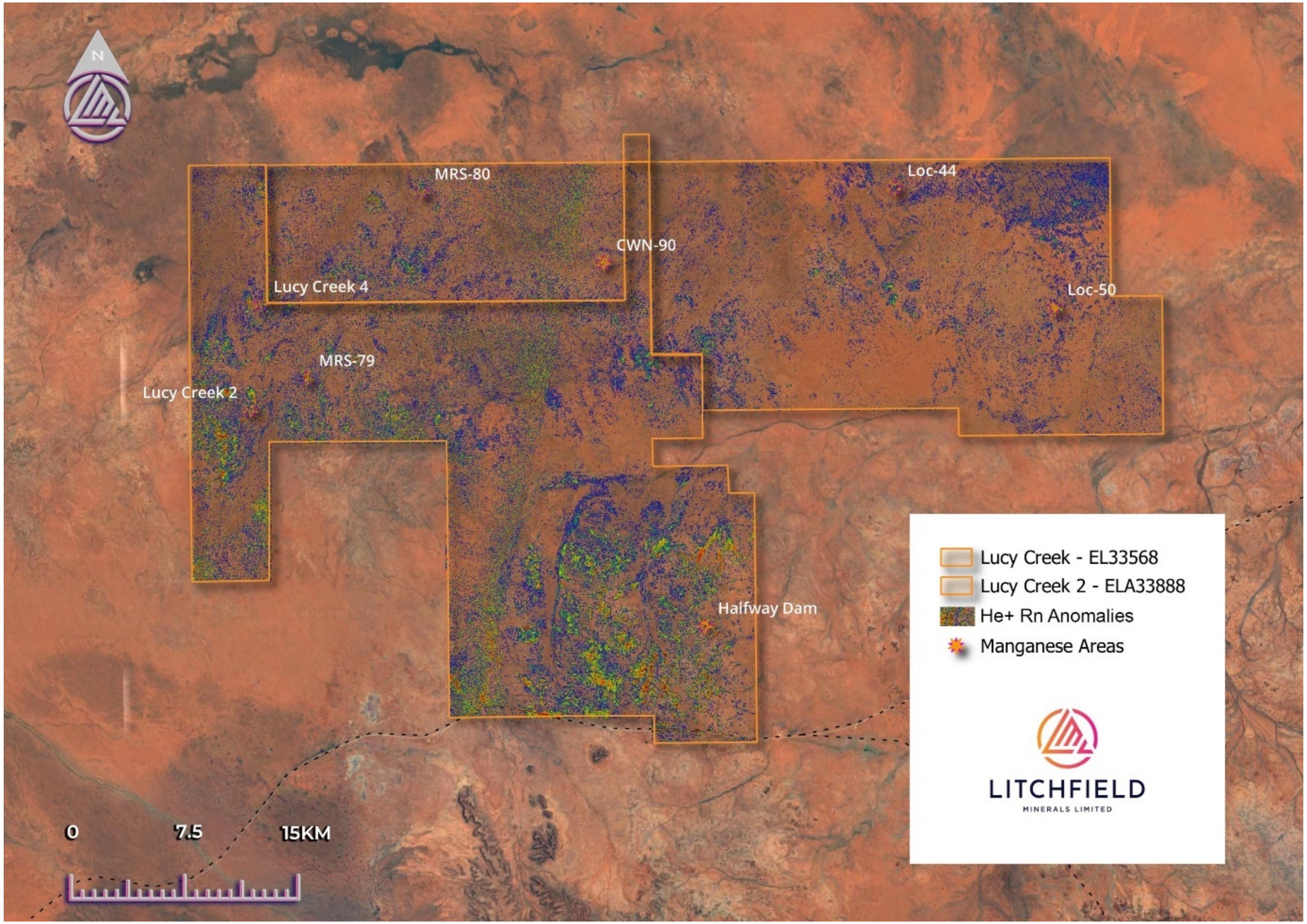

Figure 4. *Remote sensing data showing new potential areas of manganese and base metal mineralization utilising Helium and Radon data.*

Whats Next?

Geochemical Surveys

- Rock Chip Sampling: Collect rock chip samples from targeted areas based on the provided data above. The focus is to identify manganese and associated elements such as iron, cobalt, and barium, alongside lead and zinc, indicative of Mississippi Valley-Type (MVT) style mineralisation.

- Surface Geochemical Sampling: Perform systematic grid-based or stream sediment geochemical sampling to detect anomalous concentrations of manganese base metals and pathfinder elements.

Cautionary Note – Visual Estimates of Mineralisation

Any references to visual results above, are based on historical observations and results from previous exploration companies. These visual observations are derived from logged observations. Accurate and representative estimates of manganese and other metal content require laboratory assays.

Forward looking statement

This announcement may include forward-looking statements, which are subject to risks and uncertainties. Actual results could differ significantly due to factors beyond LMS's control, including market conditions and industry-specific risks. No warranty is given regarding the completeness of the information provided. Please avoid placing undue reliance on forward-looking statements, as they reflect views only as of the announcement date.

