Vulcan Energy Resources Ltd.: Future phase pipeline: Mannheim resources growth - 76% increase in lithium brine resource estimate

07.07.2025 | DGAP

Maiden geothermal energy resource estimate
Scoping study in progress for future phase of production

Vulcan Energy (Vulcan, ASX: VUL, FSE: VUL, the Company[1]) is pleased to announce that following a 3D seismic survey, it has successfully completed an updated lithium brine Resource estimation, together with a maiden geothermal energy Resource estimation, for the Mannheim licence area of Germany's Upper Rhine Valley Brine Field (URVBF).

Key highlights

- The lithium brine Resource estimation update for the Mannheim sector estimates the total lithium brine Resource (Indicated and Inferred) has increased from 1,833kt LCE @ 153 mg/Li to 3,225kt LCE @ 155 mg/Li, which is an increase of 1,392kt LCE[2]
- A large-scale in place maiden geothermal Resource of 2,848 PJ (Indicated) and 10,539 PJ (Inferred) has also been estimated for the Mannheim sector of which 171 PJ (Indicated) and 377 PJ (Inferred) are considered recoverable. The Company intends to continue to complete geothermal energy Resource estimations under the Australian Geothermal Reporting Code for all its development areas within the URVBF, to better assist with investors' understanding of the scale of the URVBF geothermal potential
- Mannheim is one of a number of areas the Company is progressing within the URVBF to potentially develop as a future phase of integrated lithium and renewable energy production in addition to the Company's Phase One Lionheart development
- Vulcan is progressing a Scoping Study for the Mannheim licence which is located 40km to the northeast of Phase One. The study will look to add further production in addition to the Phase One integrated lithium and geothermal renewable energy development including expansion of the downstream lithium hydroxide monohydrate (LHM) facility in Industrie-Park Höchst
- It is envisaged Vulcan will deliver baseload geothermal heat from the Mannheim region geothermal resource to the district heating network of MVV Energie AG (MVV), one of Germany's leading energy companies, while simultaneously extracting sustainable lithium for EV battery production. Negotiations with MVV to revise the current heat offtake agreement are ongoing to take into account an updated development
- Harnessing natural heat to produce lithium from sub-surface brines and to power conversion to battery-quality material, the Company is building a local, low-cost source of sustainable lithium for European electric vehicle batteries. Phase One of the Project has recently been identified as a Strategic Project under the European Commission's Critical Raw Materials Act (CRMA), reflecting the Project's alignment with the objectives of the CRMA: to secure a sustainable supply chain for critical raw materials, including lithium, across Europe.

Vulcan Energy Managing Director and CEO, Cris Moreno, commented: "The completion of the lithium brine Resource update, together with our first geothermal energy Resource estimate, is yet another step forward in advancing our pipeline of integrated lithium and renewable energy project development in the Upper Rhine Valley Brine Field beyond our Phase One development.

"This further validates our strategy to replicate the current phase into future phases by utilising the URVBF bordering Germany and France. The URVBF is the largest lithium Resource in Europe, as well as one of the highest quality brine geothermal resources, and therefore a significant asset for Europe's energy and critical raw materials security."

Figure 1: Overview of the Vulcan Group Upper Rhine Valley Brine Field

Background

This lithium brine Resource estimation update, and maiden geothermal energy Resource estimation, both for the Mannheim region of Germany's URVBF, is based on a Competent Person's Report prepared by GLJ Ltd as Competent Person (CP) for the Company (Report).

Lithium Mineral Resource Estimation update - Mannheim, Germany

The Mineral Resource Estimation for the Indicated Resource classification is 820 kt LCE and for the Inferred Resource classification is 2,405 kt LCE for the Mannheim licence per Table 1. In accordance with the JORC code the checklist of assessment and reporting criteria as applicable for the Report is contained in the JORC Table in Annexure 2. The Lithium Mineral Resource Estimations are in line with and build on previous work, with increased confidence in the Mannheim area where Vulcan Group has performed additional exploration activities, gathered and analysed further data, and advanced the lithium extraction technology project at Phase One that is the basis for the Mannheim future development.

Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. Inferred Mineral Resources have a lower level of confidence associated with their estimation than Indicated Mineral Resources, but it is reasonably expected that with further exploration most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources. Indicated Mineral Resources are sufficiently well defined to allow application of modifying factors to support mineral extraction planning and economic evaluations of the deposit.

It is the opinion of the CP that the methods utilised to estimate the lithium Mineral Resources followed accepted industry practices and utilised a thorough approach and are deemed to have reasonable prospects for economic extraction with application of modifying factors.

Table 1: Summary of Lithium Mineral Resource Estimation for Vulcan Group Mannheim licence area

Note 1: Mineral Resources are not Ore Reserves and do not have demonstrated economic viability. Note 2: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs). Numbers may not add up due to rounding of the resource value percentages. Note 3: Reservoir abbreviations: MUS - Muschelkalk Formation, BST - Buntsandstein Group; BM - Variscan Basement. Note 4: To describe the resource in terms of industry standard, a conversion factor of 5.323 is used to convert elemental Li to Li_2CO_3, or LCE. Note 5: NTG and Phie averages have been weighted to the thickness of the reservoir. Note 6: GRV refers to gross rock volume, also known as the aquifer volume. Note 7: Mineral Resources are considered to have reasonable prospects for eventual economic extraction under current and forecast lithium market pricing with application of Vulcan Group's A-DLE processing. Note 8: The values shown are an approximation and with globalised rounding of values in the presented summary table as per JORC guidelines, cannot be multiplied through to achieve the Mineral Resource Estimated volumes shown above. Note 9: The Company's combined URVBF Mineral Resource Estimate is contained on page 141 of its 2024 Annual Report. See also the Competent Person Statement at the end of this announcement.

The previously reported Mineral Resource Estimation for Mannheim was made up of Indicated Resources of 288 kt LCE and Inferred Resources of 1,545 kt LCE based on average lithium concentration of 153 mg/L. The upgrading of volumes is associated with a slight revision to the lithium concentration to be consistent with available data, and increased Gross Rock Volume and adjustment to NTG for Inferred based on newly acquired and processed 3D seismic and updated geological modelling. There has been no change to the remainder of the Company's Mineral Resource, which is contained on page 142 of Vulcan's 2024 Annual Report.[3]

Geothermal Resource Estimation - Mannheim, Germany

The report provides an initial reporting of Geothermal Resources for Vulcan Group's Mannheim licence area, which are within the Vulcan Group licences in the URVBF. The Geothermal Resource Estimation is being publicly disclosed in accordance with the Geothermal Reporting Code and the Assessment and Reporting criteria are listed in the Geothermal Code Table in Annexure 1. The Geothermal Resources Estimation presented in the report was completed in accordance with the Geothermal Reporting Code. In the opinion of the Competent Person (CP), the Mannheim licence area has a reasonable prospect for eventual economic extraction based on aquifer geometry, delineation of fault zones using newly acquired and re-interpreted seismic data, brine volume, porosity, and heat flow.

Geothermal Resources are not Geothermal Reserves and may not be economically recoverable with existing technology and prevailing market conditions. Geothermal Resources are not an inventory of all heated areas drilled or sampled, regardless of Base or Cut-Off Temperature, likely dimensions, location or extent. It is a realistic inventory of those geothermal plays which, under assumed and justifiable technical and economic conditions, might, in whole or in part, be developed.

Table 2: Summary of Geothermal Resource Estimation for the Mannheim licence area

Overview

Vulcan Energy is a producer of geothermal renewable heat and power in the Upper Rhine Valley of Germany and holds geothermal and lithium licences in an area referred to as the Upper Rhine Valley Brine Field ("URVBF") or in some cases referred to as the Upper Rhine Graben Brine Field ("URGBF"). The URVBF is a geothermally hot and deep subsurface brine field which is enriched in lithium. It is strategically located in the heart of the European electric vehicle ("EV") market, providing close access to the EV supply chain, and the infrastructure supporting the automobile industry. The Vulcan Group is progressing an integrated commercial scale lithium co-production with renewable geothermal heat and power as part of their phased development of the URVBF starting with the Project Phase One Lionheart ("Lionheart" or "Phase One"). This Project proposes to provide geothermal renewable electricity and heat to local communities, as well as the production of battery-quality lithium in the form of lithium hydroxide monohydrate ("LHM").

In November 2023, Vulcan Group completed a Bridging Engineering Study ("Bridging Study" or "BES") on the Phase One commercial development. Pursuant to the Bridging Study, Phase One includes the construction of a geothermal plant and a lithium extraction plant ("LEP"), and a central lithium plant ("CLP") with a production target capacity of approximately 24,000 metric tonnes per annum ("tpa") of lithium monohydrate ("LHM"), along with over 275 gigawatt hours ("GWh") per annum ("GWh/a") of renewable power production capacity and over 560 GWh/a of renewable heat production capacity. Vulcan Group intends to develop

further phases across its licence areas, as the Company plans to grow production in a staged, modular fashion, however the development of any further expansion beyond Phase One remains subject to the availability of funding, and the exact timing is still to be defined.

Vulcan Group has built a large team that includes scientists, geoscientists, engineers and commercial specialists in the fields of lithium chemicals, subsurface characterisation, field development and geothermal renewable energy. Vulcan Group has binding lithium offtake agreements with some of the largest cathode, battery, and automakers in the world. As a company whose business model for the Project combines a carbon neutral extraction process with renewable energy generation, Vulcan Group has Environment, Social and Governance ("ESG") considerations deeply embedded in its corporate strategy.

Vulcan Group has previously reported Lithium Mineral Resources and Ore Reserves in accordance with Joint Ore Reserves Committee Code ("JORC") of the Australasian Institute of Mining and Metallurgy (2012) for licences in the URVBF. The last Competent Person Report was published December 17, 2024, on the

ASX as part of the Prospectus for Regulated Market of FSE (Prime Standard), referred to as the "Prospectus CPR 12-2024" in this announcement. The content in the report is based on much of the content of the last CPR, and where information is the same, the report will reference to the Prospectus CPR 12-2024 in lieu of repeating the information.

The report provides the reporting of Geothermal Resource estimation for the Mannheim licence area, in accordance with the Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves, ("Geothermal Reporting Code" or "GRC"), Second Edition (2010), developed by the Joint Committee of the Australian Geothermal Energy Group ("AGEG") and the Australian Geothermal Energy Association ("AGEA") as well as the supporting Geothermal Lexicon for Resources and Reserves Definition and Reporting ("Geothermal Lexicon"), Edition 2, compiled by Lawless, J. for The Geothermal Code Committee. Additionally, due to newly acquired data in the Mannheim licence area, there is an update provided on Lithium Mineral Resource estimation for the Mannheim licence in this announcement.

Geothermal Resource Estimation is reported for the Mannheim licence, which is part of a future phase of development, described as Mannheim Sector or Mannheim licence area in the report.