About Litchfield Minerals

Litchfield Minerals is a critical mineral explorer, primarily searching for base metals and uranium out of the Northern Territory of Australia. Our mission is to be a pioneering copper exploration company committed to delivering cost-effective, innovative and sustainable exploration solutions.

We aim to unlock the full potential of copper and other mineral resources while minimising environmental impact, ensuring the longevity and affordability of this essential metal for future generations.

We are dedicated to involving cutting-edge technology, responsible practices and stakeholder collaboration drives us to continuously redefine the industry standards and deliver value to our investors, communities and the world."

The announcement has been approved by the Board of Directors.

For further information please contact:

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Competent Person's Statement

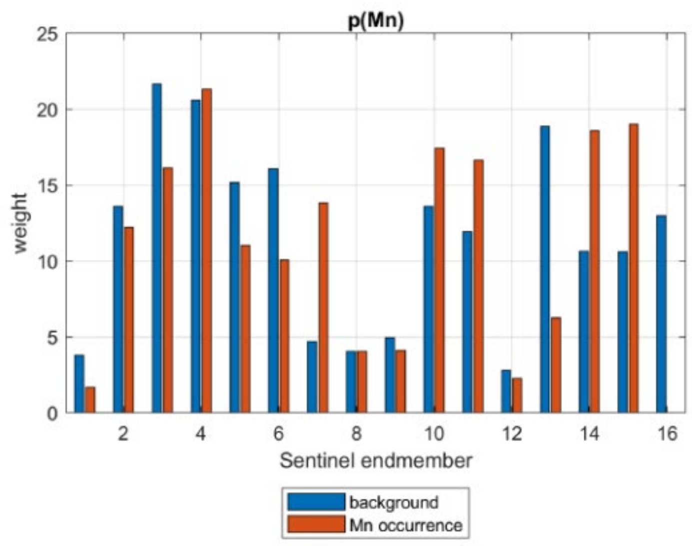
The information in this Presentation that relates to Exploration Results is based on, and fairly represents, information and supporting documentation compiled by Mr Russell Dow (MSc, BScHons Geology), a Competent Person who is a Member of the Australian Institute of Mining and Metallurgy (AUSIMM) and is a full-time employee of Litchfield Minerals Limited. Mr Dow has sufficient experience that is relevant to the style of mineralisation and types of deposits under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (JORC Code). Mr Dow consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. With regard to the Company's ASX Announcements referenced in the above Announcement, the Company is not aware of any new information or data that materially affects the information included in the Announcements.

JORC Code, 2012 Edition – Table 1 report

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual*	**SENTINEL 2 (visible spectrum minerals)** • Two scenes from the Sentinel-2 Satellite were obtained. The dates of the scenes are 22nd August, 2024. • Data was corrected for atmospheric effects. All ten VNIR/SWIR bands were resampled to 10m. 16 spectral endmembers were then derived for the image as it is assumed that each 10m x 10m parcel of ground is a nonnegative linear combination of 16 pure endmembers. 16 is an ad hoc number, chosen on the assumption that it is sufficient to explain the geological variability of the scene. • Each pixel is then expressed as a sum of 16 spectral abundances, most of which will be zero as they are estimated in such a way as to produce a sparse representation of the ten-dimensional data in 16 dimensional space. Each endmember hopefully corresponds to a geologically meaningful unit and interpretation consists of the process of interpreting these endmembers. • To interpret these spectral endmembers, we compared them to an appropriately resampled spectral library of 481 minerals from the USGS.

Criteria	JORC Code explanation	Commentary
	commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.	• The 16 closest endmember matches are Vegetation (correlation 0.86), Hapatite (0.92), Rhodochrosite (0.97), Microcline (0.84), Goethite (0.96), Serpentine (0.34), Psilomelane (0.79), Chert (0.59), Dolomite (0.97), Gypsum (0.95), Beryl (0.94), Chrysocolla (0.60), Muscovite (0.75), Galena (0.75), Hematite (0.77), Malachite (0.94). • A multivariate statistical classifier was trained on the 8 Mn occurrences within the Lucy Creek Project using the 16 closest endmembers with weights shown below: 

Criteria	JORC Code explanation	Commentary
		• Neil Pendock used proprietary algorithms to assess distribution of the following gases: Methane, Hydrogen, Helium, Carbon Dioxide, Radon • A multivariate statistical classifier was trained on the 8 Mn occurrences within the Lucy Creek Project using the distribution of these five gases. **ALOS-1 (used for UV / fluorescent minerals)** • The Japanese ALOS-1 satellite was launched in 2006 and includes a visible spectrometer which images rocks in the far ultraviolet at 10 m spatial resolution. Two scenes were obtained on 22nd August, 2024 to define fluorescent mineral species or minerals with impurities that make typically non-fluorescent minerals fluoresce. **Rock Chip Sampling** • Historical rock chip sampling was completed as representative grab samples.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• Not applicable as no drilling is reported.

Criteria	JORC Code explanation	Commentary
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Not applicable as no drilling is reported.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Not applicable as no drilling is reported.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*	• Not applicable as no drilling is reported.

Criteria	JORC Code explanation	Commentary
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• The method used by Neil Pendock from Dirt Exploration to assess the manganese, base metal and REE prospectivity of the Lucy Creek Project using supervised classification employs a standard workflow for the processing of Sentinel-2 data along with proprietary algorithms so assess gas distribution. • Historical rock chip samples were assayed using conventional analytical techniques in a modern laboratory.

Criteria	JORC Code explanation	Commentary
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Not applicable as no drilling is reported.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• Not applicable, there are no new data points included in the Release. The grid system used at the Lucy Creek Project is GDA94 (MGA Zone 53). • Location of rock chip samples was controlled using a handheld GPS device.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Eight spectral bands of Sentinel-2 VNIR imagery have 10m spatial resolution and two bands of SWIR have 20m resolution. • ALOS-1 satellite imagery has a spatial resolution of 10m. • Rock chip samples were collected randomly over outcropping manganese mineralization zones.

Criteria	JORC Code explanation	Commentary
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Not applicable as no drilling is reported, and not applicable to rock chip samples.
Sample security	• *The measures taken to ensure sample security.*	• Not applicable as no drilling is reported.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No audits or reviews of sampling techniques and data were completed.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*	• Refer to Section 4 in Independent Geologists Report (IGR) by Ross *et al.*, 2023 for further detail. In summary, the Lucy Creek Project is secured by EL 33568 and ELA 33888 for total of approximately 1,572km^2.

Criteria	JORC Code explanation	Commentary
	• *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• All tenements within the Lucy Creek Project are 100% owned by Litchfield Minerals Ltd. • The Lucy Creek Project is located 400km east-northeast of Alice Springs. The tenements are in good standing and there are no known impediments.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Refer to Section 7 in Independent Geologists Report (IGR) by Ross *et al*,, 2023 for further detail. A summary of previous exploration and mining is presented below: • Previous exploration across the district encompassing the project area commenced in the 1960s and was predominantly focused on the search for base metals within the Georgina Basin e.g., MVT and stratiform sediment-hosted base metal deposits. The Box Hole/Turkey Creek lead-zinc prospect located 340 km northeast of Alice Springs was discovered during this phase. • In the 1980s, CRA Exploration (CRAE) undertook some reconnaissance stream sediment sampling as part of a diamond exploration program that recovered numerous chromite grains, three microdiamonds, and one microdiamond. Although several indicator mineral drainage anomalies were identified, CRAE undertook no further work to identify the source of the drainage anomalies (Elkedra, 2003).

Criteria	JORC Code explanation	Commentary
		• In the early 2000s, Elkedra Diamonds NL (Elkedra) held a very large tenement package comprising over 30 tenements covering an area of more than 47,000km^2, including the area covered by ELA 33568. Elkedra's main focus was diamonds, following up on the previous exploration completed by CRAE, but exploration also identified the presence of base metals, manganese, and REE mineralisation (Elkedra, 2003). • Auvex completed regional geological mapping and rock chip sampling between 2009 and 2010.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Refer to Section 5 and 7 in Independent Geologists Report (IGR) by Ross *et al.*, 2023 for further detail. In summary: • The project is located within the southern portion of the Georgina Basin, a large intracratonic sedimentary basin located in central and northern Australia. The basin comprises marine and non-marine sedimentary rocks deposited from the Neoproterozoic to the late-Palaeozoic (850 – 350 Ma). Locally, basin sediments can reach a thickness of 4 km. • Basement rocks below the Georgina Basin sediments comprise the Altjawarra Block, which is part of the North Australian Craton. This craton is a composite terrane made up of numerous continental blocks that were amalgamated in the early Proterozoic. The Aljawarra Block is interpreted from geophysics and several deep drillholes to be comprised of

Criteria	JORC Code explanation	Commentary
		granitoid – granitic gneiss terranes separated by deformed mafic and ultramafic rocks. • Much of the tenement is comprised of the Cambrian Tomahawk Formation, part of the Georgina Basin sequence. This formation is composed of quartzose and glauconite sandstone with minor dolostone, limestone, dolomitic quartz sandstone, and conglomerate. Manganese and iron occurrences have been noted in association with this formation. • Significant areas of the tenement are overlain with thin veneers of Quaternary and Cenozoic unconsolidated sands and silts that mask the underlying geology.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not*
		• No drilling or assaying is reported in this report.

Criteria	JORC Code explanation	Commentary
	detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No drilling or assaying is reported in this report.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• No drilling or assaying is reported in this report.

Criteria	JORC Code explanation	Commentary
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Refer to Section 4, 5 and 7 of the Independent Geologists Report (IGR) by Ross *et al.*, 2023.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• Surface geochemical sampling is presented on a representative basis.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• See the main body of this report for all pertinent observations and interpretations.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Future planned exploration includes: • RAB/RC/DD drill testing • Geological mapping and geochemical sampling.