Phase One of the Project plans for a central surface facility for geothermal energy and lithium extraction, where the integrated facilities are referred to as the geothermal and lithium extraction plant ("GLEP"), which will be fed from a number of multi-well pads. Lithium extraction and processing will be conducted in two stages, starting at the GLEP and proceeding to a CLP processing facility at Hoechst, near Frankfurt. The battery grade product LHM will be produced and sold from the CLP.

The Mannheim licence area, as reported in this study, has been granted an exploration licence. In the Prospectus CPR 12-2024 there is further detail on the other licences that the Vulcan Group holds within the URVBF. Figure 2 shows the location of the Lionheart and Mannheim licence areas. There are currently no operating geothermal facilities in the Mannheim licence area. The Vulcan Group plans a similar development to the Phase One Project which has been described in the Prospectus CPR 12-2024, for lithium coproduction with geothermal power and heat at Mannheim in the future as part of a different Phase.

Listing Rule 5.8 Requirements - Mineral Resources

Listing Rule 5.8.1 Item	Location i
• geology and geological interpretation	Pages 66
• sampling and sub-sampling techniques;	Pages 63
• drilling techniques;	Page 62,
• the criteria used for classification, including drill and data spacing and distribution. This includes separately identifying the drill spacing used to classify each category of + mineral resources (inferred, indicated and measured) where estimates for more than one category of +mineral resource are reported;	Pages 64
• sample analysis method;	Pages 62
• estimation methodology;	Pages 9,
• cut-off grade(s), including the basis for the selected cut-off grade(s); and	Pages 65
• mining and metallurgical methods and parameters, and other material modifying factors considered to date	Pages 81

Figure 2: Geothermal and Lithium Licences for Mannheim and Lionheart cluster

Geology and exploration

The Upper Rhine Graben ("URG") regional geology and lithium system are fully described in the previous report Prospectus CPR 12-2024. In this study, the content provides updates as applicable, and content related to geothermal characterization for the Mannheim licence area. Since the publication of the previous report Prospectus CPR 12-2024, interpretations from the reprocessed and merged Weinheim 3D and Mannheim 3D seismic data have been integrated into the geologic model, providing updated mapping of geologic formations and faults over the Mannheim licence area. In the sections below, the Mannheim geologic model, URG geothermal system, and predicted reservoir temperatures for the Mannheim licence are described.

Figure 3: Mannheim licence 2D and 3D seismic coverage

The targeted reservoir at Mannheim is composed of Middle and Lower Buntsandstein along with fault damage zones ("FDZ") that cut through the upper 100 m of crystalline basement, Rotliegend (where present), Buntsandstein, and Muschelkalk. The Rotliegend is interpreted to not be present in the Mannheim area based on seismic interpretation. Lithology and sedimentology of the Buntsandstein and the Muschelkalk is essentially the same as in Lionheart, except that the Muschelkalk in the Mannheim licence area is interpreted to have been closer to surface during Early Tertiary and therefore potentially prone to karstification. The Muschelkalk is also interpreted to only be present in the western and southern parts of the Mannheim license, due to Early Tertiary erosion.

Petrophysical data from various sources, including public datasets and proprietary datasets purchased by Vulcan, were integrated as part of the Bridging Study to assess regional reservoir quality. Porosity and permeability estimates were derived from offset wells, including Brühl GT1, Offenbach GT1, Kraichgau 1002, Soultz EPS-1, Landau, Römerberg, and Appenhofen-1. The data includes well log data, core plug data (inhouse and published), reports on hydraulic tests, and published ranges and mean values.

Data availability varies between the different stratigraphic units with the largest data set being available for the Buntsandstein formation, which represents the primary target reservoir. Due to differences observed between outcrop and subsurface rock properties, subsurface datasets were prioritized for reservoir quality assessment. Core measurements from seven wells in the URG basin (Appenhofen-1, five Römerberg oil wells, and one Landau well) were used to evaluate porosity and permeability within the Buntsandstein.

Figure 4: Well data availability for the Buntsandstein interval on a regional scale showing the Lionheart and Mannheim licence areas.

Effective porosity, defined as the interconnected pore space that contributes to significant fluid flow, was established based on permeability thresholds. Using results from producing and previously producing geothermal and hydrocarbon wells in the URG (Appenhofen-1, Landau 207 and 211, Römerberg oil field wells), effective porosity was defined as porosity associated with a permeability greater than 0.02 mD. This threshold aligns with the Canadian Oil and Gas Evaluation Handbook (COGEH, 2005) and the theoretical framework provided by Nelson (1994). The table below presents a porosity-permeability crossplot for Buntsandstein core data, highlighting a positive correlation and supporting an effective porosity cutoff of approximately 5%.

Figure 5: (Left to right) Overall porosity-permeability relationship of the compiled core data (Landau oil field (1 well), Römerberg (5 wells), and Appenhofen-1); and histograms of the core porosity and permeability data from Appenhofen-1 and the Römerberg wells.

For the Mannheim licence, structural and geocellular models have been created from well and seismic data, following the methodology as previously described in the Prospectus CPR 12-2024.

Mannheim geology

Top Buntsandstein is mapped to be between 3.2 km and 4.2 km depth, which is significantly deeper than in the Lionheart project area reflecting the Mannheim licence's location within the "Heidelberger Loch" or "Heidelberger Basin", where the thickest Pliocene and Quaternary sedimentary fill within the entire URG is observed. The Eastern Rhine Graben bounding fault intersects the licence area in a roughly N-S direction and is itself not considered a target but instead marks the Eastern boundary of the static geological model area. The Buntsandstein thickness map shows the effect of Early Tertiary erosion in the northwest edge of the licence.

Figure 6: Structure map of top Buntsandstein from the Mannheim (MAN) static model shows the area is structurally divided in two areas, separated by a prominent fault.

Figure 7: Buntsandstein reservoir thickness map for the Mannheim (MAN) licence showing a thinning towards the northwest due to Early Tertiary erosion.

The geothermal well Brühl GT1 is currently the main and nearest reference well available for the evaluation of the Mannheim licence. The well has been drilled into a fault zone within the Buntsandstein. The production and injection tests showed that the heavily fractured fault zone encountered in the Middle Buntsandstein is highly permeable. During a production test, a total of 1,000 m^3 of thermal fluid was produced by a natural artesian outflow at a flow rate of approximately 50-70 l/s. No production pump was required, and the pressure drop at reservoir depth was approximately 2.5-2.8 bar. This roughly corresponds with a productivity index of 15-25 l/s*bar. With a standard Line Shaft Pump (LSP) as used in Vulcan's current projects, a production in excess of 100l/s would be expected from the Brühl well. The evaluation of the injection test resulted in an injectivity index of 5-10 l/s*bar. The well Brühl GT1 flow tests were at very high rates, and this well showed no induced seismicity during the test.

The new 3D seismic and updated interpretation, combined with results from nearby wells, indicates the presence of Muschelkalk, Buntsandstein, and basement units within the Mannheim licence. The data also suggests that reservoir quality is similar to that observed in the Lionheart area and is modelled from the seismic data to extend northward into Mannheim. The interpretation of the reservoir and the corresponding volumetric estimate will be further refined when the first wells are drilled within the license area.

URG geothermal system

The URG represents a non-magmatic, fault-controlled geothermal system situated in an extensional tectonic setting (Moeck, 2014). As a Cenozoic continental rift with significant lithospheric thinning, up to 25% compared to surrounding regions (Brun et al. 1992), the URG experiences elevated heat flow and geothermal gradients relative to much of Central Europe. This unique geodynamic environment forms the basis for a convection-dominated geothermal play.

Geothermal and lithium-enriched fluids in the URG are primarily driven by deep-seated convection through active fault zones, where frequent natural seismicity helps maintain fracture permeability. The primary heat source is a combination of elevated radiogenic heat production in the mica-rich granitic Variscan basement and enhanced heat flow due to crustal thinning. Temperature anomalies across the basin are further influenced by the low thermal conductivity of overlying clay-rich Keuper and Tertiary sediments, which act as thermal blankets and regional top seals. These formations not only cap convection cells but also mark the transition from conductive to convective heat flow regimes, as observed in temperature-depth profiles of regional geothermal wells. According to Freymark et al. (2017) the median geothermal gradient in the central to northern part of the URG is 48 K/km modelled at 3,000 m depth and 41 K/km at 5,000 m depth.

Figure 8: Temperature versus depth plot for wells across the Upper Rhine Graben show that the convection cells are capped by a regional shale (Keuper or lower Tertiary), which acts as a top seal (modified after Ledesert & Hebert, 2020). The change of slope in geothermal gradient indicates change from conductive to convective heat flow regime.

The Buntsandstein formation functions as a key geothermal reservoir due to its high fracture permeability and matrix porosity, capable of storing and conducting hot lithium-rich fluids. Confinement of these fluids is achieved by the overlying regional seals, while meteoric recharge supports fluid budgets and drives fluidrock interactions. The regional variation in predicted reservoir temperature at the top of the Buntsandstein formation is shown.

Figure 9: Temperature map of the URG along the Top Buntsandstein (south of dashed line) based on the GeORG model, north of dashed line along Top Rotliegend based on GeotIS model. Diamonds show locations of available key wells.

Mannheim geothermal temperatures

The Permo-Triassic strata and Variscan basement are the focus of the geothermal resource model for the Mannheim licence. The only in-field temperature measurement is from the well Sandhofen 1 on the western edge of the licence area. However, this well TD is 1292 m within the Miocene, which is shallower than the target reservoirs. The nearest offset well encountering Buntsandstein is Brühl GT1, approximately 10 km south of Mannheim licence area, which shows temperatures between 150-160 °C in the Buntsandstein section at 3.0-3.3 km depth. A regional model is available from the geological survey (GeORG model) that is based on kriging of all available well data across the URG. The GeORG model suggests temperatures in the order of 170 °C for the Top Buntsandstein at 3.7 km depth in the Mannheim area but does not specifically model the impact of heat convection along faults.

Figure 10: Left: Plotted temperature profiles (lines) and BHT data (points) from surrounding offset wells for Mannheim licence area (temperature data from GeotIS). Right: Locations of wells with temperature profiles relative to the Mannheim licence area

Figure 11: Temperature prognosis at top Buntsandstein in the Mannheim licence by the GeORG model.

Geothermal Resources Estimation

An updated Geothermal Resources Estimation is provided for the Mannheim sector only. While Vulcan Group holds additional licences in the URVBF, geothermal resource estimates for those areas will be provided in future reports. This represents the first formal reporting of Geothermal Resource Estimation for the Vulcan Group within the licence area, since lithium Mineral Resource Estimation has been the primary focus to date, in line with JORC and ASX requirements. Going forward, Vulcan will seek to update both Geothermal and Lithium Resource Estimations across the URVBF.

It is important to note that Geothermal Resources are not Geothermal Reserves, and their economic recoverability under current technology and market conditions is not assured. Geothermal Resources are not a catalogue of all heated areas drilled or sampled, regardless of temperature cut-offs, dimensions, or extent. Rather, they represent a realistic and technically justified inventory of geothermal plays that may be partially or fully developed under assumed technical and economic conditions. Geothermal Resources are classified in accordance with the Geothermal Reporting Code into three confidence levels: Inferred, Indicated, and Measured.

Inferred Geothermal Resources are based on geological, geochemical, and geophysical evidence, with assumptions made about the extent and capacity to deliver geothermal energy. These resources have a lower level of confidence than Indicated Resources, but it is reasonably expected that further exploration could upgrade many Inferred Resources to Indicated status.

Indicated Geothermal Resources are supported by sufficient direct measurements, such as temperature and formation thickness, that allow for the estimation of Recoverable Thermal Energy with a reasonable level of confidence. The data are adequate to apply modifying factors for preliminary project planning and economic evaluation.

Measured Geothermal Resources are defined by high-confidence direct measurements and testing of drilled rock and/or fluids, where well deliverability has been demonstrated. The spatial distribution of data confirms continuity in temperature and fluid chemistry. The quality, amount, and distribution of information are sufficient to estimate Recoverable Thermal Energy within close limits, such that any variation would be unlikely to significantly affect economic viability. The geology and heat source are well understood, enabling the application of technical and economic parameters for project evaluation. There are no Measured Geothermal Resources reported for Mannheim at this time.

Geothermal Resources Estimation methodology

The methodology used to estimate the geothermal resources follows guidelines as outlined in the Geothermal Lexicon. The reported values of in-place and recoverable thermal energy are derived from deterministic calculations using mean values for key input parameters (e.g. porosity, rock and fluid densities, specific heat capacities, and reservoir temperature). These inputs represent the best available interpretations from geoscientific data and modelling, but no stochastic or probabilistic uncertainty analysis (e.g. Monte Carlo simulation) was conducted. As such, the reported values should not be interpreted as P50 estimates but rather as indicative central estimates based on current knowledge.

The geothermal resource assessment utilises a comprehensive data set that includes 3D seismic, 2D seismic, geological well data (including temperature measurements, core samples, outcrop data, depositional environment interpretations), and production data from currently producing wells in the Lionheart license area, outside the license area in Mannheim. The volumetric heat in-place is estimated using the following equation:

?? = ?????? ? $??_{??}$? $??_{????}$? (1 ? ?? ? ??????) + $??_{??}$? $??_{????}$? ?? ? ?????? ? $??_{??????}$? $??_{??????}$ (1)

Where Q is the heat in place, GRV is the geothermal reservoir Gross Rock Volume, $?_r$ is the particle density for rock, $?_f$ is the density of the fluid, C_{pr} is the specific heat capacity for rock, C_{pf} if the specific heat capacity of the fluid, ? is the effective porosity adjusted for NTG, the Net To Gross ratio, T_{res} is the average reservoir temperature, and T_{rej} is the rejection temperature.

The rock and fluid input parameters have been defined according to the Bridging Study. Geologically for Mannheim, the geothermal resource bulk rock volume includes the middle and lower Buntsandstein host rock matrix, fault damage zones of the Permo-Triassic sediments (i.e. Muschelkalk, Buntsandstein, and Rotliegend where present), and fault damage zones in the upper 100 meters of the Variscan basement. The North-South striking fault planes that are associated with fault permeability are interpreted from 2D and 3D seismic data and the associated fault damage zones were modeled to uniformly include 200 meters on either side of each fault. Gross rock volumes for the host rock matrix and fault damage zones were extracted from 3D static models. The derivation of NTG and porosity inputs to the resource calculations was supported by a compilation of publicly available and proprietary porosity and permeability data for the Rotliegend, Buntsandstein, and Muschelkalk units (fault damage zones and host rock matrix). For the Buntsandstein matrix reservoir, NTG has been defined using a 5% total porosity cutoff. The rock properties (i.e. density and porosity) were determined from the petrophysical evaluation of well logs in the region of the zones of interest, supplemented with core and plug data where available. The rock specific heat capacities for each formation are from the GeORG report (GeORG, 2013 and Bär, 2012) and are corrected for reservoir temperature following Vosteen and Schellschmidt (2003) as described in Bär (2012).

Average reservoir temperature estimation is described above. The rejection temperature is assumed to be 65 °C, which is in line with the planned reinjection temperature for the ORC facility design for Phase One. This is defined as the Base Temperature as outlined in the Geothermal Lexicon and can also be referred to as the rejection temperature for the report. This Base temperature is the lowest temperature that could be reached in the reservoir using the currently assumed design parameters for power and heat production. The Cut-off temperature is assumed to be 100 °C based on the minimum temperature for economic reservoir fluid temperature for commercial energy extraction for district heating. This parameter is based on the Phase One design for power and heat production.

Dynamic flow and analytical reservoir simulations assuming a project lifetime of 50 years, along with production data from currently producing wells (i.e. Insheim), have been used to estimate recovery factors. The recovery factor is defined to be the fraction of heat in-place that can be carried by fluid to the production wellhead. Recoverable thermal energy is calculated using the following equation:

$??_{??}$ = ?? ? ?? (2)

Where Q_R is the recoverable thermal energy and R is the recovery factor.

The Geothermal Resource Estimation for the Mannheim license area is classified into Indicated and Inferred Geothermal Resources. As described above, the estimation methodology follows the formulas presented above. As described in previous reports, the fault damage zones are modelled with a 200-meter half-width. The GRV for the host rock matrix of the Middle and Lower Buntsandstein accounts for Early Tertiary erosion, particularly in the northwestern portion of the volume. The following parameters were used uniformly across all classifications and license areas in the Mannheim resource estimation:

- Rock density: 2,650 kg/m³
- Water density: 978 kg/m³
- Water specific heat capacity: 3,755-3,850 J/kg·K
- Initial reservoir temperature: 170°C
- Re-injection (or rejection) temperature: 65°C.

The rock specific heat capacity was originally adapted from Bär (2012) and corrected for reservoir temperature according to Vosteen and Schellschmidt (2003). Fluid properties are assumed to closely resemble those at Insheim GTI2. Fluid density and specific heat capacity were corrected for in-situ reservoir conditions using an average reservoir temperature of 170°C. A Base temperature of 65°C was adopted, reflective of proven power plant technology and district heating design. This may vary in future if a different plan design is implemented but is a reasonable assumption for the report.

Reservoir modelling was based on both 2D and newly acquired 3D seismic data. However, no in-field deep wells currently intersect the target reservoir formations, and thus well ties could not be performed. The nearest deep well that intersects the Buntsandstein is Brühl GT1.

Due to the absence of direct well control within the geothermal reservoir interval in the license itself, Geothermal Resource classifications are based on geologic interpretation. The nearby Brühl well has demonstrated productivity in the fault damage zones of the Middle and Lower Buntsandstein, supporting the classification of this interval as Indicated Geothermal Resources. Other geologic units interpreted to be present, but lacking direct evidence of productivity, are classified as Inferred Geothermal Resources. These include the Middle and Lower Buntsandstein host rock matrix and the fault damage zones associated with the Muschelkalk, Upper Buntsandstein, and the top 100 meters of the Variscan basement across the Mannheim license area. The average initial reservoir temperature across the entire license area and for both Geothermal Resource classes is 170 °C.

Recovery factors for geothermal energy represent the recovery from both rock and fluids, unlike recovery of lithium which is only from the fluid. The recovery factors describe the fraction of the stored heat which can be economically extracted in terms of economically recoverable energy rather than energy in place. The recovery factor takes into consideration heat losses in the pipe, efficiency factors of the technology utilized to produce the energy, a project lifetime that is assumed to be 50 years for Geothermal Resource Estimation for the report, and the base temperature or in this case, reinjection temperature of 65 °C. Typical recovery factors vary substantially dependent on the rock type, permeability, porosity, recovery process, fracture widths, and flow rates. Recovery factors can range from 3-25% and even higher, depending on the methodology and project type and location, as described in the Geothermal Lexicon.

Recovery factors used in the Geothermal Resource Estimates for the Mannheim licence area was derived using a combination of site-specific data and validated modelling approaches. This has been applied for the Lionheart development, where dynamic simulation incorporating tracer tests were conducted based on the planned well configuration. This provided a robust model of the expected long-term thermal recovery under active production and has been adapted for Mannheim development in the report.

To complement these results, production data from the Insheim geothermal plant were analysed to benchmark fluid and thermal performance under similar geologic and operational conditions. In addition, analytical 1D convective and conductive heat transport models were applied to estimate recovery potential from both fault damage zones and the host rock matrix.

Based on the modelled results, the following geothermal recovery factors were assigned for the Mannheim licence area:

- Fault Damage Zones (across all stratigraphy): 6%
- Matrix Rock (Middle and Lower Buntsandstein only): 3%

The total geothermal recovery factor applied to each classified geothermal resource estimate depends on the volumetric ratio between the FDZ and matrix rock within each unit. This methodology results in differing overall recovery factors across license areas and geothermal resource classifications, which are applied to the estimated thermal energy in place to calculate recoverable thermal energy. These assumptions are considered conservative and reflect current best practice in geothermal resource evaluation.

The summary of Geothermal Resource Estimated Recoverable Thermal Energy is shown below for the Mannheim licence area

Table 3: Summary of Geothermal Resource Estimation for Vulcan Group Mannheim licence area

Note 1: Geothermal Resources are not Geothermal Reserves and do not have demonstrated economic viability. Note 2: The Recoverable Energy is reported in PetaJoules. Numbers may not add up due to rounding of the resource value percentages. Note 3: Reservoir abbreviations: MUS - Muschelkalk Formation, BST - Buntsandstein Group; BM - Variscan Basement. Note 4: NTG and Phie averages have been weighted to the thickness of the reservoir. Note 5: GRV refers to gross rock volume, also known as the aquifer volume. Note 6: Geothermal Resources are considered to have reasonable prospects for eventual economic extraction with application of modifying factors.

Lithium Mineral Resource update - Mannheim

Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. Inferred Mineral Resources have a lower level of confidence associated with their estimation than Indicated Mineral Resources, but it is reasonably expected that with further exploration most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources. Indicated Mineral Resources are sufficiently well defined to allow application of modifying factors to support mineral extraction planning and economic evaluations of the deposit.

The report only provides an update of the Lithium Mineral Resource estimate for the Vulcan Group's Mannheim licence area. This is done in accordance with the JORC code. Mineral Resources have been previously reported for the Mannheim licence area as referenced in the Prospectus CPR 12-2024.

Vulcan Group has collected and analysed the brine chemistry through the progression of the Phase One project since 2019, which includes data from operating wells within the Phase One licence area and from off location wells within the URVBF. This geochemical data has been consistently acquired and verified to determine concentration of the lithium within the brine. Samples have been verified independently and are consistent with the averages used in the mineral resource estimates across the field.

For the Mannheim licence area, the lithium concentration has been determined using data from a Brühl GT1 well sample which was taken during a production test in 2013. The Brühl well is owned and operated by a third party and Vulcan Group does not have access for further sampling. Aliquots of the 2013 sample were provided to Vulcan and were archived, and analysed in 2019, as part of a wider sampling and analysis program at that time. Results were recognized as being influenced by dilution, consistent with the use of freshwater during production testing and with loss of drilling fluids. Vulcan conducted an assessment and interpretation of the results based on reservoir temperature estimates using geothermometers developed for geothermal brines. These calculations resulted in an estimate of original lithium content (i.e. before dilution) of 155 mg/L with an error range of +/-3 mg/L, which was identified as a potentially conservative correction. The calculated lithium value of 153 mg/L was used as the lithium grade in the previous Mineral Resource Estimation for Mannheim. The Vulcan Group has provided clarifying documentation for the sample analysis results that confirms and supports the update of the estimated lithium content to 155 mg/L. The CP has reviewed these interpretations and considers the resource grade to be conservative to realistic at 155 mg/L.

The updated Lithium Mineral Resource estimate for the Mannheim licence is underpinned by a new 3D seismic survey that was acquired in early 2023 and which covers much of the Mannheim licence area. The seismic data has since been processed and interpreted together with the existing 3D Weinheim seismic survey and tied via legacy 2D lines with regional offset wells.

The resultant new subsurface model confirms previous findings about the general structural setup and the general prospectivity of the area but now has a higher certainty than the previous model that was based on sparse 2D seismic data only. As a further consequence of the improved seismic data quality and coverage, additional fault zones were interpreted, and reservoir units were mapped out in more detail and split-out in more sub-units. This resulted in a slight increase in the overall estimated Mineral Resource Estimation for the Mannheim licence area. The increased certainty in fault orientations, extent, and configuration resulted in an upgraded classification from Inferred to Indicated Mineral Resources for the fault damage zone associated with the Buntsandstein.

As there is no well data available within the Mannheim license itself, as the references wells are located in other licenses in the URVBF, and no dedicated Field Development Plan exists for Mannheim, no Measured Mineral Resources or Ore Reserves are currently attributed to Mannheim. Estimated Mineral resources are summarised below.

Table 4: Summary of Lithium Mineral Resource Estimation for Vulcan Group Mannheim licence area.

Note 1: Mineral Resources are not Ore Reserves and do not have demonstrated economic viability. Note 2: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs). Numbers may not add up due to rounding of the resource value percentages. Note 3: Reservoir abbreviations: MUS - Muschelkalk Formation, BST - Buntsandstein Group; BM - Variscan Basement. Note 4: To describe the resource in terms of industry standard, a conversion factor of 5.323 is used to convert elemental Li to Li_2CO_3, on LCE. Note 5: NTG and Phie averages have been weighted to the thickness of the reservoir. Note 6: GRV refers to gross rock volume, also known as the aquifer volume. Note 7: Mineral Resources are considered to have reasonable prospects for eventual economic extraction under current and forecast lithium market pricing with application of Vulcan Group's A-DLE processing. Note 8: The values shown are an approximation and with globalised rounding of values in the presented summary table as per JORC guidelines, cannot be multiplied through to achieve the Mineral Resource Estimated volumes shown above.

The previously reported Mineral Resource Estimation for Mannheim was made up of Indicated Resources of 288 kt LCE and Inferred Resources of 1545 kt LCE based on average lithium concentration of 153 mg/L. The upgrading of volumes is associated with a slight revision to the lithium concentration to be consistent with available data, and increased Gross Rock Volume and adjustment to NTG for Inferred based on newly acquired and processed 3D seismic and updated geological modelling.

Competent Person's statement

The information in this document that relates to Geothermal Resources is based on and fairly represents, information that was reviewed, overseen, and compiled by Mike Livingstone, P.Geo., who is a full-time employee of GLJ Ltd. and deemed to be a 'Competent Person'. Mr. Livingstone is a member as a Professional Geoscientist of the Association of Professional Engineers and Geoscientists of Alberta (APEGA), a 'Recognised Professional Organisation' included in a list that is posted on the ASX website from time to time. Mr. Livingstone has sufficient experience which is relevant to the style and type of geothermal play under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the Second Edition (2010) of the 'Australian Code for Reporting Exploration Results, Geothermal Resources and Geothermal Reserves'. Mr. Livingstone has consented in writing to the inclusion in the document of the matters relating to Geothermal Resources based on his information in the form and context in which it appears.

The information in this document that relates to Lithium Mineral Resources is based on and fairly represents, information that was reviewed, overseen, and compiled by Mike Livingstone, P.Geo., who is a full-time employee of GLJ Ltd. and deemed to be a 'Competent Person'. Mr. Livingstone is a member as a Professional Geoscientist of the Association of Professional Engineers and Geoscientists of Alberta (APEGA), a 'Recognised Professional Organisation' included in a list that is posted on the ASX website from time to time. Mr. Livingstone has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the JORC Code for the reporting of Lithium Mineral Resources. Mr. Livingstone consents to the disclosure of the technical information as it relates to the Lithium Mineral Resources information in this document in the form and context in which it appears.

The information in this announcement that relates to estimates of Mineral Resources (other than the update to the Mannheim region of the URVBF as contained in this announcement) and Ore Reserves is extracted from the following ASX announcement: "Zero Carbon Lithium™ Project Phase One Bridging Engineering Study" released on 16 November 2023, which is available to view on Vulcan's website at https://v-er.eu. Vulcan confirms, that:

a) in respect of any estimates of Mineral Resources (other than the update to the Mannheim region of the URVBF as contained in this announcement) and Ore Reserves included in this announcement:

1. it is not aware of any new information or data that materially affects the information included in the original market announcement, and that all material assumptions and technical parameters underpinning the estimates in the original market announcement continue to apply and have not materially changed; and
2. the form and context in which the Competent Persons' findings are presented in this announcement have not been materially modified from the original market announcement; and

all material assumptions underpinning the production targets (and the forecast financial information derived from such production targets) included in this announcement continue to apply and have not materially changed.

Financing and economic consideration

For the Phase One Lionheart development as a template for future phase development, Vulcan has already received 879m EUR in conditional debt commitments from commercial and development banks, and a Board-approved 500m EUR financing envelope from the EIB. Vulcan has also received approval for 100m EUR in grant funding for the geothermal part of the project and is expecting an indication of approval on further public funding shortly. Vulcan is aiming to finalise its full financing package for Phase One Lionheart, and commence construction, in H2 2025. For the Mannheim development, the project is at a much earlier stage. Vulcan is aiming to fund the project in the next development stage through a combination of heating and geothermal related government grants, as well as project level investment from strategic and infrastructure type investors. Discussions are currently ongoing.

For the Mannheim sector, in April 2022, Vulcan Energie Ressourcen GmbH entered into a heat supply agreement with MVV Grüne Wärme GmbH. The agreement covers an expected heat quantity of 240 GWh/a over a period of 20 years, starting at the end of 2026. If no termination is given with a one-year notice period, the contract will automatically extend for an additional five years. This arrangement enables the exclusive supply of heat to the MVV. The contract is currently being negotiated to reflect a changed market and updated project timeline since this contract was originally signed.

Vulcan is carrying out a high level, internal Scoping Study to develop a similar project to Phase One. It has selected four drill site options, each of which could contain multiple production and re-injection wells. Three sites were considered to host two doublets (four wells), and one site was considered to have the potential of one doublet (two wells). For these well sites and corresponding pipelines, 20 to 40% public grant funding is expected to be available, through the BEW (heating networks) grant scheme operated by the German Federal Government. It should also be noted that the new German Coalition government has committed to further upsizing the funds being made available to this scheme. OPEX costs are expected to be broadly in line with Vulcan's Phase One project. A Lithium Extraction Plant (LEP) could be built to produce lithium chloride concentrate from the wells, in a similar manner to Phase One, and could be transported to Vulcan's

CLP, which has been sized to allow for two more trains of production to be built beyond Phase One. Key considerations for the next phase of development include the sizing of the brine and therefore heat production, since production beyond the capacity of local customers' ability to take the heat in lowest demand periods in Summer would necessitate the building of an ORC plant to generate power, but would also enable more lithium production. This will be progressed, subject to a positive outcome from the Scoping Study, in a Pre-Feasibility Study as part of a next phase of development, alongside updated heat demand profiles from MVV.

As this is an internally completed Scoping Study, it will not be subject to external Competent Person (CP) review, however, such a review is planned as part of the upcoming Pre-Feasibility Study.

Summary of risks and uncertainties

Herein is a summary of key risks and uncertainties that relate to the estimation of Geothermal Resources and Mineral Resources for Mannheim.

Geological

- Reservoir connectivity may be influenced by currently unidentified features, such as baffles and barriers, high permeability zones and the impact and geometries of fault/fracture zones which can impact brine flow rate estimates. This is mitigated by flexibility in the field development plan.
- Whilst data from wells in the vicinity is available, no deep wells are available so far in the Mannheim license itself. There is a risk that the geologic interpretation for the Mannheim area might be different when data from new wells is gathered. This will be mitigated by allowing for flexibility in the yet to be drafted field development plan.

Technical/ operational

- Drilling issues with downhole collision as multiple wells and side-tracks are drilled from the same pad. This is mitigated with measurement while drilling and specialised tools and control systems to manage the drilling.
- Scaling and corrosion are risks that can affect the operating equipment including wells, piping, and vessels. There is historical knowledge from the operating facilities and mitigation is planned utilizing inhibitor chemicals and maintenance operating plans that manage the risk.
- Transport activities could lead to accidents, which is mitigated with proper training and staffing for driver selection and having an emergency response plan prepared.

Geothermal

- Producing temperature may suffer from depletion within the reservoir and be lower than the minimum operating temperatures for the ORC plant or for district heating.
- Since the district heating network operates with feed-in temperatures of 100 to 120°C, temperature depletion is seen as a very-low risk.

Economic

- Failure of product to meet on-spec lithium requirements can lead to loss in revenues. This is mitigated with communication with offtake holders to manage delivery schedules, and to identify buyers for off-spec product, as well as achieving qualification through Vulcan's existing qualification plants that are operational.
- Change in market conditions that impacts the price negatively or impacts market demand is considered with a low likelihood and mitigated by Vulcan's existing lithium offtake contracts and relationships.
- Change in facility and infrastructure equipment supply that can impact costs and schedule.

Environmental

- There is potential risk associated with induced seismicity caused by injection of brine, which is mitigated with injection control, monitoring systems and passive seismic monitoring.

- Risk of hazardous gas or fluid release to air or surface. This is being mitigated with Hazard and Operability ("HAZOP") and Layers of Protection Analysis ("LOPA") studies and engineering design considerations, plus maintaining emergency response plans, having spill containment, and ensuring safe operating procedures are in place.

Political/regulatory

• Changes in regulations and permitting may impact Project schedule, design specifications, and cost. This can be mitigated through communication and advocacy with levels of government and regulatory authorities to be aware of upcoming changes. It is also mitigated by the recent designation of the Project as a Strategic Project by the EU.

The Company has identified Project risks and conducted risk assessments for all aspects of the Project. Through this process they have identified mitigations and management processes and identified which activities may still carry residual risks even after mitigation and management. Vulcan Group has plans to monitor and manage risks and uncertainties as the Project progresses through design, construction, commissioning, operations, and decommissioning.

Competent Person's Cautionary statements

The report is based on the material assumptions outlined within and based on the Bridging Engineering Study (BES) report in November 2023 and updated CPR from the Prospectus released in December 2024 for the Phase One Lionheart project, and on newly acquired 3D seismic data for Mannheim. Although GLJ considers all of the material assumptions to be based on reasonable grounds as provided by Vulcan Group, there is no certainty that they will prove to be correct or that the range of outcomes indicated in the report will be achieved.

To achieve the range of outcomes indicated in the report, additional funding will be required. Investors should note that is no certainty that Vulcan Group will be able to raise the amount of funding when needed. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of the Company's existing shares. It is also possible that Vulcan Group could pursue other financing strategies such as a partial sale or joint venture ("JV") of the Project. If it does, this could materially reduce the Company's proportionate ownership of the Project.

Vulcan Group has carried out a Bridging Engineering Study (BES) for Phase One, the results of which were announced to the ASX in November 2023 and updated in the Prospectus CPR 12-2024. This document may include certain information relating to the BES. The BES is based on material assumptions outlined in the BES announcement. The report uses the results of the BES combined with the newly acquired seismic data as a basis to report Geothermal Resources for Mannheim and combined with newly acquired 3D seismic data to update Mineral Resources for Mannheim, estimated in accordance with the Geothermal Code and the JORC Code. While Vulcan considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the BES will be achieved. This document includes information relating to a future phase of development at Mannheim, which is yet to have a defined field development plan and requires further exploration activities. This announcement may also include certain information relating to a potential future phase of development, Vulcan has not yet carried out a definitive feasibility study for this future phase of development.

The Geothermal Resource Estimate classification criteria used for Mannheim are based on the quality of the data available and the CP confidence level in the integration of all the data by Vulcan Group's multidisciplinary team. This team includes geophysicists, geologists, reservoir engineers with experience from the oil and gas industry, hydrogeologists, geothermal specialists, with relevant experience in the PermoTriassic brine geology, and hydrogeology. Some important points to support the assigned Geothermal Resource Estimate classifications for Mannheim include: 1) a greater level of confidence in the subsurface geological modelling because of Vulcan Group's acquisition of 2D and 3D seismic data, as well as static and dynamic modelling of the Permo-Triassic strata calibrated to available well data, 2) ongoing production data from two producing geothermal wells in the Phase One sector at Insheim (i.e. production since 2012) and Landau (i.e. production since 2007), and 3) the acquisition of new well test data during a recent production well workover to serve as reference for future Mannheim geothermal plants.

The Mineral Resource Estimate classification criteria used for Mannheim are based on the quality of the data available and the CP confidence level in the integration of all the data by Vulcan Group's multidisciplinary team. The updated volumes reflect a slight revision to the lithium concentration from 153 mg/L to 155mg/L and increased Gross Rock Volume and adjustment to NTG for Inferred based on newly acquired and processed 3D seismic and updated geological modelling.

Vulcan Group has completed extensive brine sampling, geothermal production operations monitoring, and data interpretation that are adequate to support the disclosure of Geothermal Resource Estimates. In the opinion of the CPs, the Mannheim licence for geothermal lithium projects have reasonable prospects for eventual economic extraction based on aquifer geometry, delineation of fault zones using new 3D seismic data, brine volume, brine composition, hydrogeological characterisation, porosity, fluid flow, geothermal assessment, optimisation of field development plan, and historical geothermal operations. The CP Mike Livingstone, P.Geo. takes responsibility for this statement.

Forward-looking statements

Some of the statements appearing in the report may be in the nature of forward-looking statements. Such forward-looking statements include details of the proposed production plant, production targets, estimated Geothermal Resources, and Mineral Resources, expected future market for geothermal power and heat, thermal recovery rates, future demand for lithium products, planned strategies, corporate objectives, lithium recovery rates, projected flow rates, capital and operating costs, permits and approvals, levies, the Project development timeline and exchange rates, among others.

GLJ and Vulcan Group do not undertake any obligation to update publicly or release any revisions to these forward-looking statements to reflect events or circumstances after today's date or to reflect the occurrence of unanticipated events. No representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information, opinions or conclusions contained in the report. To the maximum extent permitted by law, none of Vulcan Group; nor its directors, employees, advisors or agents, nor GLJ, nor any other person, accepts any liability for any loss arising from the use of the information contained in the report.

You are cautioned not to place undue reliance on any forward-looking statement. The forward-looking statements in the report reflect views held only as at the date of the report. The report is not an offer, invitation or recommendation to subscribe for, or purchase securities by Vulcan Group. Nor does the report constitute investment or financial product advice (nor tax, accounting or legal advice) and is not intended to be used for the basis of making an investment decision. Investors should obtain their own advice before making any investment decision.

Forward looking statements inherently involve known and unknown risks, uncertainties and other factors that may cause the Company's actual results, performance, and achievements to differ materially from any future results, performance, or achievements. Relevant factors may include, but are not limited to, changes in commodity prices, foreign exchange fluctuations and general economic conditions, increased costs and demand for production inputs, the speculative nature of exploration and Project development, including the risks of obtaining necessary licences and permits and diminishing quantities or grades of reserves, political and social risks, changes to the regulatory framework within which Vulcan Group operates or may in the future operate, environmental conditions including extreme weather conditions, recruitment and retention of personnel, industrial relations issues and litigation.

Forward looking statements are based on Vulcan Group and its management's good faith assumptions relating to the financial, market, regulatory and other relevant environments that will exist and affect the Company's business and operations in the future. The Company does not give any assurance that the assumptions on which forward looking statements are based will prove to be correct, or that the Company's business or operations will not be affected in any material manner by these or other factors not foreseen or foreseeable by the Company or management or beyond the Company's control.

Although the Company attempts and has attempted to identify factors that would cause actual actions, events, or results to differ materially from those disclosed in forward looking statements, there may be other factors that could cause actual results, performance, achievements, or events not to be as anticipated, estimated or intended, and many events are beyond the reasonable control of the Company.

Statements regarding plans with respect to the Company's geothermal and mineral properties may contain forward-looking statements in relation to future matters that can only be made where the Company has a reasonable basis for making those statements. The report has been prepared based on the Bridging Study which is in compliance with the JORC Code 2012 Edition, Geothermal Code and the current ASX listing rules.

Investment risks

An investment in the Company is subject to both known and unknown risks, some of which are beyond the control of Vulcan Group, see also the risks contained in the Bridging Study (announcement on "Positive Zero Carbon Lithium Project Bridging Study Results") and the Bridging Study Presentation (announcement on "Bridging Engineering Study Results - Presentation") released to the ASX on 16 November 2023 ("Previous Disclosures"), risks contained in the "Equity Raise Presentation" and "Information Memorandum" released to the ASX on 11 December 2024, and risks contained in the Prospectus dated on or around 17 December 2024. These factors may include, but are not limited to, changes in commodity and renewable energy prices, foreign exchange fluctuations and general economic conditions, increased costs and demand for production inputs lithium, the speculative nature of exploration and Project development (including the risks of obtaining necessary licences and permits and diminishing quantities or grades of reserves), political and social risks, changes.

Vulcan Group does not guarantee any particular rate of return or its performance, nor does it guarantee any particular tax treatment. Prospective investors should have regard to the risks in the Previous Disclosures, particularly the May 2023 Prospectus, which have not materially changed, when making their investment decision, and should make their own enquires and investigations regarding all information in this document, including, but not limited to, the assumptions, uncertainties and contingencies that may affect Vulcan Group 's future operations, and the impact that different future outcomes may have on Vulcan Group. There is no guarantee that any investment in the Company will make a return on the capital invested, that dividends will be paid on any fully paid ordinary shares in the Company, or that there will be an increase in the value of the Company in the future. Accordingly, an investment in Vulcan Group and the Company's shares should be considered highly speculative, and potential investors should consult their professional advisers before deciding whether to invest in Vulcan Group.

Financial data

All monetary values expressed as "$" or "A$" in this document are in Australian dollars, unless stated otherwise. All monetary values expressed as EUR or â‚¬ in this document are in Euros, unless stated otherwise. All monetary values expressed as "US$" in this document are in US dollars, unless stated otherwise.

In addition, readers should be aware that financial data in this document includes "non-IFRS financial information" under ASIC Regulatory Guide 230 'Disclosing non-IFRS financial information' published by ASIC and also 'non-GAAP financial measures' within the meaning of Regulation G under the U.S. Securities Exchange Act of 1934.

The non-IFRS financial measures do not have standardised meanings prescribed by Australian Accounting Standards and, therefore, may not be comparable to similarly titled measures presented by other entities, nor should they be construed as an alternative to other financial measures determined in accordance with Australian Accounting Standards. Although Vulcan Group believes the non-IFRS financial information (and non-IFRS financial measures) provide useful information to readers of this document, readers are cautioned not to place any undue reliance on any non-IFRS financial information (or non-IFRS financial measures).

Similarly, non-GAAP financial measures do not have a standardised meaning prescribed by Australian

Accounting Standards or International Financial Reporting Standards and therefore may not be comparable to similarly titled measures presented by other entities, nor should they be construed as an alternative to other financial measures determined in accordance with Australian Accounting Standards or International Financial Reporting Standards. Although Vulcan Group believes that these non-GAAP financial measures provide useful information to readers of this document, readers are cautioned not to place undue reliance on any such measures.

Industry data

Certain market and industry data used in connection with or referenced in this document may have been obtained from public filings, research, surveys or studies made or conducted by third parties, including as published in industry-specific or general publications. Neither Vulcan Group nor its advisers, nor their respective representatives, have independently verified any such market or industry data. To the maximum extent permitted by law, each of these persons expressly disclaims any responsibility or liability in connection with such data.

Effect of rounding

A number of figures, amounts, percentages, estimates, calculations of value and fractions in this document are subject to the effect of rounding. Accordingly, the actual calculation of these figures may differ from the figures set out in this document.

About Vulcan Energy

Vulcan Energy (ASX: VUL, FSE: VUL) is building the world's first carbon neutral, integrated lithium and renewable energy business to decarbonise battery production. Vulcan's Lionheart Project, located in the Upper Rhine Valley Brine Field bordering Germany and France, is the largest lithium resource in Europe[4] and a tier-one lithium project globally. Harnessing natural heat to produce lithium from sub-surface brines and to power conversion to battery grade material and using its in-house industry-leading technology VULSORB®, Vulcan is building a local, low-cost source of sustainable lithium for European electric vehicle batteries. For more information, please go to https://v-er.eu/

<ENDS>

For and on behalf of the Board

Daniel Tydde | Company Secretary

Further information

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Please contact Vulcan's Legal Counsel Germany, Dr Meinhard Grodde, for matters relating to the Frankfurt Stock Exchange listing on mgrodde@v-er.eu.

1. ANNEXURE 1 - GEOTHERMAL CODE TABLE - MANNHEIM

Geothermal Assessment and Reporting Criteria Table

Pre-Drilling Exploration Technical Data

Parameter	Consideration Description
Geological Maps and interpretation	Nature and quality of available mapping (e.g. scale, completeness, age, authors, 2 for interpretation and any implications for likely Geothermal Resource types Description of any relevant Geothermal Plays previously recorded in the vicinity or

Parameter	Consideration Description
Data Location and spacing	Adequacy of base maps Methodology and quality of sample location (e.g. GPS etc.) Datum and projection used along with any relevant parameters (loc recognised co-ordinate systems and not local grids wherever possil Spacing of available data points Extent of data interpolation/extrapolation including explanation of te

Evidence for past or present water/rock interaction • Location and description of observed hydrothermal alteration

Hydrology • Nature and quality of near-surface hydrological data and the indicators of deeper hydrology

Parameter Consideration Description Commentary

Most of these hot springs originate from relatively shallow, meteoric water that in
Due to their shorter residence times in the basement rocks of the graben should
have lower concentrations of lithium and other dissolved solutes. For example, th
BadenBaden have a total dissolved solids (TDS) concentration of about 3 g/l, in c
concentrated deep brines found within the URG, which have TDS values ranging
In a few locations along the boundary fault, deep saline brines also rise to the su
diluted by near-surface groundwater. This mixing can lead to salinities that rende
unsuitable for drinking water production. A key example is near Trebur, in the no
upper groundwater aquifer contains mixed water with a TDS of 6.7 g/l, equivalen
Sea.
At Weinheim, rising brines with a TDS of approximately 110 g/l infiltrate laterally
Miocene sand lenses. Clay-rich layers above these sands prevent the fluid from
groundwater, helping to isolate the mineralized brine.
Another notable case is the Odenwaldquelle spring, located south of Heppenhei
with a TDS of about 1.5 g/l is extracted from protected wells 80-200 meters deep
Originally, brine from the boundary fault spread laterally into these sands, but it is
meteoric water from the overlying shallow aquifer, which consists of granite wash
water from the Odenwaldquelle is suitable for sale as mineralized drinking water.
In general, near-surface groundwater in the URG is not affected by natural salinit
rather by anthropogenic pollutants, such as nitrate from fertilizers. Therefore, gro
relies on deeper aquifers.
With few exceptions (such as at major neo-tectonically active faults), the calcium
shallow aquifers (TDS: 0.3 to 1.0 g/l) are well separated from the deep NaCl-dom
130 g/l) by over 2,000 meters of sediment, including clay-rich layers from the Ter

Parameter	Consideration Description
Sampling techniques	• Nature and appropriateness of geological, geochemical or fluid collection, steps taken to ensure samples are representative, sample
Analytical Techniques	Identification and experience of analytical laboratory Nature, quality and appropriateness of laboratory techniques and rela determination of petrographic, geochemical, fluid or gas analysis, phy etc.) The level of analytical uncertainty and whether acceptable levels of a have been established

Temperature measurement and geothermometry	• Nature and quality of available surface temperature data (e.g. scans, existing shallow wells etc.)

Parameter	Consideration Description
	Nature, quality and appropriateness of techniques used to determine temperatures from fluid chemical geothermometry, including source of fluids, level of uncertainty in measurement and assumptions made Nature of thermal features used to determine temperature and their relation to chemical samp
Temperature Gradient	Nature, quality and appropriateness of calculations used to determine temperature gradient in nature and source of surface temperature data and the associated level of uncertainty Depth intervals of determined gradients
Thermal conductivity (K)	Whether determined analytically, modelled or assigned Where determined analytically, identification and experience of analytical laboratory and natu appropriateness of analyses used (e.g. number and frequency of samples, technique used to type of samples (e.g. core etc.), sample preparation (e.g. sample dimension, polish etc.) and specifications (e.g. orientation of samples, wet or dry analysis, temperature at which K was de

Parameter	Consideration Description
	Where modelled, the nature, quality and appropriateness of the model used, the source and quality of input parameters, corrections applied and/or key assumptions made Where assigned, the basis for interpretation including key assumptions and data sources The estimated level of uncertainty
Heat Flow	Whether based upon measured or assumed parameters Where based on measured data, the nature and quality of the measurements (temperature and thermal conductivity), including characteristics of any thermal features from which they were derived, frequency and distribution of the samples, method/s used for depth matching temperature and thermal conductivity data, assumptions made and any evidence of temporal change Where reliant upon assumed or assigned data, then the basis for interpretation, including key assumptions and data sources In all cases nature, quality and appropriateness of the model/s used (e.g.1D, 2D or 3D modelling), corrections applied, and key assumptions made regarding physical conditions, vertical heat flow, topograph models etc. The estimated uncertainty including key assumptions made

Parameter	Consideration Description
Heat generation determination	Basis for the identification of significant sources of subsurface heat generation Nature, quality and appropriateness of model used to calculate heat generation capacit uncertainty in the results

Geophysical techniques	• Nature, quality and appropriateness of any geophysical techniques used to descr geothermal anomalies including uncertainty and key assumptions made before, during a interpretation, modelling, calibration of rock properties especially with drill hole data, co available survey parameters (e.g. resistivity, seismic, gravity, magnetic, MT) for both reg surveys
Data integrity and verification	Measures taken to ensure data have not been corrupted between initial collection and u models/calculations Data validation process The verification of significant results by application of alternative techniques and/or inde

Parameter	Consideration Description

And Tenement, Environment and Infrastructure Data

Parameter	Consideration Description
Tenement and land tenure status	Type, reference name/number, location and ownership including agreements or mate parties such as joint ventures, partnerships, overriding royalties, native title interests, wilderness or national park and environmental settings. The security of the tenure held at the time of reporting along with any known impedin licence to operate in the area.

Parameter	Consideration Description

Terrain, geotechnical issues and access • Identification of significant geotechnical, geohazard or access issues w
locations or sterilise sectors

Parameter	Consideration Description
Environmental Issues	• Identification of significant environmental issues (for example, water requirements, induce which could affect future drilling locations or sterilise sectors
Land use issues	• Identification of significant land use conflicts which could affect future drilling locations or s sectors
Infrastructure	• Proximity to and quality of relevant infrastructure and water supply, in particular transmiss when the project is being considered for electricity generation

Parameter	Consideration Description

Exploration by other parties • Acknowledgment and appraisal of exploration by other parties to the extent the data

Parameter	Consideration Description

Subsurface and Well Discharge Data

Parameter	Consideration Description
Drilling Data	Type of drilling used (e.g. core, rotary etc.) including basic spud/collar details (e.g. date drilled, depth etc.) Availability of drilling records and data from rig instrumentation (e.g. ROP, WOB, circulation losses, mud logging, drilling breaks, well kicks etc.) Nature and quality of directional survey data Type of completion used and related details (e.g. depth to casing etc.)

Parameter	Consideration Description

Well sample recovery	• Nature and quality of down-hole samples (e.g. cuttings, core, fluids etc.) and sampling inte including the basis for determination of sampling depths and measures taken to ensure samples representative
Geological log	The nature and scale of logging as well as the basis for geological interpretation and identifi alteration zones (e.g. qualitative vs. quantitative logs, lithology, palaeontology, palynology, mineralogy, fluid inclusions reflectance etc.) Whether there is any evidence from mineralogy indicating acid or high-gas fluids

Parameter Consideration Description	Commentary
	approximately 9km south of the Mannheim licence area. It penetrated through th strata being assessed by Vulcan Group. Wireline logging runs were performed in included: FMI-GR (resistivity image, caliper), DSI-GPIT-PPS-GR (sonic, caliper), electric factor), and UBIGR (acoustic image). The downhole information provided litho-logs) and quantitative information such as porosity and permeability measur used to study and assess the hydrogeological characteristics and variations betw matrix porosity and fault zone fracture porosity. From 2020 to 2022, Vulcan Group reinterpreted existing 2D seismic data in the O and Lionheart licence areas. This interpretation benefited particularly from detaile logs from two wells (Appenhofen 1 and Brühl GT1). These logs were acquired by Vulcan Group, but their content facilitated Vulcan Group's interpretation and corr stratigraphy. That is, the historical well logs data helped with interpretation of sei confirm and validate key stratigraphic marker horizons including the Buntsandste zones that are critical to the current Geothermal Resource Estimation process. In late 2022 to early 2023, the in Vulcan Group acquired, processed, and interpre imaged 3D seismic data in the Lionheart and Mannheim areas. The new 3D seis existing subsurface data resulting in a high confidence reservoir model of the brin optimised well placement for Phase One. The detailed lithologic and geophysical well logging data acquired by Vulcan Gro was assessed based on quality and resolution and incorporated into the Lionhea the Geothermal Resource Estimation program carried out by the company. The Mannheim licence area is largely covered by 3D seismic surveys (Mannheim 3D and Weinheim 3D were processed together and merged). The small areas in not covered by 3D are covered by 2D lines with a spacing of about 2-3 km. Furth available and were interpreted to tie the

Parameter	Consideration Description

Downhole temperature pressure and flow logs	Nature (e.g. continuous log, maximum recording thermometer, injectivit (e.g. tool precision, operating parameters, time allowed, resolution, type appropriateness (e.g. tool operating parameters relative to hole conditio corrections required and/or applied) of instrument/s used Characteristics and quality of measurement(s) (depth, frequency, timing level of uncertainty Appropriateness of interpretation with consideration for all significant inf aquifers or known fluid circulation, well status at time of logging (e.g. shut in, flowing, injection rate etc.) Nature and quality of any temperature correction/s applied or justificatio length of time

Parameter	Consideration Description
	elapsed between drilling and temperature measurement) • If no corrections are applied and the measured temperature is likely to be affected by th thermal anomaly this must be clearly state
Other downhole logging	Nature (e.g. FMI, Gamma, calliper etc.), quality (e.g. tool precision, operating parameters, res and frequency of calibration) and appropriateness (e.g. tool operating parameters relative to h tool resolution, processing or corrections required and/or applied) of instrument/s used Nature and quality of measurement(s) (depth, frequency, timing) Appropriateness of interpretation with consideration for all significant influences (e.g. hole con temperature, formation invasion etc.
Aquifers	Location of permeable zones/aquifers, their significance and relationship to structures and str Nature, quality and appropriateness of model/s used to determine adjusted heat flow

Parameter	Consideration Description
Depth of reservoir	• Depth of anticipated reservoir development
Injection tests	Nature and quality of injectivity tests conducted across permeable zones Nature (e.g. calculated or observed, flow versus wellhead pressure) and appropriateness of determi injection capacity of well including key assumptions and temperature data Any evidence of temporal change

Parameter Consideration Description Commentary

o To enhance injectivity of GTI1, which was limiting the performance
drilling and testing GTI2, a series of tests were performed in GTI1
04 November 2009 (Jung 2009b), and then the well was stimulate
(Jung 2010a) with acid and water injection. The stimulation jobs
(acidisation and hydraulic fracturing) turned out to be counterprod
decreased significantly. This is most likely due to the acid job who
carbonate formation than a sandstone formation. Following this ou
GTI1b as a mitigation measure.

• GTI-1b: After drilling the side-track, three injection tests with 30, 60 and 80

o The initial production/injection rates were recovered with this side

o Pressure and temperature logging were done under shut-in condit

• GTI-2 o After drilling and completion of GTI2, a series of production and in
test were performed, the latter to investigate the hydraulic commu

o Injection tests in steps of increasing pump rates (28 April 2009, 03

o Injection tests with constant pump rate (22 April 2009, 04 May 200

o Production tests (25 April 2009, 30 April 2009)

o Circulation tests (06 May 2009 with GTI2 producing, 16 May 2009

o As with testing of GTI1, all tests, but circulation tests, were limited
site of 1,550 m³. A report of the test analysis is available, however

Parameter Consideration Description

Parameter Consideration Description

Parameter	Consideration Description
Multi-well tests	Nature (e.g. circulation, interference, tracer etc.) and quality of well tests and measurements, in duration and sampling methods where relevant Appropriateness of test interpretation including any corrections or omissions and any evidence o variation

Well discharge testing	Nature (e.g. James method, separator and orifice plates, Tracer Dilution Flow Test etc.) and du (including completeness of the measurement suite over the wellhead pressure discharge curve) Quality and reliability of monitoring equipment Characteristics observed over time including any chemical and/or physical indications of dilutio fluids, stability, multi-zone behaviour, possible scaling or dry-out, tracer returns

Naturally Convective Systems and Hot Sedimentary Aquifer Resource Parameters

Parameter	Consideration Description
Flow rate	Nature (e.g. individual vs. interference, duration, depth etc.), quality and appropriateness of techniques used to record flow rates in wells together with key assumptions made Where rates are derived from individual well tests these must be detailed individually and must not be summed except with suitable acknowledgement of possible interference Magnitude and uncertainty of temperature and pressure drawdown observed during flow tests, in relatio chemical indications of stability and long-term trends
Pressure Data	• Nature, quality and appropriateness of techniques used to determine reservoir pressures includin multi-well correlations, fluids and key assumptions made
Recharge	• What allowance (if any) has been made for heat and fluid recharge, and the basis thereof

Parameter	Consideration Description
Water saturation and enthalpy	Nature and appropriateness of techniques used to determine in-situ water saturation Nature and quality (e.g. accuracy) of measurements of well discharge enthalpy includin how they relate to in situ saturation

Parameter	Consideration Description

Scaling, gas content (composition) and acidity	Data on reservoir fluid chemistry and its impact on the reservoir, wells and surface facilities Nature and appropriateness of tests carried out to determine surface and down hole scaling p fluids including the basis for interpretation of test results Nature and appropriateness of tests run, models applied or analogies used as evidence for p scaling by methods of downhole or surface inhibition

Parameter	Consideration Description
Reservoir properties	Nature, quality and appropriateness of methods used to determine reservoir p permeability, anisotropy, specific permeable structures etc.) Basis for interpretation of temperature and pressure profile
Conceptual model: nature of the system	Nature, quality and appropriateness of integrated geo-hydrological reservoir m and key assumptions made Whether the fluid is naturally convecting If the project is based on a laterally extensive aquifer, what are its hydrologica concession area Interpretation of physico-chemical reservoir process
Numerical modelling	• Nature of numerical simulation modelling, including model structure, key

Parameter	Consideration Description
	boundaries and relationship to conceptual modelling Results of natural state modelling Results of history matching (if any) Results of forecast runs including descriptions of scenarios modelled Sensitivity analysis and the effects of alternative interpretation
Data extrapolation	• The extent of data interpolation/extrapolation including explanation and applied

Reporting of Exploration Results

Parameter	Consideration Description
Diagrams	Where possible, maps and sections (with scales) and tabulations of intercepts should be included f material discovery being reported if such diagrams significantly clarify the report Diagrams and maps should be presented using recognised coordinate systems with datum, project all relevant parameters declared on the map face

Balanced reporting	Where possible reporting should be comprehensive Where comprehensive reporting of all Exploration Results is not practicable,

Parameter	Consideration Description
	representative reporting should be practiced to avoid misleading reporting of Explor
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported includi geological observations; geophysical survey results; geochemical survey results; gr and rock characteristics; potentially deleterious or contaminating substances
Audits or reviews	• The results of any audits or independent reviews of exploration data, models
Further Work	• The nature and scale of planned further work (e.g. tests for lateral extensions large-scale stepout drilling).

Parameter	Consideration Description

Estimation and Reporting of Geothermal Resources

Parameter	Consideration Description	Con
Expected use	• Nature of the anticipated Geothermal Resource exploitation including any assumptions made	For will Furt and If fro will the
Data integrity	• Source and reliability of all relevant Geothermal Resource data	The Refe Aus

Parameter	Consideration Description

	Measures taken to ensure data described has not been corrupted between initial models/calculations Data validation process
Data interpretation	Confidence in (or conversely the uncertainty of) any interpretation of geological, g data to be used in the Geothermal Resource estimation The effect, if any, of alternative interpretation/s upon Geothermal Resource estim
Well deliverability	Must be demonstrated if Geothermal Resource/s to be regarded as Measured Whether the project will rely on pumping or self-discharging wells Information on expected parasitic power requirement for production or injection p
Estimation and modelling techniques	The nature and appropriateness of the estimation technique(s) applied and key a The availability of previous production records and whether such data is conside Any assumptions regarding the correlation of variables The process of validation, the checking process used and the reconciliation of mo the verification of significant results by application of alternative techniques and/o

Parameter	Consideration Description
Cut-off parameters	• The basis for any adopted cut-off temperatures, flow rates or quality parameters (e.g. rese porosity, well deliverability etc.) applied, preferably related to a known technology pathway
Recovery factors	• Must be explicitly stated and justified
Conversion efficiency	If used, expected conversion efficiency for converting heat into electricity Methodology used for determination of conversion efficiency including an explanation of the tech pathway and justification of any assumptions made
Dimensions	• The extent and variability of the estimated Geothermal Resource expressed as surface are below surface including an

Parameter	Consideration Description
	explanation of the basis for any interpretations of reservoir geometry
Geothermal resource life	The expected life of the Geothermal Resource based upon available modelling and anticipated d Nature, quality and appropriateness of methods used for Geothermal Resource-life modelling inc assumptions Estimation of deleterious elements (e.g. short circuiting, scaling etc.

Classification	The basis for the classification of the Geothermal Resource into varying confidence categories Whether appropriate account has been taken of all factors Whether the results appropriately reflect the views of the Competent Person

Parameter	Consideration Description
Third party involvement	• Acknowledgement of possibly conflicting developments by other par
Audits or reviews	• The results of any audits or reviews of the Geothermal Resource es
Balanced and impartial reporting	Where possible reporting should be comprehensive Where comprehensive reporting of all Geothermal Resource estimation is reporting should be practiced to avoid misleading reporting of Geothermal
Discussion of relevant accuracy/confidence	Where appropriate a statement of the relative accuracy and/or confidence estimate using an approach or procedure deemed appropriate by the Com application of sensitivity analysis, probabilistic analysis or use of scenario t not deemed appropriate, a qualitative discussion of the factors which could confidence of the estimate The statement should specify whether it relates to the whole or partial Geo clearly state the
Parameter	Consideration Description
	extents along with assumptions made and procedures used • These statements of relative accuracy and confidence of the estima production data, where available
Qualifications and accountability	• A statement of the qualifications, experience and accountability of th assessment

Estimation and Reporting of Geothermal Reserves (Not Applicable) Additional Factors: Existing Developments

Parameter	Consideration Description

Production data	Production data on past total heat and fluid extraction and reinjection Pressure, temperature, enthalpy and chemical historical trends both for individual wells and th Geothermal Resource, together with any interpretations in terms of reservoir processes and th hydrogeological conceptual model Any assessments of heat and fluid recharge
Reservoir monitoring	• Methods used and an assessment of data quality for reservoir monitoring, including but not limited to: o Surface and downhole pressure a temperature measurements Fluid flows and enthalpy measurements o Tracer tests o Well output tests Thermal activity and heat flow monitoring Ground deformation monitoring o Microgravity monitoring o Environmental monitoring
Production history	• History of Geothermal Resource usage including numbers and locations of wells used fo and reinjection, especially in relation to observed reservoir changes
Numerical modelling	• Numerical simulation modelling should be used at this stage as soon as sufficient produ • available to do so in meaningful fashion • Good history matchings should be achieved for credibility Should include a detailed description of all scenarios modelled and bear a close relationship to the actual existing or proposed development scheme
Development scenarios	• Future Geothermal Resource usage scenarios

2. ANNEXURE 2 - JORC Code 2012 Table 1 - MANNHEIM

SAMPLING TECHNIQUES AND DATA

Criteria	JORC Code Explanation

Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry s measurement tools appropriate to the minerals under investigation, such as down hole gamma s handheld XRF instruments, etc). These examples should not be taken as limiting the broad mea sampling. Include reference to measures taken to ensure sample representivity and the appropriate calibra measurement tools or systems used. Aspects of the determination of mineralisation that are Material to the Public Report. In cases wh standard' work has been done this would be relatively simple (eg. 'reverse circulation drilling was obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In o more explanation may be required, such as where there is coarse gold that has inherent samplin Unusual commodities or mineralisation types (eg. submarine nodules) may warrant disclosure of detailed information.
Drilling techniques	• Drill type (eg core, reverse circulation, openhole hammer, rotary air blast, auger, Bangka, s and details (eg core diameter, triple
Criteria	JORC Code Explanation
	or standard tube, depth of diamond tails, facesampling bit or other type, whether core is oriented by what method, etc.).
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 occurred due to preferential loss/gain of fine/coarse material.
Logging	Whether core and chip samples have been geologically and geotechnically logged to a level of d support appropriate Mineral Resource Estimation, mining studies and metallurgical studies. Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photogra The total length and percentage of the relevant intersections logged.

Criteria	JORC Code Explanation

Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all cores ta If non-core, whether riffled, tube sampled, rotary split, etc and wheth For all sample types, the nature, quality and appropriateness of the Quality control procedures adopted for all subsampling stages to ma Measures taken to ensure that the sampling is representative of the instance results for field duplicate/second-half sampling. Whether sample sizes are appropriate to the grain size of the mater
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and l the technique is considered partial or total.

Criteria	JORC Code Explanation
	For geophysical tools, spectrometers, handheld XRF instruments, etc, the param the analysis including instrument make and model, reading times, calibrations fa derivation, etc. Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, and whether acceptable levels of accuracy (i.e. lack of bias) and precision have
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative c The use of twinned holes. Documentation of primary data, data entry procedures, data verification, data sto electronic) protocols. Discuss any adjustment to assay data.
Location of data points	Accuracy and quality of surveys used to locate drill holes (collar and down-hole s workings and other locations used in Mineral Resource Estimation. Specification of the grid system used. Quality and adequacy of topographic control.
Data spacing and distribution	Data spacing for reporting of Exploration Results. Whether the data spacing, and distribution is sufficient to establish the degree of continuity appropriate for the

Criteria	JORC Code Explanation
	Mineral Resource and Ore Reserve Estimation procedure(s) and c • Whether sample compositing has been applied.

Orientation of data in relation to geological structure	• Whether the orientation of sampling achieves unbiased sam to which this is known, considering the deposit type.

Criteria	JORC Code Explanation
	• If the relationship between the drilling orientation and the orientation of key mineralised structu considered to have introduced a sampling bias, this should be assessed and reported if material.

Criteria	JORC Code Explanation
Sample security	• The measures taken to ensure sample security.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.

REPORTING OF EXPLORATION RESULTS

Criteria	JORC Code Explanation

Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environm The security of the tenure held at the time of reporting along with any known i licence to operate in the area.
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.

Criteria JORC Code Explanation	Commentary
	data developed in support of non-Vulcan Group initiatives and evaluations is present. accessed to the maximum degree possible by Vulcan Group for application in its own development programs. Historical brine geochemical analytical results include historical analysis from the Landau, Insheim, Soultz, Brühl, and Vendenheim geothermal sites from 2019 to 2021 are presented in referenced journal manuscripts, or acquired from the operators, and CP reviewed the analytical protocols which are considered standard in the field of bri conducted at university-based and/or accredited laboratories. The historical geochem used as background information and was also used as part of the Mineral Resource E For Mannheim, the mean Li concentration from Brühl Gt1 and Bruchsal GB 2 have be most representative considering the geographical position and structural setting of Ma Phase 1 and in close proximity to the eastern graben shoulder. From the nearest geothermal offset well Brühl GT1 a production test brine sample is a corrected lithium value is 155 ± 3 mg/l i.e. equal to the concentration of the Bruchsal The long-term mean Li concentration of Bruchsal Buntsandstein brine is 155 mg/l ± 4 representative for the fluid of production well GB 2. All samples had been professiona GeotIS and GeORG data were evaluated and used to support construction of the 3D in Vulcan Group's current Mineral Resource Estimates. GeotIS and GeORG are digit with emphasis on geothermal energy. They provide access to extensive compilations profiles, information, and interpreted schematic cross sections from the evaluation of emphasis on deep stratigraphy and aquifers in Germany. The raw data, such as seis available, as they are owned by the respective energy companies, but data profiles h interpreted for inclusion in the representative geo-dataset information systems. Detailed studies of data from geothermal well Brühl GT-1 which was drilled in 2013, w Vulcan Group in 2019-2020 to better understand the

Criteria	JORC Code Explanation	Commentary
		hydrogeological characteristics of the fault/f dataset included detailed lithological log an (resistivity image, caliper), DSI-GPITPPS-G UBI-GR (acoustic image). Vulcan Group co characterise this well data.

Geology • Deposit type, geological setting and style of mineralisation.	The lithium mineralisation in the URVBF is s Permocarboniferous Rotliegend Group, the Triassic Buntsandstein Group, and the Midd (collectively, the Permo-Triassic strata) san 2,165 and 4,004 m below surface. The Permo-Triassic strata are comprised pr carbonates, and anhydrites, deposited in ar sedimentary environments. The various facies exert controls on the por sub-units. Within the Permo-Triassic strata, fault, fracture and microfracture zones that a Lithium mineralisation occurs in the brine th With respect to a deposit model, the lithium geothermal fluid-rock geochemical interactio in NaCl-dominated brine. Lithium enrichmen hot crystalline basement fluids and/or disso New 3D seismic was run in 2022/2023 withi interpreted. This new data enhanced previo the Mannheim area. Additional fault zones w In the opinion of the Mineral Resources CP is reasonable in terms of identifying the spa

Criteria	JORC Code Explanation
Drill hole Information	A summary of all information material to the understanding of the exploration results including a tabulation 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 detract from the understanding of the report, the Competent Person should clearly explain why this is the case.

Criteria	JORC Code Explanation
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or m truncations (eg cutting of

Criteria	JORC Code Explanation
	high grades) and cut-off grades are usually Material a Where aggregate intercepts incorporate short lengths results, the procedure used for such aggregation sho aggregations should be shown in detail. The assumptions used for any reporting of metal equ
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the r If the geometry of the mineralisation with respect to t reported. If it is not known and only the down hole lengths are (eg 'down hole length, true width not known').

Diagrams	• Appropriate maps and sections (with scales) a significant discovery being reported These should inc locations and appropriate sectional views.
Balanced reporting	• Where comprehensive reporting of all Explorat of both low and

Criteria	JORC Code Explanation
	high grades and/or widths should be practiced to avoid misleading reporting of Expl
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported includi geological observations; geophysical survey results; geochemical survey results; bu method of treatment; metallurgical test results; bulk density, groundwater, geotechn characteristics; potential deleterious or contaminating substances.
Further work	The nature and scale of planned further work (eg tests for lateral extensions or dept large-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main g and future drilling areas, provided this information is not commercially sensitive.

Criteria	JORC Code Explanation

ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	JORC Code Explanation
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or k between its initial collection and its use for Mineral Resource Estimation purposes. Data validation procedures used.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those v If no site visits have been undertaken indicate why this is the case.

Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral d Nature of the data used and of any assumptions made. The effect, if any, of alternative interpretations on Mineral Resource Estimation. The use of geology in guiding and controlling Mineral Resource Estimation. The factors affecting continuity both of grade and geology.

Criteria	JORC Code Explanation
Dimensions	• The extent and variability of the Mineral Resource expressed as length (alo plan width, and depth below surface to the upper and lower limits of the Mineral F
Estimation and modelling techniques	The nature and appropriateness of the estimation technique(s) applied and key a treatment of extreme grade values, domaining, interpolation parameters and max extrapolation from data points. If a computer assisted estimation method was cho computer software and parameters used. The availability of check Estimates, previous Estimates and/or mine production re Mineral Resource Estimate takes appropriate account of such data. The assumptions made regarding recovery of byproducts. Estimation of deleterious elements or other nongrade variables of economic sign mine drainage characterisation).

Criteria JORC Code Explanation Cor

In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.
Any assumptions behind modelling of selective mining units.
Any assumptions about correlation between variables.
Description of how the geological interpretation was used to control the resource Estimates.
Discussion of basis for using or not using grade cutting or capping.
The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.

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Criteria JORC Code Explanation Commentary

offs for effective fluid flow within reservoirs (Canadian Oil and Gas Evaluation Handbo
1994) achievable because of the availability of production data from producing geothe
wells within the URVBF (Landau 207, 211, Appenhofen, Römerberg A to E). For the I
sediments in the URVBF, a porosity cut-off of 5 %, equivalent to a permeability cut-of
reasonable for significant fluid flow to occur. Net thickness is then determined from th
applying the 5 % effective porosity cut-off to the gross interval thickness. Determinatio
average lithium concentration (C) for each licence, based on Vulcan Group's brine sa
interpretation program. Determination of average grade (C) is discussed under "Data
in Section 2 of this JORC Table. o Spreadsheet compilation of all volumes and applic
followed by resource calculation, according to the equation noted above.
o Confirmation of reasonable prospects of eventual economic extraction for the identi
The current Mineral Resource Estimation for Mannheim replaces and supersedes the
estimates.
The only element being estimated is lithium, and consideration of deleterious element
of this Project and Mineral Resource Estimate. Determination of such factors is deper
specific mineral processing and lithium recovery flowsheet assessments and compreh
Based on the lithium extraction piloting that Vulcan Group has conducted since April 2
elements have been noted which have a materially negative effect on Vulcan Group's
extraction process.
The average lithium-in-brine concentration used in the Mineral Resource Estimations
No top cuts or capping upper limits have been applied, or are deemed to be necessar
brine deposits typically do not exhibit the same extreme values as precious metal dep
applicable to the Permo-Triassic aquifer lithium brine data in this study.
A cut-off grade / resource quantity analysis was not strictly applicable to the resource
average grade in the static resource estimate. However,

Criteria JORC Code Explanation

Moisture	• Whether the tonnages are estimated on a dry basis or with natural moisture determination of the moisture content.
Cut-off parameters	• The basis of the adopted cut-off grade(s) or quality parameters applied.
Mining factors or assumptions	• Assumptions made regarding possible mining methods, minimum mining di if applicable, external) mining dilution. It is always necessary as part of the proces reasonable prospects for eventual economic extraction to consider potential minin assumptions made regarding mining methods and parameters when estimating M always be rigorous. Where this is the case, this should be reported with an explan mining assumptions made.
Metallurgical factors or assumptions	• The basis for assumptions or predictions regarding metallurgical amenabilit part of the process of determining reasonable prospects for eventual economic ex potential metallurgical methods, but the assumptions regarding metallurgical treat parameters made when reporting Mineral

Criteria	JORC Code Explanation
	Resources may not always be rigorous. Where this is the case, this should be re of the basis of the metallurgical assumptions made.
Environmental factors or assumptions	• Assumptions made regarding possible waste and process residue dispos necessary as part of the process of determining reasonable prospects for eventu consider the potential environmental impacts of the mining and processing oper determination of potential environmental impacts, particularly for a greenfields P well advanced, the status of early consideration of these potential environmenta Where these aspects have not been considered this should be reported with an environmental assumptions made.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If d used, whether wet or dry, the frequency of the measurements, the nature, size a samples. The bulk density for bulk material must have been measured by methods that ac spaces (vugs, porosity, etc), moisture and differences between rock and alterati

Criteria	JORC Code Explanation
	• Discuss assumptions for bulk density estimates used in the evaluatio materials.

Classification	The basis for the classification of the Mineral Resources into varying confic Whether appropriate account has been taken of all relevant factors (ie rela estimations, reliability of input data, confidence in continuity of geology anc and distribution of the data). Whether the result appropriately reflects the Competent Person's view of tl

Criteria	JORC Code Explanation
Audits or reviews.	• The results of any audits or reviews of Mineral Resource Estimates.
Discussion of relative accuracy/confi dence	Where appropriate a statement of the relative accuracy and confidence lev Estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatisti relative accuracy of the resource within stated confidence limits, or, if such appropriate, a qualitative discussion of the factors that could affect the rela the estimate. The statement should specify whether it relates to global or local estimates tonnages, which should be relevant to technical and economic evaluation. assumptions made and the procedures used. These statements of relative accuracy and confidence of the estimate shou data, where available.

[1] Vulcan Group refers to Vulcan and one or more of its subsidiaries.

[2] This consists of the Indicated Resource increasing from 288kt LCE @ 153 mg/Li to 820kt LCE @ 155 mg/Li and the Inferred Resource increasing from 1,545kt LCE @ 153 mg/Li to 2,405kt LCE @ 155 mg/Li.

[3] See also the Competent Person Statement in this announcement.

[4] On a lithium carbonate equivalent (LCE) basis, according to public information, as estimated and reported in accordance with the JORC Code 2012. See Appendix 4 of Vulcan's Equity Raise Presentation dated 11 December 2024 for comparison information.